

SERVICE MANUAL

AIRSTAGE™ VR-II

Variable Refrigerant Flow System

Simultaneous cooling & heating operation with
Heat Recovery System



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6. DISASSEMBLY PROCESS



AIRSTAGE™ VR-II

Variable Refrigerant Flow System

1. TEST RUN

1. TEST RUN

1-1 EXECUTION PROCEDURE AND EXECUTION PRECAUTIONS

Before execution

	Execution procedure and precautions	Reason
Execution zone decision		
Confirmation of refrigerant used	① Check the characteristics of the refrigerant used and grasp the special features of the refrigerant. If refrigerant must be charged, always charge the refrigerant specified for the product. R410A 609psi (4.20MPa)	• Use of a refrigerant other than the specified refrigerant will invite equipment trouble.
Preparation of execution drawings		
Confirmation of installation site	① Use new refrigerant piping of the thickness specified by the D&T manual. ② Since R410A dedicated tools are necessary, prepare them in advance. ③ Absolutely avoid use of existing piping. If use of existing piping is unavoidable, the piping must be cleaned.	• Secure the necessary pressure resistance.
Preparations before execution		

Execution

Sleeve and insert work	Always use a level and keep the indoor unit level. If the equipment is tilted toward the drain port, install it so that the tilt is within 10mm. Excessive tilt will cause water leakage.	• Prevention of water leakage
Indoor unit installation	When performing piping work, observe the following items so that the inside of the piping is clean and air tight. ① Use pipe that is not dirty inside. ② When the pipe is left standing, protect it. ③ Finish flaring exactly. ④ Confirm the width across flats dimension and shape of flare nuts. ⑤ Always blow nitrogen while brazing. ⑥ Perform flushing before connecting the equipment.	• Foreign matter, water, etc. in the piping will cause faulty cooling and compressor trouble. • Refrigerant leakage will cause low performance and abnormal stopping.
Refrigerant piping work		
Drain piping work		
Duct work		
Heat insulation work		
Electrical work		
Foundation work for products	① Always make the downward slope of the drain pipe 1/100 or greater and make the horizontal length within 66ft.(20m). ② Use hard polyvinylchloride pipe as the drain pipe. ③ Support the drain pipe between 59-1/16 in(1.5m) to 6-3/4 in (2.0m). ④ Use pipe of 1 rank up (VP30 or greater) as central piping.	• Prevention of water leakage
Products installation work <small>*Refer to warning or caution in the attached installation manual of each products</small>	Select the size of the heat insulating material according to the ambient temperature and relative humidity of the refrigerant. Use a heat insulating material having a heat conductivity of 0.043W/(m·k) or less.	• Prevention of water leakage
Refrigerant piping connection work	When making flare connections always use a torque wrench and tighten the flare nut positively to the specified torque.	• Refrigerant leakage will cause low performance and abnormal stopping.
Air tightness test	Pressurize the product with nitrogen gas up to the design pressure and conduct a 24Hr air tightness test.	• Refrigerant leakage will cause low performance and abnormal stopping.
Vacuum drying	① Install a vacuum pump with reverse flow check mechanism or a reverse flow check adaptor to a conventional vacuum pump and use. ② Pump down sufficiently. Approximately 1 hour or longer after 500 micron (-100.7kPa) reached. Allow to stand for approximately 1 hour after stopping the vacuum pump and confirm that the needle does not return. ③ Air purging using refrigerant is strictly prohibited.	• Mixing in of vacuum pump oil by reverse flow will cause equipment trouble. • Prevents degradation of the oil by completely removing water and air. *recommend the vacuuming mode

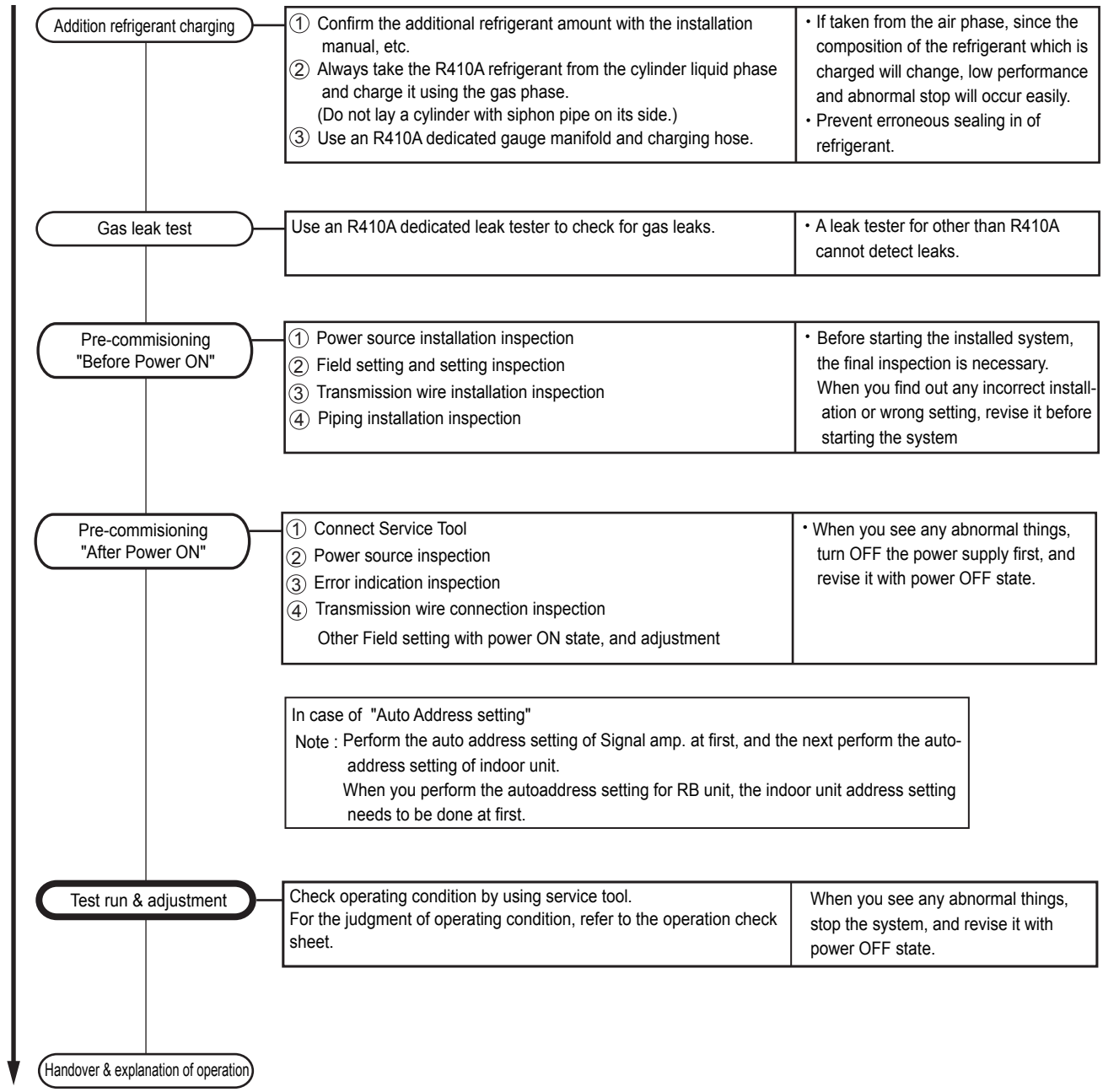
* Vacuuming mode

This function is used for vacuuming the indoor unit and the connection piping.
 Note: For starting Vacuuming mode, the refrigerant address setting has to be finished.

When the [vacuuming mode] is set, <Push switch setting, F3:21> EEV of connected all indoor units opens.
 So, the vacuuming indoor unit and piping becomes easier.

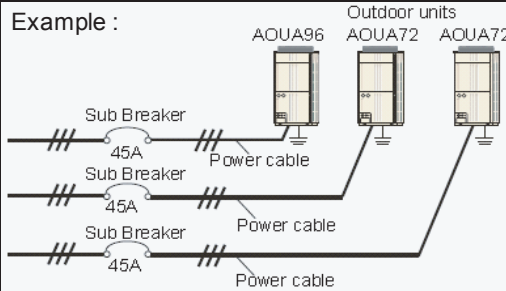
When the vacuuming ends, please turn off the power supply for all of the indoor units, RB units and outdoor unit, [vacuuming mode] is released.

Execution

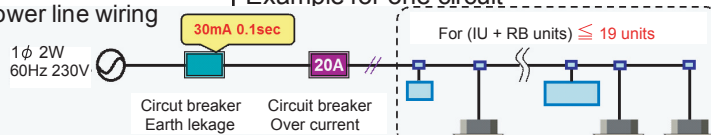


1-2 Check Items Before Power ON

1-2-1 Power source Inspection sheet

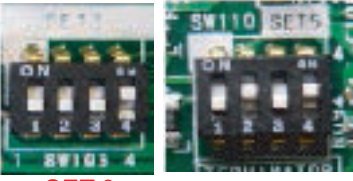
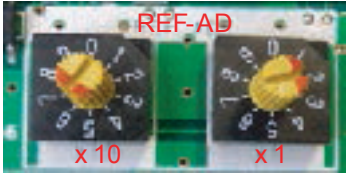
Check Item	Check contents	Judgement	Present Status	
Ref. circuit name: _____				
Power Source	Outdoor Unit	Power supply	3 ϕ / 3W / (208-230V \pm 10%) / 60Hz <input type="checkbox"/> Yes / <input type="checkbox"/> No	
		Circuit Breaker Size (A)	<ul style="list-style-type: none"> For AJUA72G : 45A For AJUA90G / 120G : 55A 	Master (AJUA __G) : ____ (A) Slave-1(AJUA __G): ____ (A) Slave-2(AJUA __G): ____ (A)
			Leakage current : 100mA, 0.1 sec or less	<input type="checkbox"/> Yes / <input type="checkbox"/> No
		Power Line Wire Size (mm ²)	Check the breaker capacity vs. wire size	Master: ____ (AWG) Slave-1: ____ (AWG) Slave-2: ____ (AWG)
		Power line Wiring Note: One Outdoor Unit must have one individual Circuit Breaker	Example : 	<input type="checkbox"/> Complied <input type="checkbox"/> Not complied

* Note: Regulation of wire size and circuit breaker differs from each locality, please refers in accordance with local rule

Check Item	Check contents	Judgement	Present Status	
Ref. circuit name: _____				
Power Source	Indoor Unit & RB Unit	Power supply	1 ϕ / (208-230V \pm 10%) / 60Hz <input type="checkbox"/> Yes / <input type="checkbox"/> No	
		Circuit Breaker Size (A) (Check, Leakage current vs. number of IUs & RB units)	<ul style="list-style-type: none"> 20A breaker for one circuit Leakage current as follows: No. of units vs. leakage current: 30mA for number of unit \leq 44 units 100mA for 45 \leq number of units \leq 128 units (Units means Indoor unit + RB unit) Note: MCA for total connected units (IU + RB) less than 15A for 20A breaker capacity MCA means, minimum circuit ampere	Circuit number -1 Breaker capacity: ____ (A) Nos. of Connected units: ____ (IU+RB) Circuit number -2 Breaker capacity: ____ (A) Nos. of connected units: ____ (IU+RB) Circuit number -3 Breaker capacity: ____ (A) Nos. of Connected units: ____ (IU+RB)
		Power line wire size	Check the breaker capacity vs. wire size	____ (AWG)
		Power line wiring	Example for one circuit 	<input type="checkbox"/> Complied <input type="checkbox"/> Not complied

* Note: Regulation of wire size and circuit breaker differs from each locality, please refers in accordance with local rule

1-2-2 Outdoor unit field setting inspection sheet

Check Item		Check contents	Judgement	Present Status	
No. of outdoor unit for one ref. circuit: _____, Ref. circuit name: _____					
Outdoor Unit	Outlook	Appearance	Shall be no deformation	<input type="checkbox"/> OK / <input type="checkbox"/> NG	
		Serial No.	Master: _____ Slave -1: _____ Slave -2: _____		
		Power source & transmission wiring	Connection points & loose screws check	<input type="checkbox"/> OK / <input type="checkbox"/> NG	
		Connection piping	Is it insulated properly without gap?	<input type="checkbox"/> OK / <input type="checkbox"/> NG	
		Outdoor air temperature	Checked & entered the value	(°C)	
	Setting	• DIP-SW setting  SET-3 SET-5  REF-AD x 10 x 1 • Rotary-SW setting	OU Address (SET 31 & SET 3 -2) Note: setting for Master & Slave units (Default : OFF - OFF)	Master (OFF - OFF)	<input type="checkbox"/> Y / <input type="checkbox"/> N
			No. of Slave Unit (SET 3-3 & SET 3-4) Note: setting for Master unit only (Default : OFF - OFF)	Slave1 (OFF - ON)	<input type="checkbox"/> Y / <input type="checkbox"/> N
				Slave2 (ON - OFF)	<input type="checkbox"/> Y / <input type="checkbox"/> N
				NO Slave (OFF - OFF)	<input type="checkbox"/> Y / <input type="checkbox"/> N
			No. of OU (SET 5 -1 & SET 5 -2) Note: setting for Master & Slave units (Default : OFF - OFF)	1 x Slave (OFF - ON)	<input type="checkbox"/> Y / <input type="checkbox"/> N
				2 x Slave (ON - OFF)	<input type="checkbox"/> Y / <input type="checkbox"/> N
				1 x OU (OFF - OFF)	<input type="checkbox"/> Y / <input type="checkbox"/> N
			Terminal Register (SET 5 -4) Note : setting for Master units	2 x OU (OFF - ON)	<input type="checkbox"/> Y / <input type="checkbox"/> N
				3 x OU (ON - OFF)	<input type="checkbox"/> Y / <input type="checkbox"/> N
Ref. Add. (among Master & Slave units)	Ref ADx10 & Ref ADx1	<input type="checkbox"/> Y / <input type="checkbox"/> N			

1-2-3 Indoor unit field setting inspection sheet

Check contents													
Ref. circuit name: _____, Ref. address: ____ (00 ~ 99)													
Model Name & Serial No.	Outlook				Function setting by DIP-SW (Off / On)					Add. Setting (by Rotary-SW)			
	Access hole for maintenance (For Duct type & Cassette type units)	RC wiring connection points: (loose / deform)	Refrigerant pipes insulation	Drain pipes installation	Wired RC setting (DIP SW 1-1) (default: 2 wire / 3 wire)	External Input (edge/pulse) SET 2-2 (default: OFF)	Wireless RC custom code SET 3-1 (default: OFF)	Wireless RC custom code SET 3-2 (default: OFF)	Drain Pump SW (for Slim duct) SET 4-1 (default: OFF)	Wireless RC custom code SET 3-2 (default: OFF)	Ref. Add. (REF AD x 0)	Ref. Add. (REF AD x 1)	IU Add. (IU AD x 0)
	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N				
	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> Y / <input type="checkbox"/> N				
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1-2-4 RB unit field setting Inspection sheet

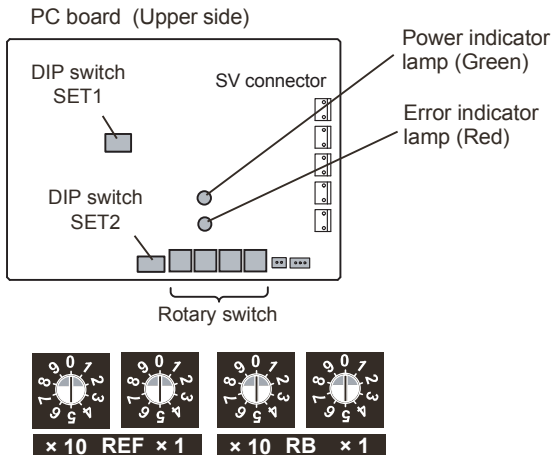
RB Unit	Check contents										
Ref. circuit name: _____, Ref. address : __ (00 ~99)											
Model Name	Outlook			RB unit Add. set by Rotary-SW				Related Indoor Unit Address	No. of connected IU vs. total capacity		
	Transmission & Power line wiring connection (Loose / Tilting)	Access hole for maintenance (Have / Not have)	Refrigerant piping insulation	Ref. Add. (REF AD x 9)	Ref. Add. (REF AD x -)	RB Add. (IU AD x 9)	RB Add. (IU AD x -)		For single type RB unit		For multi type RB unit (single / series connection)
									Number of Connected IUs	Total capacity (kW) of the connected IUs	Number of Connected IUs



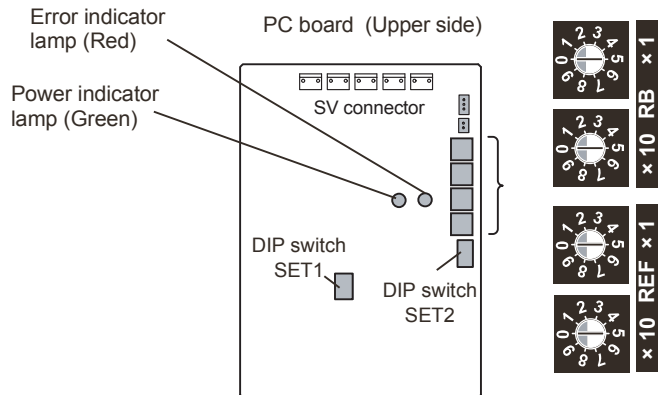
RB unit (single type)	Indoor units / Branch	Total capacity
UTP- RU01AH	Maximum 3 units	8.0 kW or less
UTP- RU01BH	Maximum 8 units	18.0 kW or less
UTP- RU01CH		28.0 kW or less

RB unit (multi type)	Number of RB units	Indoor unit / Branch	Capacity	
			Each Branch	Total
UTP-RU04BH	1 unit	Maximum 8 units	Up to 18.0kW	Up to 56.0kW
	2 units series			

Single type RB unit

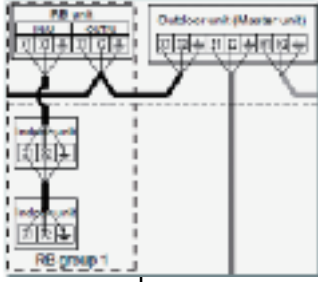


Multi type RB unit



1-2-5 Transmission wire installation inspection sheet 1/3

Check Item	Check contents	Judgement	Present Status	
Number of ref. circuit connected in the network system: _____, Ref. addresses: _____(00 - 99)				
VRF Network System	Transmission wire	Outlook	Is it LonWorks compatible? Maker name?	<input type="checkbox"/> Yes / <input type="checkbox"/> No
		Wire specification	0.33mm ² , shield wire	(AWG)
	Transmission line connection points	For cooling only IU Between RB unit & IU	Must be properly connected (Between RB unit & IU) RB unit 【Terminal (OUT/U) : X1, X2, Earth】 IU 【Terminal (IN/U) : X1, X2, Earth】	<input type="checkbox"/> Yes / <input type="checkbox"/> No
		For Heat Recovery IU Between RB unit & IU	Must be properly connected (Between RB unit & IU) RB unit 【Terminal (IN/U) : X1, X2, Earth】 IU 【Terminal (IN/U) : X1, X2, Earth】	<input type="checkbox"/> Yes / <input type="checkbox"/> No
		Between RB unit & Master OU	Must be properly connected (Between RB unit & Master OU) RB unit 【Terminal (OUT/U) : X1, X2, Earth】 Master OU 【Terminal (RB/U) : X1, X2, Earth】	<input type="checkbox"/> Yes / <input type="checkbox"/> No
		Between Master OUs	Must be properly connected (Between Master OUs) Master OUs 【Terminal: Z1 & Z2】	<input type="checkbox"/> Yes / <input type="checkbox"/> No
		Between Master OU & Slave OU or In between Slave OUs	Must be properly connected (Between Master OU and Slave OU / Slave OU and Slave OU) 【Terminal: H1 & H2】	<input type="checkbox"/> Yes / <input type="checkbox"/> No
		Shield wire connection	Both ends of shield wire must be grounded	<input type="checkbox"/> Yes / <input type="checkbox"/> No
		Wiring connection	Wiring connection per terminal (≤2)	<input type="checkbox"/> Yes / <input type="checkbox"/> No



Check Item	Check contents	Judgement	Present Status
Number of ref. circuit connected in the network system: _____, Ref. addresses: _____(00 ~ 99)			
Transmission line	Transmission line layout (Between RB unit & IU)	<p>Correct Layout</p> <p>Not Correct Layout Example - 1</p> <p>Not Correct Layout Example - 2</p> <p>Not Correct Layout Example - 3</p>	<input type="checkbox"/> Correct <input type="checkbox"/> Not correct <p>If not correct, pls. rectify the connection</p>
	Reference: (Piping Layout)	<p>Reference:</p> <p>Reference:</p>	

1-2-5 Transmission wire installation inspection sheet 2/3

Check Item	Check contents	Judgement	Present Status
Number of ref. circuit connected in the network system: _____, Ref. addresses: _____ (00 ~ 99)			
Transmission line	<p>Transmission line layout (Between RB unit & IU)</p> <p>Reference: (Piping Layout)</p> <p>Reference: From outdoor unit RB To indoor unit</p>	<p>Correct Layout</p> <p>Not Correct Layout Example - 1</p> <p>Not Correct Layout Example - 2</p> <p>Not Correct Layout Example - 3</p> <p>Not Correct Layout Example - 4</p>	<input type="checkbox"/> Correct <input type="checkbox"/> Not correct <p style="color: red;">If not correct, pls. rectify the connection</p>

Check Item	Check contents	Judgement	Present Status
Number of ref. circuit connected in the network system: _____, Ref. addresses: _____ (00 ~ 99)			
VRF Network System	Network wiring	Total transmission line length	Wiring length \leq 11811ft.(3600m) (Value taken from Network Design Drawing) (m)
		Network wiring layout	Do not make a loop configuration <input type="checkbox"/> Looped / <input type="checkbox"/> Not looped
		No. of network segment (*1)	No. of network segment \leq 41

(*1) Create one Network Segment based on the following conditions,

Condition -1: if the transmission line length \leq 1640ft.(500m)

Condition -2: if a total number of connected units \leq 64 connected units (*2)

(*2)connected units mean a total of (Indoor Units + Master Outdoor Units + RB Units (*3)+ TPC Units + System Controller Units
Network Converter for LonWorks Unit + Central RC Units + Network Converter Units +
BACnet Gateway Unit + Signal Amplifier Units + Service Tool Unit + Web Monitoring Tool Unit)

(*3)for single type RB Unit, count as '0', for multiple type RB Unit, when all ports are connected with Indoor Unit, count as '0'.
However, if one of the port of the multiple type RB Unit is not connected with Indoor Unit, at that time count as one RB Unit.

1-2-5 Transmission wire installation inspection sheet 3/3

Check Item	Check contents	Judgement	Present Status		
Number of ref. circuit connected in the network system : _____, Ref. addresses : _____ (00 ~ 99)					
VRF Network System	Network Configuration	No. of IUs & OUs	For one VRF Network System (IU ≤ 400 & OU ≤ 100)	IU number : _____ OU number: _____	
		No. of System Controller	One System Controller per VRF Network System		
		No. of Touch panel controller (TPC)	Connectable Nos. 16	Total 16 Nos. Per VRF Network System (including one Network Converter for LonWorks)	TPC: _____
		No. of Central RC (CRC)	Connectable Nos. 16		CRC: _____
		No. of Network Convert for Group RC	Connectable Nos. 64		Group RC: _____
		No. of Signal Amplifier (SA) ≤ 40 Detail contents • No. of SA (filter mode OFF) ≤ 8 • No. of SA (filter mode ON) ≤ 32	<ul style="list-style-type: none"> One per 1640ft.(500m) transmission line length OR, One per 1312ft.(400m) transmission line length between units OR, One per every 64 number of connected units OR, One per every master OU if total number of connected IndoorUnits > 320 	Number of Signal Amplifier : _____	
		No. of Network Convertor (≤ 100)	One for each separate Room-Air conditioning system	Total: _____	
		No. of BACnet Gateway	One BACnet Gateway per VRF Network System	Total: _____	
		Terminal Register	One per Network Segment (refer to table -9)	Total: _____	
		No. of Network Convertor for LonWorks	One per VRF Network System (IU ≤ 128 & OU ≤ 100) [NOTE: Special VRF Network system configuration]	IU number : _____ OU number: _____	

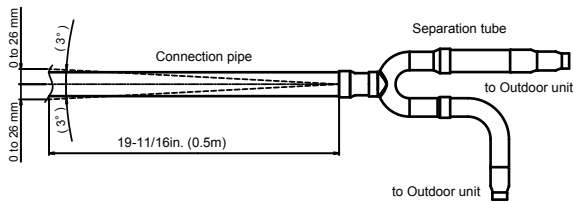
Check Item	Check contents	Judgement	Present Status	
Number of ref. circuit connected in the network system : _____, Ref. addresses : _____ (00~ 99)				
VRF Network System	Terminal Resistance of transmission line	Terminal resistance of transmission line: From device with connected terminal resistance (OU or SA) to the most distance device	50 ohm ≤ (Resistance value) ≤ 180 ohm	<input type="checkbox"/> OK / <input type="checkbox"/> Not OK In-between OU (add____) & SA (add____)
				<input type="checkbox"/> OK / <input type="checkbox"/> Not OK In-between SA (add____) & RB (add____)
				<input type="checkbox"/> OK / <input type="checkbox"/> Not OK In-between OU (add____) & SA (add____)

1-2-6 Piping installation inspection sheet 1/2

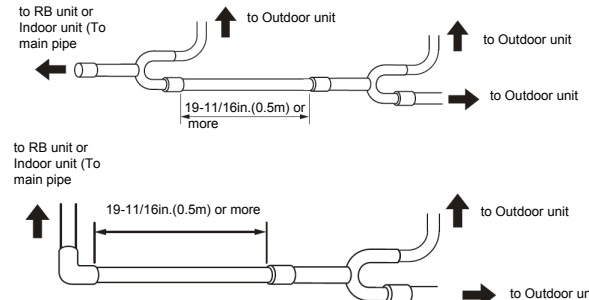
Check Item	Check contents	Judgement	Present Status	
Ref. circuit name : _____, Ref. address: _____ (00~99)				
Refrigerant system piping	Outlook	Insulation & Fastening	Insulated without gap & properly fastened (Yes / No)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
		Suction line filter	Is there any external filter in the suction line	<input type="checkbox"/> Yes / <input type="checkbox"/> No
		Oil Trap	If Distance between OUs 2m , Place oil trap both at suction & at Discharge line	<input type="checkbox"/> Yes / <input type="checkbox"/> No <input type="checkbox"/> Not applicable
	Piping	Actual Pipe Length	Between Master OU and farthest IU ($\leq 541\text{ft./165m}$)	(feet)
			Between first separation tube and farthest IU ($\leq 197\text{ft./60m}$)	(feet)
			Total Pipe Length ($\leq 3280\text{ft./1000m}$)	(feet)
			Between OU and OU branch kit ($\leq 9\text{ft./3m}$)	(feet)
			Between farthest OU and first OU branch kit ($\leq 39\text{ft./12m}$)	(feet)
			Between RB units (for multi type RB series connection) ($\leq 3\text{ft./1m}$)	(feet)
		Height Difference	Between OU and IU (when OU is installed above) ($\leq 164\text{ft./50m}$)	(feet)
			Between OU and IU (when OU is installed below) ($\leq 131\text{ft./40m}$)	(feet)
			Between IUs ($\leq 49\text{ft./15m}$)	(feet)
			Between OUs ($\leq 1.6\text{ft./0.5m}$)	(feet)
			Between RB units ($\leq 49\text{ft./15m}$)	(feet)
			Between RB unit and IU ($\leq 16\text{ft./5m}$)	(feet)

Other check point of separation tube

Bending of connection pipe toward separation tube.



• Like the figure, adjust the pipe angle so as to be within 3-degree angle.



• Leave the distance 19-11/16 in. (0.5m) or more for straight part to outdoor unit branch kit.

Check Item	Check contents	Judgement	Present Status
Ref. circuit name: _____, Ref. address: _____ (00~99)			
For single type & multi type RB Units	Piping layout (Between RB & IU)	<p>● Existence of additional RB in between RB branch port and indoor unit is prohibited</p>	<input type="checkbox"/> Correct <input type="checkbox"/> Not correct
For multi type RB Unit	Branch port piping layout (RB branch port vs. IU connection pattern)	<p>1) Number of free branch port more than one is prohibited</p>	<input type="checkbox"/> Correct <input type="checkbox"/> Not correct

1-2-6 Piping installation inspection sheet 2/2

Check Item	Check contents	Judgement	Present Status
Ref. circuit name: _____, Ref. address: (_____(00~99))			
For multi type RB Unit	Branch port piping layout (RB branch port vs. IU connection pattern)	<p>2) Connect the IU to the RB unit in order of farthest branch port</p>	<input type="checkbox"/> Correct <input type="checkbox"/> Not correct
		<p>Keep free branch port within 2 or less per refrigerant cycle</p>	<input type="checkbox"/> Correct <input type="checkbox"/> Not correct

Check Item	Check contents	Judgement	Present Status
Ref. circuit name: _____, Ref. address: (_____(00~99))			
For multi type RB Unit	RB series connection	<p>● Maximum two RB units (for multi type) in series is allowable</p>	<input type="checkbox"/> Correct <input type="checkbox"/> Not correct
			<input type="checkbox"/> Correct <input type="checkbox"/> Not correct

1-2-7 Refrigerant charge amount inspection sheet

Check Item		Check contents		Judgement	Present Status
Ref. circuit name: _____,		Ref. address : _____(00~99)			
Additional Charged Refrigerant	Outdoor Unit	OU Model Name		Additional Refrigerant Amount for OU	
		AJUA72G / AJUA90G / AJUA120G		AJ*A72G / AJ*A90G / AJ*108G : 6.31lbs / 3.0kg	(kg)
	Connecting Pipe	Liquid Pipe Length		Additional Refrigerant Amount based on the liquid pipe length	
		@ 6.35mm	(ft)	For pipe diameter ϕ 6.35mm : 0.014 lbs./ft.(0.021 kg/m)	(lbs)
		@ 9.52mm	(ft)	For pipe diameter ϕ 9.52mm : 0.039 lbs./ft.(0.058 kg/m)	(lbs)
		@ 12.7mm	(ft)	For pipe diameter ϕ 12.7mm : 0.077 lbs./ft.(0.114 kg/m)	(lbs)
		@ 15.88mm	(ft)	For pipe diameter ϕ 15.88mm:0.120 lbs./ft.(0.178 kg/m)	(lbs)
@ 19.05mm	(ft)	For pipe diameter ϕ 19.05mm :0.180 lbs./ft.(0.268 kg/m)	(lbs)		
Total Additional Amount of Charged Refrigerant =				(lbs)	

Note: In the refrigerant system, overall refrigerant amount ≤ 77.16 lbs / 35 kg (for 1 OU), ≤ 154.3 lb / 70kg (for 2 OUs) and ≤ 231.5 lbs / 105 kg (for 3 OUs)

Overall refrigerant amount (kg) in the refrigerant system = Factory charged refrigerant (lb/kg) for OU[※] + Total additional amount of charged refrigerant (lb/kg) 【= Additional charged refrigerant for OU + Additional charged refrigerant for connecting pipe】

※ Factory charged refrigerant for outdoor unit :
AJUA72G or AJUA90G or AJUA120G : 26.01lbs.11.8(kg)

1-2-8 3-way valve opening inspection sheet

Check Item		Check contents		Judgement	Present Status
Ref. circuit name: _____,		Ref. address : _____(00~99)			
Outdoor Unit	3-way valves opening	3-way valve of each OU at - Discharge pipe side - Suction pipe side - Liquid pipe side		Master OU (all 3-way valve must be full open)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				Slave1 OU (all 3-way valve must be full open)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				Slave2 OU (all 3-way valve must be full open)	<input type="checkbox"/> Yes / <input type="checkbox"/> No

1-3 Check Items After Power ON

Overview of system operation check procedure

Step-1: Connect Service Tool PC to the VRF VR-II system.

Do scanning of refrigerant system which should be commissioned.

Step-2: Compare the number of installed units (OU, RB Group and IU) with the System List data obtained from the Service Tool.

Step-3: Operate all Indoor Units under Test Mode Cooling (Select Test mode either cool or heat based on ambient temperature.).

Step-3-1: During operation, check the RB unit SV status and IU thermistor value

Step-3-2: After 1-hour operation, check the Refrigerant System

Step-4: After 1-hour Test run operation (excluding special operation),

Step-4-1: Switching the operation mode of IU, in order of RB group number, from cool to heat.

- Check the RB unit SV status and IU thermistor value

Step-4-2: When all IUs run under heating, continue operation minimum 15min. And check the Refrigerant system

1-3-1 Power source check sheet

Check Item		Check contents	Judgement	Present Status
Ref. circuit name _____,		Ref. address _____ (00 ~ 99)		
Power Source	Outdoor Unit	Actual Power Supply (V) Between L1-L2 / L1-L3 / L2-L3 < 3N, 3Wire + ground, 60Hz >	AC (208 - 230V) ± 10% Incoming voltage per breaker	Master (V): R-S: _____ / S-T: _____ / T-R: _____
				Slave -1 (V): R-S: _____ / S-T: _____ / T-R: _____
				Slave -2 (V): R-S: _____ / S-T: _____ / T-R: _____
	Indoor Unit & RB Unit	Actual Power Supply (V) < 1, 2Wire + ground, 60Hz >	AC (208 - 230V) ± 10% Incoming voltage per breaker	Breaker-1 (V): _____
				Breaker-2 (V): _____
				Breaker-3 (V): _____

1-3-2 Error indication check sheet 1/2

Check Contents		Judgement	Present Status
Ref. circuit name _____,		Ref. address _____ (00 ~ 99)	
For each refrigerant system	Outdoor unit		Check PCB Lighting status
	•Master	• LED101 (green light) Judgment : must be ON ⇒ Yes / No	LED101: <input type="checkbox"/> Yes <input type="checkbox"/> No 7-SEG : <input type="checkbox"/> Yes <input type="checkbox"/> No
	•Slave-1	【 Note : LED102 (Red) must not be flash & must not be ON 】 •7-SEG LED	LED101: <input type="checkbox"/> Yes <input type="checkbox"/> No 7-SEG : <input type="checkbox"/> Yes <input type="checkbox"/> No
	•Slave-2	Judgment : 'Sn' displayed ⇒ Yes / No	LED101: <input type="checkbox"/> Yes <input type="checkbox"/> No 7-SEG : <input type="checkbox"/> Yes <input type="checkbox"/> No
	Indoor unit		Check LED & RC display status
	IU address _____ (RB address _____)	Indoor Unit ● For Wall mounted, Universal, Ceiling & Small Cassette Check IU operation LED & timer LED condition Judgment : must be flashing alternately ⇒ Yes / No ● For Large Cassette and Duct type IU Check Wired RC (3-wire) display screen Judgment : Clock display "AM 12:00" will appear ⇒ Yes / No Check Wired RC (2-wire) display screen Judgment : Language selection screen will appear ⇒ Yes / No	<input type="checkbox"/> Yes <input type="checkbox"/> No
	IU address _____ (RB address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	IU address _____ (RB address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	IU address _____ (RB address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	IU address _____ (RB address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	IU address _____ (RB address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	IU address _____ (RB address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	IU address _____ (RB address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	IU address _____ (RB address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	IU address _____ (RB address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	IU address _____ (RB address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
IU address _____ (RB address _____)	<input type="checkbox"/> Yes <input type="checkbox"/> No		

1-3-2 Error indication check sheet 2/2

Check Contents		Judgement	Present Status
Ref. circuit name _____, Ref. address _____ (00 ~ 99)			
For each refrigerant system	RB unit & respective IU address (Design Value)	Check RB unit PCB-LED status	
	RB address _____ (IU address _____)	LED1 (Green) Judgment : must be ON ⇒ Yes / No Note: LED2 (Red) of RB unit must not be ON	<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No
	RB address _____ (IU address _____)		<input type="checkbox"/> Yes <input type="checkbox"/> No

1-3-3 Installed unit and their addresses check sheet

Check Contents	Check items	Checking method	Judgement	Present Status	
Ref. circuit : Name _____, Ref. address _____ (select from 00 to 99)				Design value	Check status
Installed units and their addresses check	Number of IU IU address	Checked by Service Tool	Number of units and their address appeared in the System List must be same as the Actual Design value Judgment: (OK / Not OK)	Connected number of IU _____	<input type="checkbox"/> OK
				Connected number of RB Gr. ____	<input type="checkbox"/> Not OK
				IU add _____ (RB add _____)	
				IU add _____ (RB add _____)	
				IU add _____ (RB add _____)	
	Number of RB unit RB unit address			IU add _____ (RB add _____)	<input type="checkbox"/> OK
				IU add _____ (RB add _____)	<input type="checkbox"/> Not OK
				IU add _____ (RB add _____)	
				IU add _____ (RB add _____)	
				IU add _____ (RB add _____)	
				IU add _____ (RB add _____)	
				IU add _____ (RB add _____)	
				IU add _____ (RB add _____)	
				IU add _____ (RB add _____)	
				IU add _____ (RB add _____)	

1-3-4 Transmission line connection check sheet

Note: The following check method by using test-run is necessary for checking of incorrect transmission wire connection.

Check Contents	Check items	Checking method	Judgement	Present Status		
				Design value	Check status	
Ref. circuit : Name _____, Ref. address _____(select from 00 to 99)					① IU	② RB
Transmission line connection confirmation check	Cooling status	Operate all Indoor Units under Testrun Cooling Mode by using Commissioning Function of Service Tool	Judgment Point during test - mode cooling : ① For Indoor Unit - Thermistor value 【(TH21 - TH22)14.4°F 8°C】 (Yes / No) ② For RB Unit - SV status 【SVB1 & SVS must ON】 (Yes / No)	IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No	<input type="checkbox"/> Yes / <input type="checkbox"/> No

Check Contents	Check items	Checking method	Judgement	Present Status	
				Design value	Check status
Ref. circuit : Name _____, Ref. address _____(select from 00 to 99)					IU
Transmission line connection confirmation	Heating status	Switching the operation of IU from cool to heat in order of RB group number by using, Control function of Service Tool	Judgment Point after switching IU mode from cool to heat in order of RB group number: For Indoor Unit - Thermistor value (TH24 > TH21) (Yes / No)	IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
				IU add ____ (RB add ____)	<input type="checkbox"/> Yes / <input type="checkbox"/> No

1-3-5 Operation check sheet

Check Contents		Judgement	Present Status
Refrigerant Circuit : Name _____, Address _____ (00 ~ 99)			
Test-run operation Cooling mode Conducted by Service Tool	<ul style="list-style-type: none"> Degree of sub-cool at OU sub-cooler side should be, $9^{\circ}\text{F} \leq \Delta\text{Tsc} \leq 36^{\circ}\text{F}$ ($5^{\circ}\text{C} \leq \Delta\text{Tsc} \leq 20^{\circ}\text{C}$) AND Pulse value EEV3 should be, $\text{EEV3} \leq 400\text{P}$ 	ΔTsc _____ $^{\circ}\text{F} (^{\circ}\text{C})$ EEV3 _____ P	<input type="checkbox"/> Yes / <input type="checkbox"/> No
	<ul style="list-style-type: none"> Discharge refrigerant pressure should be, $363\text{psi} \leq \text{Pd} \leq 479\text{psi}$ ($2.5\text{MPa} \leq \text{Pd} \leq 3.3\text{MPa}$) 	Pd _____ Psi(MPa)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
	<ul style="list-style-type: none"> Suction refrigerant pressure should be, $102\text{psi} \leq \text{Ps} \leq 174\text{psi}$ ($0.7\text{MPa} \leq \text{Ps} \leq 1.2\text{MPa}$) 	Ps _____ Psi(MPa)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
	<ul style="list-style-type: none"> Discharge refrigerant temp. should be, $\text{Td} \leq 212^{\circ}\text{F}$ (100°C). And, Discharge refrigerant superheat should be, ($\Delta\text{Tshd} > 18^{\circ}\text{F}$ (10°C)) 	Td _____ $^{\circ}\text{F} (^{\circ}\text{C})$ ΔTshd _____ $^{\circ}\text{F} (^{\circ}\text{C})$	<input type="checkbox"/> Yes / <input type="checkbox"/> No
	<ul style="list-style-type: none"> IU refig. superheat should be, ($3.6^{\circ}\text{F} \leq \Delta\text{Tshe} \leq 9^{\circ}\text{F}$) ($2^{\circ}\text{C} \leq \Delta\text{Tshe} \leq 5^{\circ}\text{C}$). And, RB group SV (SBS & SVB1) should be ON AND Pulse value IU EEV should be, $\text{EEV} \leq 1000\text{P}$ 	ΔTshe _____ $^{\circ}\text{F} (^{\circ}\text{C})$ SBS & SVB1 ON IU EEV _____ P	<input type="checkbox"/> Yes / <input type="checkbox"/> No
	<ul style="list-style-type: none"> Ps between Master & Slave OUs should be, ($\Delta\text{Ps} \leq 29\text{psi}$ (0.2Mpa)) 	ΔPs _____ Psi(MPa)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
	<ul style="list-style-type: none"> Air temperature of each RB group IU should be, $\Delta\text{Tair cooling} > 14.4^{\circ}\text{F}$ (8°C) 	$\Delta\text{Tair cooling}$ _____ $^{\circ}\text{F} (^{\circ}\text{C})$	<input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none"> No water fall from IU No abnormal noise from IU 		<input type="checkbox"/> Yes / <input type="checkbox"/> No	

Reference mark of Service tool

ΔTsc = Saturated liquid temperature of HPS - TH5
 ΔTshd = TH1- Saturated liquid temperature of HPS

ΔTshe = TH24 - TH22

Td = TH1

$\Delta\text{Tair cooling}$ = TH21 - Outlet Air temperature

Pd = HPS
 Ps = LPS

Check Contents		Judgement	Present Status
Refrigerant Circuit : Name _____, Address _____ (00 ~ 99)			
Test-run operation Heating mode	<ul style="list-style-type: none"> Discharge refrigerant pressure should be, $363\text{psi} \leq \text{Pd} \leq 479\text{psi}$ ($2.5\text{MPa} \leq \text{Pd} \leq 3.3\text{MPa}$) 	Pd _____ Psi(MPa)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
	<ul style="list-style-type: none"> Suction refrigerant pressure should be, $44\text{psi} \leq \text{Ps} \leq 174\text{psi}$ ($0.3\text{MPa} \leq \text{Ps} \leq 1.2\text{MPa}$) 	Ps _____ Psi(MPa)	<input type="checkbox"/> Yes / <input type="checkbox"/> No
	<ul style="list-style-type: none"> Discharge refrigerant temperature should be, $\text{Td} \leq 212^{\circ}\text{F}$ (100°C) AND Discharge refrigerant superheat should be, ($\Delta\text{Tshd} > 18^{\circ}\text{F}$ (10°C)) 	Td _____ $^{\circ}\text{F} (^{\circ}\text{C})$ ΔTshd _____ $^{\circ}\text{F} (^{\circ}\text{C})$	<input type="checkbox"/> Yes / <input type="checkbox"/> No
Conducted by Service Tool	<ul style="list-style-type: none"> Degree of sub cool (at IU side) should be, $7.2^{\circ}\text{F} \leq \Delta\text{Tsc} \leq 12.6^{\circ}\text{F}$ ($4^{\circ}\text{C} \leq \Delta\text{Tsc} \leq 7^{\circ}\text{C}$) AND RB group SV (SBD1 & SVB2) should be ON 	ΔTsc _____ $^{\circ}\text{F} (^{\circ}\text{C})$ SVD1 & SVB2 ON	<input type="checkbox"/> Yes / <input type="checkbox"/> No
	<ul style="list-style-type: none"> Refrigerant superheat (at OU side) should be, $3.6^{\circ}\text{F} \leq \Delta\text{Tshe1} \& \Delta\text{Tshe2} \leq 9^{\circ}\text{F}$ ($2^{\circ}\text{C} \leq \Delta\text{Tshe1} \& \Delta\text{Tshe2} \leq 5^{\circ}\text{C}$) 	ΔTshe _____ $^{\circ}\text{F} (^{\circ}\text{C})$	<input type="checkbox"/> Yes / <input type="checkbox"/> No
	<ul style="list-style-type: none"> Pd between Master & Slave OUs should be, ($\Delta\text{Ps} \leq 29\text{psi}$ (0.2MPa)) $\Delta\text{T}_{\text{OUHE}}$ at each OU connected in series should be, ($\Delta\text{T}_{\text{OUHE}} > 9^{\circ}\text{F}$ (5°C)) 	ΔPs _____ Psi(MPa) $\Delta\text{T}_{\text{OUHE}}$ _____ $^{\circ}\text{F} (^{\circ}\text{C})$	<input type="checkbox"/> Yes / <input type="checkbox"/> No
	<ul style="list-style-type: none"> Air temperature of each RB group IU should be, $\Delta\text{Tair heating} > 27^{\circ}\text{F}$ (15°C) 	$\Delta\text{Tair heating}$ _____ $^{\circ}\text{F} (^{\circ}\text{C})$	<input type="checkbox"/> Yes / <input type="checkbox"/> No

Reference mark of Service tool

ΔTsc = Saturated liquid temperature of HPS - TH22

ΔTshe1 = TH7 - Saturated vapor temperature of LPS

$\Delta\text{T}_{\text{OUHE}1}$ = TH4 - TH9

ΔTshd = TH1- Saturated liquid temperature of HPS

ΔTshe2 = TH8 - Saturated vapor temperature of LPS

$\Delta\text{T}_{\text{OUHE}2}$ = TH4 - TH10

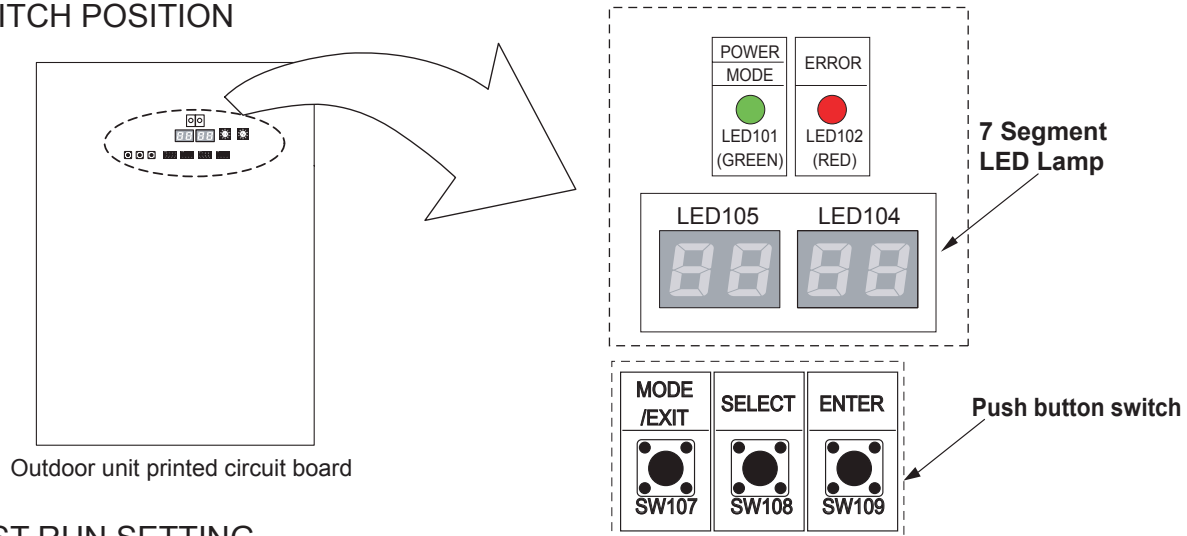
$\Delta\text{Tair heating}$ = TH21 - Outlet Air temperature

1-4 Test Run Operation

1-4-1 Test Run From Outdoor unit PC Board

All the indoor units connected to the outdoor unit can be test-operated by push button setting. (Only for master unit)

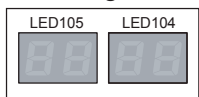
● SWITCH POSITION



● TEST RUN SETTING

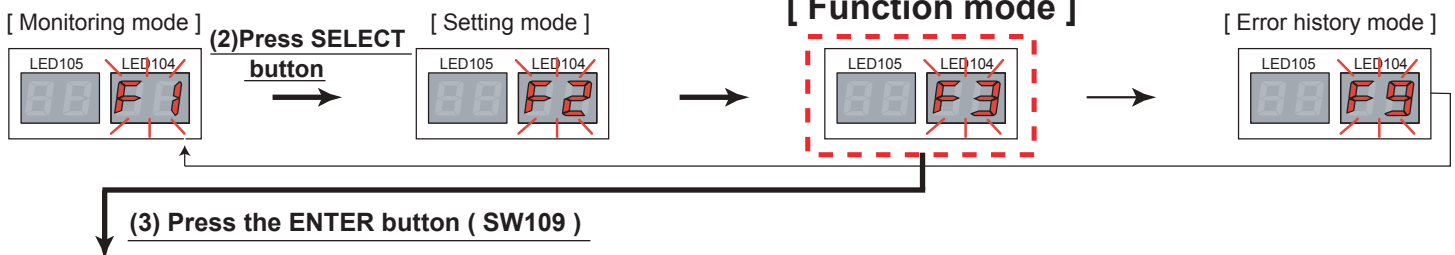
For a detailed description of push button operation, refer to the [D&T manual Chapter 6. SYSTEM DESIGN]

< Monitoring condition >

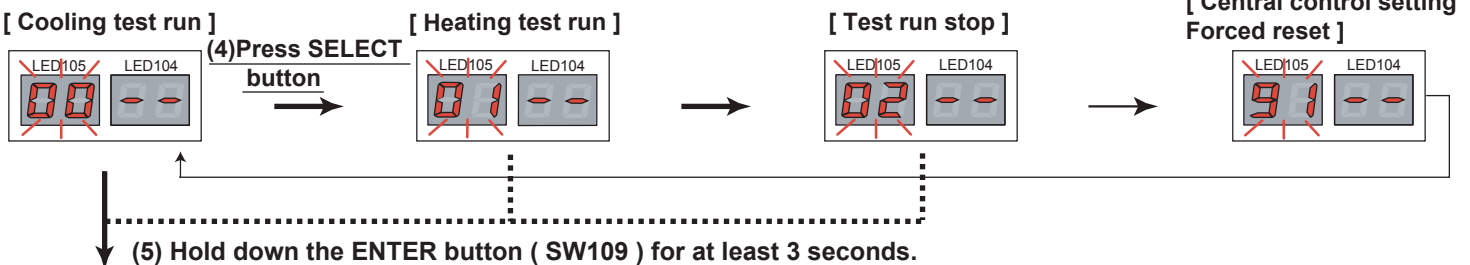


(1) Press the MODE / EXIT button (SW107) once.

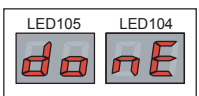
< Mode select condition >



< Function select condition >

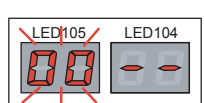


< Pursuance completion >



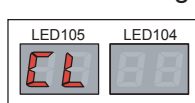
(6) Press the ENTER button (SW109) or Time out (5 seconds)

< Return to mode select condition >



(7) Press the MODE / EXIT button



< Return to monitoring condition >





example,
Normal indicate : [Cooling mode]

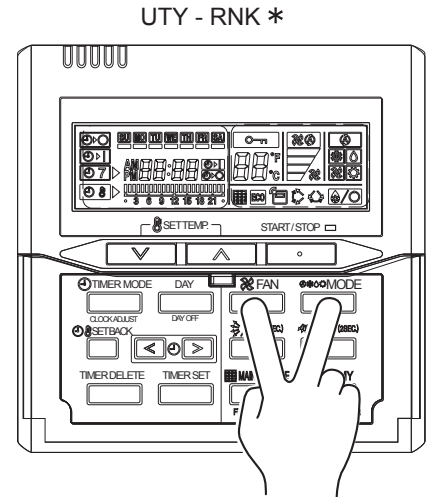
1-4-2 Test Run From Remote Controller

1. Standard wired remote controller


Stop the indoor unit. Push the  button and  button simultaneously for more than two seconds. The air conditioner will start to conduct a test run and "a f" will display on the remote controller display.

However, the ,  setting button does not have function, but all other buttons, displays, and protection functions will operate.

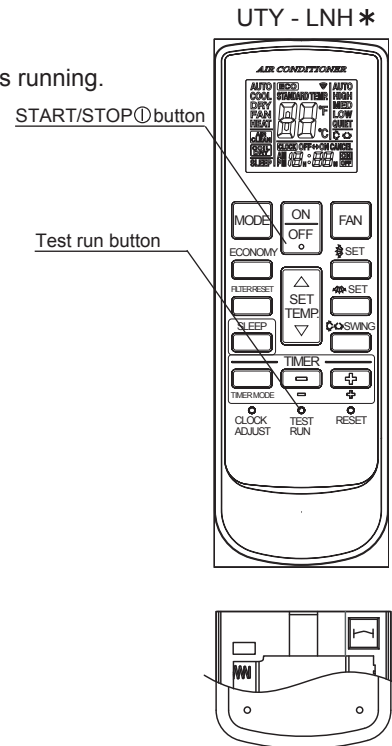
- Perform the test operation for 60 minutes.
- To stop test run, push the START / STOP button of the standard wired remote controller.
- For the operation method, refer to the operating manual and perform operation check.
- Check that there are no abnormal sounds or vibration sounds during test run operation.





2. Standard wireless remote controller



- Short two metal contacts under the battery compartment lid, while the air conditioner is running.
- To stop test run operation, push  button of the wireless remote controller.


When the air conditioner is being test run, the OPERATION and TIMER lamps of indoor unit flash slowly at the same time.

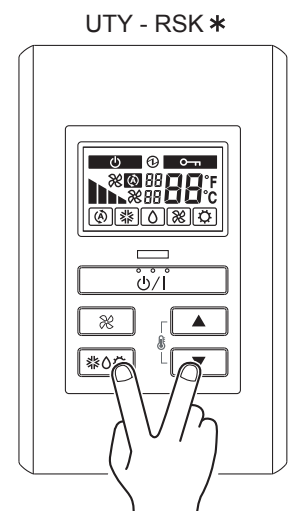


3. Simple remote controller

Stop the indoor and outdoor units. Push the remote controller  button and  button simultaneously for more than three seconds. The air conditioner will start to conduct a test run and "a f" will display on the temperature display.

However the ,  setting button does not have function but all other buttons, displays and protection functions will operate.

- To stop test running press the  button of the simple remote controller.
- For the operation method refer to the operating manual and perform operation check.
- Check that there are no abnormal sounds or vibration sounds during test run operation.



4. Touch panel controller

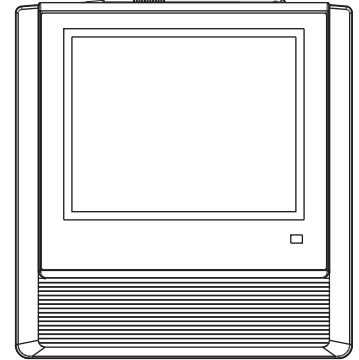
- (1) Select the objective you want to test run.
Select the objective icon or list at the monitor screen. (Multiple selections is possible)
Select all the devices registered as objectives by pressing "Select All" on the monitor screen.
- (2) After objective selection at (1), switch to the <Setting screen> by pressing "Operation".
- (3) Switch to the <Detail setting screen > by pressing "Optional setting" on the setting screen,
- (4) Press "Start" button and OK on the details setting screen.

Test run continues for 60 minutes.

To interrupt test run, select the device being the test run and excute an operation stop.

At the monitor screen, test run can cancel by selecting objective device and press OFF.

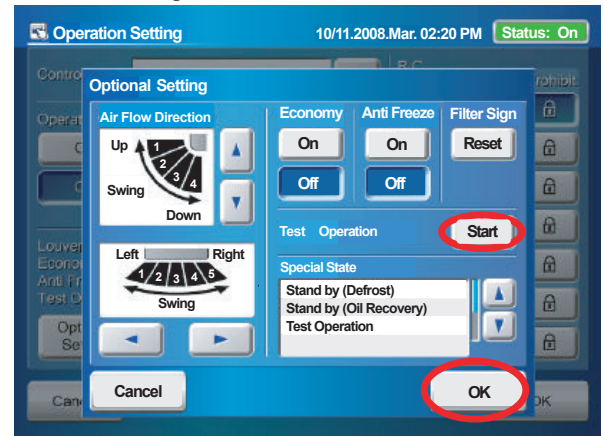
UTY - DTG *



<Setting screen>



<Detail Setting screen>



5. Central remote controller

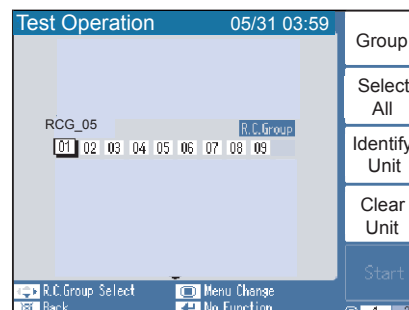
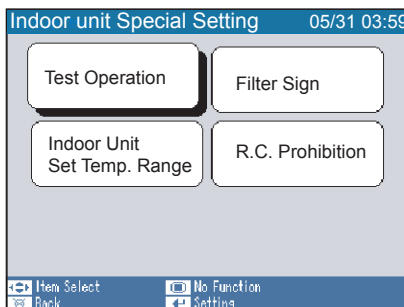
- (1) Press " " button.
- (2) Press "Set up Menu" and input password.
- (3) Select "Indoor unit special setting" by presing or button.
- (4) Select "Test operation by presing" or button
- (5) Press the "Select ALL button" or "Identify unit" button
 [Select All]: All of R.C.Group (Indoor units)
 [Identify Unit] : Specific R.C.Group (Indoor unit)

- (6) Press the " Start " button

The test run continues for 60 minutes.

To interrupt test run before it is complet, return to the "Monitor Mode Screen", and press ON/ OFF.

UTY-DCG *



6. 2-wire type wired remote controller

- (1) Press "Menu" on the monitor screen. the < Main Menu screen > is displayed.
- (2) Press "Next Page" and press "Maintenance"
- (3) Press "Next Page" and press "Test Run". the <Test run screen > is displayed.
- (4) Press "OK"

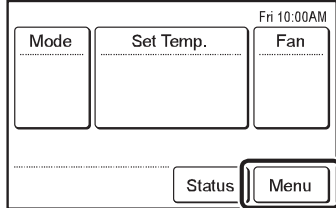
The test run continues for 60 minutes.

To interrupt test run before it is complet, return to the "Monitor Mode Screen", and press ON/ OFF.

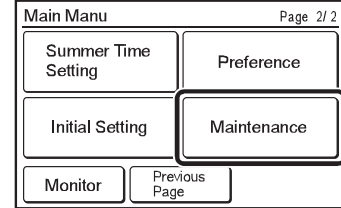
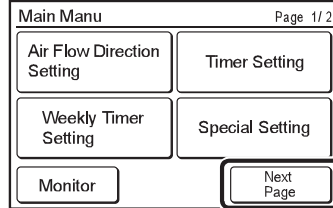
UTY - RNR*



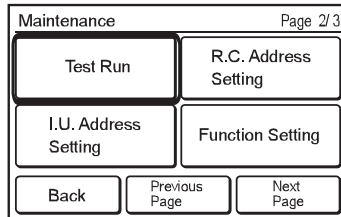
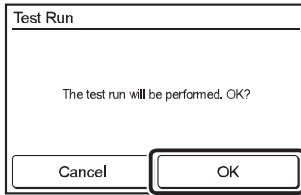
< Monitor Mode Screen >



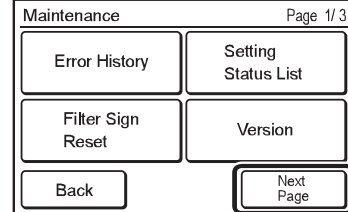
< Main Menu Screen >



< Test Run Screen >



< Maintenance Screen >



1-5 TEST RUN CONTROL

1. When the test run signal is transmitted from standard wired, wireless remote controller, simple remote controller, transmitted network, and outdoor unit.

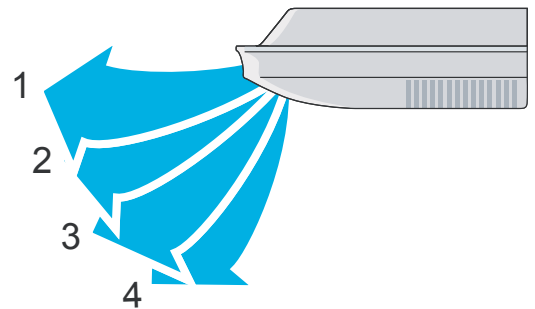
- (1) The test run operation starts and the electric expansion valve is controlled to a maximum flow, regardless of the temperature condition.
- (2) Frost prevention operation has priority over item(1).
- (3) Whether state of the indoor unit operates or stops, All units in the same refrigerant circuit will start to conduct a test run in accordance with the operation mode set by push switch of outdoor unit (see 1 - 2 - 3).
- (4) After 60 minutes passes, the test run stops.
- (5) Test running initialization is shown below.
 - * The temperature controlling on the test run operates regardless of setting temperature.

Operating Mode	EXCEPT FOR THE DUCT MODEL		DUCT TYPE	
	Cooling	Heating	Cooling	Heating
Fan speed	Hi	Hi	Hi	Hi
Vertical Air Direction Panel	Position ①	Position ④	————	————
Swing	OFF	OFF	————	————

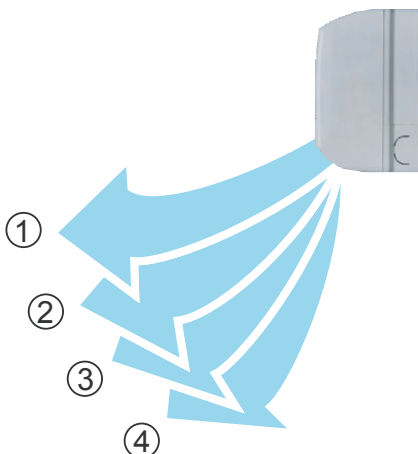
*EXAMPLE



■ COMPACT CASSETTE TYPE



■ CEILING TYPE



■ COMPACT WALL MOUNTED TYPE

1-6 Field Setting And Monitor Mode List for Outdoor unit

	Classification	ITEM CODE No.	Setting Mode	Information contents
Push switch on outdoor unit PCB Monitoring mode [F1]	Device and system	00	Connected number of indoor unit	The number of the communicating unit is displayed
		01	Software version of outdoor unit	Software version : E●●●V○○☆■□L△△-◎
		02	Software version of INV PCB	[E●●●][V○○][☆■□][L△△][-◎] displays by five items
		03	Software version of communication PCB	It skips when there is no suffix「-◎」
	Operation of each part	10	Rotational speed of outdoor unit fan motor	The rotational speed of the outdoor unit fan motor is displayed [0 ~ 999] rpm
		11	Rotational speed of INV compressor	The rotational speed of the compressor is displayed [0 ~ 999] rps
		12	Current value of INV compressor	Current value of INV compressor is displayed [0.00 ~99.99] A
		14	Pulse of EEV1	Pulse of EEV1 is displayed [0 ~ 9999] pls
		15	Pulse of EEV2	Pulse of EEV2 is displayed [0 ~ 9999] pls
		16	Pulse of EEV3	Pulse of EEV3 is displayed [0 ~ 9999] pls
	Time guard	20	Accumulated current time	Accumulated current time is displayed [0 ~ 9999] ×10hour
		21	INV compressor accumulated time [Cooling]	Accumulated time is displayed in the cooling operation of the INV compressor [0 ~ 9999] ×10hour
		22	INV compressor accumulated time [Heating]	Accumulated time is displayed in the heating operation of the INV compressor [0 ~ 9999] ×10hour
	Refrigerant cycle data 1	30	Information on Thermistor 1 (Discharge temperature sensor 1)	The value of the Thermistor 1 is displayed [-99.9 ~ 999.9] °C or °F
		31	Information on Thermistor 2 (Outdoor temperature sensor)	The value of the Thermistor 2 is displayed [-99.9 ~ 999.9] °C or °F
		32	Information on Thermistor 3 (Suction temperature sensor)	The value of the Thermistor 3 is displayed [-99.9 ~ 999.9] °C or °F
		33	Information on Thermistor 4 (Liquid temperature sensor 1)	The value of the Thermistor 4 is displayed [-99.9 ~ 999.9] °C or °F
		34	Information on Thermistor 5 (Liquid temperature sensor 2)	The value of the Thermistor 5 is displayed [-99.9 ~ 999.9] °C or °F
		35	Information on Thermistor 6 (Sub-cool H-Ex (outlet) sensor)	The value of the Thermistor 6 is displayed [-99.9 ~ 999.9] °C or °F
		36	Information on Thermistor 7 (Heat exchanger 1 gas sensor1)	The value of the Thermistor 7 is displayed [-99.9 ~ 999.9] °C or °F
		37	Information on Thermistor 8 (Heat exchanger 2 gas sensor2)	The value of the Thermistor 8 is displayed [-99.9 ~ 999.9] °C or °F
		38	Information on Thermistor 9 (Heat exchanger 1 liquid sensor)	The value of the Thermistor 9 is displayed [-99.9 ~ 999.9] °C or °F
		39	Information on Thermistor 10 (Heat exchanger 2 liquid sensor)	The value of the Thermistor 10 is displayed [-99.9 ~ 999.9] °C or °F
	Refrigerant cycle data 2	40	Information on Thermistor 11 (Compressor temperature sensor)	The value of the Thermistor 11 is displayed [-99.9 ~ 999.9] °C or °F
	Refrigerant cycle data 3	50	Information on pressure sensor 1 (High pressure sensor)	The value of the pressure sensor 1 is displayed If unit is [MPa], it is displayed as [0.00 ~ 9.99] [psi], it is displayed as [0.0 ~ 999.9]
		51	Information on pressure sensor 2 (Low pressure sensor)	The value of the pressure sensor 2 is displayed If unit is [MPa], it is displayed as [0.00 ~ 9.99] [psi], it is displayed as [0.0 ~ 999.9]

	Classification	ITEM CODE No.	Setting Mode	ITEM CODE No.	Setting Function	Default
Push switch on outdoor unit PCB Setting mode [F2]	Install	00	Pipe length setting	00	131-213ft.(40-65m)	○
				01	0-131ft.(0-40m)	
				02	213-295ft.(65-90m)	
				03	295-394ft.(90-120m)	
				04	394-492ft.(120-150m)	
	Correction	10	Sequential start shift	00	Normal	○
				01	21sec. Delay	
				02	42sec. Delay	
		11	Cooling capacity shift	03	63sec. Delay	
				00	Normal mode	○
				01	Save energy mode +4°F(+2°C)	
				02	High power mode 1 -4°F(-2°C)	
		12	Heating capacity shift	03	High power mode 2 -7°F(-4°C)	
				00	Normal mode	○
				01	Save energy mode -4°F(-2°C)	
		13,14,15	Forbidden	02	High power mode 1 +4°F(+2°C)	
				03	High power mode 2 +7°F(+4°C)	
				00	Forbidden	○
	Change of function 1	20	Switching between batch stop or emergency stop	00	Batch stop	○
				01	Emergency stop	
		22	Snow falling protection fan mode	00	Valid	○
				01	Invalid	
		23	Interval setting for snow falling protection fan mode	00	Standard (30min)	○
				01	Short 1 (5min)	
				02	Short 2 (10min)	
				03	Short 3 (20min)	
		24	High static pressure mode	00	Standard	○
				01	High static pressure 1 (equivalent to 0.12 in.WG /30Pa)	
	02			High static pressure 2 (equivalent to 0.32 in.WG /80Pa)		
	25,26,27	Forbidden	03	Forbidden		
			00		○	
	28	Change of unit Temperature	01			
			00	Celsius (°C)	○	
	29	Change of unit Pressure	01	Fahrenheit (°F)		
			00	MPa	○	
	Change of function 2	30	Energy saving level setting	01	psi	
				00	Level 1 (stop)	○
				01	Level 2 (operated at 40% capacity)	
				02	Level 3 (operated at 60% capacity)	
				03	Level 4 (operated at 80% capacity)	
		32,33	Forbidden	04	Level 5 (operated at 100% capacity)	
				00		○
		35	Presence of heater selection control using outdoor temperature *1	01		
				00	No	○
		36	Outdoor temperature zone boundary temperature A*1	01	Yes	
				00	-4.0°F(-20°C)	○
				01	-0.4°F(-18°C)	
				02	-3.2°F(-16°C)	
				03	6.8°F(-14°C)	
				04	10.4°F(-12°C)	
				05	14.0°F(-10°C)	
				06	17.6°F(-8°C)	
	37	Outdoor temperature zone boundary temperature B*1	07	21.2°F(-6°C)		
08			24.8°F(-4°C)			
00			42.8°F(6°C)	○		
01			14.0°F(-10°C)			
02			17.6°F(-8°C)			
03			21.2°F(-6°C)			
04			24.8°F(-4°C)			
05			28.4°F(-2°C)			
06			32.0°F(0°C)			
07			35.6°F(2°C)			
08	39.2°F(4°C)					
09	42.8°F(6°C)					
10	46.4°F(8°C)					
11	50.0°F(10°C)					
12	53.6°F(12°C)					
13	57.2°F(14°C)					
14	60.8°F(16°C)					
15	64.4°F(18°C)					

	Classification	ITEM CODE No.	Setting Mode	ITEM CODE No.	Setting Function	Default
Push switch on outdoor unit PCB Setting mode [F2]	Low noise setting 1	40	Capacity priority setting (in low noise mode)	00	Off (quiet priority)	○
				01	On (capacity priority)	○
		41	Low noise mode setting	00	Off (Normal)	○
				01	On (Low noise mode operation is always done)	○
		42	Low noise mode operation level setting	00	Level 1 (55dB)	○
				01	Level 2 (50dB)	○
	Change of function 3	60	Back up operation	00*2	On	○
				01*3	Off	○
				00	On	○
	Change of function 4	61,62,63	Forbidden	01	Off	○
				00	On	○
				00~99	Setting number x00~x99 (Refer to Design & Technical Manual for details.)	00
				*4		
	Change of function 4	70	Electricity meter No. setting 1 (Set the ones digit and tens digit of the No. of the electricity meter connected to CN135.)	00~02	Setting number 0xx~2xx (Refer to Design & Technical Manual for details.)	00
				*4		
				00~99	Setting number xx00~xx99 (Refer to Design & Technical Manual for details.)	00
*5						
Change of function 4	71	Electricity meter No. setting 2 (Set the hundreds digit of the No. of the electricity meter connected to CN135.)	00~99	Setting number 00xx~99xx (Refer to Design & Technical Manual for details.)	00	
			*4			
			00~99	Setting number 00xx~99xx (Refer to Design & Technical Manual for details.)	00	
			*5			
Change of function 4	72	Electricity meter pulse setting 1 (Set the ones digit and tens digit of the No. of the electricity meter pulse setting connected to CN135.)	00~99	Setting number 00xx~99xx (Refer to Design & Technical Manual for details.)	00	
			*4			
			00~99	Setting number 00xx~99xx (Refer to Design & Technical Manual for details.)	00	
			*5			
Change of function 4	73	Electricity meter pulse setting 2 (Set the hundreds digit and thousands digit of the electricity meter pulse setting connected to CN135.)	00~99	Setting number 00xx~99xx (Refer to Design & Technical Manual for details.)	00	
			*4			
			00~99	Setting number 00xx~99xx (Refer to Design & Technical Manual for details.)	00	
			*5			

*1 : Do not set this for outdoor units with Slave setting.

*2 : If one of compressor fails, backup operation will be performed by the remaining compressors.(For starting the system SET4-2 switching is required)

*3 : If one of compressor fails, all units will be abnormal stop.

*4 : When electricity meter No. is set to "000" and "201 to 299", the pulses input to CN135 become ineffective.
Available setting number is "001" to "200"

*5 : When the electricity meter pulse setting is set to "0000", the pulses input to CN135 become ineffective.
Available setting number is "0001" to "9999"

	Classification	ITEM CODE No.	Setting Mode	Setting Function
Push switch on outdoor unit PCB Function mode [F3]	Forced operation	00	Cooling test run	Forced thermostat-ON in Cooling
		01	Heating test run	Forced thermostat-ON in Heating
		02	Test run stop	Test run is stopped
		03,04	Forbidden	
	Install and maintenance 1	10	Signal amplifier automatic address	Automatic address setting operates for signal amplifier
		11	Indoor unit automatic address	Automatic address setting operates for indoor unit of same refrigerant circuit
		22	RB unit automatic address	Automatic address setting operates for RB unit of same refrigerant circuit
	Install and maintenance 2	21	Vacuuming mode	Vacuuming mode operates Refer to page 01-01 for the function
	Clear	30	Error history clear	All the abnormal code histories are cleared
		31	Forbidden	
		32	Current time clear	Accumulated current time becomes [0]
		33	INV compressor accumulated time clear	Accumulated time of the INV compressor becomes [0]
		35	Field setting all clear	Return to default the all set items
	Abnormal	40	*Abnormal reset	It was displayed when abnormality occurs, and abnormal code is reset This is a function that uses to clear abnormal display after the repair is completed Please operate the switch after power off or power on the outdoor unit
	Specialty function	91	Forced Central control function forced release	When the centralized control device failure, and the centralized control setting cannot be released, this function is used All the limitations set with the centralized control device are released

	Classification	ITEM CODE No.	Meaning of Error History Number	Information contents
Push switch on outdoor unit PCB Error history mode [F9]	Error history	00	1 time ago (Newest)	When the error occurred, the error code is memorized up to 10 on Main PCB.
		01	2 times ago	
		02	3 times ago	If the memorized error code becomes over 10, the oldest one will be erased.
		03	4 times ago	
		04	5 times ago	Refer to Chapter TROUBLE SHOOTING Error Code List of Outdoor unit
		05	6 times ago	
		06	7 times ago	
		07	8 times ago	
		08	9 times ago	
		09	10 times ago (Oldest)	

<< Error code which manual error release will be required >>
A5.1 Low pressure abnormal
84.1 Current sensor 1 error
93.1 Inverter compressor start up error
94.1 Trip detection
A1.1 Discharge temperature 1 abnormal
A3.1 Compressor 1 temperature abnormal
97.1 Outdoor unit fan motor lock error
97.5 Fan motor temperature abnormal
97.9 Fan motor driver abnormal
68.2 Rush current limiting resistor temp rise protection
95.5 Compressor motor loss of synchronization
A6.3 Outdoor heat exchanger 1 gas temperature abnormal
A6.4 Outdoor heat exchanger 2 gas temperature abnormal

1-7 Field Setting / Function Setting for Indoor unit

	Classification	ITEM CODE No.	Setting Mode	ITEM CODE No.	Setting Function	Default	
Indoor unit field setting setting by remote controller	Address	01	Indoor unit address	00~63	00~63	00	
		02	Refrigerant circuit address	00~99	00~99	00	
	Filter	11	Filter indicator Interval	00	Default	○	
				01	Longer		
				02	Shorter		
	Airflow	13	Filter sign display	00	Enable	○	
				01	Disable		
				02	Display only on central remote control		
		20	Ceiling airflow (Cassette type only)	00	Default	○	
				01	High ceiling		
			23	Vertical airflow direction (Cassette type only)	00	Default	○
					01	Raise	
			24	Horizontal swing airflow direction (For horizontal swing equipped models)	00	Default	○
					01	Left half	
			26 *1	Static Pressure setting - Slim Duct type - The Range of static pressure is different from one model to other.	00	SP mode 00 [0 in.WG (0 Pa)]	
					01	SP mode 01 [0.04 in.WG (10 Pa)]	
					02	SP mode 02 [0.08 in.WG (20 Pa)]	
					03	SP mode 03 [0.12 in.WG (30 Pa)]	
					04	SP mode 04 [0.16 in.WG (40 Pa)]	
					05	SP mode 05 [0.20 in.WG (50 Pa)]	
	06	SP mode 06 [0.24 in.WG (60 Pa)]					
	07	SP mode 07 [0.28 in.WG (70 Pa)]					
	08	SP mode 08 [0.32 in.WG (80 Pa)]					
	09	SP mode 09 [0.36 in.WG (90 Pa)]					
	31	Normal SP [0.10 in.WG (25 Pa)]			○		
	Static Pressure setting *2*3 - Duct (middle pressure) type - The Range of static pressure is different from one model to other.	00			SP mode 00 [0 in.WG (0 Pa)]		
		01			SP mode 01 [0.04 in.WG (10 Pa)]		
		02			SP mode 02 [0.08 in.WG (20 Pa)]		
		03			SP mode 03 [0.12 in.WG (30 Pa)]		
		04			SP mode 04 [0.16 in.WG (40 Pa)]		
		05			SP mode 05 [0.20 in.WG (50 Pa)]		
06		SP mode 06 [0.24 in.WG (60 Pa)]					
07		SP mode 07 [0.28 in.WG (70 Pa)]					
08		SP mode 08 [0.32 in.WG (80 Pa)]					
09		SP mode 09 [0.36 in.WG (90 Pa)]					
10		SP mode 10 [0.40 in.WG (100 Pa)]					
11		SP mode 11 [0.44 in.WG (110 Pa)]					
12	SP mode 12 [0.48 in.WG (120 Pa)]						
13	SP mode 13 [0.52 in.WG (130 Pa)]						
14	SP mode 14 [0.56 in.WG (140 Pa)]						
31	Normal SP [0.16 in.WG (40 Pa)]	○					
Static Pressure setting *4*5 - Duct (high pressure) type - The Range of static pressure is different from one model to other.	04	SP mode 04 [0.16 in.WG (40 Pa)]					
	05	SP mode 05 [0.20 in.WG (50 Pa)]					
	06	SP mode 06 [0.24 in.WG (60 Pa)]					
	07	SP mode 07 [0.28 in.WG (70 Pa)]					
	08	SP mode 08 [0.32 in.WG (80 Pa)]					
	09	SP mode 09 [0.36 in.WG (90 Pa)]					
	10	SP mode 10 [0.40 in.WG (100 Pa)]					
	11	SP mode 11 [0.44 in.WG (110 Pa)]					
	12	SP mode 12 [0.48 in.WG (120 Pa)]					
	13	SP mode 13 [0.52 in.WG (130 Pa)]					
	14	SP mode 14 [0.56 in.WG (140 Pa)]					
	15	SP mode 15 [0.60 in.WG (150 Pa)]					
	16	SP mode 16 [0.64 in.WG (160 Pa)]					
	17	SP mode 17 [0.68 in.WG (170 Pa)]					
	18	SP mode 18 [0.72 in.WG (180 Pa)]					
	19	SP mode 19 [0.76 in.WG (190 Pa)]					
	20	SP mode 20 [0.80 in.WG (200 Pa)]					
	21	SP mode 21 [0.84 in.WG (210 Pa)]					
22	SP mode 22 [0.88 in.WG (220 Pa)]						
23	SP mode 23 [0.92 in.WG (230 Pa)]						
24	SP mode 24 [0.96 in.WG (240 Pa)]						
25	SP mode 25 [1.00 in.WG (250 Pa)]						
26	SP mode 26 [1.04 in.WG (260 Pa)]						
27	SP mode 27 [1.08 in.WG (270 Pa)]						
28	SP mode 28 [1.12 in.WG (280 Pa)]						
29	SP mode 29 [1.16 in.WG (290 Pa)]						
30	SP mode 30 [1.20 in.WG (300 Pa)]						
31	Normal SP [0.60 in.WG (150 Pa)]	○					

*1: Please refer to FAN PERFORMANCE CURVE within Design and Technical manual for the features of each setting.

*2: If the Setting Number in ARUM30TLAV is configured to "12 to 14", the operation is the same as that in "11 (SP mode 11)".

*3: If the Setting Number in ARUM36TLAV is configured to "10 to 14", the operation is the same as that in "09 (SP mode 09)".

*4: If the Setting Number in ARUH96TLAV is configured to "30", the operation is the same as that in "29 (SP mode 29)".

*5: ARUH72TLAV : 04 (SP mode 04) - 27 (SP mode 27) and 31 (Normal SP)

ARUH96TLAV , ARUH72TLAV1 : 05 (SP mode 05) - 30 (SP mode 30) and 31 (Normal SP)

	Classification	ITEM CODE No.	Setting Mode	ITEM CODE No.	Setting Function	Default
Indoor unit field setting setting by remote controller	Correction	30	Cool air temperature trigger	00	Default 0°F(0°C)	○
				01	Temperature overshoot setting +4°F(+2°C)	
				02	Temperature undershoot setting -4°F(-2°C)	
		31	Heat air temperature trigger	00	Default 0°F(0°C)	○
				01	Temperature undershoot setting -11°F(-6°C)	
				02	Temperature slightly unndershoot setting -7°F(-4°C)	
	Change of function 1	40	Auto restart *1	00	Enable	
				01	Disable	○
		43	Cool air prevention	00	Super low	○
				01	Follow the setting on the remote controller	
		46	External control	00	Start / Stop	○
				01	Emergency stop	
				02	Forced stop (Start/Stop by RC is restricted)	
		47	Error report target	00	All	○
				01	Display only for central remote control	
		49	FAN Setting when cooling thermostat OFF *2	00	Follow the setting on the remote controller	○
	01			Forced stop		
	Change of function 2	60	Switching functions for external inputs and external outputs terminals	00	Mode 0	○
				01	Mode 1	
				02	Mode 2	
				03	Mode 3	
				04	Mode 4	
				05	Mode 5	
				06	Mode 6	
				07	Mode 7	
				08	Mode 8	
		61	Control switching of external heaters (Except Compact wall mounted and Wall mounted)	00	Auxiliary heater control 1	○
				01	Auxiliary heater control 2	
02				Heat pump prohibition control		
03				Heater selection control using outdoor temperature 1		
04				Heater selection control using outdoor temperature 2		
62		Operating temperature switching of external heaters (Except Compact wall mounted and Wall mounted)	00	Setting 0	○	
			01	Setting 1		
			02	Setting 2		
			03	Setting 3		
	04		Setting 4			
			05	Setting 5		

*1: Auto restart is an emergency function such as for power failure etc.

Do not start and stop the indoor unit by this function in normal operation.

Be sure to operate by the control unit, converter or external input device.

*2: Fan Setting when cooling thermostat OFF, Connection of the wired remote controller (2-wire type or 3-wire type) and switching its thermistor are necessary.

1-8 Field Setting / Function Setting for Outdoor air unit

	Classification	ITEM CODE No.	Setting Mode	ITEM CODE No.	Setting Function	Default			
Indoor unit field setting setting by remote controller	Address	00	Indoor unit address	00~63	00~63	00			
		02	Refrigerant circuit address	00~99	00~99	00			
	Filter	11	Filter indicator Interval	00	Default	○			
				01	Longer				
		02	Shorter						
		13	Filter sign display	00	Enable				
	01			Disable	○				
	Airflow	26	Static Pressure setting - Outdoor air unit Only - The Range of static pressure is different from one model to other.	05	SP mode 05 [0.20 in.WG (50 Pa)]				
				06	SP mode 06 [0.24 in.WG (60 Pa)]				
				07	SP mode 07 [0.28 in.WG (70 Pa)]				
				08	SP mode 08 [0.32 in.WG (80 Pa)]				
				09	SP mode 09 [0.36 in.WG (90 Pa)]				
				10	SP mode 10 [0.40 in.WG (100 Pa)]				
				11	SP mode 11 [0.44 in.WG (110 Pa)]				
				12	SP mode 12 [0.48 in.WG (120 Pa)]				
				13	SP mode 13 [0.52 in.WG (130 Pa)]				
				14	SP mode 14 [0.56 in.WG (140 Pa)]				
				15	SP mode 15 [0.60 in.WG (150 Pa)]				
				16	SP mode 16 [0.64 in.WG (160 Pa)]				
				17	SP mode 17 [0.68 in.WG (170 Pa)]				
				18	SP mode 18 [0.72 in.WG (180 Pa)]				
				19	SP mode 19 [0.76 in.WG (190 Pa)]				
				20	SP mode 20 [0.80 in.WG (200 Pa)]				
				21	SP mode 21 [0.84 in.WG (210 Pa)]				
				22	SP mode 22 [0.88 in.WG (220 Pa)]				
				Change of function 1	40, 43, 46, 47		31	Normal SP	○
							00	Enable	
							01	Disable	○
							00	Super low	
	01	Follow the setting on the remote controller	○						
	00	Start / Stop	○						
	01	Emergency stop							
	02	Forced stop (Start/Stop by RC is restricted)							
	00	All	○						
	01	Display only for central remote control							
	Change of function 2	60,61,62	Forbidden	00		○			
				01					
		63	Humidifier control *2	00	mode 00	○			
				01	mode 01				
		65	Threshold temperature setting for cool / heat switch over*3	02	mode 02				
00				mode 0 ±10°F (±5°C)	○				
01	mode 1 ±4°F (±2°C)								
02	mode 2 ±6°F (±3°C)								
03	mode 3 ±8°F (±4°C)								
04	mode 4 ±10°F (±5°C)								
05	mode 5 ±12°F (±6°C)								
06	mode 5 ±14°F (±7°C)								

*1: Auto restart is an emergency function such as for power failure etc.

Do not start and stop the indoor unit by this function in normal operation.
Be sure to operate by the control unit, converter or external input device.

*2: Select control conditions of external output.

"Mode 00" is output when heating thermostat is ON, "Mode 01" is output in heating operation, "Mode 02" is output in heating operation and in fan operation.

*3: Threshold temperature setting for cool / heat mode under auto operation ; Set temperature ±4°F (±2°C) to ±14°F (±7°C)

*Cool / heat mode tends to be switched as the threshold temperature range gets smaller,
and cool / heat mode becomes difficult to be switched as the threshold temperature range gets larger.
Set the proper value according to use conditions.

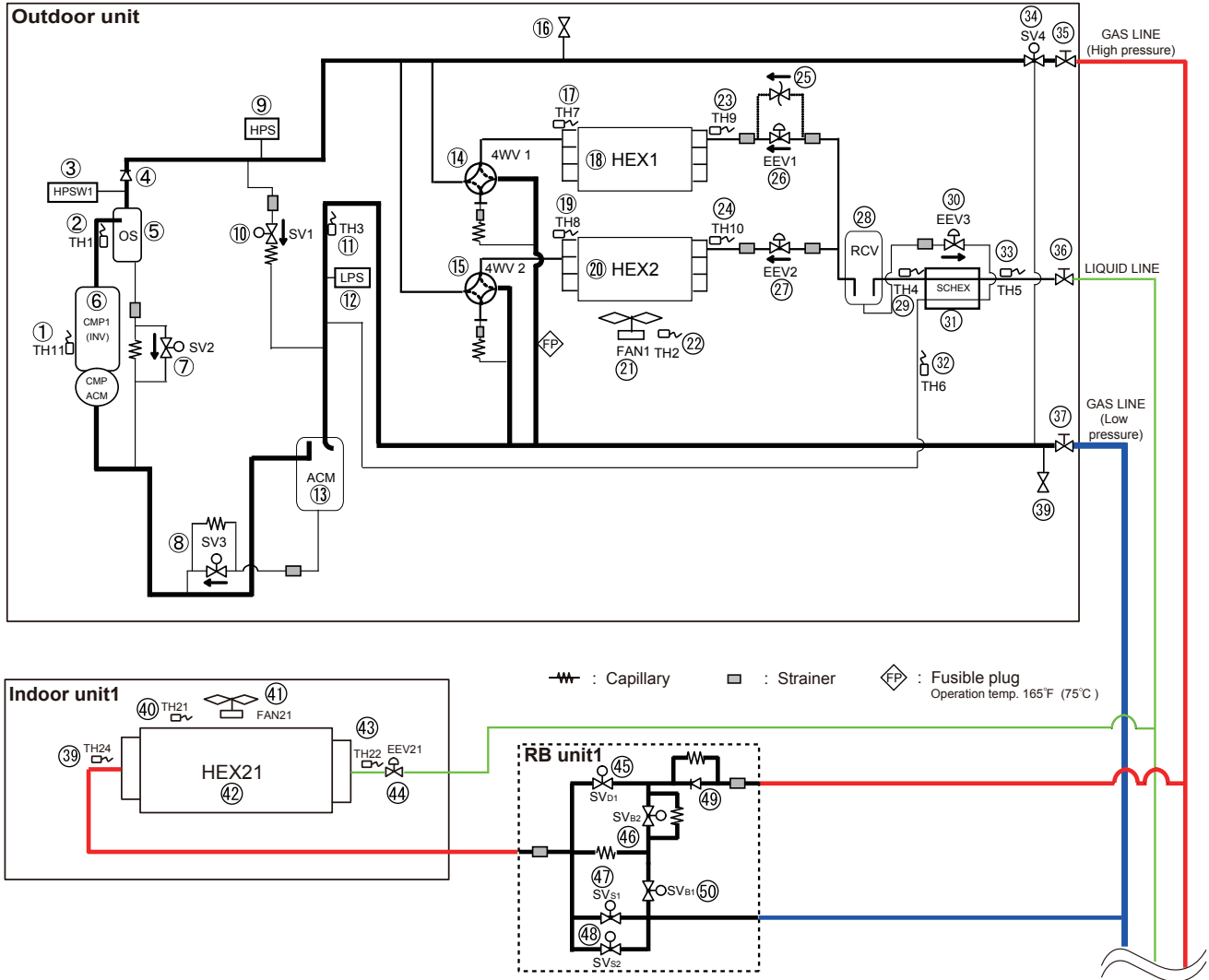
AIRSTAGE[™] *VR-II*

Variable Refrigerant Flow System

2. OUTDOOR UNIT OPERATION CONTROL

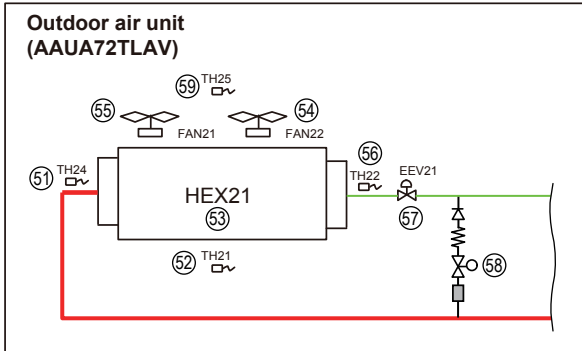
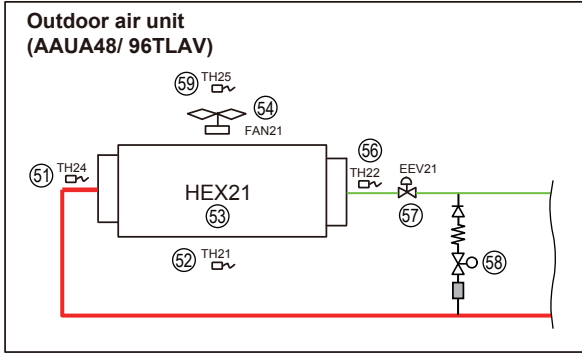
2. OUTDOOR UNIT

2-1 REFRIGERANT CIRCUIT



No.	Part name	Function	No.	Part name	Function
1	Compressor temp. Sensor 1	Detects the compressor temperature	26	Outdoor unit EEV1	Controls the flow of ref. based on target pressure
2	Discharge temp. Sensor 1	Detects the discharge temperature	27	Outdoor unit EEV2	Controls the flow of ref. based on target pressure
3	High pressure Switch	Detects abnormal high pressure 609 psi (4.20 MPa)	28	Receiver tank	Storage extra refrigerant
4	Check valve	Comp. pressure equalization	29	Liquid pipe temp. Sensor 1	Detects the temperature of liquid refrigerant
5	Oil Separator	Separates oil and refrigerant	30	Outdoor unit EEV3	Controls ref. subcooling / Operates in protection
6	Compressor (Inverter)	Operation range (20 rps - 115 rps)	31	Sub-Cool Heat exchanger	Subcool of liquid refrigerant
7	Bypass / Oil return Valve	HP-LP bypass in protection, Returns the oil to COMP	32	Sub-Cool HEX gas outlet temp Sensor	Detects the temperature of refrigerant
8	Oil return Valve	Returns the oil to Compressor	33	Liquid pipe temp. Sensor 2	Detects the temperature of liquid refrigerant
9	High pressure Sensor	Detects the High pressure	34	High pressure gas cut valve	Shut off High pressure gas line in all Cooling mode
10	Bypass Valve	HP-LP bypass in protection / Comp. pressure equalization	35	3way-valve (High pressure Gas)	Open / Close for High pressure Gas line
11	Suction gas temp. Sensor	Detects the temp of refrigerant	36	3way-valve (Liquid)	Open / Close for Liquid line
12	Low pressure Sensor	Detects Low pressure	37	3way-valve (Low pressure Gas)	Open / Close for Low pressure Gas line
13	Accumulator	Collects refrigerant and the returned oil	38	Service port	Measure Low pressure for Service
14	4-Way-Valve 1	Changes operation mode of HEX 1	39	I.U HEX outlet temp. Sensor	Detects the temperature of refrigerant
15	4-Way-Valve 2	Changes operation mode of HEX 2	40	Room temp. Sensor	Detects the temperature of room
16	Service port	Measure High pressure for Service	41	Indoor unit FAN (Motor)	Controlled by setting / protection / Thermo OFF
17	Heat-Ex 1 gas temp. Sensor	Detects the temperature of refrigerant	42	I.U Heat Exchanger	Operates as Condenser / Evaporator
18	Heat Exchanger 1	Operates as Condenser / Evaporator	43	I.U HEX inlet temp. Sensor	Detects the temperature of refrigerant
19	Heat-Ex 2 gas temp. Sensor	Detects the temperature of refrigerant	44	Indoor unit EEV	Controlled by setting / protection / Thermo OFF
20	Heat Exchanger 2	Operates as Condenser / Evaporator	45	SVD1 (Discharge)	Opens in Heat / Vacuum mode
21	Outdoor unit FAN (Motor)	Control FAN speed for heat exchange of HEX	46	SVB2 (Pressurization)	Opens in Heat / Vacuum mode
22	Outdoor temp. Sensor	Detects the ambient temperature	47	SVS1 (Suction 1)	Opens in Cool / Dry / Defrost / Oil-Recovery / Vacuum
23	Heat-Ex 1 liquid temp. Sensor	Detects the temperature of refrigerant	48	SVS2 (Suction 2)	Opens in Cool / Dry / Defrost / Oil-Recovery / Vacuum
24	Heat-Ex 2 liquid temp. Sensor	Detects the temperature of refrigerant	49	Check valve	Shut off opposit refrigerant flow
25	Pressure regulation valve	Operates in regulated pressure 580 psi (4.00 MPa)	50	SVB1 (Decompression)	Opens in Stop / FAN / same as the function of SVS

2-1-1 REFRIGERANT CIRCUIT for Outdoor air unit



-W- : Capillary □ : Strainer

No.	Part name	Function
51	Heat exchanger outlet thermistor	Detects the temperature of refrigerant
52	Suction airflow temp. thermistor	Detects the temperature of suction airflow
53	Heat exchanger	Operates as Condenser / Evaporator
54	Fan motor	Controlled by setting / protection / Thermo OFF
55	Fan motor	Controlled by setting / protection / Thermo OFF
56	Heat exchanger inlet thermistor	Detects the temperature of refrigerant
57	Electric expansion valve	Controlled by setting / protection / Thermo OFF
58	Solenoid valve (Bypass)	Opens at Thermo OFF in Heating mode
59	Discharge airflow temp. thermistor	Detects the temperature of discharge airflow

2-2 INPUT / OUTPUT LIST

		Input / output or kind of detail	Control range
I N P U T	High pressure sensor Low pressure sensor Discharge temperature sensor 1 Outdoor temperature sensor Suction gas temperature sensor Liquid pipe temperature sensor 1 Liquid pipe temperature sensor 2 Sub-cool heat exchanger gas outlet temp.sensor Heat exchanger 1 gas temp. sensor Heat exchanger 2 gas temp sensor Heat exchanger 1 liquid temp. sensor Heat exchanger 2 liquid temp. sensor Compressor temperature sensor 1 Operation current sensor High pressure switch 1	Pressure sensor Pressure sensor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Thermistor Current transformer Pressure switch	Measure range 0 to 5.0MPa (0 to 725psi) Measure range 0 to 1.7MPa (0 to 247psi) Measure range 10 to 130°C (50 to 266°F) Measure range -25 to 58°C (-13 to 136°F) Measure range -35 to 70°C (-31 to 158°F) Measure range -35 to 70°C (-31 to 158°F) Measure range -35 to 70°C (-31 to 158°F) Measure range -35 to 70°C (-31 to 158°F) Measure range -35 to 70°C (-31 to 158°F) Measure range -35 to 70°C (-31 to 158°F) Measure range -35 to 70°C (-31 to 158°F) Measure range -35 to 70°C (-31 to 158°F) Measure range -35 to 70°C (-31 to 158°F) Measure range -35 to 70°C (-31 to 158°F) Measure range -35 to 70°C (-31 to 158°F) Measure range -35 to 70°C (-31 to 158°F) Measure range 10 to 130°C (50 to 266°F) Open 4.2MPa(609psi) / Short 3.2MPa(464psi)
	Rotary SW & DIP-SW & Push SW	Address and function setting	
O U T P U T	Compressor 1 (Inverter) Electric expansion valve 1 (HEX1) Electric expansion valve 2 (HEX2) Electric expansion valve 3 (SC - HEX) Fan motor 4-way valve 1 (HEX1) 4-way valve 2 (HEX2) Solenoid valve 1 Solenoid valve 2 Solenoid valve 3 Solenoid valve 4 Crank case heater 1 Crank case heater 2 Base heater	Magnetic relay EEV coil EEV coil EEV coil DC Brushless motor 4-way valve coil 4-way valve coil Hot gas bypass Comp. pressure equalization valve ACM oil return valve1 High pressure gas cut off valve For Compressor (Lower) For Compressor (Upper) Field supply	Operation coil AC208-230V, 60Hz Operating voltage DC12V Operating voltage DC12V Operating voltage DC12V AC208-230V, 60Hz 6/5 W AC208-230V, 60Hz 6/5 W AC208-230V, 60Hz, 8W AC208-230V, 60Hz, 6W AC208-230V, 60Hz, 6W AC208-230V, 60Hz 6/5 W AC230V, 35W AC230V, 35W AC230V The allowable current is 1A or less
	Communication Input / Output	LON WORKS Inverter communication Outdoor unit communication	Indoor unit ↔ Outdoor unit Outdoor unit ↔ Outdoor unit
E x t e r n a l I n p u t / O u t p u t	External input 1 (CN131) (Low noise mode operation) External input 3 (CN133) (Outdoor unit operation peak control) External input 4 (CN134) (Emergency stop operation) Electricity meter puls input (CN135)	Non-voltage contact input	
	External output 1 (CN136) (Error display) External output 2 (CN137) (Operation display)		ON (Error) / OFF (Normal) ON (Operation) / OFF (Stop)
LED display	Single LED 101 Single LED 102 7 Segment LED	Display the information on operation, error and setting with single LED and 7 segment LED.	

2-3 Heat Recovery Operation controlling

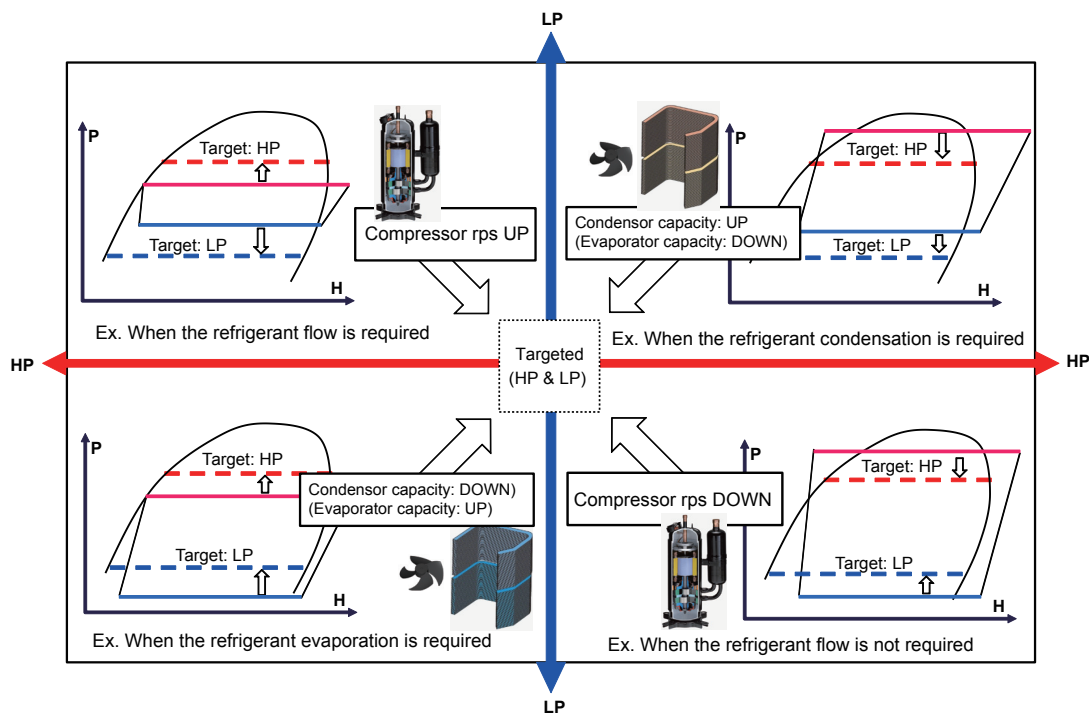
2-3-1 Operation mode selection and controlling

Under Heat Recovery operation, the heat balance for the system is controlled based on the Target High pressure and the Target low pressure. By changing compressor rotation speed or changing Heat exchange capacity, the system can maintain the good heat balance. The target High pressure value and the target low pressure value in the target range are decided by the outdoor unit's operation mode (Condenser or Evaporator).

The outdoor unit's operation mode is decided by depending on the operation order from the connecting indoor unit at the first start up.

- Indoor unit's cooling demand is bigger than heating demand: Outdoor unit operates as Condenser
- Indoor unit's heating demand is bigger than cooling demand: Outdoor unit operates as Evaporator

After the mode was decided at the start up, the operation mode of outdoor unit will be selected by based on the target pressure.



2-4 COMPRESSOR OPERATION

2-4-1 Operation / Stop Condition

When cooling requirement capacity or heating requirement capacity from either of the indoor units in the same refrigerant circuit is input, the compressor operates.

When all the indoor units in no "cooling requirement capacity" or "heating requirement capacity", the compressor is stopped.

But in the following case, the compressor operates in accordance with operation of each mode.

- During 3 minute restart prevention operation
- Icing protection
- Failure (Refer to chapter 4, TROUBLE SHOOTING)
- Oil recovery
- Under expansion valve initialization
- At protective operation
- Emergency stop
- Defrost operation
- Peak cut stop operation

2-4-2 Compressor speed control

(1) Speed range and controlling

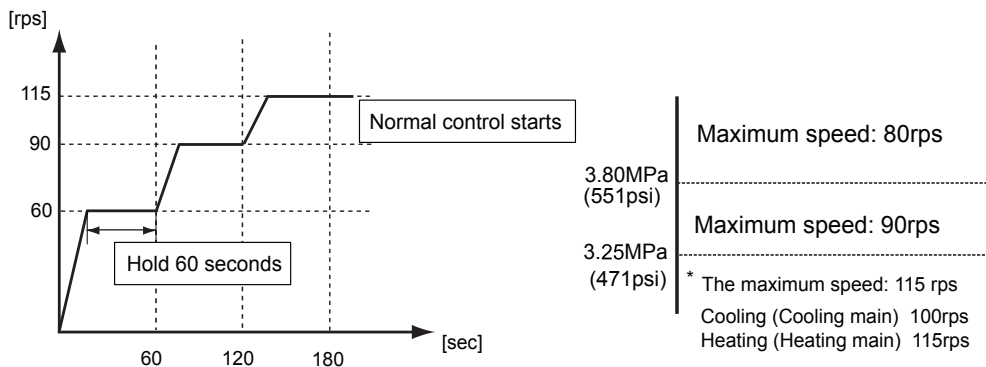
- On operation range: 20 - 115 rps *
- Changing interval: 60 sec.
- When the multi connection outdoor unit has the same type of compressor, all of compressors rotational speed are controlled with the same speed at the normal operating condition.
- All of the outdoor unit compressors must start at the start-up process.

- The Normal start process (Except the condition of Cold start)

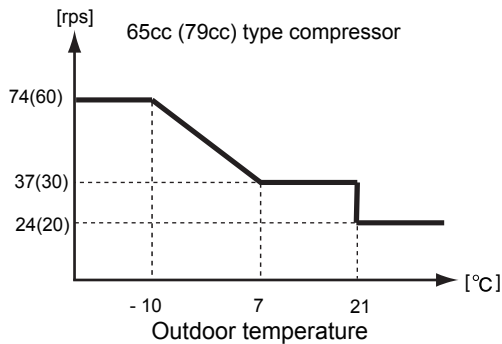
The first target speed is decided by indoor unit capacity demand.

The upper limit speed at starting is made 60 rps and is raised in 30 rps to 90 rps after 60 seconds.

(The upper speed limit depends on the operating high pressure value)



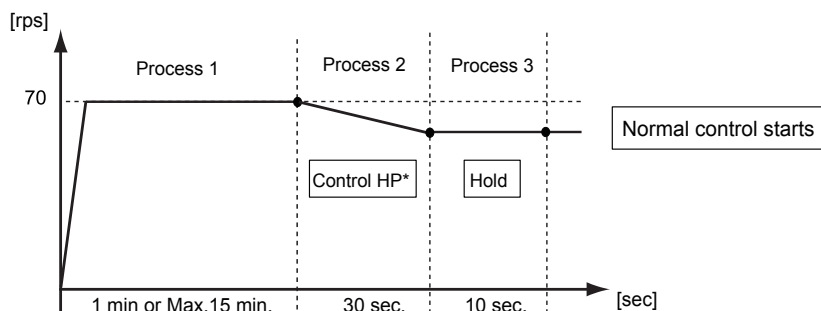
- The lower limit speed at start-up changes depending on the outdoor temperature



- Cold Start start process

Condition: Outdoor temperature below 21°C (69.8°F) and the system stopped for more than 1 hour]

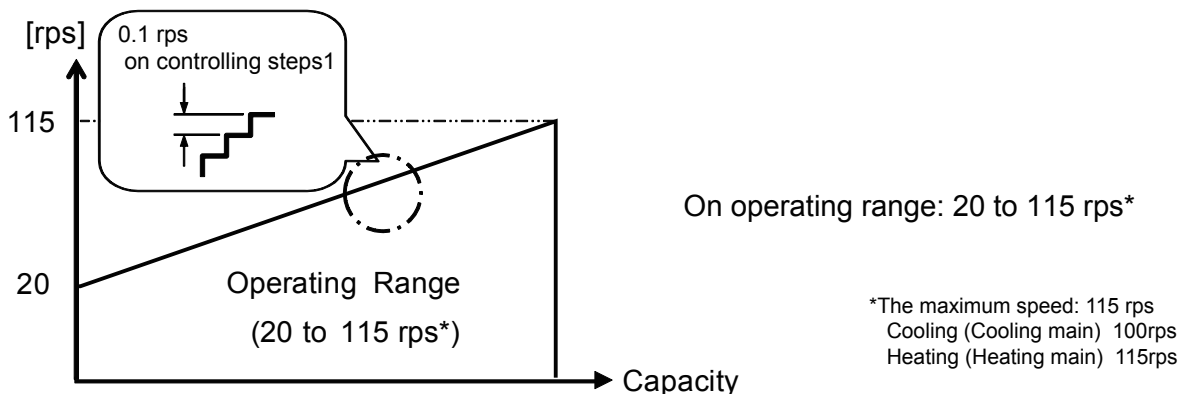
Control HP*: Change the rps so that high pressure does not reach to protection condition



2-4-3 Capacity Control

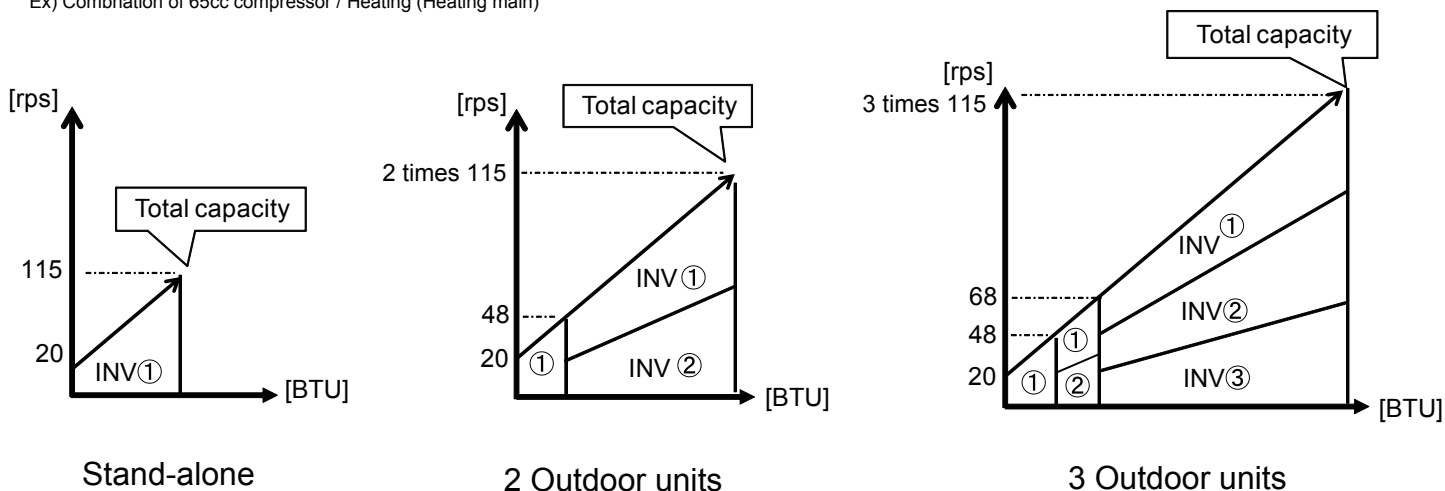
(1) Capacity of compressor operation

The inverter compressor is able to control the amount of required refrigerant circulation in details.



By combining the operation of inverter compressors, the amount of required refrigerant circulation according to cooling and heating load can be supplied from compressor efficiently.

Ex) Combination of 65cc compressor / Heating (Heating main)



(2) Target low-pressure and high-pressure control

<Cooling>

In order to make the evaporation pressure of the indoor unit at the proper pressure on a variety of operations, capacity of the compressor will be controlled by low-pressure sensor.

<Heating>

In order to make the condensation pressure of the indoor unit at the proper pressure on a variety of operations, capacity of the compressor will be controlled by high-pressure sensor.

<Cooling main / Heating main>

In order to keep evaporation pressure / condensation pressure of the indoor unit at the proper pressure on a variety of operations, capacity of the compressor and the capacity Heat exchange(incl. fan controll) will be controlled by both of pressure sensor at the sametime

Target low-pressure and high pressure temperature depends on system capacity, capacity of compressor operation, pipe length, and capacity shift switch settings.

2-4-4 Compressor Sequence Operation

Make starting sequence and start and stop of the compressors in accordance with the below sequence.

Starting sequence condition

Example)

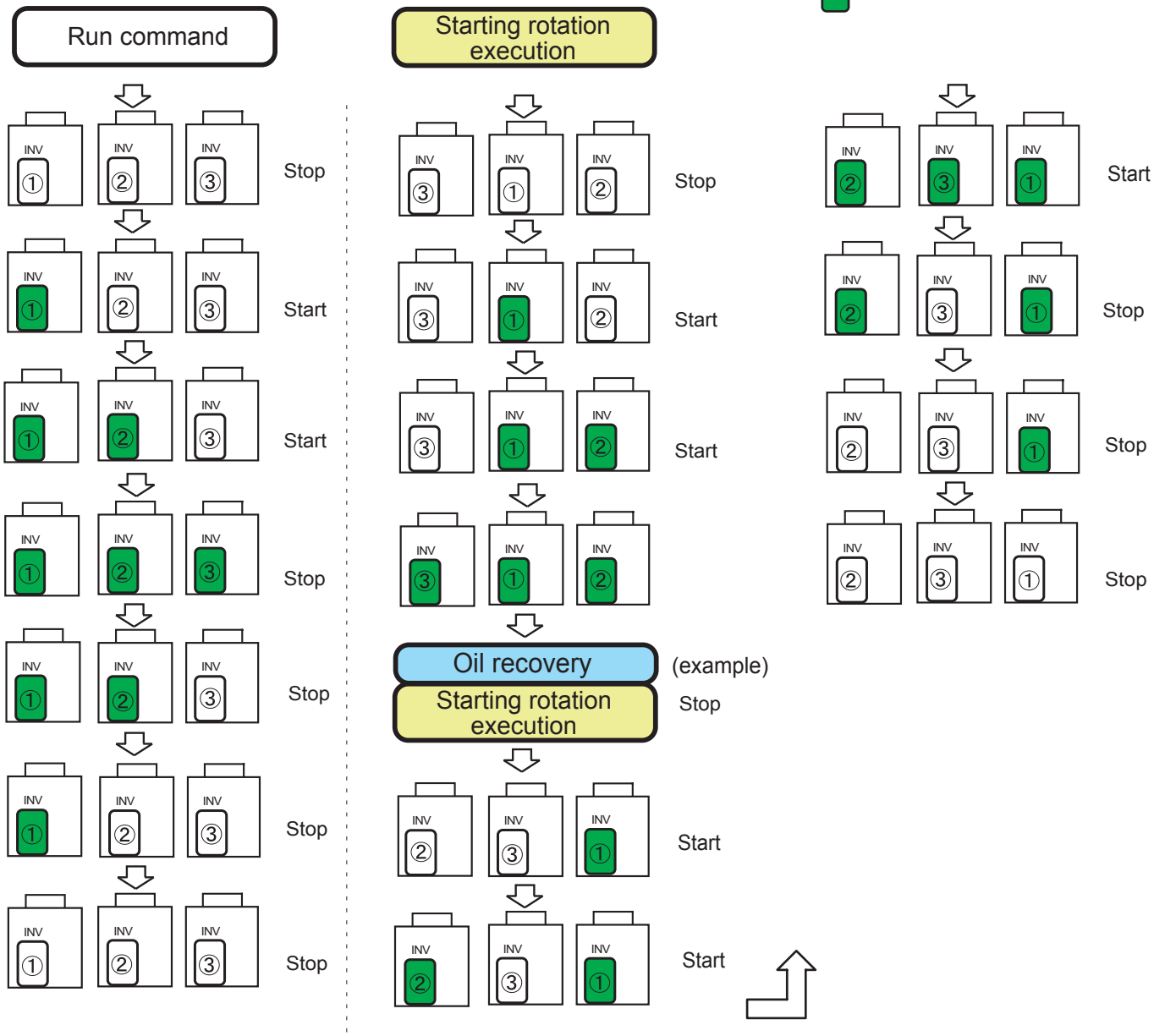
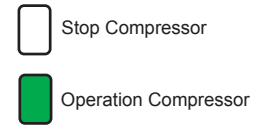
Starting sequence ① : Compressor started first, compressor stopped last

Starting sequence ② : Compressor started 2nd, compressor stopped 2nd from the end

Starting sequence ③ : Compressor started 3rd, compressor stopped 3rd from the end

Rotate the starting sequence under the following conditions:

- (1) Defrosting
- (2) Oil recovery
- (3) When cooling discharge temperature is high
- (4) After stopping from Heating operation / Heating main operation



2-5 HEAT EXCHANGER CAPACITY CONTROL

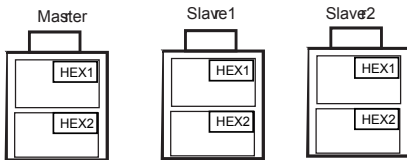
2-5-1 Operation mode selection and controlling

Under The heat exchanger capacity is controlled using the 4WV, fan, and EEV according to the target high and low pressures. The method for changing the capacity of the heat exchanger differs depending on the operation mode.

System demand	Heat-Ex conditions	Controlling device	Control target
Cooling	Condensor	Fan Motor + 4WV (ON/OFF) +EEV	Target High pressure
Heating	Evaporator	Fan Motor (Max rpm) + 4WV (ON) +EEV	Maximum control
Cooling main	Condensor	Fan Motor + 4WV (ON/OFF) + EEV	Target High / Low pressure
Heating main	Evaporator	Fan Motor + 4WV (ON) + EEV	Target High / Low pressure

2-5-2 Capacity control

The heat exchanger is operated at maximum efficiency by using each outdoor unit. (Max. 6 Heat exchanger can be used)



(1) Cooling (In case of 3 outdoor units connection)

Heat Exchanger condition: Condensor

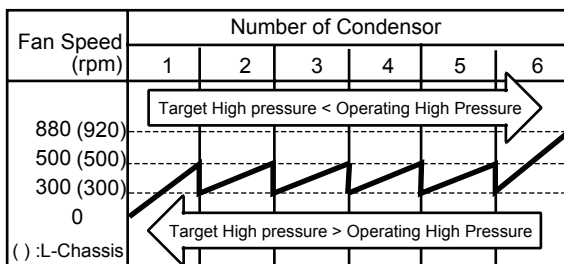
- 4WV ON / OFF (Dpending on HEX capacity shift)

Fan speed Controlling range

- 0 to 500 rpm Only one HEX in use
- 300 to 500 rpm During HEX capacity shift
- Over 500 rpm Full of Heat-Ex capacity

Heat Exchanger capacity shift controlling

- Increases: Upper HEX has a priority in usage condition.
(No available Upper HEX, Lower HEX use)
- Decrease: Lower HEX has a priority in stop condition.



(2) Heating

Heat Exchanger condition: Evaporator

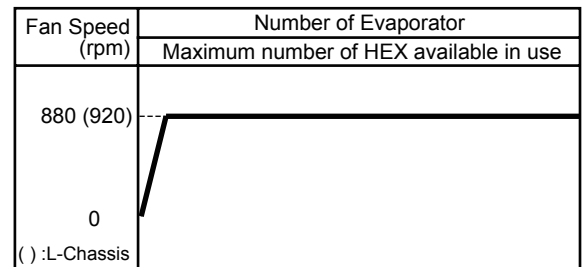
- 4WV ON state

Fan speed Controlling range

- Maximum speed

Heat Exchanger capacity shift controlling

- Use all of available HEXs (Maximum capacity)



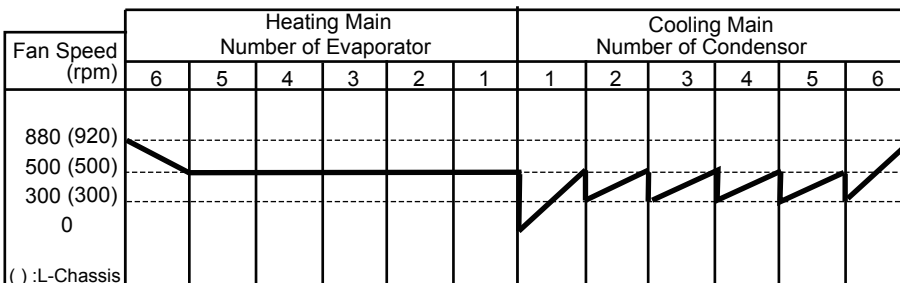
(3) Cooling Main / Heating Main (In case of 3 outdoor units connection)

Heat Exchanger condition: Depending on the difference between operating pressure and the Target High pressure and the Target Low pressure.

Fan speed controlling: Depending on the condition of HEX (Condensor / Evaporator)

Heat Exchanger capacity shift controlling:

- Increases: Upper HEX has a priority in usage condition.
(No available Upper HEX, Lower HEX use)
- Decrease: Lower HEX has a priority in stop condition.



2-6 FAN CONTROL

2-6-1 Cooling / Cooling Main Operation

The outdoor fan speed at start up is 300 rpm

Fan step	Fan speed (rpm)	
	S-Chassis	L-Chassis
16	880	920
15	860	870
14	810	820
13	720	720
12	620	620
11	500	500
10	420	420
9	360	360
8	320	320
7	300	300
6	intermittent 6	intermittent 6
5	intermittent 5	intermittent 5
4	intermittent 4	intermittent 4
3	intermittent 3	intermittent 3
2	intermittent 2	intermittent 2
1	intermittent 1	intermittent 1
0	0	0

<< Ex. Cooling operation >>

The fan speed is controlled to keep high pressure saturation temperature within the target range as follows
The high-pressure is monitoring at a set time interval and the fan speed is changed by the following conditions.

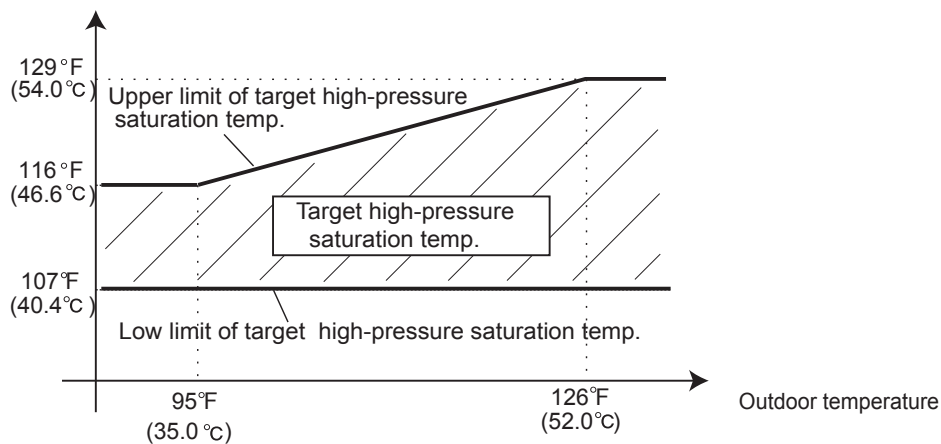
(Conditions which raise the fan speed)

High-pressure saturation > upper limit of target high-pressure saturation or heat sink temperature $\geq 176^{\circ}\text{F}(80^{\circ}\text{C})$

(Conditions which lower the fan speed)

High-pressure saturation < low limit of target high-pressure saturation range and heat sink temperature $\leq 167^{\circ}\text{F}(75^{\circ}\text{C})$

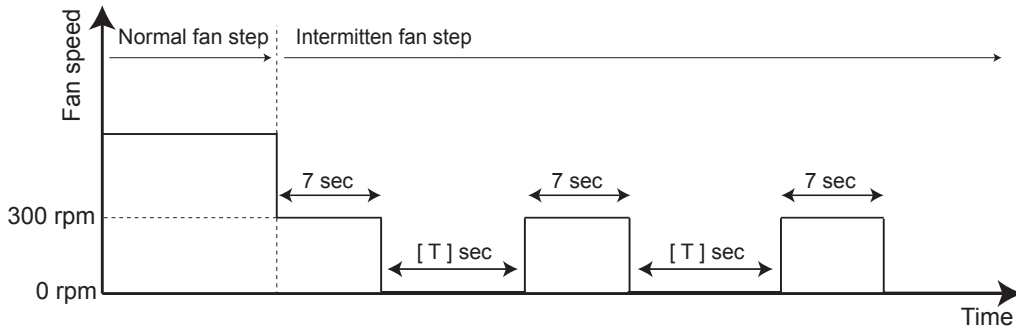
High-pressure saturation temp.



Intermittent fan mode

When switched from normal fan step to intermittent fan step, always start from 300rpm/7sec.
 When there was a change during intermittent step 1-6, switching is performed at the time the current speed duration time reaches time-up.

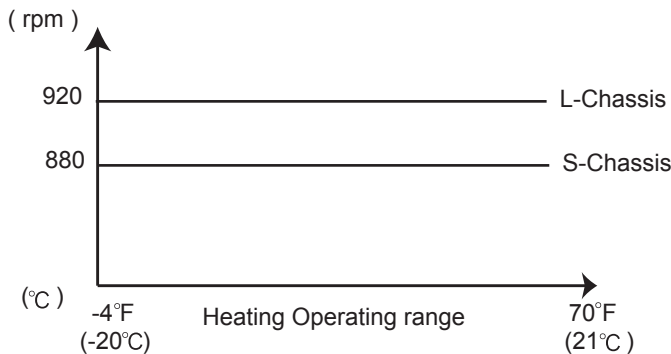
Fan step	Fan mode	Fan speed 0 rpm duration time T (sec)	Fan speed 300 rpm duration time (sec)
6	intermittent 6	40	7
5	intermittent 5	33	
4	intermittent 4	26	
3	intermittent 3	19	
2	intermittent 2	12	
1	intermittent 1	6	



2-6-2 Heating / Heating main Operation

(1) Heating Operation

The fan speed during all heating is constant with **Fan step 16*** regardless of the outdoor air temperature.



Fan step	Fan speed (rpm)	
	S-Chassis	L-Chassis
16*	880	920
15	860	870
14	810	820
13	720	720
12	620	620
11	500	500

(2) Heating main Operation

Operate at 500 rpm until all the heat exchangers are used up.
 Then adjust the rpm up or down in accordance with the load.

Fan Speed (rpm)	Number of Evaporator					
	1	2	3	4	5	6
880 (920)						
500 (500)						
300 (300)						
0						

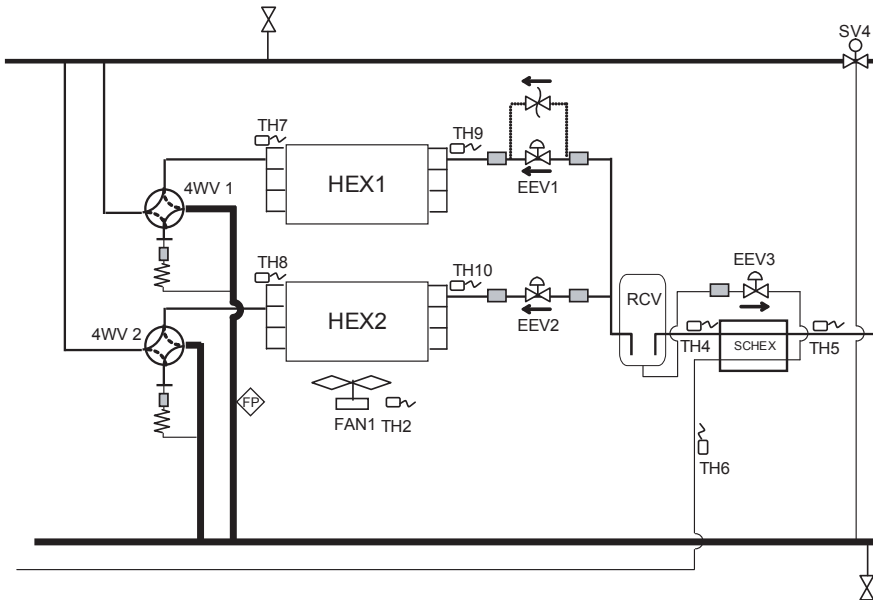
() : L-Chassis

2-7 EXPANSION VALVE CONTROL

The EEV controls the flow of refrigerant

	Operation mode	Contrl and detection	Control range	
			operation range	stop
EEV 1 EEV 2	Cooling Cooling Main	- Liquid Pressue control (TH4) - HEX balance (TH9,TH10) "TH9 \approx TH10"	52- 480 pulses	0 pulses
	Heating Heating Main	- SH control (TH7,TH8 - LPS) "Target SH: 8°F (4°C) " - Protection (TH1) (LPS)	11 - 480 pulses	0 pulses
EEV 3	Cooling Cooling Main	- SH control (TH6 - LPS) "Target SH: 8°F (4°C) " - Protection (TH1)	0- 500 pulses	0 pulses
	Heating Heating Main			

Initialization conditions: - When power turned On. - When operation stopped.



2-8 SPECIAL OPERATION

2-8-1 Oil Recovery operation

(1) Purpose of the operation

The amount of refrigerant lubricant oil which has been transported to the indoor units and the connection pipe with the refrigerant will become large as the operation time of compressor increases. It is necessary to recover the oil back into the outdoor unit for a certain time interval in order to prevent compressors from damaging due to lack of lubrication oil.

< Start condition >

Compressor accumulated operation time since last oil recovery operation exceeds 3 hours
(first time: 1 hour.)

< End condition >

3 minutes have elapsed since the compressor restart and Suction superheat "Suction temperature - Lowpressure saturation temperature" $\leq 10^{\circ}\text{F}$ (5°C) at all Outdoor units

Or



6 minutes have elapsed since the start

< Operation >

Actuator	Preparation process	On Oil recovery operation	Finishing process
Compressor	All compressor operation Stop	All compressor start	All compressor operation Stop
Heat Ex(4WV)	Keeps the operation mode	Condensor (OFF)	Keeps the operation mode
FAN	Stops	Start (Target high pressure control)	Stops
Heat Ex EEV	0 pls	480pls	0 pls
SV1,SV2	Open	Close	Open

Others

During the oil recovery operation, the status can confirm:

- 2 wires WRC --- Press the Status button on the screen.
- 3 wires WRC and Central remote controller ---  appears on the display
- Simple remote controller ---  appears on the display
- LED indication --- Operation LED (Green) flash slowly.

2-8-2 Pre-heat operation

This pre-heat operation protects the start up failure by preventing the refrigerant from soaking into the oil in compressor.

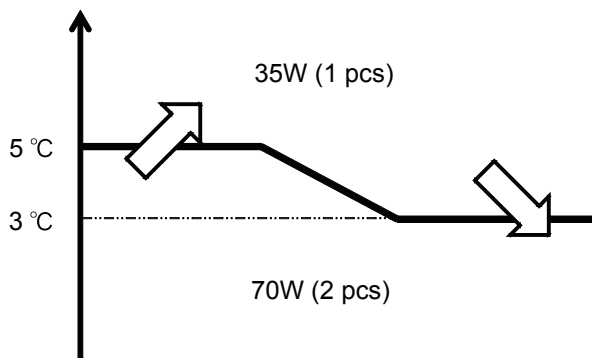
2 pcs of belt heater installed on the compressor

The crankcase heaters are controlled by the outdoor temperature

< Control condition >

Crankcase heater ON: 30 minutes elapsed since installed compressors stopped (However, ON when power turned on)

OFF: Installed compressors operation



2-8-3 Defrost Operation Control

< Defrosting start condition >

Accumulated heating operation time is 40 minutes or longer
(Accumulated heating operation time is reset at the end of cooling operation or defrosting operation.)

And

One of Heat-Ex satisfies condition ① or ② or ③ below

Condition ① : Accumulated operating time is 150 minutes* or longer:

"Heat exchange liquid temperature (TH9 and TH10) \leq 28.4°F (-2°C)"

*75 minutes: when indoor unit connection capacity \leq 90% at 1 outdoor unit connection.

Condition ② : Accumulated time 10 minutes:

"Heat exchange liquid temperature (TH9 and TH10) \leq Defrosting Start Judgment Temperature*

And

"During heat exchange liquid temperature keeps dropping "

*Defrosting Start Judgment Temperature(°F) = 0.8 x Outdoor temperature (°F) - 52.9

However, -17.7°F to 21.2°F

If the calculated result is lower than -17.7°F, the judgment temperature is defined as -17.7°F

If the calculated result is higher than 21.2°F, the judgment temperature is defined as 21.2°F

(Defrosting start judgment temperature are determined by the outdoor temperature.)

*Defrosting Start Judgment Temperature(°C) = 0.8 x Outdoor temperature (°C) - 11.6

However, -27.6°C to -6°C

If the calculated result is lower than -27.6°C, the judgment temperature is defined as -27.6°C

If the calculated result is higher than -6°C, the judgment temperature is defined as -6°C

(Defrosting start judgment temperature are determined by the outdoor temperature.)

Condition ③ : Less than 10 minutes operation at outdoor temperature below 35.6°F (2°C) occurred 20 times

< Defrosting end condition >

① At all outdoor units, heat exchange liquid temperature \geq Defrosting End Judgment Temp.* and 180sec elapsed,
and all of outdoor unit's Suction temperature - Low pressure saturation temperature \leq 10°F (5°C)

or

② When 15 minutes have elapsed from the start

*Defrosting End Judgment Temperature(°F)= 0.39 x outdoor temperature(°F) + 54.8

-However, 41.0°F to 53.6°F range

If the calculated result is lower than 41.0°F, the judgment temperature is defined as 41.0°F.

If the calculated result is higher than 53.6°F, the judgment temperature is defined as 53.6°F.

*Defrosting End Judgment Temperature(°C)= 0.39 x outdoor temperature(°C) + 12.7

-However, 5°C to 12°C range

If the calculated result is lower than 5°C, the judgment temperature is defined as 5°C.

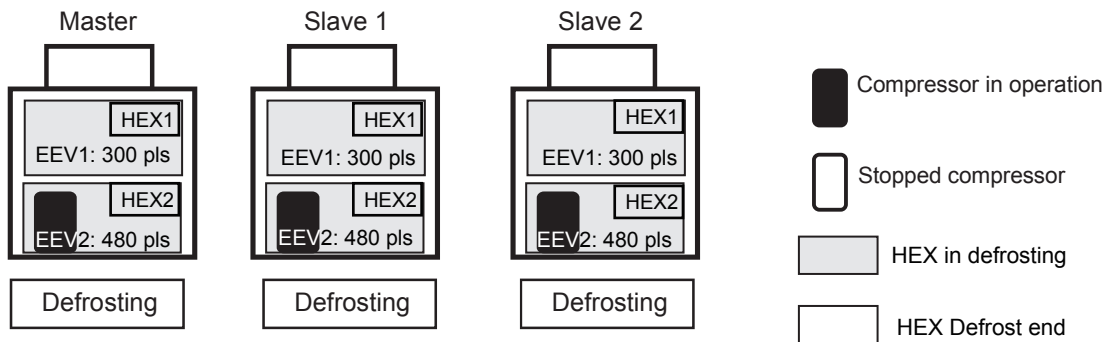
If the calculated result is higher than 12°C, the judgment temperature is defined as 12°C

< Operating state of each part during defrosting operation >

Actuator	Preparation process	On Defrost operation	Finishing process
Compressor	All compressor operaiotn Stop	All compressor start	All compressor operaiotn Stop
Heat Ex(4WV)	Change Condensor (OFF)	Cndensor (OFF)	Keeps the operation mode
FAN	Stops	Stops	Stops
EEV1 EEV2	0 pls	EEV1: 300 -> 200 pls EEV2: 480 -> 330 pls	0 pls
EEV3	0 pls	100 - 500 pls	0 pls
SV1,SV2	Open (Balancing)	Close	Open

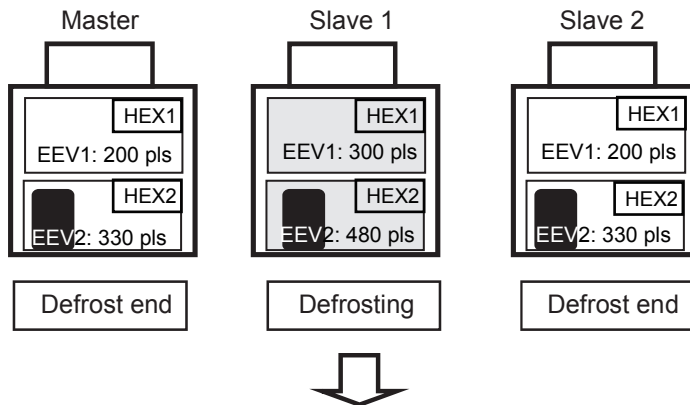
[STEP 1]

All compressors sart the operation in defrosting



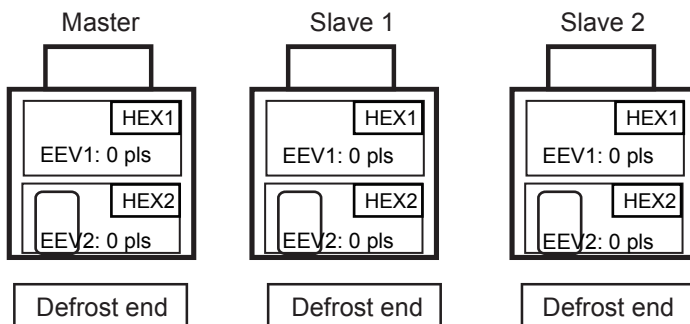
[STEP 2]

When one of the heat exchanger reached to the End condition, the expansion valve open pls will be set as smaller pls to make it easier for refrigerant distribution to another heat exchanger.



[STEP 3]

When the defrosting of all outdoor units ends, all outdoorunit stop.
The start rotation excution is done, and restarts



2-8-4 Low noise mode

When the low noise mode setting ON from Push SW or External input or System controller Input, the outdoor unit operates in the low noise mode as follows.

« Setting and corresponding operations »

External Input (CN131) on Master O.U or Low noise mode setting (Push SW)	Capacity priority setting (Push SW)	Low noise level setting (Push SW)	Operation mode
ON	OFF	LEVEL 1	LOW NOISE MODE ①
		LEVEL 2	LOW NOISE MODE ②
	ON	LEVEL 1	* Automatic switching ①
		LEVEL 2	* Automatic switching ②

« Low noise mode and operation contents »

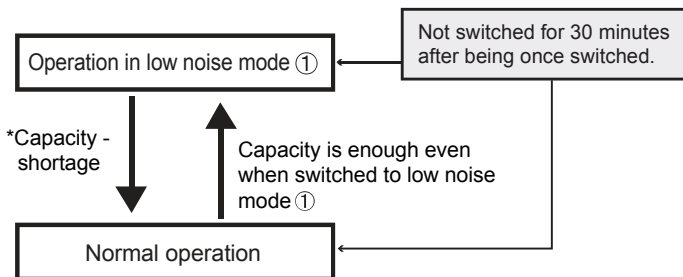
			6 ton	8 ton	10 ton
LOW NOISE MODE ①	COOL	Fan upper limit speed	620rpm	620rpm	620rpm
		Upper limit compressor capacity	50rps	54rps	56rps
	HEAT	Fan upper limit speed	620rpm	620rpm	620rpm
		Upper limit compressor capacity	50rps	62rps	56rps
LOW NOISE MODE ②	COOL	Fan upper limit speed	500rpm	500rpm	500rpm
		Upper limit compressor capacity	50rps	50rps	47rps
	HEAT	Fan upper limit speed	500rpm	500rpm	500rpm
		Upper limit compressor capacity	50rps	52rps	53rps

The operating noise is reduced by limiting the rotational speed of compressor and fan motor

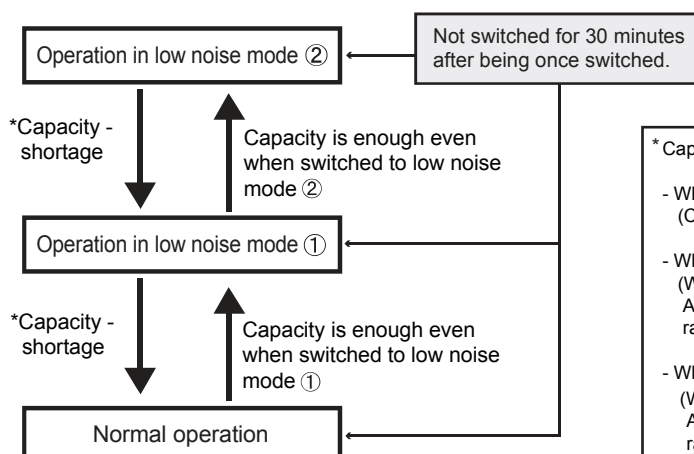
LOW NOISE MODE ① ▪ ▪ ▪ The operating sound lowers from about 3 to 5 dB more than the rated value

LOW NOISE MODE ② ▪ ▪ ▪ The operating sound lowers from about 3 to 5 dB more than the LOW NOISE MODE ①

* Automatic switching ①



* Automatic switching ②



* Capacity shortage condition

- When the compressor capacity is not enough (Compressor operates with upper limit capacity for long time.)
- When condensing capacity is not enough in cooling / cooling main operation (When the following condition keeps for 5 minutes, All of HEX in use and FAN speed can not increase and High pressure saturation temperature $\geq 136.4^{\circ}\text{F}$ (517.65psi) / 58°C (3.57MPa))
- When evaporating capacity is not enough in heating / heating main operation (When the following condition keeps for 5 minutes, All of HEX in use and FAN speed can not increase and low pressure saturation temperature $\leq 32^{\circ}\text{F}$ (0 $^{\circ}\text{C}$))

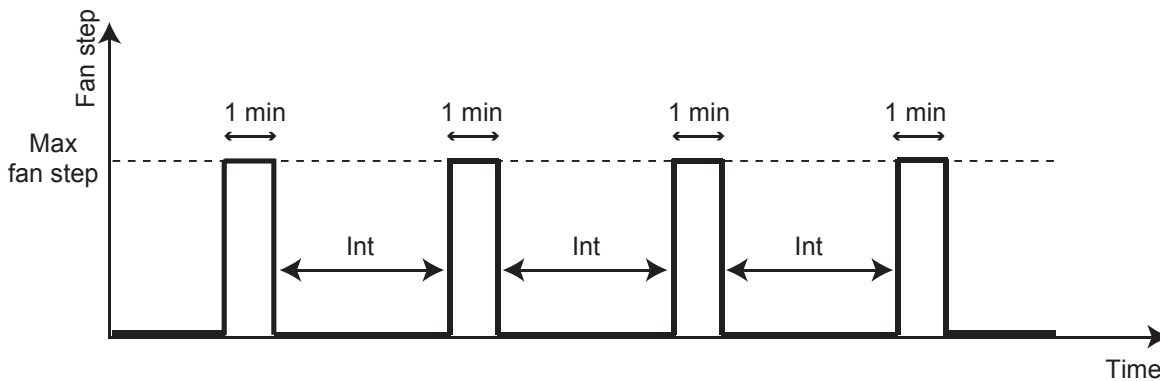
2-8-5 Snow Falling Protection Fan mode - Default Setting -

The fan rotates compulsorily at the maximum speed when the outdoor temperature becomes 41°F(5°C) or less
 The fan is rotated for 1 minute at the fan step upper limit at the interval set by PUSH SW.
 This mode ends when the outdoor temperature becomes 44.6°F (7°C) or more or operation starts.

When the Snow Falling protection is not necessary, change the Function setting F2 -22 "Invalid"

(Operation contents)

Interval setting	PUSH SW setting (F2 - 23)	Interval time Int (min)
setting ④ (standard)	00	30
setting ①	01	5
setting ②	02	10
setting ③	03	20



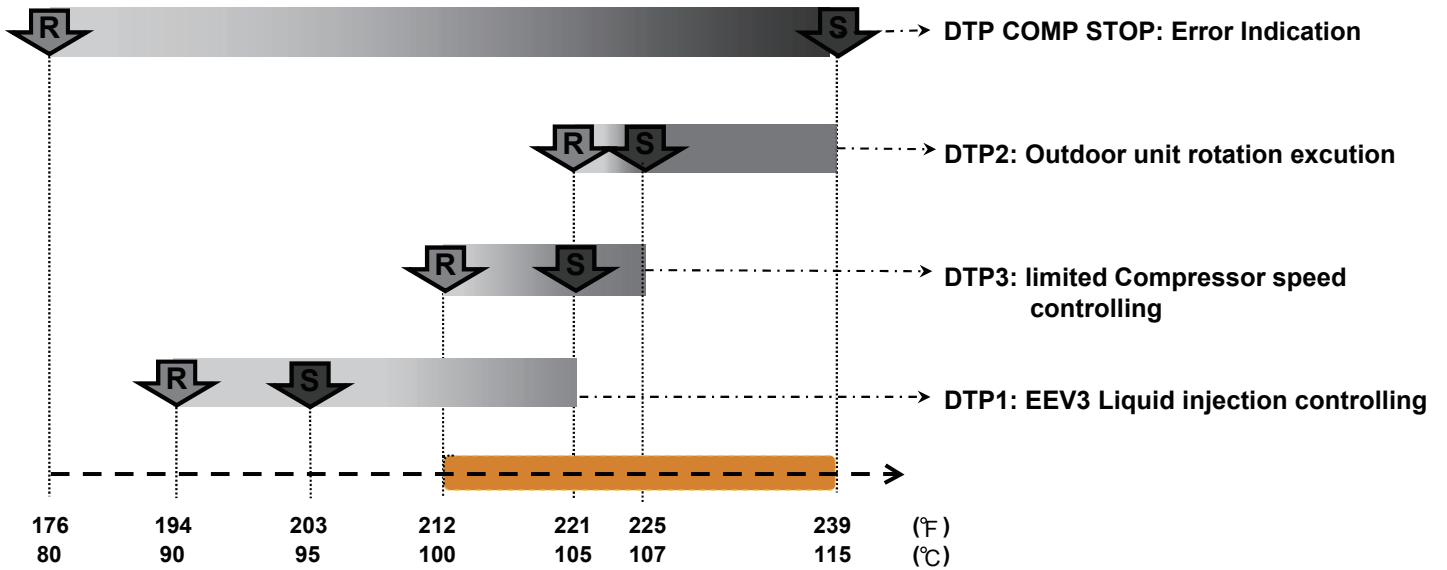
2-9 PROTECTIVE FUNCTION

2-9-1 Discharge temperature protection

Protective function	Detect device	Cool	Heat	Display	Starting conditions	Release conditions	Operation
Discharge temperature protection 1	Discharge temp. sensor <TH1>	○	○	—	Cooling/Cooling Main: Discharge temperature above 203°F(95°C) Heating/Heating Main: Discharge temperature above 216°F(102°C)	Below 194°F (90°C) Below 207°F (97°C)	EEV3 + 30pls/30 sec.
Discharge temperature protection 2	Discharge temp. sensor <TH1>	○		—	Cooling/Cooling Main: Discharge temperature Above 225°F(107°C)	Below 221°F (105°F)	Outdoor unit rotation execution * After rotation has been executed once; it is executed every 15 minutes.
Discharge temperature protection 3	Discharge temp. sensor <TH1>	○	○	—	Discharge temperature Above 221°F(105°C)	Below 212°F (100°F)	Compressor speed decrease - 6rps every 30 sec. until it becomes the cancelation condition.
Discharge temperature protection 4	Discharge temp. sensor <TH1>		○	—	Discharge temperature Above 194°F(90°C) (Heating/ Heating main)	Below 185°F (85°C)	EEV's of operating indoor unit in heating mode (incl. the Thermo OFF indoor units) gradually opens. (Thermo OFF indoor unit; max. 200 pls)
Discharge temperature protection 5	Discharge temp. sensor <TH1>		○	—	Discharge temperature Above 203°F(95°C)	Below 194°F (90°C)	EEV1 and EEV2 operating outdoor unit +10pls / 30sec
Discharge temperature protection stop	Discharge temp. sensor <TH1>	○	○	P1	Pattern 1: Discharge temperature above 239°F(115°C)	3 minutes have elapsed and Discharge temperature below 176°F (80°C)	Corresponding outdoor unit stops
				EA11	Pattern 2 Condition 1 generated 2 times within 40 minutes	Error reset (push button SW) executed after power reset	Corresponding outdoor unit stops (Permanent stop) & Error display

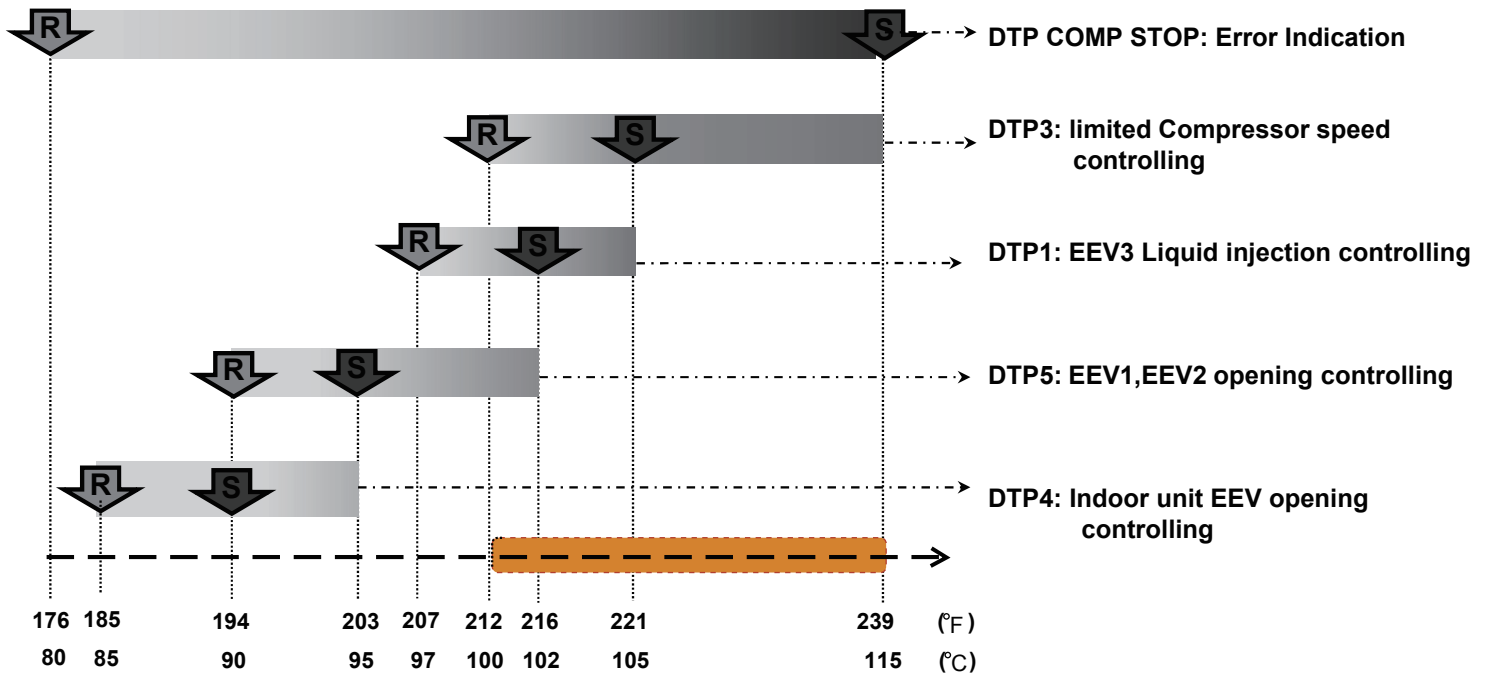
Discharge temperature protection -Summary-

Protection controlling range in Cooling mode



Note: Target pressure controlling will be cancelled when the temperature is in the range color orange.

Protection controlling range in Heating mode



Note: Target pressure controlling will be cancelled when the temperature is in the range of orange.

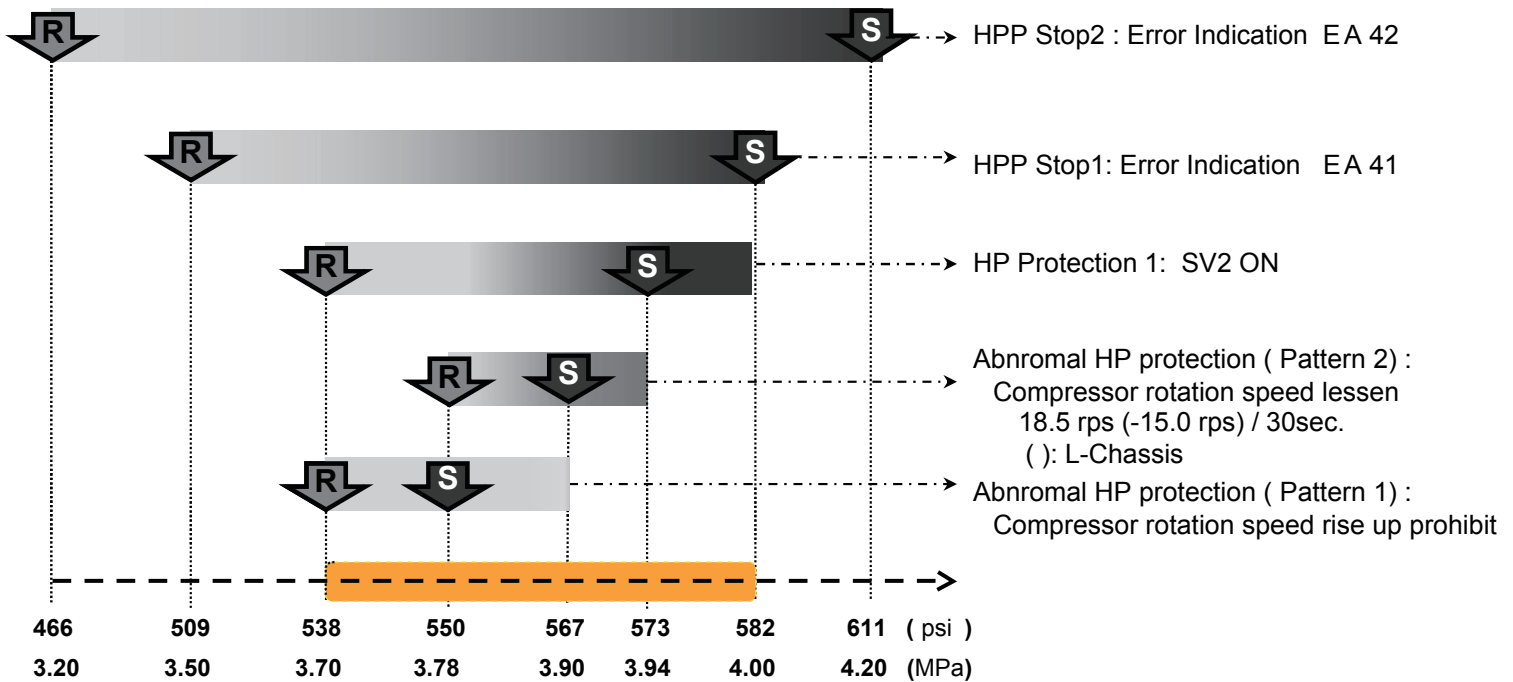
2-9-2 High pressure protection

Protective function	Detect device	Cool	Heat	Display	Start condition	Release condition	Operation
High pressure protection 1	High pressure sensor	○		—	Above 573psi (3.94MPa)	60 sec. elapsed and Below 538psi (3.70MPa)	SV2 =>ON
High pressure protection 2	High pressure sensor		○	—	Pattern 1 Above 495 (539)* psi (3.40 (3.70)* MPa)	60 sec. elapsed and Below 471 (515)*psi (3.24 (3.54)* MPa)	SV2 =>ON
					Pattern 2 Above 509 (553)*psi (3.50 (3.80)* MPa)	180 sec. elapsed and Below 486 (530)*psi (3.34 (3.64)* Mpa)	SV1, SV2 =>ON
Abnormal high pressure protection control	High pressure sensor	○	○	—	Pattern 1 Cooling/Cooling Main: Above 550psi (3.78MPa)	25 sec. elapsed and Below 538 psi (3.70Mpa)	Compressor rotation speed rise up prohibit
					Heating /Heating Main: Above 471(515)*psi (3.24 (3.54)* MPa)	25 sec. elapsed and Below 464(508)*psi (3.19 (3.49)* Mpa)	
					Pattern 2 Cooling/Cooling Main: Above 567psi (3.90MPa)	25 sec. elapsed and Below 550psi (3.78MPa)	Compressor rotation speed decrease - 18.5 rps (-15.0 rps) every30 sec. until cancel condition. (): L-Chassis
					Heating /Heating Main: Above 480(524)*psi (3.30 (3.60)* Mpa)	25 sec. elapsed and below 3.24(3.54)* MPa	
High Pressure Protection Stop 1	High pressure sensor	○	○	P2	Pattern 1 Above 582psi (4.00MPa)	5 minutes elapsed and Below 501psi (3.50MPa)	Corresponding outdoor unit stops
				EA41	Pattern 2 Pattern 1 generated 3 times within 60 minutes	10minutes elapsed and below 501psi (3.50MPa)	Corresponding outdoor unit stops & Error display
High pressure protection stop 2	High pressure switch	○	○	P2	Pattern 1 Pressure SW operate (More than 611psi (4.20 MPa) detects)	5 minutes elapsed and pressure SW reset 466psi (3.2MPa)	Corresponding outdoor unit stops
				EA42	Pattern 2 Pattern 1 generated 3 times within 60 minutes	10 minutes elapsed and pressure SW reset 466psi (3.2MPa)	Corresponding outdoor unit stops & Error display

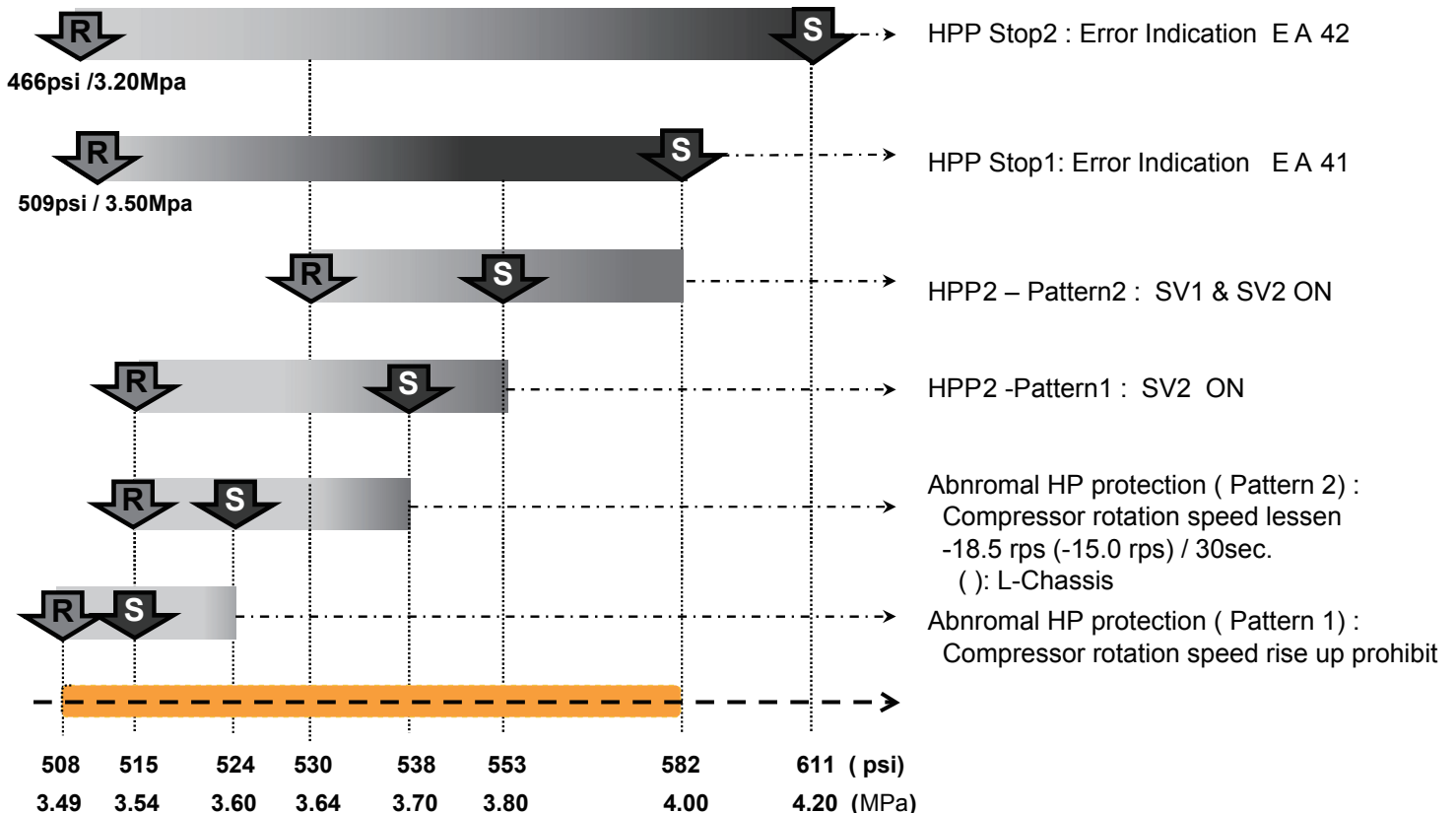
*The value in () , when the compressor is operating more than 30Hz.

High pressure protection -Summary-

Protection controlling range in cooling operating mode



Protection controlling range in heating operating mode

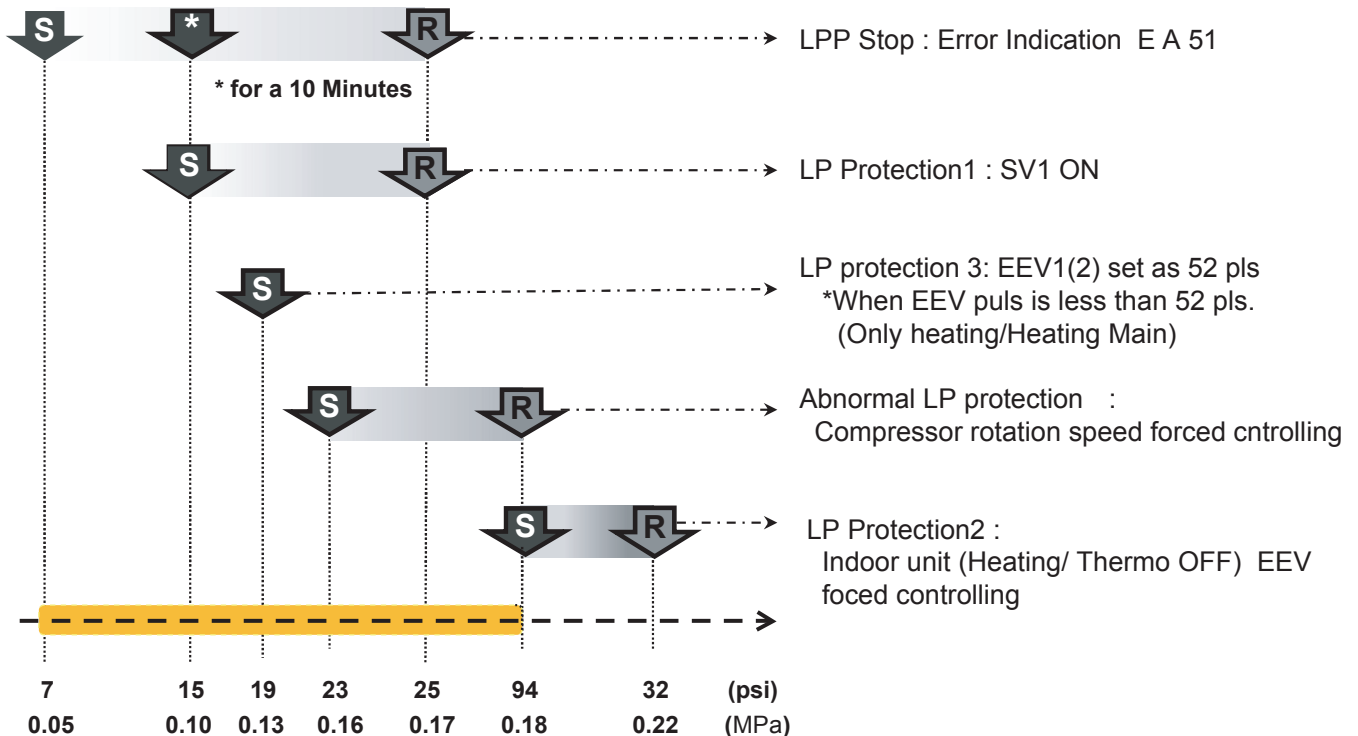


2-9-3 Low pressure protection

Protective function	Detect device	Cool	Heat	Display	Start condition	Release condition	Operation
Low pressure protection 1	Low pressure sensor	○	○	—	Below 15psi (0.10MPa)	3minutes elapsed and Above 25psi (0.17MPa)	SV1 =>ON
Low pressure protection 2	Low pressure sensor		○	—	After compressor started and 3 minutes elapsed and Below 94psi (0.18MPa)	3minutes elapsed and above 32psi (0.22MPa)	Operating Indoor unit EEV forced controlling -Thermo-OFF indoor unit: 450pls. -Thermo-ON indoor unit: gradually opens.
Low pressure protection 3	Low pressure sensor		○	—	Below 19psi (0.13MPa) and SH* above 50°F (10°C) and EEV1 (EEV2) is operating with less than 52pls. *SH = Heat-Ex1(2) Gas temp - Low pressure saturation temp.	Except the start condition	EEV1 (EEV2) set 52 plus
Abnormal low pressure protection control	Low pressure sensor	○	○	—	Below 23psi (0.16MPa)	3minutes elapsed and above 94psi (0.18MPa)	Compressor rotation speed lessen in the limited time until above 25psi (0.17Mpa) (Compressor rotation speed rise up prohibit)
Low pressure protection stop	Low pressure sensor	○	○	P3	Pattern 1 Below 7psi (0.05MPa) or 15psi (0.10MPa) for 10min.	3minutes elapsed and Above 25psi (0.17Mpa)	Corresponding outdoor unit stops
				EA51	Pattern 2 Pattern 1 generated 5 times within 180 minutes	Error reset (push button SW) executed after power turned on	Corresponding outdoor unit stops (Permanent stop) & Error display

Low pressure protection - Summary -

Protection controlling range in cooling / heating operating mode



Note: Target pressure controlling will be cancelled when the operating pressure is in the range of orange.

2-9-4 Heatsink temperature protection

Protective function	Detect device	Cool	Heat	Display	Start condition	Release condition	Operation
Heat sink temperature protection 1	Heatsink temp sensor	○	○	—	Above 167°F (75°C)	Below 167°F (75°C)	Cancel Fan speed step down.
Heat sink temperature protection 2	Heatsink temp sensor	○	○	—	Above 181°F (83°C)	Below 181°F (83°C)	Fan speed up 1 step every 2 minutes.
Heat sink temperature protection 3	Heatsink temp sensor	○	○	—	Above 189°F (87°C)	Below 167°F (75°C)	Compressor rotation speed lessens- 10 rps/ 120sec.
Heatsink temperature protection stop	Heatsink temp sensor	○	○	—	(Pattern 1 Above 196°F (91°C))	3 minutes elapsed, and below 167°F(75°C)	Compressor stops
				EAC4	Pattern 2 Pattern 1 generated 3 times within 60 minutes	10 minutes elapsed, and below 167°F(75°C)	Compressor stop and Error indication.

2-9-5 Compressor temperature protection

Protective function	Detect device	Cool	Heat	Display	Start condition	Release condition	Operation
Compressor temperature protection stop	Compressor temp. sensor <TH11>	○	○	P4	Pattern 1 Compressor temperature above 239°F(115°C)	3 minutes have elapsed and Discharge temp. below 176°F(80°C)	Corresponding outdoor unit stops
				EA31	Pattern 2 Pattern 1 generated 2 times within 40 minutes	Error reset (push button SW) executed after power reset.	Corresponding outdoor unit stops (Permanent stop) & Error display

2-9-6 O.U Heat - Ex.1(2) Gas Temp. abnormal stop

Protective function	Detect device	Cool	Heat	Display	Start condition	Release condition	Operation
O.U Heat - Ex. 1(2) Gas Temp. abnormal stop	Heat-Ex 1(2) Gas temp. Sensor <TH7,TH8>	○		EA63 (Heat Ex1) EA64 (Heat Ex2)	Heat Ex.1(2) gas temp. sensor TH7 (TH8) for use as condenser (4Way valve: Off, EEV: Open) is detected abnormally-low to High pressure saturated temp. for 4 minutes or more.	Error reset (push button SW) executed after power turned on	System Stop and Error indication

2-9-7 Over current protection

Protective function	Detect device	Cool	Heat	Display	Start condition	Release condition	Operation
Overcurrent protection stop	Inverter PCB Embedded	○	○	E941 (permanent stop)	Over current protection circuit detects (Abnormal current) in 5 times during compressor operating.	Error reset (push button SW) executed after power turned on	Compressor stop and Error indication "Trip Detection"
				E931 (permanent stop)	Over current protection circuit detects (Abnormal current) at the compressor start-up.		Compressor stop and Error indication "Inverter Compressor Start up Error"

2-9-8 Compressor Frequency Maximum setting protection

Protective function	Detect device	Cool	Heat	Display	Start condition	Release condition	Operation
Compressor Frequency Maximum setting protection	Filter PCB Current transformer	○	○	—	Pattern 1 Current value more than : 28.7A (6ton, 8ton) 35.5A (10ton)	Current value less than the start condition	Compressor speed rise up prohibited
				—	Pattern 2 Current value more than: 29.7A (6ton, 8ton) 36.5A (10ton)	Current value less than the start condition	Compressor speed lowered

2-9-9 Compressor compress ratio protection

() : L-Chassis

Protective function	Detect device	Cool	Heat	Display	Start condition	Release condition	Operation
Compressor compression ratio protection	High pressure sensor and Low pressure sensor	○	○	—	Compression ratio* above 9 (8)	3 minutes elapsed, and below 8 (7.5)	SV1 => ON

*1 Compress ratio:
$$\frac{\text{HPS} + 0.1}{\text{LPS} + 0.1}$$

2-9-10 Fan Motor, Motor Driver abnormal stop protection

Protective function	Detect device	Cool	Heat	Display	Start condition	Release condition	Operation
Fan Motor lock protection stop	Embedded device	○	○	E97. 1	1. When the outdoor fan rotation speed is less than 100rpm in 20seconds after fan motor starts. 2. After the fan motor restarts, and when the condition 1 is repeated consecutively 4 times.	Error reset (push button SW) executed after power turned on	Fan Motor and Compressor Stop Error indication
Fan Motor temperature protection stop	Embedded device	○	○	E97. 5	1. When the FAN motor failed the operation more than 470rpm. 2. After the fan motor restarts, and if the fan motor cannot operate at 470rpm or more, or the condition 1 is repeated consecutively 3 times within 60 minutes.		
Fan Motor driver protection stop	Embedded device	○	○	E97. 9	When the Driver PCB detects the following abnormalities, Driver PCB defective, Fan motor defective (short circuit), Main PCB defective (DC output abnormal), lose connection, or Disconnecting wire.		

2-9-11 EEV Coil abnormal Stop

Protective function	Detect device	Cool	Heat	Display	Start condition	Release condition	Operation
Indoor unit EEV coil abnormal Stop	Indoor unit Controller PCB EEV drive Circuit	○	○	Error on IU. LED blinks Operation 5 times Timer 2 times	When the EEV coil drive circuit is open circuit	Drive circuit detects normal condition and Power reset	System Stop Error indication "I.U Coil 1 Error"
Outdoot unit EEV coil 1,2,3 abnormal Stop	Outdoor unit Controller PCB EEV drive Circuit	○	○	Error on OU. 7-Seg display E9A"X" Coil No, "X"			System Stop Error indication "Coix1 Error" Coil No, "X"

AIRSTAGE[™] *VR-II*

Variable Refrigerant Flow System

3. INDOOR UNIT OPERATION

INDOOR UNIT OPERATION

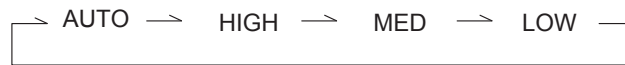
3-1 FAN CONTROL

3-1-1 Fan Speed Setting

Fan speed setting



Press the FAN CONTROL button to set the fan speed.

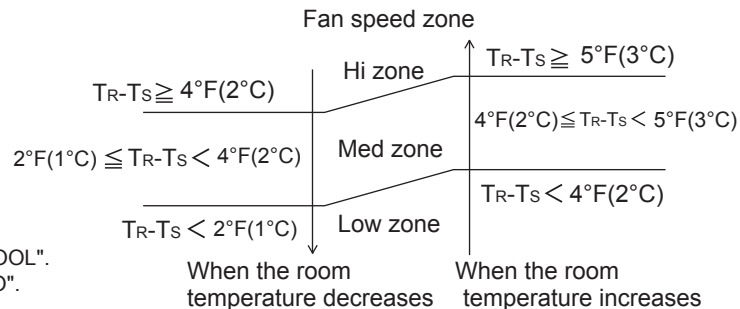


3-1-2 "AUTO" Position

1. COOL OPERATION

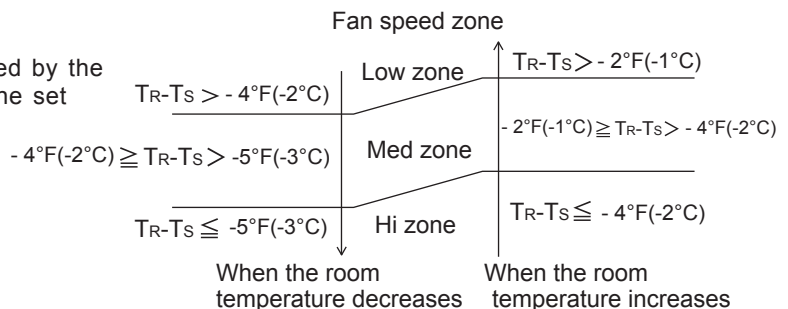
The fan speed is determined automatically in accordance with the condition " T_R (corrected room temperature) - T_S (corrected set temperature)" as shown on the right. However, the fan speed zone is determined in the manner as the room temperature increases for the following cases.

- (1) When the T_S is changed.
- (2) When the operation mode is changed from other mode to "COOL".
- (3) When the fan control is changed from other position to "AUTO".



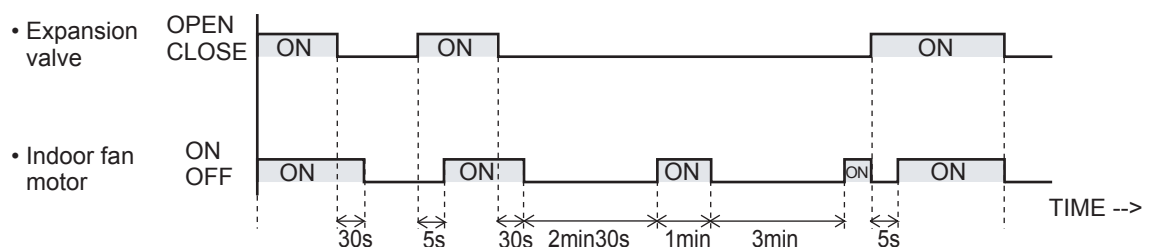
2. HEAT OPERATION

Same as Cooling operation, fan speed is decided by the difference between the room temperature and the set temperature.



3. DRY OPERATION

The indoor fan always rotates at "Lo" speed.



- (1) The indoor fan starts operation 5 seconds after the electric expansion valve opens. However, when the indoor unit just starts its operation or the operation mode is changed from other to "DRY" and the refrigerant circulation is not stopped, the fan will rotate immediately without a delay time of 5 seconds.
- (2) The indoor fan will stop in 30 seconds when the refrigerant circulation stops.
- (3) The indoor fan will stop immediately when the indoor unit is stopped by pushing the stop button or by a setting of ON timer.
- (4) When the refrigerant circulation is stopped due to a lower room temperature for more than 3 minutes, the fan will rotate 1 minutes at intervals of 3 minutes.
- (5) When the indoor unit just starts its operation or the operation mode is changed from other to "DRY" and the refrigerant circulation is stopped, the fan will rotate for 1 minute and then it will operate according to the statement (4).

4. FAN OPERATION

The indoor fan always rotates at "Lo" speed.

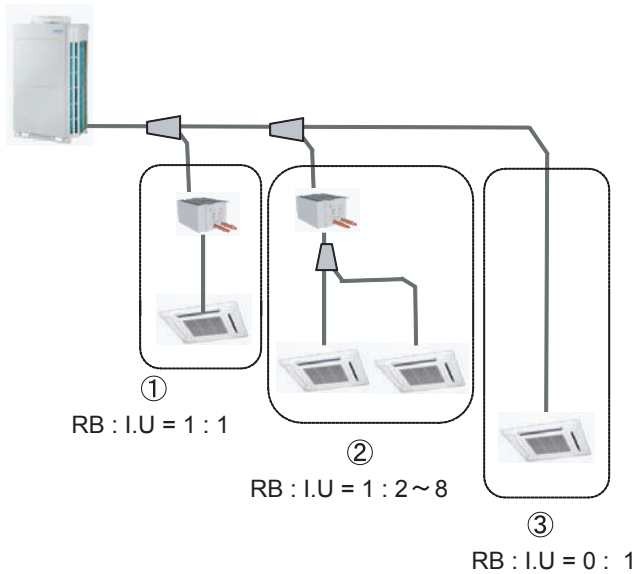
* The above explanation may differ from the actual operating condition when the compressor is controlled under protection function.

3-2 MASTER CONTROL

3-2-1 Operation Mode Control

(1) Mode setting

Each possible operation mode in each connectable type is controlled as below.



Connectable type	Cool	Dry	Heat	Auto	Custom - Auto	Fan
① Free Cool / Heat	○	○	○	○	○	○
② Fix Cool / Heat	○	○	○	*1	*1	X
③ Only Cool	○	○	X	*2	X	○

○ : Mode available

X : Mode unavailable

*1 : Mode available when the priority given to administrative indoor unit.

*2 : Mode available between Dry and Cool.

(2) Cool, Dry and Heat Mode

Each operation mode is controlled as below.

	Cool	Dry	Heat	Fan
Indoor fan motor	Operates according to the AIRFLOW MODE setting.	See the fan control page.	Operates according to the AIR FLOW-MODE setting, and besides cold air prevention operation	Operates according to the AIR FLOW-MODE setting.
Drain pump	Turns ON-OFF by the drain pump control function			
Electrical expansion valve	Pulse controlled by the temperature difference calculation and freeze prevention control	Pulse controlled by the temperature difference calculation and freeze prevention function	Pulse controlled by the temperature difference.	Stop pulse

(3) Stop mode

Indoor fan motor : OFF

Electric expansion valve : Stop pulse

Drain pump : Turns ON-OFF by the drain pump control function

(4) Priority mode (for connectable type ②)

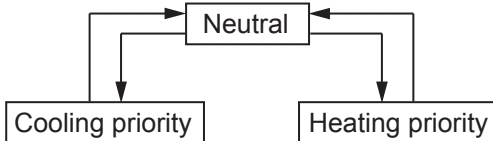
The purpose of the priority mode is to restrict operation commands (heating, cooling, dry) from the connected indoor units. There are 3 priority modes of Neutral, Cooling Priority, and Heating Priority. The operation modes restricted by each of these modes are as follows:

Priority mode	Restricted operation mode
Neutral	No restrictions
Cooling priority	Heating
Heating priority	Cooling, dry

Priority mode decision methods

Method 1. (Default value)

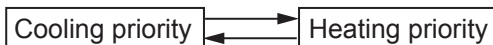
The initial priority mode is made Neutral and is shifted to Cooling Priority when cooling and to Heating Priority when heating depending on which operation mode (cooling, heating) was input first. After shifting to Cooling Priority or Heating Priority, the priority mode shifts to Neutral only when there was a Stop input from all the indoor units in the same RB Group.



Method 2. (Management by RB unit)

Operation mode management is made "Management by RB unit" by RB unit DIP-SW (field setting).

The priority mode shifts to Cooling Priority or Heating Priority in accordance with input from the RB unit regardless of the current mode.



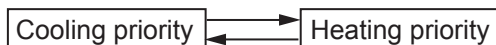
Method 3. (Management by indoor unit)

Operation mode management is made "Management by indoor unit" by RB unit DIP-SW (field setting).

Then the master indoor unit is set by wired remote controller.

Thereupon the priority mode shifts to Cooling Priority or Heating Priority in accordance with input from the master indoor unit regardless of the current priority mode.

The priority mode is fixed at either cooling or heating even if the master indoor unit stops. Cooling/Heating switching can be performed by the master indoor unit only.



(5) Opposite operation mode (for connectable type ②)

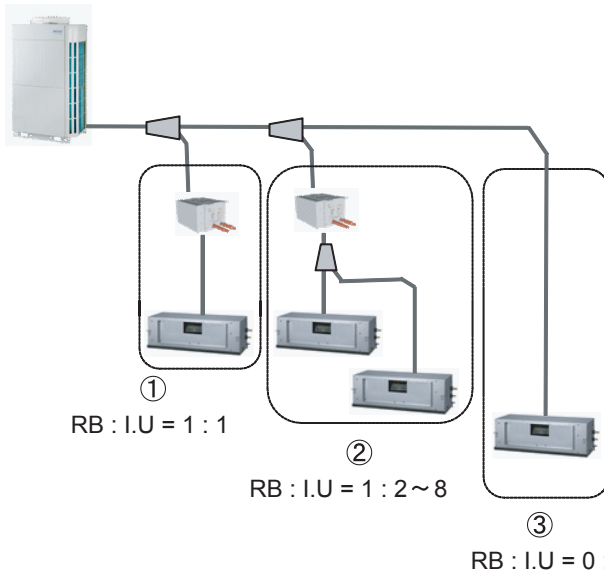
When the operation mode commanded from an indoor unit (remote controller) and the operation mode allowed by the system (cooling and dry operation for cooling only type and operation mode allowed by priority mode for heat pump type) do not match, it is indicated by blinking of an LED.

Timer lamp: 3 secs ON/1 sec OFF repeated

3-2-1 Operation Mode Control for Outdoor air unit

(1) Mode setting

Each possible operation mode in each connectable type is controlled as below.



Connectable type	Cool	Dry	Heat	Fan
① Free Cool / Heat	○	×	○	○
② Fix Cool / Heat	○	×	○	○
③ Only Cool	○	×	×	○

○ : Mode available
 × : Mode unavailable

(2) Cool and Heat Mode

Each operation mode is controlled as below.

	Cool	Heat	Fan
Outdoor air unit fan motor	Operates according to the HIGH MODE setting.	Operates according to the HIGH MODE setting.	Operates according to the HIGH MODE setting.
Drain pump	Turns ON-OFF by the drain pump control function		
Electrical expansion valve	Pulse controlled by the temperature difference calculation and freeze prevention control	Pulse controlled by the temperature difference.	Stop pulse
Solenoid valve	Closed at all times	Opened at thermostat off and compressor on. Closed at other operation.	Closed at all times

(3) Stop mode

Outdoor air unit fan motor : OFF
 Electric expansion valve : Stop pulse
 Drain pump : Turns ON-OFF by the drain pump control function
 Solenoid valve : Closed

(4) Priority mode (for connectable type ②)

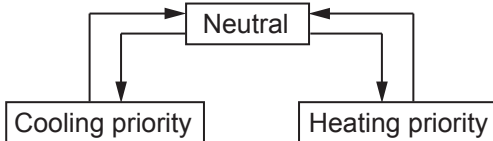
The purpose of the priority mode is to restrict operation commands (heating, cooling) from the connected outdoor air units. There are 3 priority modes of Neutral, Cooling Priority, and Heating Priority. The operation modes restricted by each of these modes are as follows:

Priority mode	Restricted operation mode
Neutral	No restrictions
Cooling priority	Heating
Heating priority	Cooling

Priority mode decision methods

Method 1. (Default value)

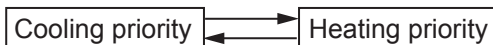
The initial priority mode is made Neutral and is shifted to Cooling Priority when cooling and to Heating Priority when heating depending on which operation mode (cooling, heating) was input first. After shifting to Cooling Priority or Heating Priority, the priority mode shifts to Neutral only when there was a Stop input from all the indoor units in the same RB Group.



Method 2. (Management by RB unit)

Operation mode management is made "Management by RB unit" by RB unit DIP-SW (field setting).

The priority mode shifts to Cooling Priority or Heating Priority in accordance with input from the RB unit regardless of the current mode.



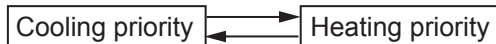
Method 3. (Management by indoor unit)

Operation mode management is made "Management by indoor unit" by RB unit DIP-SW (field setting).

Then the master indoor unit is set by wired remote controller.

Thereupon the priority mode shifts to Cooling Priority or Heating Priority in accordance with input from the master indoor unit regardless of the current priority mode.

The priority mode is fixed at either cooling or heating even if the master indoor unit stops Cooling/Heating switching can be performed by the master indoor unit only.



(5) Opposite operation mode (for connectable type ②)

When the operation mode commanded from an indoor unit (remote controller) and the operation mode allowed by the system (cooling and dry operation for cooling only type and operation mode allowed by priority mode for heat pump type) do not match, it is indicated by blinking of an LED.

Timer lamp: 3 secs ON/1 sec OFF repeated

3-2-2 Auto Changeover Heating / Cooling Operation

[Function available Indoor unit(s)]

Connectable type ① : All Indoor units

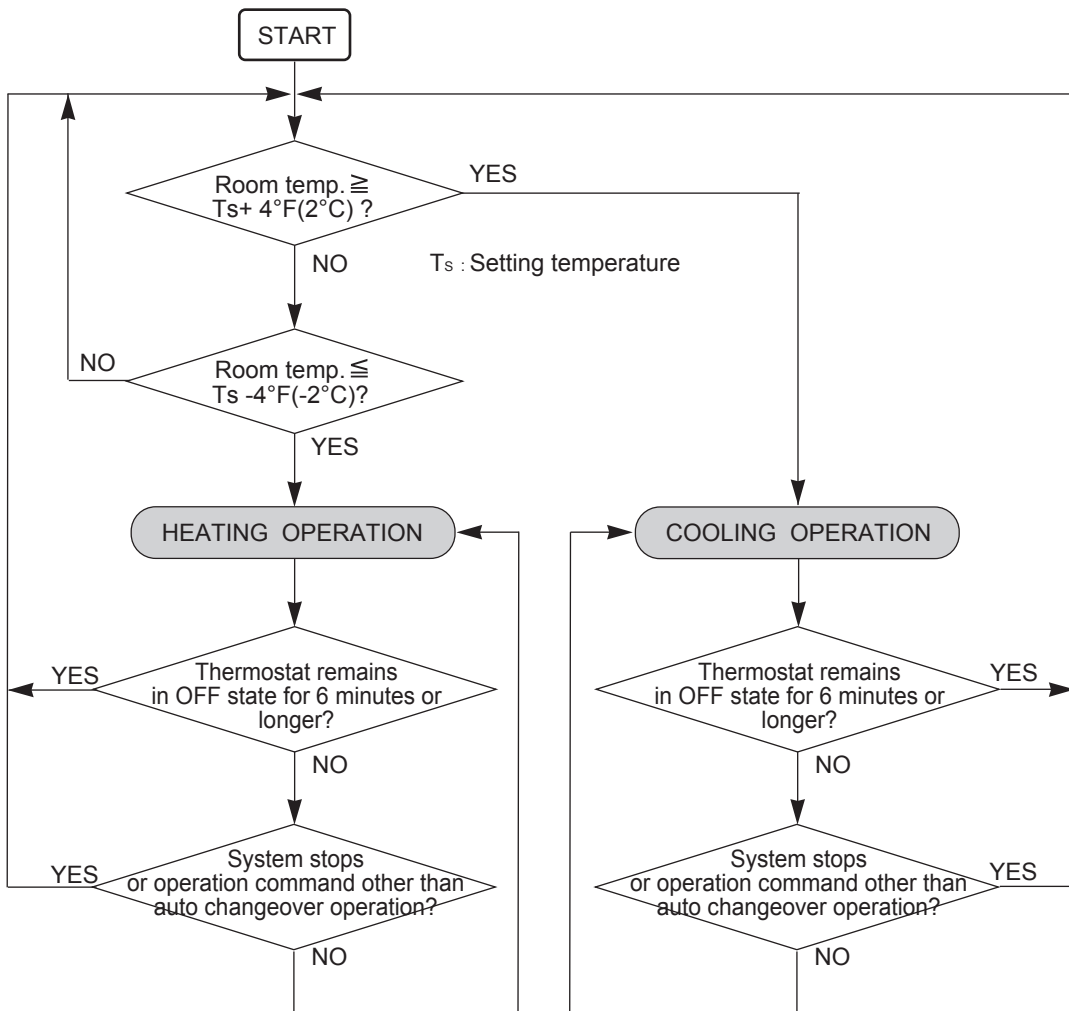
Connectable type ② : Administrative indoor unit (Management Indoor unit) Refer to the setting Method

Setting Method

1. Switch operation mode management to "Management by indoor unit" by RB unit DIP-SW.
2. Set the master indoor unit by wired remote controller.
3. Judge cooling/heating by the difference between the master indoor unit's setting temperature and the room temperature.

■ AUTO CHANGEOVER operation

Operation flow chart



3-2-2 Auto Changeover Heating / Cooling Operation for Outdoor air unit

[Function available Outdoor air unit(s)]

Connectable type ① : All Outdoor air units

Connectable type ② : Administrative outdoor air unit (Management Outdoor air unit).

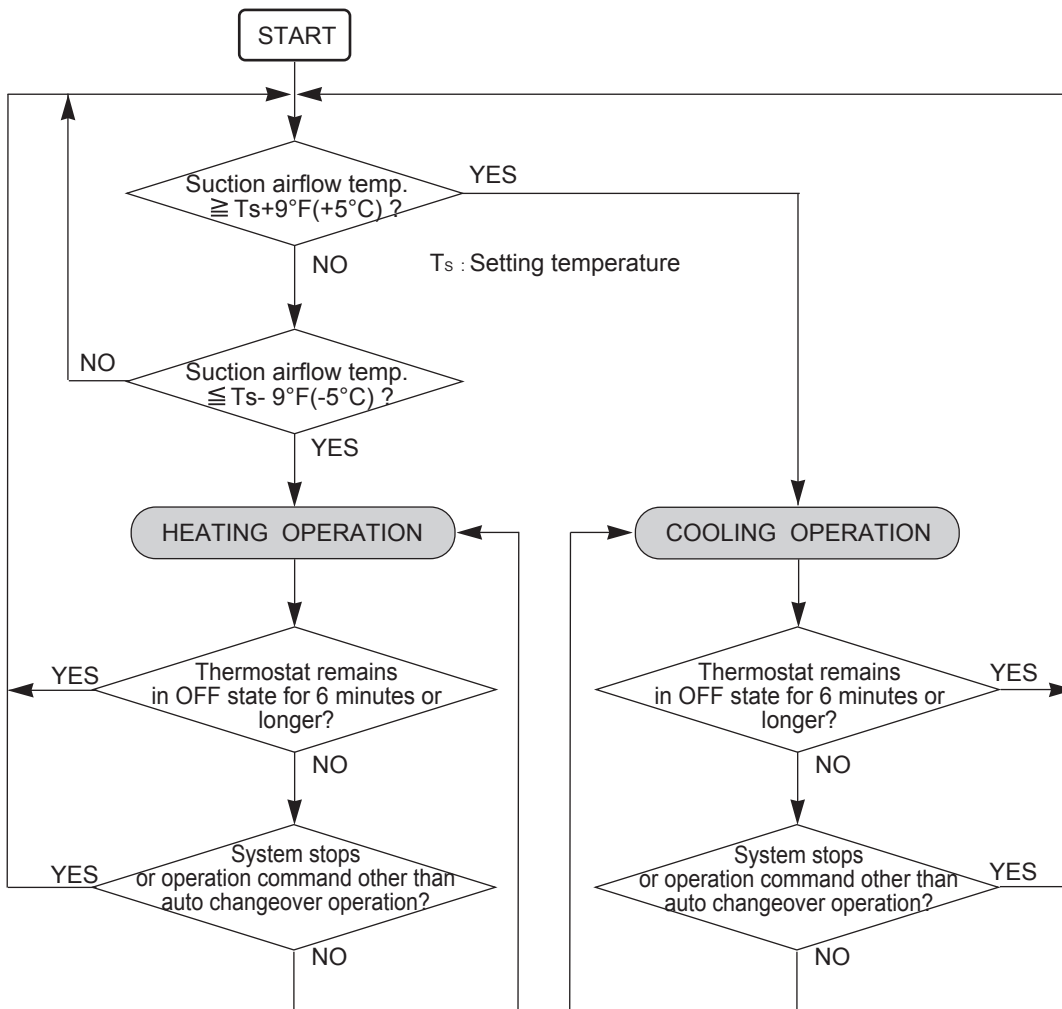
Refer to the setting Method

Setting Method

1. Switch operation mode management to "Management by outdoor air unit" by RB unit DIP-SW.
2. Set the master outdoor air unit by wired remote controller.
3. Judge cooling/heating by the difference between the master outdoor air unit's setting temperature and the suction airflow temperature

■ AUTO CHANGEOVER operation

Operation flow chart



3-2-3 Auto Changeover Cooling / Dry Operation

[Function available Indoor unit(s)]

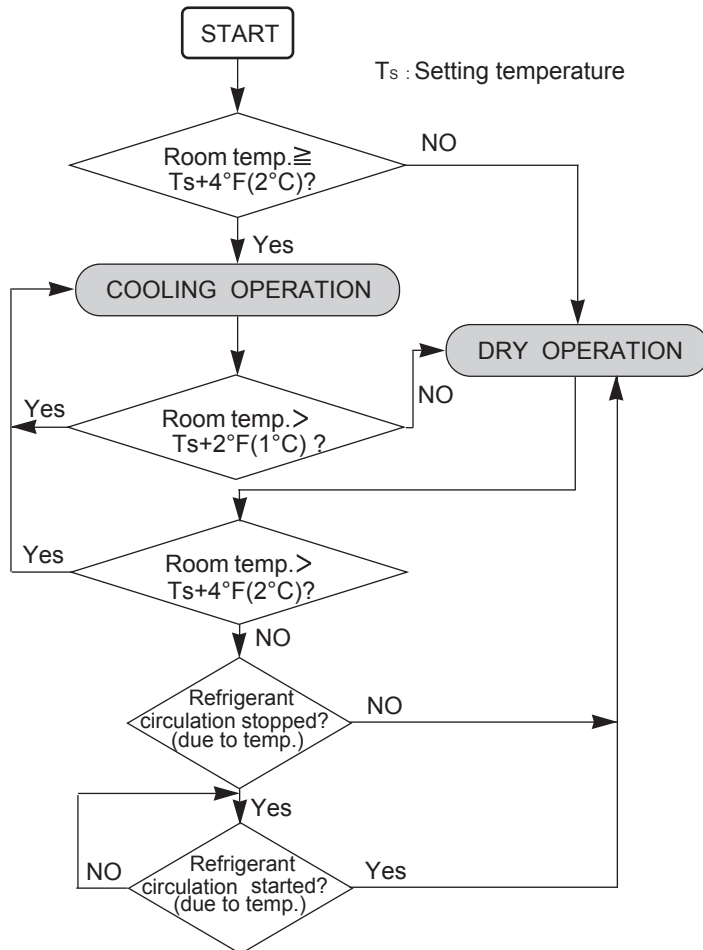
Connectable type ③ : Cooling Only indoor unit

Judge cooling/dry by the difference between the setting temperature and the room temperature.

In case of group connection of cooling only indoor unit, the room temperature sensor in wired remote controller manages the operating mode.

■ AUTO CHANGEOVER operation (COOLING ONLY TYPE)

Operation flow chart

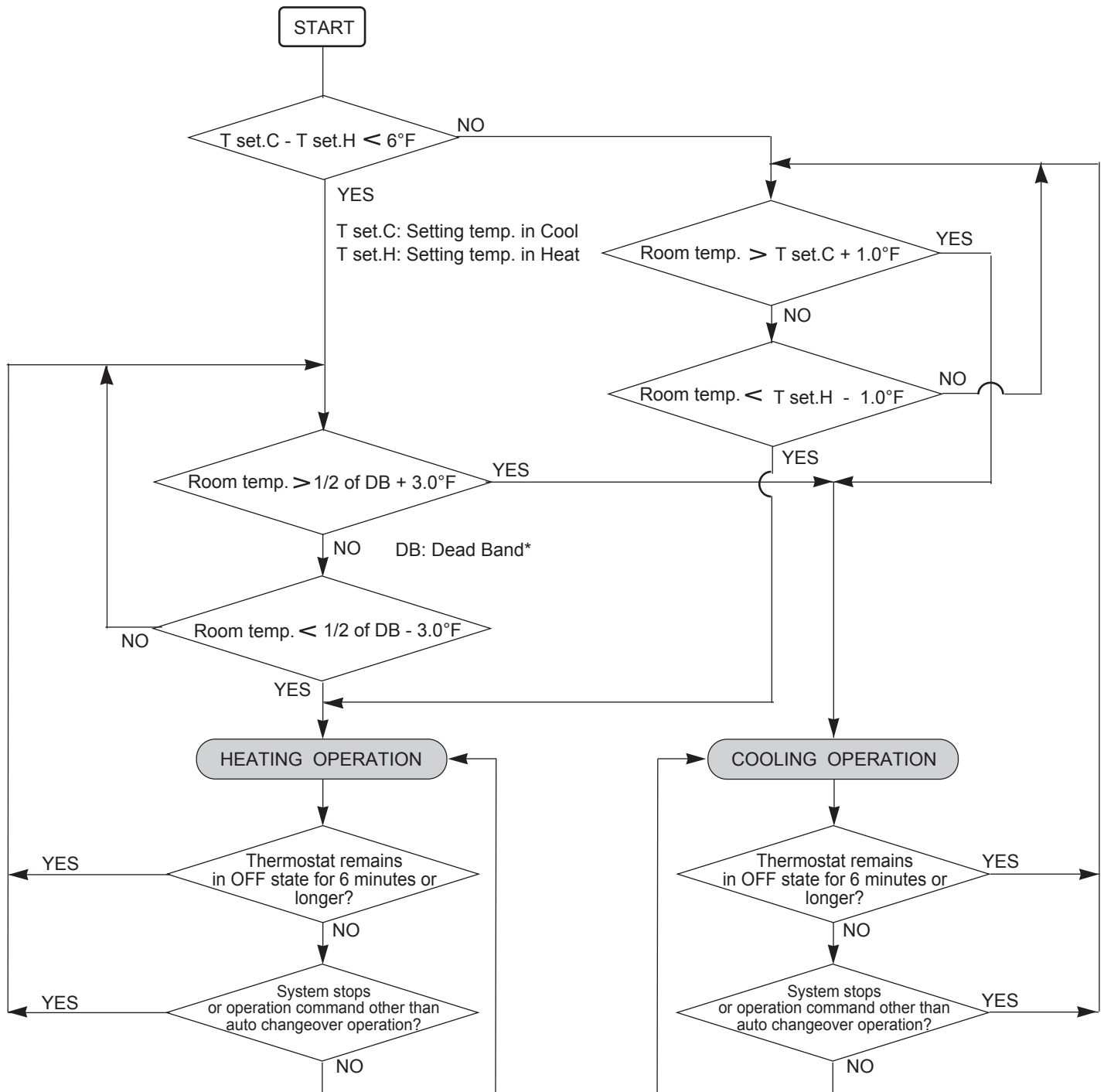


3-2-4 Custom Auto Heating / Cooling Operation

[Function available in following conditions]

- Remote controller type: UTY-RNRU
- Remote sensor in use
- Prohibit the central function from the Central controller *Reccomend

■ CUSTOM AUTO Operation
Operation flow chart



*Dead Band(DB) means between T set.C and T set.H, however the setting parameter of Dead Band always has a priority.

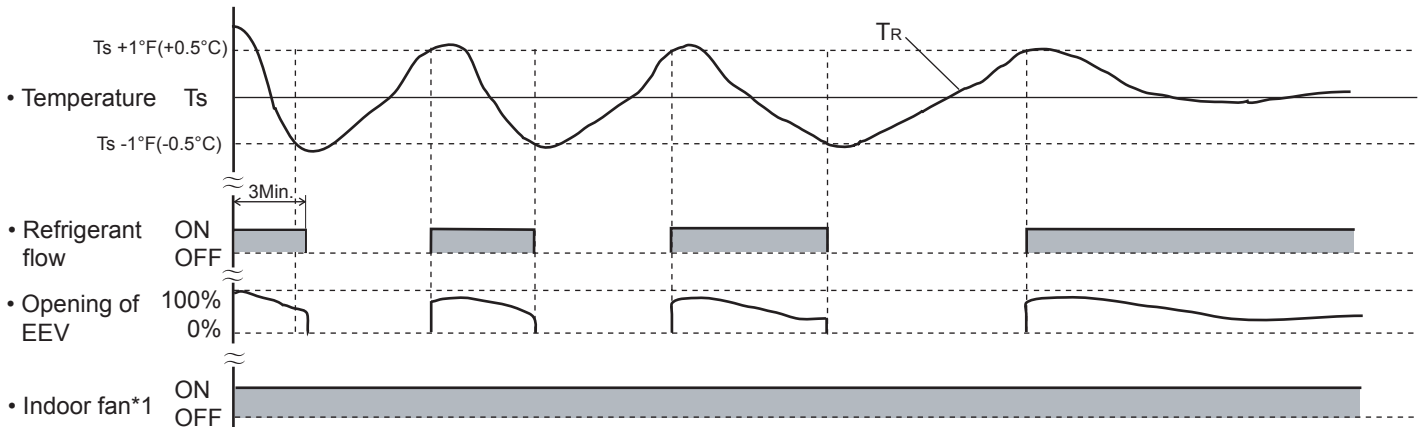
Ex) T set. C: 82°F, T set. H: 78°F DB setting: 6°F => T set. C: 82°F, T set. H: 76°F (DB will be kept from Tset.C basis)

*When the outdoor unit(s) selected the operation mode at once, the selected operation mode will be kept for 12minutes minimum.

3-2-4 "COOL" Position

When using the cooling mode, set the temperature to a value lower than the current room temperature, otherwise the indoor unit will not start the cooling operation and only the fan will rotate.

An example for COOLING TEMPERATURE CONTROL time chart (Manual setting)



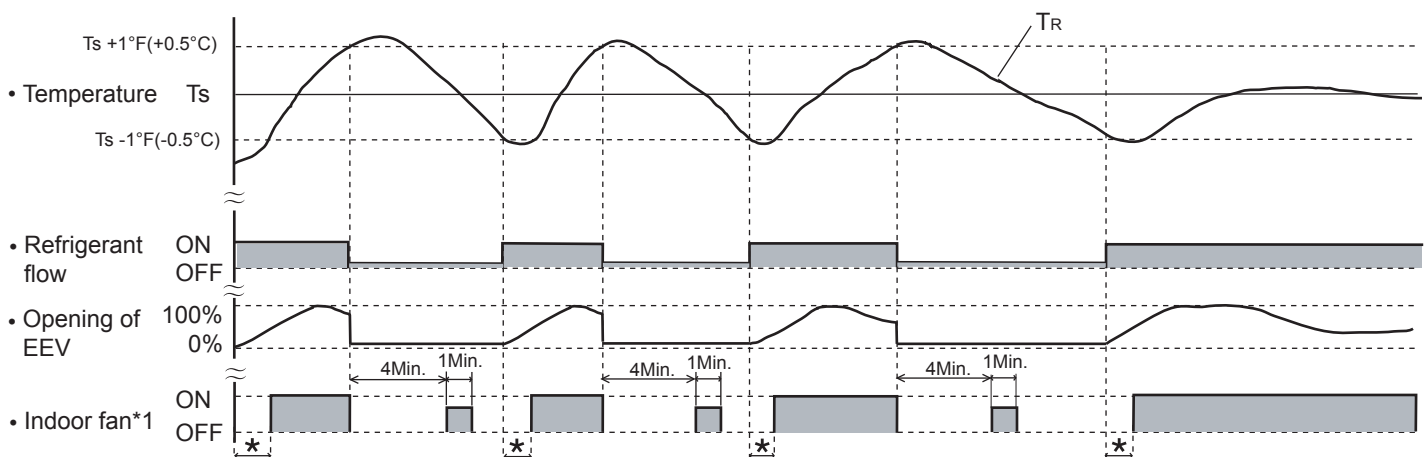
Ts : Corrected setting temperature TR : Corrected room temperature
 Ts +1°F(+0.5°C): The thres hold temperature of start of refrigant flow
 Ts -1°F(-0.5°C) : The thres hold temperature of stop of refrigant flow

*1 When Cooling Thermo-OFF(Fuction setting) activates, the Indoor fan stops under the temperature controlling. (The room temperature detection in the wired remote controller has to be activated.)

3-2-5 "HEAT" Position

- (1) When using the heating mode, set the temperature to a value higher than the current room temperature, otherwise the indoor unit will not start the heating operation.
- (2) After the start of heating operation, the fan of indoor unit will not rotate until the heater exchange is warmed up to blow out warm air.
- (3) During defrosting, the OPERATION indicator lamp flashes 6 sec. ON and 2 sec. OFF, and repeat. The heating operation will be temporarily interrupted.

An example for HEATING TEMPERATURE CONTROL time chart (Manual setting)



Ts : Corrected setting temperature TR : Corrected room temperature
 Ts +1°F(+0.5°C): The thres hold temperature of start of refrigant flow
 Ts -1°F(-0.5°C) : The thres hold temperature of stop of refrigant flow
 * : Duration of cold air prevention*2

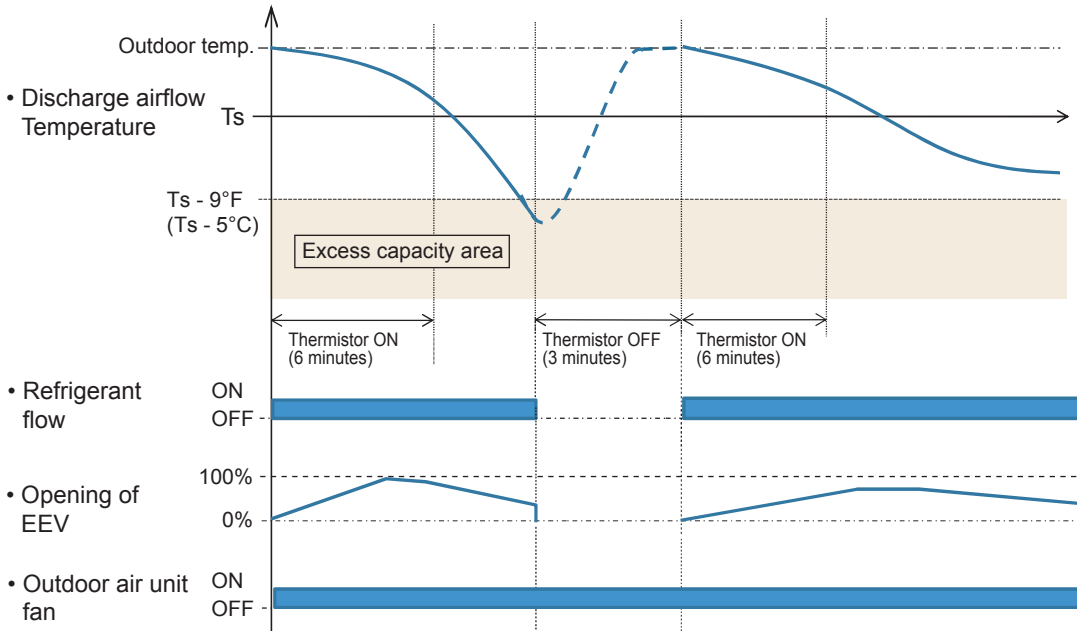
*1 When the room temperature detection in the wired remote controlle activates, the Indoor fan stops at the thermo - OFF condition.

*2 When the cold air prevention (Fuction setting) invalidiates, the Indoor fan keeps the operation by the setting.

3-2-5 "COOL" Position for Outdoor air unit

When using the cooling mode, set the temperature to a value lower than the discharge airflow temperature, otherwise the outdoor air unit will not start the cooling operation and only the fan will rotate.

An example for COOLING TEMPERATURE CONTROL time chart (Manual setting)



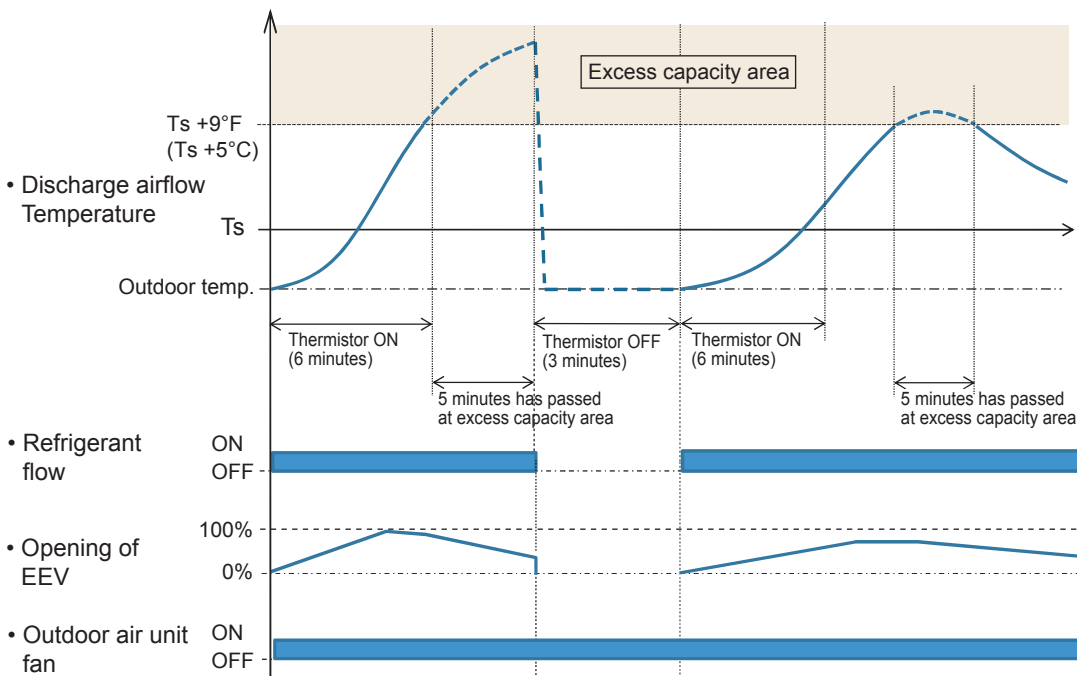
T_s : Corrected setting temperature

$T_s + 1^\circ\text{F}$ ($T_s + 0.5^\circ\text{C}$) : The threshold temperature of start of refrigerant flow
 $T_s - 9^\circ\text{F}$ ($T_s - 5^\circ\text{C}$) : The threshold temperature of stop of refrigerant flow

3-2-6 "HEAT" Position for Outdoor air unit

- (1) When using the heating mode, set the temperature to a value higher than the discharge airflow temperature, otherwise the outdoor air unit will not start the heating operation.
- (2) During defrosting, the OPERATION indicator lamp flashes 6 sec. ON and 2 sec. OFF, and repeat. The heating operation will be temporarily interrupted.

An example for HEATING TEMPERATURE CONTROL time chart (Manual setting)



T_s : Corrected setting temperature

$T_s - 1^\circ\text{F}$ ($T_s - 0.5^\circ\text{C}$) : The threshold temperature of start of refrigerant flow
 $T_s + 9^\circ\text{F}$ ($T_s + 5^\circ\text{C}$) for 5 minutes or more : The threshold temperature of stop of refrigerant flow

3-3 LOUVER CONTROL

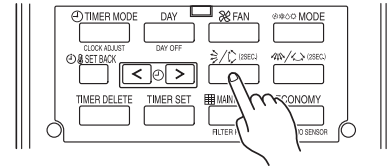
(1) ADJUSTING THE DIRECTION OF AIR CIRCULATION

Instructions relating to heating (*) are applicable only to heat pump type outdoor unit.

Begin air conditioner operation before performing this procedure.

Vertical Air Direction Adjustment

This instructions are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR/CEILING TYPE", "CASSETTE TYPE", "WALL MOUNTED TYPE" and "COMPACT WALL MOUNTED TYPE".



Example : When set to vertical air direction.

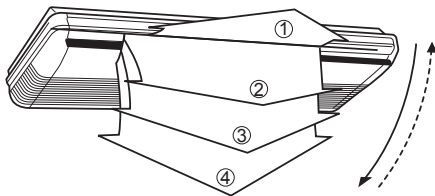
Press the **VERTICAL AIR FLOW DIRECTION SET** button.

- Press the VERTICAL AIRFLOW DIRECTION button.
The temperature display will change to the vertical airflow direction setting display.
- Press the VERTICAL AIRFLOW DIRECTION button to change the vertical louvre position.
The position number will appear on the display.

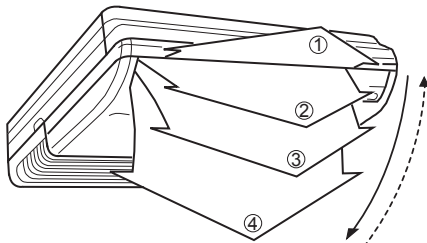
Cooling & Dry : ①, ②, ③, ④

Heating : ①, ②, ③, ④

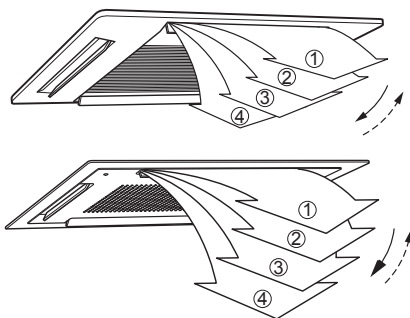
■ LARGE CEILING TYPE



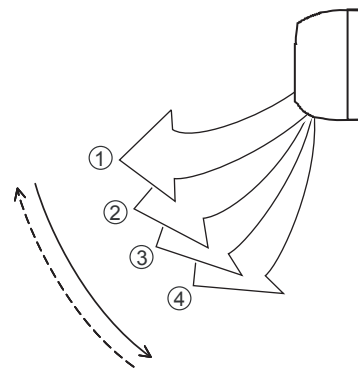
■ UNIVERSAL FLOOR/CEILING TYPE



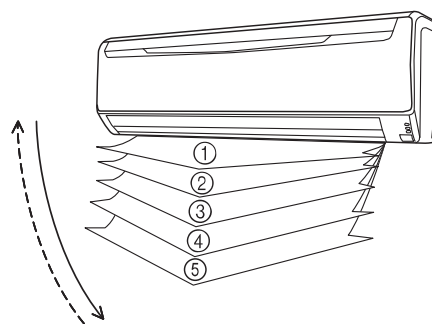
■ CASSETTE TYPE



■ COMPACT WALL MOUNTED TYPE



■ WALL MOUNTED TYPE



Adjustable Position (All Mode) ①, ②, ③, ④, ⑤
Position ② setting is available by only wireless remote controller

- Use the air direction adjustments within the ranges shown above.
- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.
During Cooling mode : Horizontal flow ①
During Heating mode : Downward flow ④ (Large Wall mounted type: ⑤)
- During AUTO mode operation, for the first minute after beginning operation, airflow will be horizontal ①, the air direction cannot be adjusted during this period.

Horizontal Air Direction Adjustment

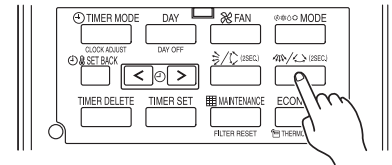
This instructions are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR/CEILING TYPE" and "WALL MOUNTED TYPE".

Press the **HORIZONTAL AIR FLOW DIRECTION SET** button.

- Press the HORIZONTAL AIRFLOW DIRECTION button. The temperature display will change to the horizontal airflow direction setting display.
- Press the HORIZONTAL AIRFLOW DIRECTION button to change the horizontal louvre position. The position number will appear on the display.

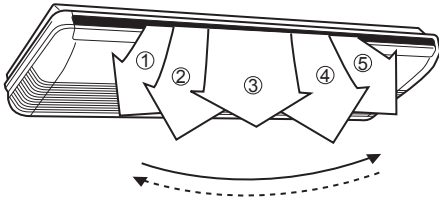
Cooling & Dry : ①, ②, ③, ④, ⑤

Heating : ①, ②, ③, ④, ⑤

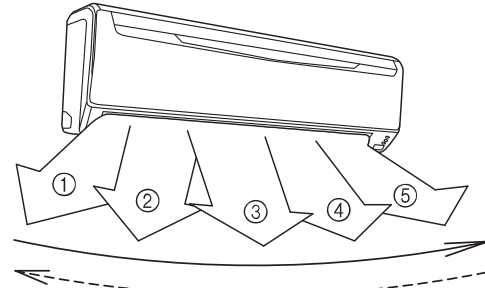


Example : When set to horizontal air direction.

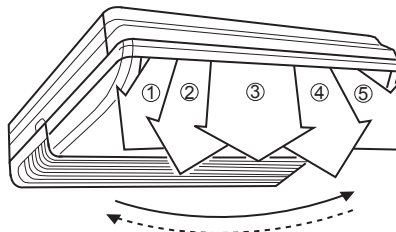
■ LARGE CEILING TYPE



■ WALL MOUNTED TYPE



■ UNIVERSAL FLOOR/CEILING TYPE



(2) SWING OPERATION

Instructions are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR / CEILING TYPE", "CASSETTE TYPE", "WALL MOUNTED TYPE" and "COMPACT WALL MOUNTED TYPE".

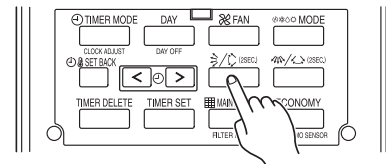
Begin air conditioner operation before performing this procedure.

To select Vertical airflow SWING Operation

This instructions are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR/CEILING TYPE", "CASSETTE TYPE", "WALL MOUNTED TYPE" and "COMPACT WALL MOUNTED TYPE".

Press the **VERTICAL SWING** button for more than two seconds.

The remote controller's Vertical Swing Display will light up.
In this mode, the UP/DOWN air direction flaps will swing automatically to direct the air flow both up and down.



Example : When set to vertical swing.

To Stop Vertical airflow SWING Operation

Press the **VERTICAL SWING** button for more than two seconds once and again.

The remote controller's Vertical Swing Display will go out.
Airflow direction will return to the setting before swing was begun.

Instructions are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR / CEILING TYPE", "CASSETTE TYPE", "WALL MOUNTED TYPE", and "COMPACT WALL MOUNTED TYPE".

About Vertical Airflow SWING Operation

- The SWING operation may stop temporarily when the air conditioner's fan is not operating, or when operating at very low speeds.
- The swing operation is not available depending on the model. Please refer to the operating manual for the indoor unit.

Air swing range

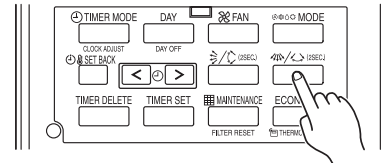
Air flow direction set	Range of swing
①	① to ④ (All range) *Large Wall Mounted type ① to ⑤
②	
③	
④	

To select Horizontal Airflow SWING Operation

This instructions are applicable to "LARGE CEILING TYPE", "UNIVERSAL FLOOR / CEILING TYPE", "WALL MOUNTED TYPE" and "CEILING WALL TYPE".

Press the HORIZONTAL SWING button for more than two seconds.

The remote controller's Horizontal Swing Display will light up. In this mode, the RIGHT/LEFT air direction louvers will swing automatically to direct the airflow both right and left.



Example : When set to horizontal swing.

To stop Horizontal airflow SWING Operation

Press the HORIZONTAL SWING button for more than two seconds once and again.

The remote controller's Horizontal Swing Display will go out. Airflow direction will return to the setting before swing was begun.

About Horizontal Airflow Swing Operation

- Left and right swing range can be changed in 3 steps by field setting.
- The SWING operation may stop temporarily when the air conditioner's fan is not operating, or when operating at very low speeds.
- The swing operation is not available depending on the model. Please refer to the operating manual for the indoor unit.

Left and right swing range (◆ ... Factory setting)

Range of swing	Function Number	Setting Value
◆ ① to ⑤ (All range)	24	00
① to ③		01
③ to ⑤		02

3-4 ELECTRONIC EXPANSION VALVE CONTROL

1. Initialization

- When the power is turned ON.
- When it has passed the limited time since the last initialization.

2. Operation Control

- When indoor unit stopping by Thermo-OFF condition.

Outdoor unit Condition	EEV Condition
OFF	Fully closed
Cooling	Fully closed
Heating	Slightly open

- When starting up
(Cooling) Move to the cooling control base pulse in steps.
(Heating) Move to the heating control base pulse in steps.
- Automatic operatic control
Automatic PI control is performed based on the indoor unit heat exchanger outlet temp and inlet temp.
- Room temperature control
The room temperature is controlled so that it reaches to the set-up temperature based on the difference between the room temperature and the set-up temperature, and the change of indoor unit temperature.
Cooling operation: if the room temperature becomes 0.5°C lower than the set-up temperature, EEV is fully closed.
Heating operation: if the room temperature becomes 0.5°C Higher than the set-up temperature, EEV is slightly opened.
*In case of protection controlling, EEV keeps open position.

3. Special Control

- Oil recovery operation : Controlled pulse(Maximum 1400 puls)
- Test run operation : Controlled pulse.
- Freeze prevention control : Fully closed.
- Vacuuming operation : Fully open.
- Defrost operation : Controlled pulse(Maximum 1400 puls)

3-5 DRAIN PUMP OPERATION

- (1) When cooling and refrigerant circulation starts, the drain pump starts simultaneously.
- (2) The drain pump operates continuously for 3 minutes after the refrigerant circulation stopped.
- (3) When the refrigent circulation is stopped by a start of indoor heat exchanger frost prevention operation, the drain pump will turn off in 1 hour after the end of indoor heat exchanger frost prevention operation.
- (4) When the water level in the drain pan rises up and then the float switch functions:
 - ① Microcomputer stops the refrigerant circulation and indoor fan motor operation.
 - ② Drain pump operates continuously for 3 minutes after the float switch is turned off.
(Almost condensing water may be drained)
- (5) When the float switch turns ON continuously for 3 minutes, 'FAILURE INDICATION' operates.
- (6) When the float switch turns OFF within 3 minutes, the unit starts cooling operation.

3-4 ELECTRONIC EXPANSION VALVE CONTROL for Outdoor air unit

1. Initialization

- When the power is turned ON.
- When it has passed the limited time since the last initialization.

2. Operation Control

- When indoor unit stopping by Thermo-OFF condition.

Outdoor unit Condition	EEV Condition
OFF	Fully closed
Cooling	Fully closed
Heating	Fully closed

- When starting up
(Cooling) Move to the cooling control base pulse in steps.
(Heating) Move to the heating control base pulse in steps.
- Automatic operatic control
Automatic PI control is performed based on the indoor unit heat exchanger outlet temp and inlet temp.
- Discharge airflow temperature control
The discharge airflow temperature is controlled so that it reaches to the set-up temperature based on the difference between the discharge airflow temperature and the set-up temperature.
Cooling operation: 1) If the discharge airflow temperature becomes 9°F (5°C) lower than the set-up temperature, EEV is fully closed.
2) If the suction airflow temperature becomes 1°F (0.5°C) lower than the set-up temperature, EEV is fully closed.
Heating operation: 1) If the discharge airflow temperature becomes 9°F (5°C) higher than the set-up temperature for 5 minutes or more, EEV is fully closed.
2) If the suction airflow temperature becomes 1°F (0.5°C) higher than the set-up temperature, EEV is fully closed.

3. Special Control

- Oil recovery operation : Controlled pulse(Maximum 1400 puls)
- Test run operation : Controlled pulse.
- Freeze prevention control : Fully closed.
- Vacuuming operation : Fully open.
- Defrost operation : Controlled pulse(Maximum 1400 puls)

3-5 DRAIN PUMP OPERATION for Outdoor air unit

- (1) When cooling and refrigerant circulation starts, the drain pump starts simultaneously.
- (2) The drain pump operates continuously for 3 minutes after the refrigerant circulation stopped.
- (3) When the refrigent circulation is stopped by a start of indoor heat exchanger frost prevention operation, the drain pump will turn off in 1 hour after the end of indoor heat exchanger frost prevention operation.
- (4) When the water level in the drain pan rises up and then the float switch functions:
 - ① Microcomputer stops the refrigerant circulation and indoor fan motor operation.
 - ② Drain pump operates continuously for 3 minutes after the float switch is turned off.
(Almost condensing water may be drained)
- (5) When the float switch turns ON continuously for 3 minutes, 'FAILURE INDICATION' operates.
- (6) When the float switch turns OFF within 3 minutes, the unit starts cooling operation.

3-6 FUNCTION

3-6-1 Auto Restart

The air conditioner restarts with the previous setting operation.

3-6-2 Freeze Prevention Control

The icing of the indoor heat exchanger is prevented during the cooling and dry mode operation.

(1) Starting Condition

- Compressor is operation more than 3 minutes.
When "Heat exchanger inlet temperature $\leq T_A$ " continues *4 minutes or more.
- Compressor is operation more than 3 minutes.
When "Heat exchanger outlet temperature $\leq T_A$ " continues 4 minutes or more.

(2) Operation

EEV is closed.
Fan is at the setting amount.

(3) Completing Condition

Heat exchanger inlet and middle temperature $\geq T_B$
After more than 5 minutes

* Drain pump turns off at 60 minutes past the completion of the icing protection operation.

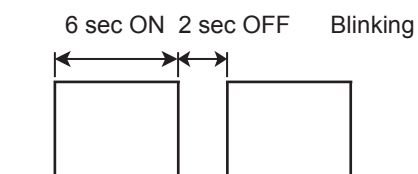
T_A	T_B
1°C	7°C

3-6-3 Oil Recovery Operation / Defrost Operation

[Oil recovery operation / Defrost operation] :

It periodically returns the residual refrigerant ion oil in the indoor unit and the connection piping back to the outdoor unit , and prevents the compressor oil level from decreasing.

Indoor unit LED : Operation LED



Indoor fan : Same operation before oil recovery operation in cooling operation or dry operation.(Heating operation: Stop)

Indoor EEV : Control pulse

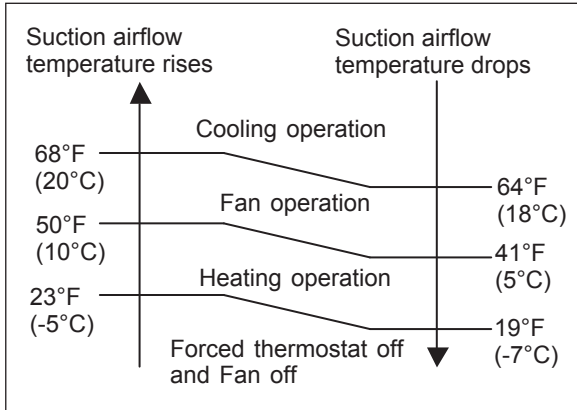
* During the above operation, a refrigerant noise might hear from the indoor unit.

3-6-4 Outdoor temperature protected operation for Outdoor air unit

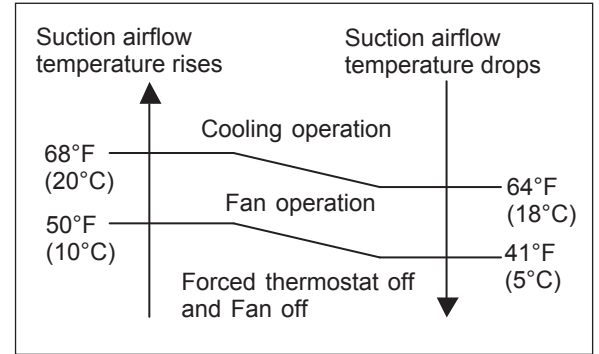
1. COOL OPERATION

The contents of operation is controlled as following based on the suction airflow temperature.

- a) Operation mode management is made "Management by indoor unit", and outdoor air unit is master indoor unit.

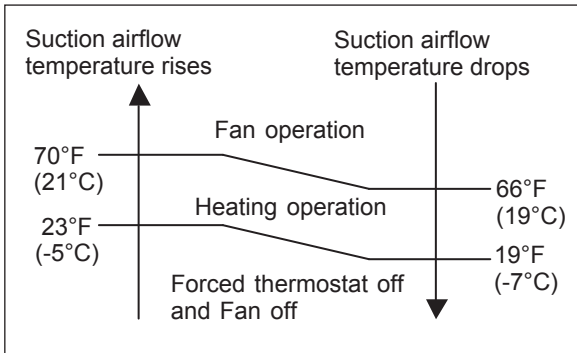


- b) Cases Other than (a)



2. HEAT OPERATION

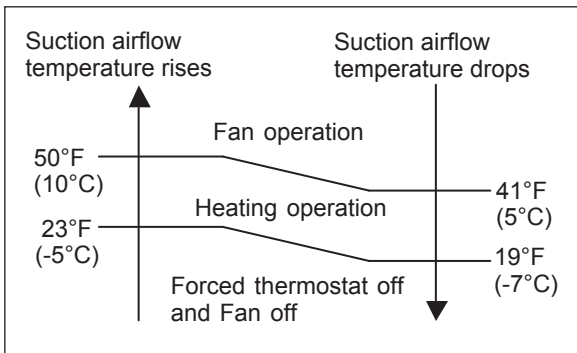
The contents of operation is controlled as following based on the suction airflow temperature.



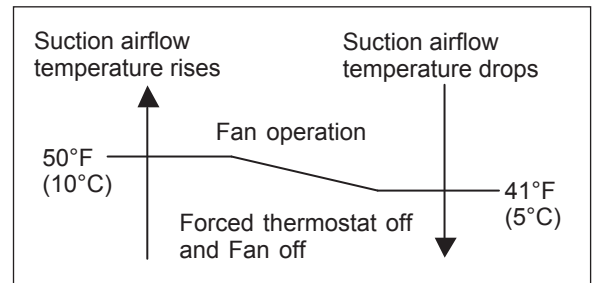
3. FAN OPERATION

The contents of operation is controlled as following based on the suction airflow temperature.

- a) Operation mode management is made "Management by indoor unit", by indoor unit, and outdoor air unit is master indoor unit.



- b) Cases Other than (a)



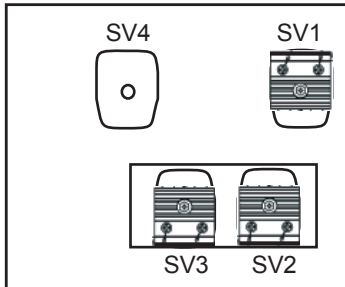
RB UNIT OPERATION

3-7 RB UNIT COMPONENT

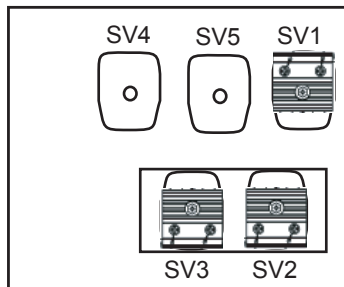
3-7-1 Position of Solenoid coil

Single type

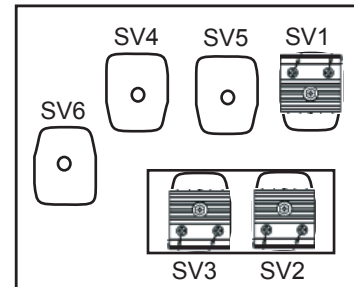
UTP-RX01AH



UTP-RX01BH

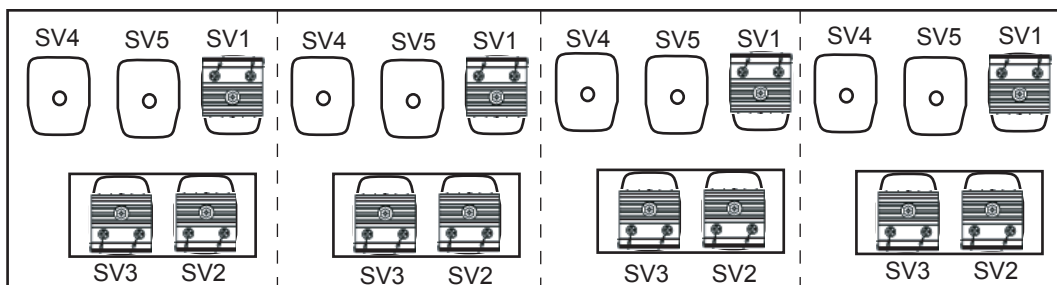


UTP-RX01CH



Multi type

UTP-RX04BH

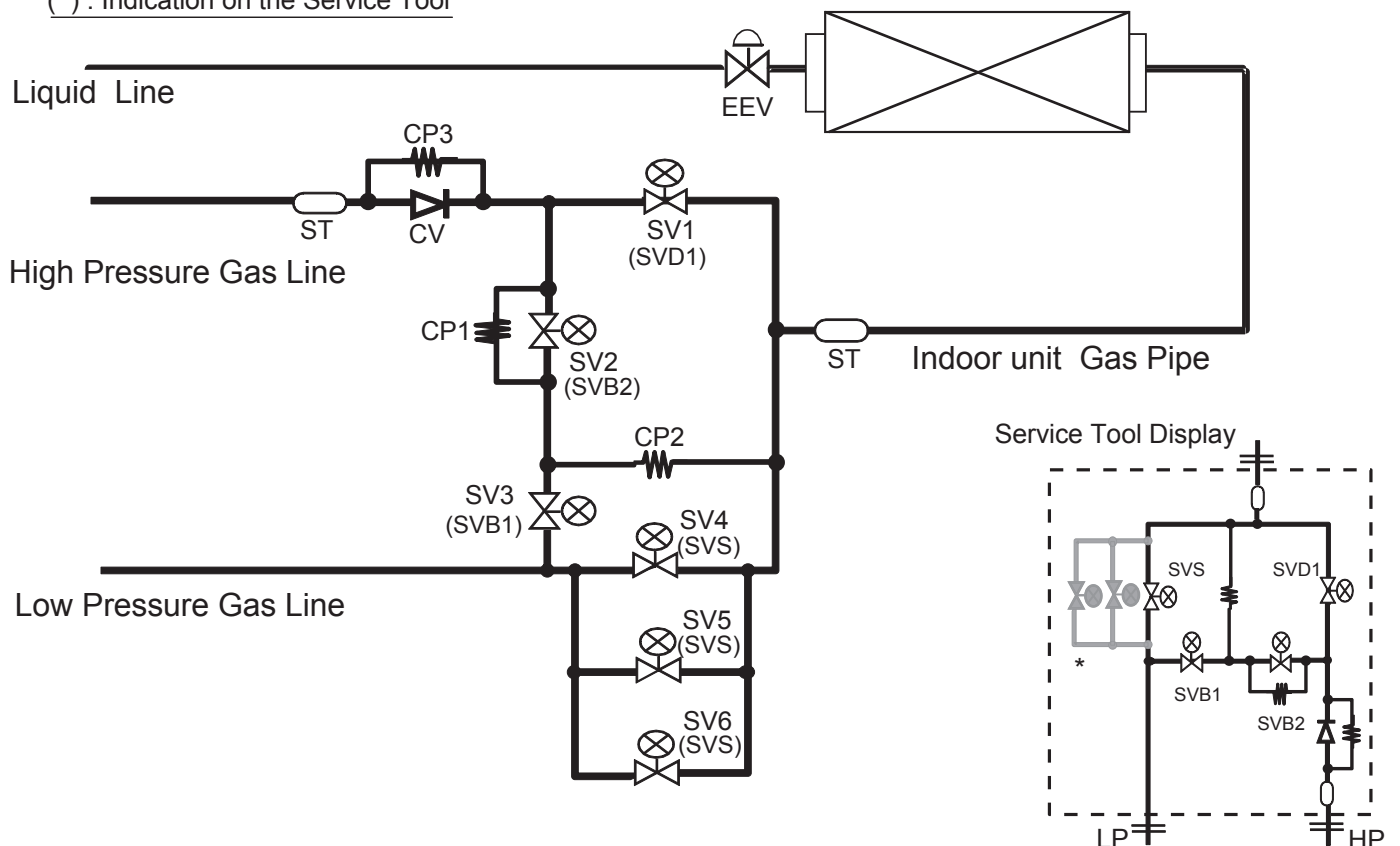


Color of Connector

SV1	Green
SV2	Blue
SV3	Black
SV4	White
SV5	Red
SV6	Yellow

3-7-2 Position of Solenoid valve

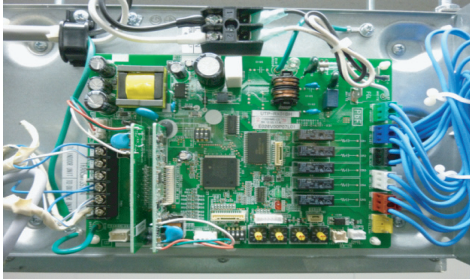
() : Indication on the Service Tool



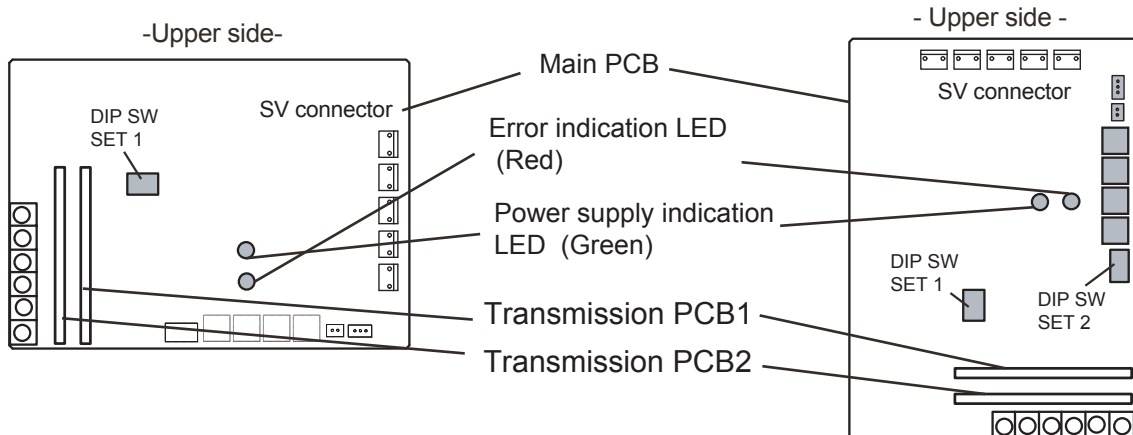
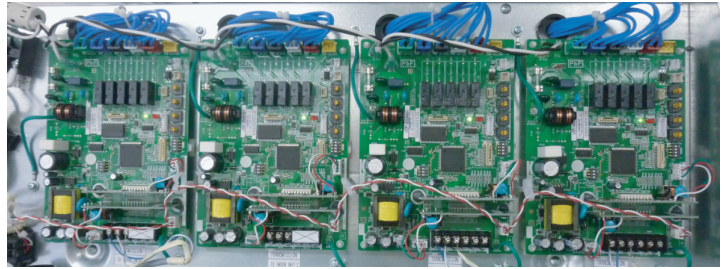
*SV5, SV6 are not indicated on the Service tool

3-7-3 PCBs layout

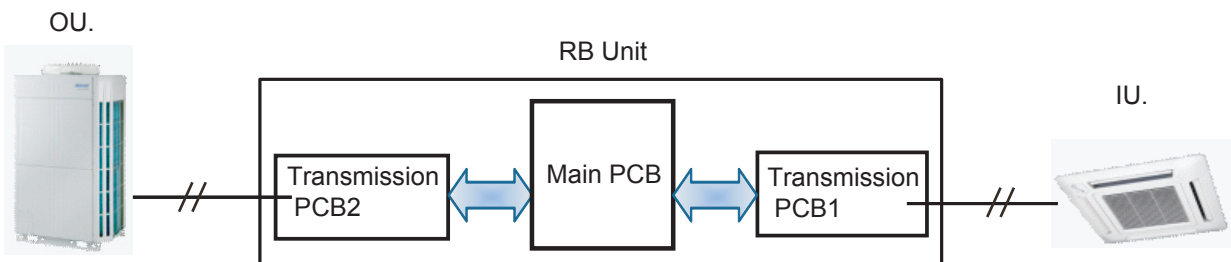
Single type



Multi type



3-7-4 PCB component



Main PCB: Pulse signal communication between Transmission PCB1 and Transmission PCB2
 Transmission PCB1: Pulse signal communication between IU. and RB Main
 Transmission PCB2: Pulse signal communication between OU. and RB Main

*The transmission PCB1 and The transmission PCB2 are the same part.

- Caution -

When the Main PCB is newly installed to the RB unit, the address setting is required.

The RBG Address number has to be set as the same address of connecting indoor unit.

(When a connection port of RB unit has a multi indoor unit connection, the youngest address number of indoor unit has to be given to the main PCB of RB.)

3-7-4 Solenoid Valve controlling

Open / Close operation in Operation

SV No.	Function	Cooling / Dry mode	Heating mode	Fan mode / Stop
SV1 (SVD1)	Discharge Valve	Close	Open	Close
SV4 - 6 (SVS)	Suction Valve	Open	Close	Close
SV2 (SVB2)	Equalization Valve (Pressurization)	Close	Open	Close
SV3 (SVB1)	Equalization Valve (Decompression)	Open	Close	Open

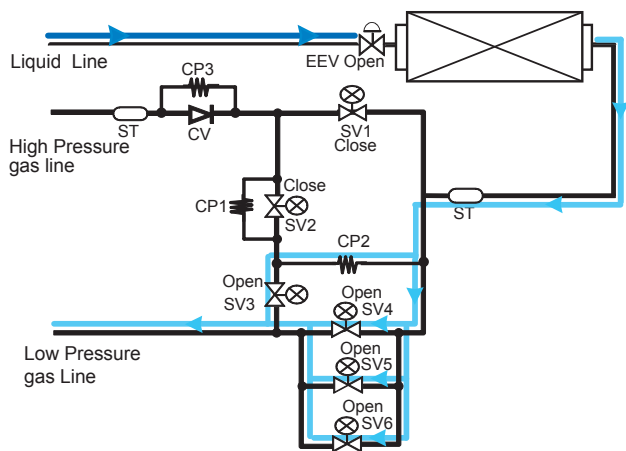
(Indication on Service Tool)

Open / Close operation in Special operation

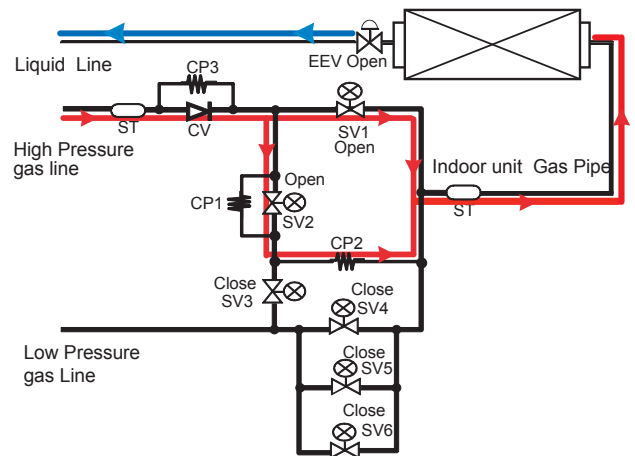
SV No.	Function	Defrost	Oil Recovery	Vacuuming Mode	IU. Freeze Prevention	Compressor Stop by protection
SV1 (SVD1)	Discharge Valve	Close	Close	Open	Close	Close
SV4 - 6 (SVS)	Suction Valve	Open	Open	Open	Close	Close
SV2 (SVB2)	Equalization Valve (Pressurization)	Close	Close	Open	Close	Close
SV3 (SVB1)	Equalization Valve (Decompression)	Open	Open	Open	Open	Open

3-7-5 Refrigerant Flow

- Cooling operation -

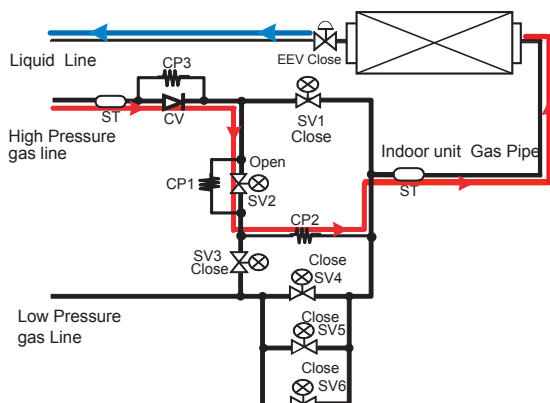


- Heating operation -



- Preparation for mode changing -

EX) Cooling operation ⇒ Heating operation



Note:

The preparation for mode changing takes a little time (about 6 minutes). By changing DIP-SW (SET4-3) to ON, the time for the mode selection controlling will be shorter (3 minutes).

If the mode selection control time is short, the sound of refrigerant may be loud during cool to heat selection control process.

AIRSTAGE™ VR-II

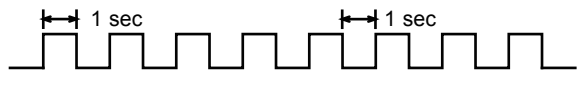
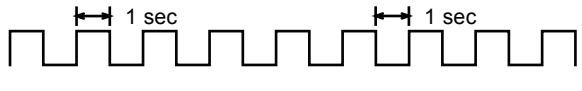
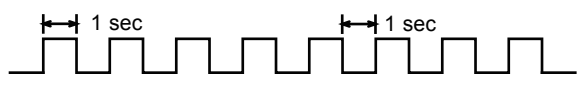
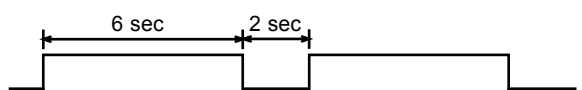

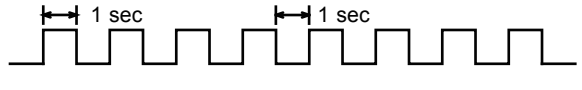
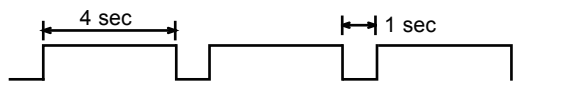
Variable Refrigerant Flow System

4. TROUBLE SHOOTING













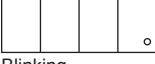

4. TROUBLESHOOTING

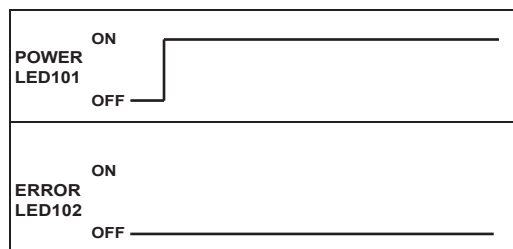
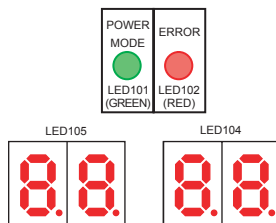
4-1 NORMAL OPERATION

4-1-1 Indoor Unit Display

Indication type	Indication Lamp	Flashing Pattern
Operation	Operation LED	Continuous lighting
Anti Freeze		Continuous lighting(lowered light)
Timer	Timer LED	Continuous lighting(lowered light)
Filter	Filter LED	Continuous lighting
Power Failure	Operation LED	ON OFF 
	Timer LED	ON OFF 
Test Operation	Operation LED	ON OFF 
	Timer LED	
Defrosting	Operation LED	ON OFF 
Oil Recovery		
Opposite Operation Mode	Timer LED	ON OFF 
Maintenance Mode	Operation LED	ON OFF 
	Timer LED	
	Filter LED	
Location Notification	Operation LED	ON OFF  This function is only available on the 2 wires remote controller. Please refer to the installation manual of UTY-RNR*
	Timer LED	
	Filter LED	

4-1-2 OUTDOOR UNIT DISPLAY

Indication type	7 Segment LED Pattern	Description
Idling(stop)	 Blank	
Cooling Mode (Mainly Cooling)	 "C" "O" "L"	
Heating Mode (Mainly Heating)	 "H" "E" "A" "T"	
Oil Recovery Operation	 "O" "I" "L" "R" "E" "C" "O" "V" "E" "R" "Y"	Refer to Chapter 02. (Outdoor unit operation control)
Defrost Operation	 "D" "E" "F" "R" "O" "S" "T"	Refer to Chapter 02. (Outdoor unit operation control)
Discharge Temp. Protection is stopped	 "P" "R" "O" "T" "E" "C" "T" "1"	<Starting condition> Discharge temp \geq fixed value 239°F(115°C) <Release condition> 3 minutes have elapsed and discharge temperature \leq 176°F(80°C)
High Pressure Protection is stopped	 "P" "R" "O" "T" "E" "C" "T" "2"	<Starting condition> High pressure \geq 611psi(4.00MPa) or Pressure SW in operation <Release condition> 5 minutes have elapsed and high pressure \leq 509psi (3.50MPa) and Pressure SW release
Low Pressure Protection is stopped	 "P" "R" "O" "T" "E" "C" "T" "3"	<Starting condition> Low pressure \leq 7psi (0.05MPa) or low pressure \leq 15psi (0.10MPa) continues for 10 mins <Release condition> 3 minutes have elapsed and low pressure \geq 25psi (0.17MPa)
Compressor Temperature Protection is stopped	 "P" "R" "O" "T" "E" "C" "T" "4"	<Starting condition> Compressor temp \geq fixed value 239°F(115°C) <Release condition> 3 minutes have elapsed and discharge temperature \leq 176°F(80°C)
Peak Cut Mode	 "P" "e" "a" "k" "C" "u" "t"	
Low Noise Mode	 "L" "O" "W" "N" "O" "I" "S" "E"	Refer to Chapter 02. (Outdoor unit operation control)
Snow Falling Protection Fan mode	 "S" "N" "O" "W"	Refer to Chapter 02. (Outdoor unit operation control)
Inverter Compressor Operation Indication	 Blinking	ON  OFF



4-2 ABNORMAL OPERATION

4-2-1 Error code Display

An Error code is represented by 3 digit characters.

The first 2 digit means the subsection Error code, and the last 1 digit means the specifics Error code.

Ex.) Indoor unit Network communication Error

1 4 . 3

Subsection Error Code

Specifics Error Code

14 : Network communication Error

3 : Indoor unit Network Communication Error

Each Error code section is shown by the following target

Subsection Error Code target	Subsection and Specifics Error code target
<ul style="list-style-type: none"> - Indoor unit (Operation / Timer / Filter) LED - 2 / 3 Wires Remote controller - Simple Remote controller - Group Remote controller - Central Remote controller - Touch - Panel Controller 	<ul style="list-style-type: none"> - Outdoor unit 7 segment Display - Service Tool

When an Error occurs, each devices indicate own abnormal detecting condition.

In order to confirm the actual error condition, the following procedure are required.

1) Confirm the Specific Error code on the Outdoor unit 7 segment display or the Service tool.

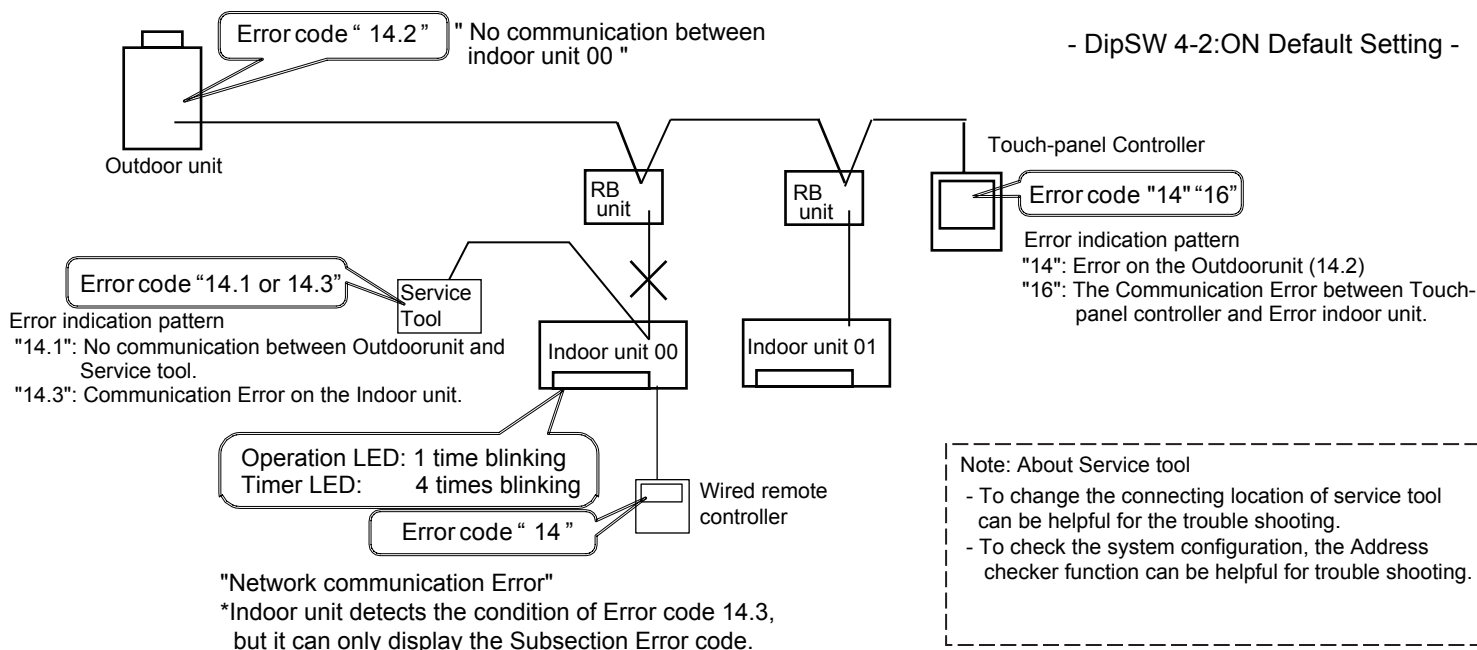
Ex.1.) When the wired remote controller shows " 9 U (Outdoor unit Error)".

Ex.2*) When the wired remote controller shows " 4 2 (Indoor unit Heat-Ex Sensor Error)"

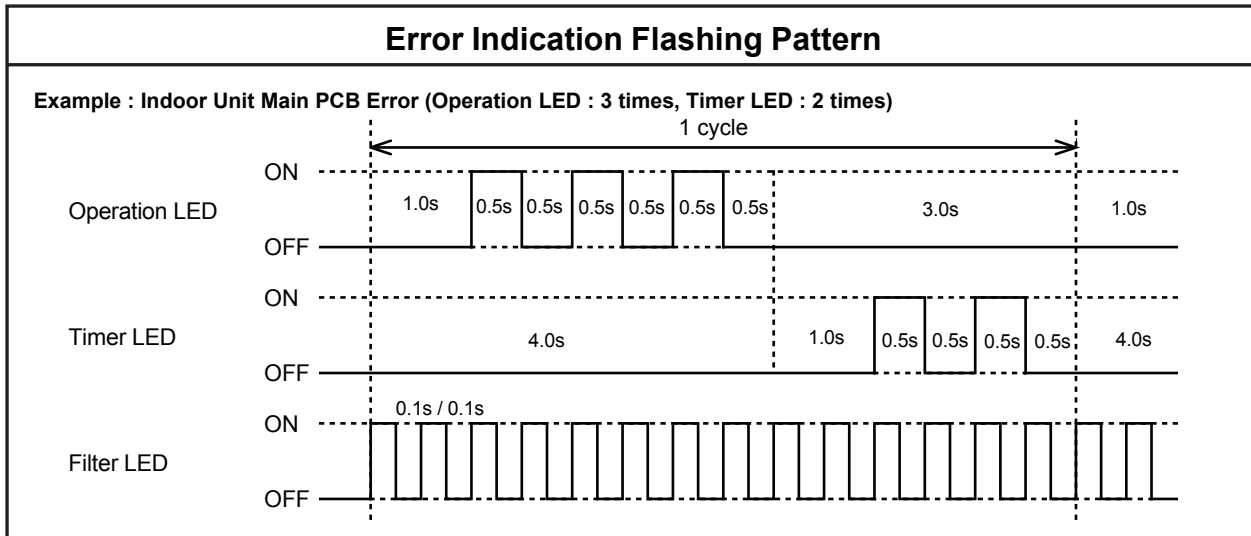
*The Specific Error code can be indicated by service tool.

2) Confirm each Error code on each devices in case of Network communication Error.

Ex.) When the Network cable of indoor unit 00 disconnected during operating.

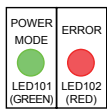


4-2-2 Indoor Unit Display

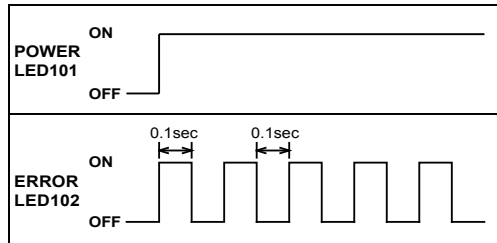


4-2-3 Outdoor Unit Display

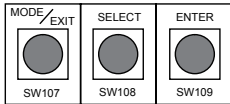
LED display



POWER MODE LED : on
ERROR LED : blink

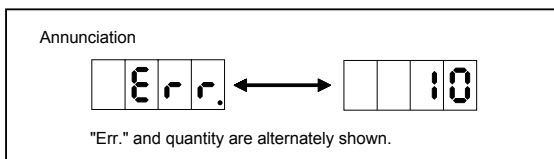


Operation button

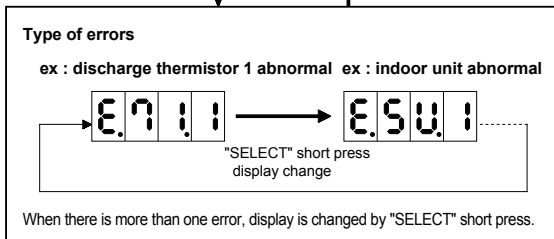


ERROR transition

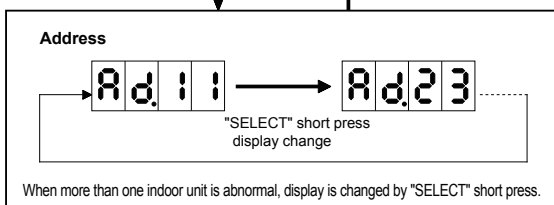
Short press : less than 3 seconds
Long press : more than 3 seconds



"ENTER" short press



"ENTER" long press *



If some error is newly occurred or resolved during transition, it is reflected after going back to "Annunciation".

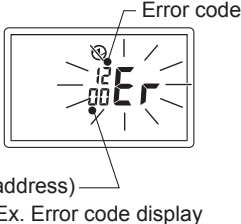
* Only in the case of "indoor unit abnormal (E.5.U.1)", indoor unit address is shown by ENTER long press.

4-2-4 Remote Controller Display

<< SIMPLE REMOTE CONTROLLER >>

ERROR CODE DISPLAY

If an error occurs, the following display will be shown.
 ("Er" will appear in the set room temperature display.)
 If "Er" is displayed, immediately contact authorized service personnel.

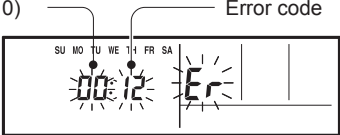


<< WIRED REMOTE CONTROLLER 3 wire type>>

ERROR CODE DISPLAY

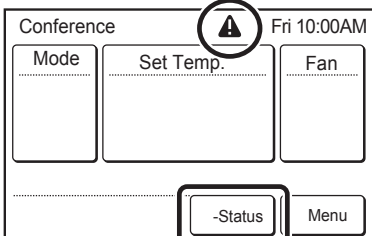
If an error occurs, the following display will be shown.
 ("Er" will appear in the set room temperature display.)
 If "Er" is displayed, immediately contact authorized service personnel.

Unit number (usually 0)

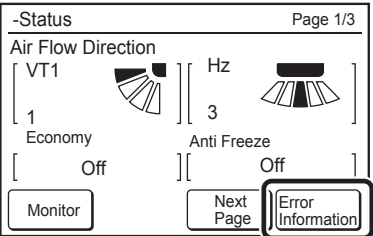


<< WIRED REMOTE CONTROLLER 2 wire type>>

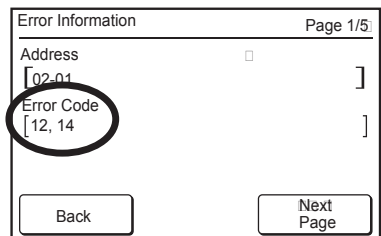
If an error occurred, an error icon appears on the Monitor mode screen.



1. Touch the [Status] on the Monitor mode screen.



2. Touch the [Error Information] on the Status screen.

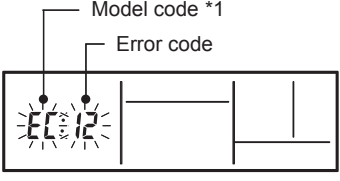


2-digit numbers are corresponding to the error code

<< GROUP REMOTE CONTROLLER >>

ERROR CODE DISPLAY

The air conditioning system must be inspected if "E" (error code) appears on the timer and Clock Display, or the operation lamp is flashing.



*1 ; Model code
 □ : Outdoor unit
 I : Indoor unit
 E : Group remote controller
 R : Converter

4-2-5 Trouble shooting index - Error code List 1/2 -

Display Target A	Display Target B	Display Target C	Display Target D
Simple Wired remote controller 2 / 3 wires Wired remote controller Indoor unit LED brinking times, " 1st figure: Operation LED, 2nd figure: Timer LED"	Group Remote controller Central Remote controller Touch- Panel controller	7 seg. Display on Outdoor unit Controller PCB	Service Tool

* : No Display A: LED 10 times Blinks J: LED 13 times Blinks U: LED 15 times Blinks

Display Target A	Display Target B	Error Contents < Subsection >	Display Target C	Display Target D	Error Contents < Supecifics >	Trouble shooting No.
1 2		Remote controller Communication Error	5 U.1	1 2 . 1	Wired Remote Controller communication Error	1
				1 2 . 2	Wired Remote Controller signal error (3 wires RC)	2
				1 2 . 3	Number Excess of device in Wired RC. System (2 Wires RC)	3
9 U	1 3	Communication Error between Outdoor unit	1 3 . 1		Communication Error Between Outdoor unit	4
1 4 *	1 4 1 6	Network Communication Error	1 4 . 1	1 4 . 1 1 4 . 3	Outdoor unit Network communication 1 Error	5
1 4 9 U	1 4 1 6		1 4 . 2	1 4 . 2 1 4 . 1 1 4 . 3	Outdoor unit Network communication 2 Error	6
1 4 9 U *	1 4 1 6		1 4 . 1 1 4 . 2	1 4 . 3 1 4 . 1 1 4 . 2	Indoor unit Network communication Error	7
9 U *	1 4 1 6		1 4 . 5	1 4 . 5 1 4 . 3	The number of indoor unit shortage Error	8
1 6 *		Peripheral device communication Error	1 4 . 1	1 4 . 3	Transmission PCB connection Error	9
			1 4 . 2		Communication Error between Controller and Indoor unit	10
2 6		Address settingError	5 U.1	2 6 . 4	Address duplication in Wired remote controller system	11
				2 6 . 5	Address setting Error in Wired remote controller system	12
*		Other setting Error	2 8 . 1	*	Auto address setting Error	13
			2 8 . 4	*	Signal amplifier auto address Error	14
2 9		Connection unit number error in wired remote controller system	5 U. 1	2 9 . 1	Connection unit number Error (Indoor unit in WRC control system)	15
2 9	*		*	*	Connection unit number Error (Remote controller)	16
3 1		Indoor unit Power supply Abnormal	5 U. 1	3 1 . 3	Indoor unit power frequency Abnormal	17
3 2		Indoor unit Main PCB Error		3 2 . 1	Indoor unit PCB Model informaiton Error	18
				3 2 . 3	Indoor unit EEPROM access Error	19
3 9		Indoor unit power supply circuit Error		3 9 . 1	Indoor unit power supply Error for fan motor 1	81
				3 9 . 2	Indoor unit power supply Error for fan motor 2	81
				3 9 . 3	Indoor unit power supply Error of AC24V system	85
3 A		Indoor unit communication circuit (WRC) Error		3 A . 1	Indoor unit communication circuit (WRC) microcomputers communication Error	20
4 1		Indoor unit Room temp. Sensor Error		4 1 . 1	Indoor unit Inlet air temp. Sensor Error	21
4 2		Indoor unit Heat-Ex. Sensor Error		4 2 . 1	Indoor unit Heat-Ex. Inlet temp. Sensor Error	22
				4 2 . 3	Indoor unit Heat-Ex. Outlet temp. Sensor Error	23
				4 A . 1	Indoor unit suciton air temp.thermistor Error	82
4 A		Indoor unit air temp.thermistor Error		4 A . 2	Indoor unit discharge air temp.thermistor Error	83
5 1		Indoor unit FAN Motor 1 Error		5 1 . 2	Indoor unit FAN Motor 1 rotation speed Error	24
5 2		Indoor unit Coil (EEV) Error		5 2 . 1	Indoor unit Coil 1 (EEV) Error	25
5 3		Indoor unit water drain Abnormal		5 3 . 1	Indoor unit Drain pump Error	26
5 9		Indoor unit fan motor 2 Error		5 9 . 2	Indoor unit fan motor 2 rotation speed Error	84
*		Indoor unit Error		*	Indoor unit Error	Refer to I.U Error
9 U	6 1	Outdoor unit Power supply Abnormal		6 1 . 5	Outdoor unit reverse phase, missing phase wire Error	27
	6 2	Outdoor unit PCB Error		6 2 . 3	Outdoor unit EEPROM access Error	28
				6 2 . 6	Inverters communication Error	29
			6 2 . 8	EEPROM data corrupted Error	30	
6 3	Outdoor unit Inverter PCB Error	6 3 . 1	Inverter Error	31		
*	*	OU. short interruption detection protected operation	6 7 . 2	Inverter PCB short interruption Error	32	
9 U	6 8	Outdoor unit Magnetic relay Error	6 8 . 2	Rush Current limiting resistor temp. rise protection	33	
9 U	6 9	Outdoor unit Transmission PCB Error	6 9 . 1	Outdoor unit transmission PCB Parallel communication Error	34	
1 4	1 4	6 9 . 1	1 4 . 1 1 4 . 3			
9 U	7 1	Outdoor unit Discharge temp. Sensor Error	7 1 . 1	Discharge temp. Sensor 1 Error	35	
	7 2	Outdoor unit Compressor temp. Sensor Error	7 2 . 1	Compressor temp. Sensor 1 Error	36	
	7 3	Outdoor unit Heat-Ex. temp. Sensor Error	7 3 . 4	Heat-Ex 1 gas temp. Sensor Error	37	
			7 3 . 5	Heat-Ex 1 liquid temp. Sensor Error	38	
			7 3 . 6	Heat-Ex 2 gas temp. Sensor Error	39	
			7 3 . 7	Heat-Ex 2 liquid temp. Sensor Error	40	

4-2-5 Trouble shooting index - Error code List 2/2 -

Display Target A	Display Target B	Display Target C	Display Target D
Simple Wired remote controller 2 / 3 wires Wired remote controller Indoor unit LED blinking times, " 1st figure: Operation LED, 2nd figure: Timer LED"	Group Remote controller Central Remote controller Touch- Panel controller	7 seg. Display on Outdoor unit Controller PCB	Service Tool

* : No Display A: LED 10 times Blinks J: LED 13 times Blinks U: LED 15 times Blinks

Display Target A	Display Target B	Error Contents < Subsection >	Display Target C	Display Target D	Error Contents < Supecifics >	Trouble shooting No.
9 U	7 4	Outdoor temp. Sensor Error	7 4 . 1		Outdoor temp. Sensor Error	41
	7 5	Suction gas temp. Sensor Error	7 5 . 1		Suction gas temp. Sensor Error	42
	7 7	Heat sink temp. Sensor Error	7 7 . 1		Heat sink temp. Sensor Error	43
	8 2	Sub cool HEX temp. Sensor Error	8 2 . 2		Sub cool HEX gas outlet temp. Sensor Error	44
	8 3	Liquid pipe temp. Sensor Error	8 3 . 1		Liquid pipe temp. Sensor 1 Error	45
			8 3 . 2		Liquid pipe temp. Sensor 2 Error	46
	8 4	Current Sensor Error	8 4 . 1		Current sensor 1 Error	47
	8 6	Pressure Sensor Error	8 6 . 1		Discharge pressure sensor Error	48
			8 6 . 3		Suction pressure sensor Error	49
			8 6 . 4		High pressure SW 1 Error	50
	9 3	Compressor start up Error	9 3 . 1		Inverter compressor Start up Error	51
	9 4	Trip Detection	9 4 . 1		Trip detection	52
	9 5	Compressor motor control Error	9 5 . 5		Compressor motor loss of synchronization	53
	9 7	Outdoor unit FAN Motor 1 Error	9 7 . 1		Outdoor unit FAN Motor Lock Error	54
			9 7 . 5		Outdoor unit FAN Motor temp. Abnormal	55
			9 7 . 9		Outdoor unit FAN Motor Driver Abnormal	56
	9 A	Outdoor unit coil (EEV) Error	9 A . 1		Coil 1 (EEV) Error	57
			9 A . 2		Coil 2 (EEV) Error	58
			9 A . 3		Coil 3 (EEV) Error	59
	*1	Outdoor unit Abnormal	*1		Slave out door unit Error	60
	A 1	Discharge temp. Abnormal	A 1 . 1		Discharge temp. 1 Abnormal	61
	A 3	Compressor temp. Abnormal	A 3 . 1		Compressor 1 Temperature Abnormal	62
	A 4	Pressure abnormal 1	A 4 . 1		High pressure Abnormal	63
			A 4 . 2		High pressure protection 1	64
A 5	Pressure abnormal 2	A 5 . 1		Low pressure Abnormal	65	
A 6	Heat-Ex temp. Abnormal	A 6 . 3		Outdoor unit Heat-Ex 1 Gas temp. Abnormal	66	
		A 6 . 4		Outdoor unit Heat-Ex 2 Gas temp. Abnormal	67	
A C	Ambient temp Abnormal	A C . 4		Outdoor unit Heat Sink temp. Abnormal	68	
J 1	RB Unit Error	5 U . 1	J 1 . 1	RB Unit EEPROM Access Abnormal	69	
1 4		14 . 1	14 . 1	RB Unit transmission PCB2 parallel communication Error	70	
J 1		14 . 2	14 . 2			
	1 6		J 1 . 3			
			J 1 . 4			
*		Initial Setting Error	-----	*	Initial Setting Error	71

*1: Master Outdoor unit : 9 U. 2 / Slave Outdoor unit and Service Tool indicate applicable Error code

Wired remote controller "Internal Error" * These error codes will be shown only on the remote controller.

CC.1	*	Sensor Error	*	*	Replace the remote controller, If the error appears on the remote controller.
C2.1		Transmission PCB Error			
15.4		Data acquisition Error			

4-2-6 Trouble shooting index - No Error code -

	Error condition	Error Contents	Trouble shooting
No Error Code System Abnormal	Indoor Unit - No Power (Except Wall Mounted)	Indoor Unit - No Power (Except Wall Mounted)	72
	Indoor unit - No Power (Wall Mounted)	Indoor Unit -No Power(Wall Mounted)	73
	Outdoor unit - No Power	Outdoor unit - No Power	74
	RB Unit - No Power	RB Unit - No Power	75
	No operation (Power is ON)	No operation (Power is ON)	76
	No Cooling	No Cooling / No Heating	77
	Abnoemal Noise	Abnormal Noise	78
	Water leaking	Water leaking	79
	Indoor Unit - No Power(Outdoor air unit)	Indoor Unit - No Power (Outdoor air unit)	80

4-2-7 TROUBLE LEVEL OF SYSTEM

<< System Condition when Outdoor Unit Error is occurred >>

System Condition	Outdoor unit Condition	Trouble Level	
		1	2
		Not indicated on Indoor Unit and Peripheral unit. Indicated on Service Tool.	Indicated on Indoor Unit (*1) and Peripheral unit. Indicated on Service Tool.
① System is not stopped compulsorily Operation continues	Abnormal LED indication Outdoor unit does not stop	- 14.1 Outdoor unit network communication 1 error	- 62.3 Outdoorunit EEPROM access error - 62.8 EEPROM data corrupted error - 73.5 Heat Ex.1 liquid temp. sensor error - 73.7 Heat Ex.2 liquid temp. sensor error - 75.1 Suction gas temp sensor error - 82.2 Sub-cool Heat Ex. gas outlet temp. sensor error - 83.1 Liquid pipe temp. sensor 1 error - 83.2 Liquid pipe temp. sensor 2 error
② System is compulsorily stopped (*4)	Abnormal LED indication Outdoor unit stop	- 67.2 Inverter PCB short interruption detection	- 62.6 Inverter communication error - 63.1 Inverter error - 68.2 Rush current limiting resistor temp. rise protection (*3) - 71.1 Discharge Temp sensor 1 error - 72.1 Compressor Temp sensor 1 error - 73.4 Heat Ex. 1 gas temp sensor error - 73.6 Heat Ex. 2 gas temp sensor error - 74.1 Outdoor Temp sensor error - 77.1 Heat sink Temp sensor error - 84.1 Current sensor 1 error (*3) - 86.1 Discharge pressure sensor error - 86.3 Suction pressure sensor error - 86.4 High pressure switch 1 error - 93.1 Inverter compressor start up error (*3) - 94.1 Trip detection (*3) - 95.5 Comp. motor loss of synchronization (*3) - 97.1 Outdoor unit fan motor lock error (*3) - 97.5 Fan motor temperature abnormal (*3) - 97.9 Fan motor driver abnormal (*3) - A1.1 Discharge temperature 1 abnormal (*3) - A3.1 Compressor1 temperature abnormal (*3) - A4.1 High pressure abnormal - A4.2 High pressure protection1 - A6.3 Outdoor Heat Ex. 1 gas temp. abnormal (*3) - A6.4 Outdoor Heat Ex. 2 gas temp. abnormal (*3) - AC.4 Heat sink temperature abnormal
③ System is compulsorily stopped	Abnormal LED indication Outdoor unit stop		- 13.1 Communication error between outdoor unit - 14.2 Outdoor unit network communication 2 error - 14.5 The number of indoor unit shortage (*2) - 61.5 Outdoor unit reverse phase, missing phase wire error - 69.1 Outdoor unit transmission PCB parallel communication error - 9A.1 Coil1 (Expansion valve1) error - 9A.2 Coil2 (Expansion valve2) error - 9A.3 Coil3 (Expansion valve3) error - A5.1 Low pressure abnormal (*3)

(*1) This will not be displayed on indoor unit which Error Report Target (function setting 47 of indoor unit) is set "for administrator".

(*2) The System condition can change to ① (Trouble Level 1) by changing DIP SW (SET 4-1:OFF)

(*3) Even if power is reset, this Error cannot release. In Error release, you need to solving the problem and operate the push switch and a and apply "Error reset" (F3-40) after power restart.

(*4) When one of outdoor unit on the multi connection detects these Error, the backup operation can activate by using of remaining outdoorunit(s)
Please check each trouble shooting, and read the caution before using the backup operation.

<< Error code which manual error release will be required >>

- A5.1 Low pressure abnormal
- 84.1 Current sensor 1 error
- 93.1 Inverter compressor start up error
- 94.1 Trip detection
- A1.1 Discharge temperature 1 abnormal
- A3.1 Compressor 1 temperature abnormal
- 97.1 Outdoor unit fan motor lock error
- 97.5 Fan motor temperature abnormal
- 97.9 Fan motor driver abnormal
- 68.2 Rush current limiting resistor temp rise protection
- 95.5 Compressor motor loss of synchronization
- A6.3 Outdoor heat exchanger 1 gas temperature abnormal
- A6.4 Outdoor heat exchanger 2 gas temperature abnormal

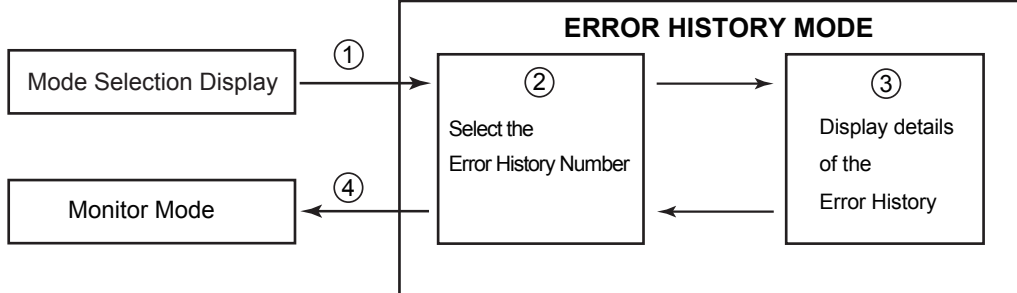
4-2-8 ERROR HISTORY MODE

When the abnormality occurred, the Outdoor unit memorizes the history of error codes up to 10 and it can be displayed on 7 segments LED.

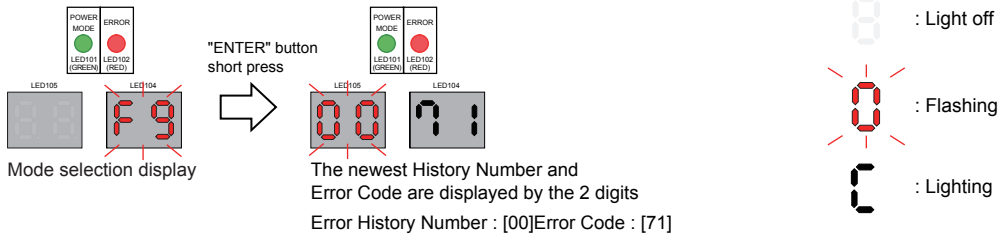
It is an effective means to examine abnormality that occurred in the past.

*The error history can be cleared by setting to F3-30.

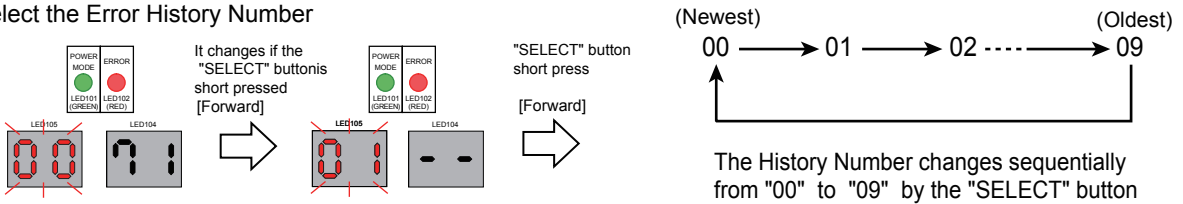
Refer to the following for the procedure.



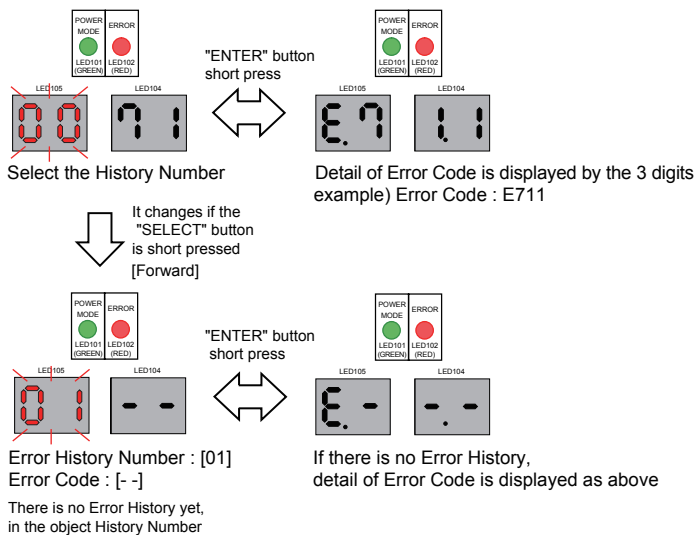
① Change to the Error History Mode from the Mode Selection Display



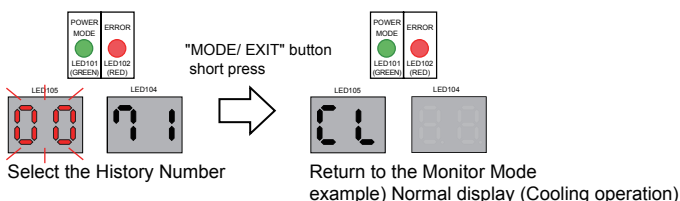
② Select the Error History Number



③ Check the detail of the Error History



④ End of the Error History mode



4-2-9 TROUBLE SHOOTING WITH ERROR CODE

Trouble shooting 1 INDOOR UNIT Error Method: Wired Remote Controller Communication Error	E12.1	Indicate or Display: Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 1 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash. < 1 2 > Error Code : 1 2
---	--------------	--

Detective Actuators: Indoor unit controller PCB circuit Wired Remote Control (3 wire / 2 Wire type)	Detective details: Upon receiving the signal more than 1 time from Wired Remote or other Indoor unit, but the same signal has not been received more than 1 minute (3 Wire type). 2.5 minute (2 Wire type)
--	--

Forecast of Cause : 1. Terminal connection abnormal 2. Wired Remote Control failure 3. Controller PCB failure

Check Point 1 : Check the connection of terminal

After turning off the power, check & correct the followings.

Indoor Unit - Check the connection of terminal between remote control and Indoor unit, or between Indoor units, and check if there is a disconnection or short of the cable.



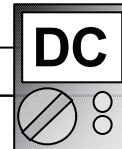
Check Point 2 : Check Remote and Controller PCB

Check terminal voltage of controller PCB Connector CNC01. (Power supply for Remote)

If DC12V, Remote Control failure (Controller PCB is OK) >>> Replace Remote controller

If DC0V, Controller PCB failure (Remote is OK) >>> Replace Controller PCB

▶ In case of re-installation is done due to removed connector or incorrect wiring, turn on the power again.



Trouble shooting 2 INDOOR UNIT Error Method: Wired Remote Controller signal Error	E12.2 Indicate or Display: Outdoor Unit : E.5 U.1, Indoor Unit : Operation LED 1 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash. Remote Controller : 1 2
--	--

Detective Actuators: Indoor unit Controller PCB circuit Wired Remote Control (3 wire type)	Detective details: More than 1 time of Token (Communication between wired remote controllers) is received, but it was not received more than 1 minute.
---	--

Forecast of Cause : 1. Terminal connection abnormal 2. Mis-setting 3. Wired Remote Control failure 4. Controller PCB failure

Check Point 1 : Check the connection of terminal

After turning off the power, check & correct the followings.

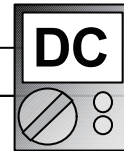
- Indoor Unit - Check the connection of terminal between remote control and Indoor unit, or between Indoor units, and check if there is a disconnection or short of the cable.



Check Point 2 : Check Remote and Controller PCB

- Check terminal voltage of Controller PCB Connector CNC01. (Power supply for Remote)
 - If DC12V, Remote Control failure (Controller PCB is OK) >>> Replace Remote
 - If DC0V, Controller PCB failure (Remote is OK) >>> Replace Controller PCB

▶ In case of re-installation is done due to removed connector or incorrect wiring, turn on the power again.



Trouble shooting 3 E12.3 INDOOR UNIT Error Method: Number excess of device in Wired remote controller system (2 Wires RC)	Indicate or Display: Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 1 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash. Error Code : 1 2
---	--

Detective Actuators: Wired remote controller (2-Wire) Indoor unit Controller PCB circuit	Detective details: When the number of connecting Indoor unit and Remote controller in one RCgroup exceeds more than 32 units.
---	---

Forecast of Cause : 1. Wrong wiring of RCgroup 2. Indoor unit controller PCB failure

Check Point 1 : Wire installation Wrong RCgroup setting
<input type="checkbox"/> Wrong wire connection in RCgroup (Please refer to the installation manual) <input type="checkbox"/> The number of connecting indoor unit and Remote controller in one RCgroup were less than 32 units.



Check Point 2 : Check Indoor unit controller PCB
<input type="checkbox"/> Check if controller PCB damage <input type="checkbox"/> Change controller PCB and check the Error after setting remote controller address

Trouble shooting 4	E1 3. 1	Indicate or Display:
OUTDOOR UNIT Error Method:		Outdoor Unit : E. 1 3. 1
Communication Error Between Outdoor unit		Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.
		Error Code : 9 U / 1 3

Detective Actuators:	Detective details:
Outdoor unit Main PCB	Master unit: State in which "number of connected slave units" by Dip-SW and the number of slave units which can be recognized by communication did not match continued for 10 seconds or more after the start of control.
	Slave unit: State in which communication from the master unit was not received continued for 10 seconds or more after the start of control.

Forecast of Cause :	1. Noise, momentary open, voltage drop	2. Power supply defective
	3. The number setting mistake of outdoor unit	5. Main PCB defective
	4. Connection of communication lines between outdoor units defective	

Check Point 1 : Noise, momentary open, voltage drop
<input type="checkbox"/> Check if temporary voltage drop was not generated. <input type="checkbox"/> Check if momentary open was not generated. <input type="checkbox"/> Check if ground is connection correctly or there are no related cables near the power line.

↓ **OK**

Check Point 2 : Check the power supply
<input type="checkbox"/> Main power ON/OFF state check <input type="checkbox"/> Power cable connection, open check

↓ **OK**

Check Point 3 : Check the number setting of outdoor units												
<input type="checkbox"/> Check the number setting of outdoor units.												
<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 30%;">Number of outdoor unit</th> <th style="width: 20%;">DIP-SW SET 5-1</th> <th style="width: 20%;">DIP-SW SET 5-2</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1 unit</td> <td style="text-align: center;">OFF</td> <td style="text-align: center;">OFF</td> </tr> <tr> <td style="text-align: center;">2 units</td> <td style="text-align: center;">OFF</td> <td style="text-align: center;">ON</td> </tr> <tr> <td style="text-align: center;">3 units</td> <td style="text-align: center;">ON</td> <td style="text-align: center;">OFF</td> </tr> </tbody> </table>	Number of outdoor unit	DIP-SW SET 5-1	DIP-SW SET 5-2	1 unit	OFF	OFF	2 units	OFF	ON	3 units	ON	OFF
Number of outdoor unit	DIP-SW SET 5-1	DIP-SW SET 5-2										
1 unit	OFF	OFF										
2 units	OFF	ON										
3 units	ON	OFF										

↓ **OK**

Check Point 4 : Check the connection of communication lines between outdoor units
Turn off the power and check.
<input type="checkbox"/> Connection and open check of communication lines between outdoor units.

↓ **OK**

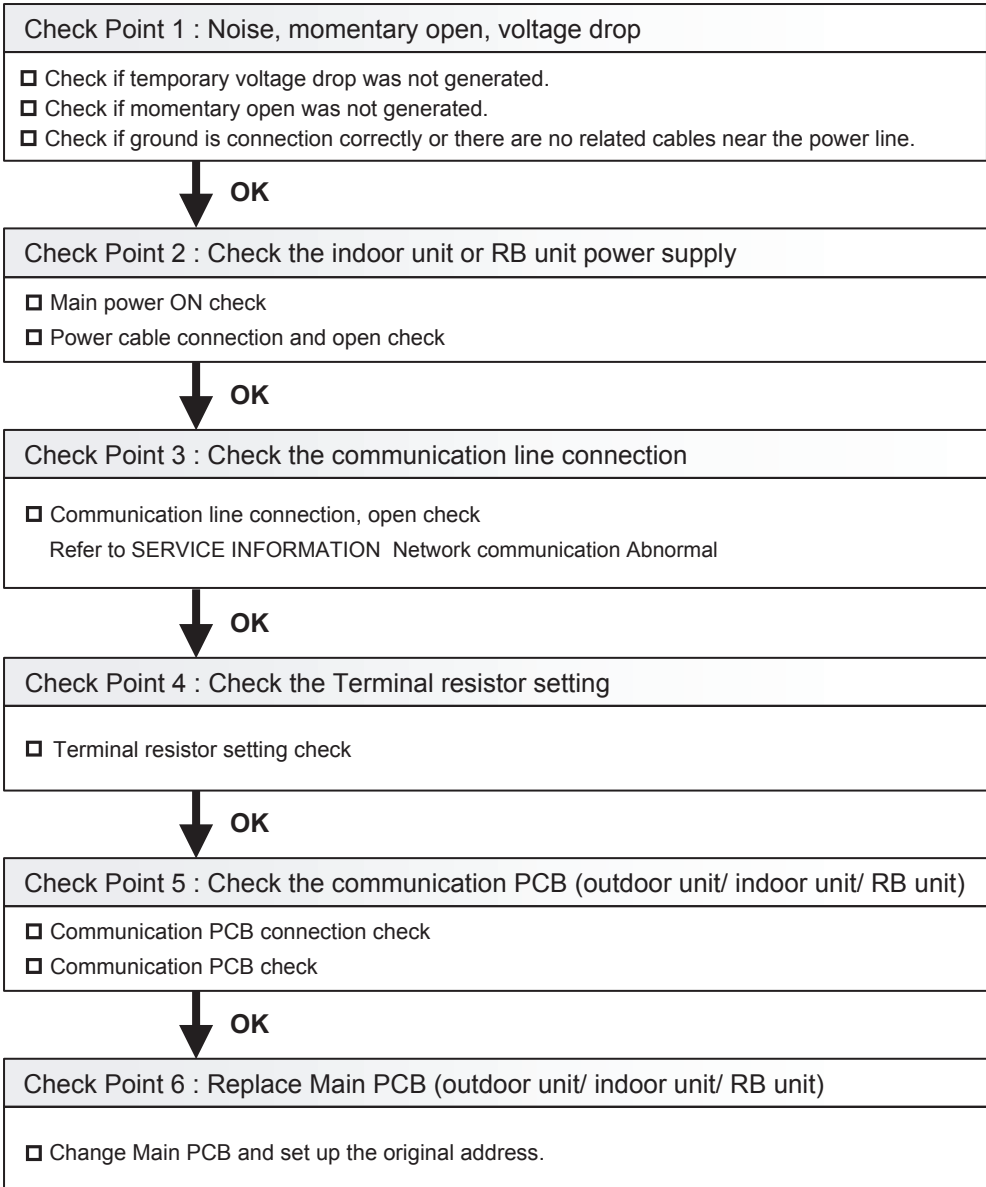
Check Point 5 : Replace Main PCB
<input type="checkbox"/> Change Main PCB and set up the original address.

Trouble shooting 5 E14.1 OUTDOOR UNIT Error Method: Outdoor Unit Network Communication 1 Error	Indicate or Display: Outdoor Unit : E. 1 4. 1 Indoor Unit : No display / Operation LED 1 times Flash, Timer LED 4 Times Flash, Filter LED Continuous Flash. Error Code : 1 4 / 1 6 / 1 4. 1 / 1 4. 3 *
--	---

* Indoor unit indicates No display or 1 4
Peripheral device indicates 1 4 or 16.

Detective Actuators: Outdoor unit Main PCB	Detective details: <ul style="list-style-type: none"> ▪DIP-SW SET4-1 is OFF. ▪No communication for 180 seconds or more from an indoor unit which received communication once and no Outdoor unit network communication 2 error.
--	---

Forecast of Cause : 1. Noise, momentary open, voltage drop 2. Indoor unit or RB unit power off
3. Communication line connection defective 4. Terminal resistor setting mistake
5. Communication PCB mounting defective, Communication PCB defective 6. Controller PCB defective

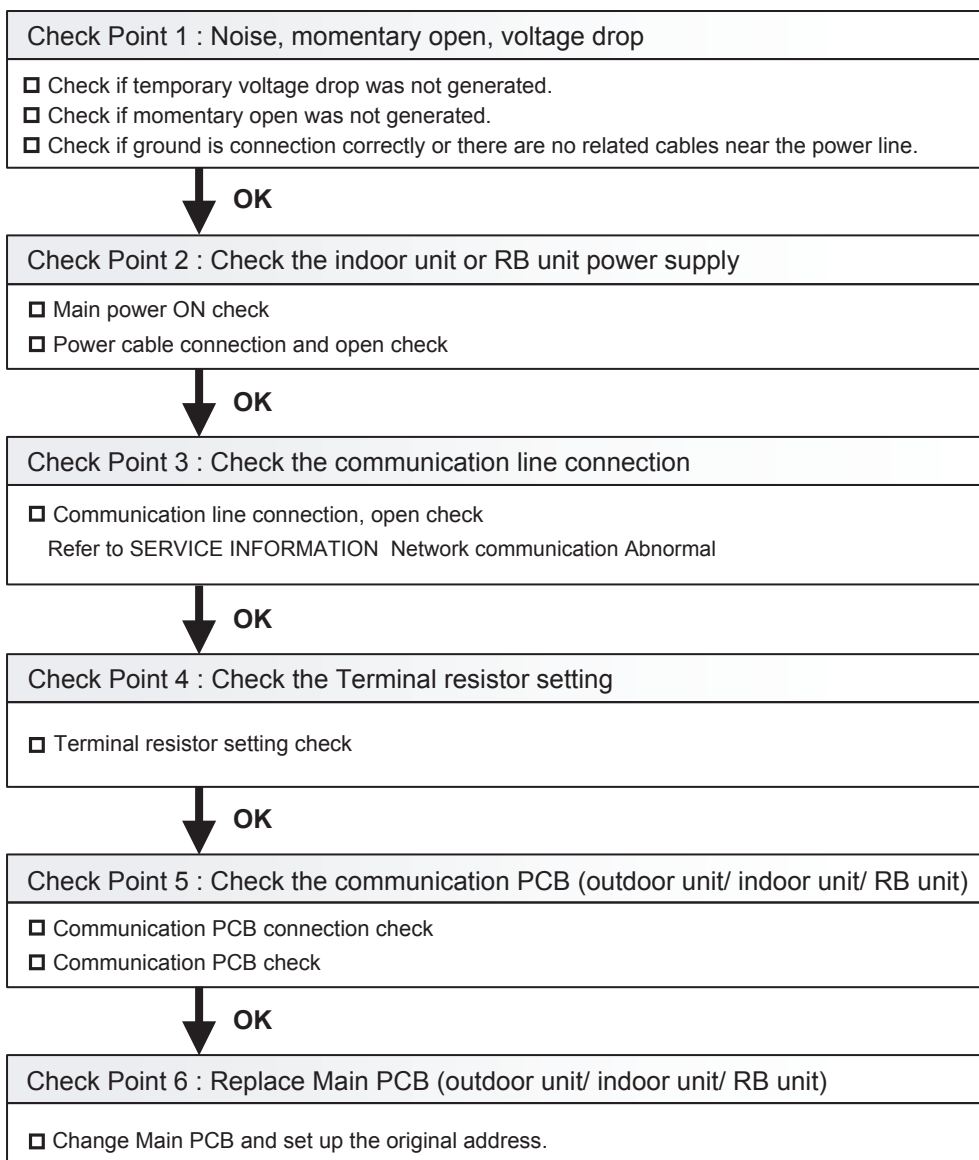


Trouble shooting 6 E14. 2 OUTDOOR UNIT Error Method : Outdoor Unit Network Communication 2 Error	Indicate or Display: Outdoor Unit : E. 1 4. 2 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. / Operation LED 1 times Flash, Timer LED 4 Times Flash, Filter LED Continuous Flash. * Error Code : 9 U / 1 4 / 1 6 / 1 4. 1 / 1 4. 2 / 1 4. 3 *
--	---

* Indoor unit indicates 9 U or 1 4
Peripheral device indicates 1 4 or 1 6

Detective Actuators: Outdoor unit Main PCB	Detective details: [DIP-SW SET4-1 : ON] (Factory setting) •No communication for 180 seconds or more from an indoor unit which received communication once. [DIP-SW SET4-1 : OFF] •No communication for 180 seconds or more from all indoor units that once received communication.
--	---

Forecast of Cause : 1. Noise, momentary open, voltage drop 2. Indoor unit or RB unit power off 3. Communication line connection defective 4. Terminal resistor setting mistake 5. Communication PCB mounting defective, Communication PCB defective 6. Control PCB defective
--



Trouble shooting 7 E14. 3 INDOOR UNIT Error Method: Indoor unit Network communication Error	Indicate or Display: Outdoor Unit : E.1 4. 1 / 1 4. 2 * Indoor Unit : Operation LED 1 times Flash, Timer LED 4 Times Flash, Filter LED Continuous Flash. Error Code : 1 4 / 1 6 / 9 U / 14.1 / 14.2 / 14.3 *
---	---

* Outdoor unit indicates 1 4.1 or 1 4.2 (No communication from 14.3 Error Indoor unit)
Peripheral device indicates 1 4 or 1 6

Detective Actuators: Indoor unit Controller PCB circuit Indoor unit Communication PCB	Detective details: When the cut-off of network communication is detected (more than 90 seconds passed since the last receipt of Outdoor unit signal).
--	---

Forecast of Cause : 1. Outside cause 2. Connection failure 3. Communication PCB failure 4. Controller PCB failure

Check Point 1 : Check if any outside cause such as voltage drop or noise

- Instant voltage drop ----- Check if there is any electric equipment with a large load within the same circuit.
- Momentary power failure ----- Check contact failure or leak current in power supply circuit
>>Check power supply for RB unit and Outdoor Unit as well.
- Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave). And check the complete insulation of grounding.
>>If the same symptom does not reappear after resetting the power, possibility of noise is high.



Check Point 2 : Check the connection

After turning off the power, check and correct followings.

- Is Indoor Communication PCB loose?
- Check loose or removed connection of communication line Indoor unit => RB unit => Outdoor unit.
Refer to SERVICE INFORMATION Network communication Abnormal
- Check the Error indication of RB unit.
Refer to SERVICE INFORMATION RB Unit Abnormal
- When the signal amplifier is connected , Check the error indication of signal amplifier. (Refer to the installation manual)



Check Point 3 : Check Communication PCB

- Replace Communication PCB of the Indoor units that have the error.
- If still the error is there, replace the communication PCB of the RB unit which corresponds to the error indicating Indoor unit.



Check Point 4 : Check Controller PCB

- Replace controller PCB of the Indoor units that have the error.
- If still the error is there, replace the controller PCB of the RB unit which corresponds to the error indicating Indoor unit.

Trouble shooting 8 E14. 5 OUTDOOR UNIT Error Method: The number of Indoor unit shortage Error	Indicate or Display: Outdoor Unit : E.1 4. 5 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. / No display (When DIP-SW4-1 is OFF.) Error Code : 9 U / 1 4 / 1 6 / 1 4. 5 / 1 4. 3 *
---	--

*Peripheral device indicates 14,16

Detective Actuators: Outdoor unit Main PCB	Detective details: When the indoor unit number decreases for 180 seconds from the memorized maximum indoor units number after power(Breaker) ON.
--	--

Forecast of Cause :	1. Indoor unit or RB unit power off 2. Noise, momentary open, voltage drop 3. Communication line connection defective 4. Terminal resistor setting mistake 5. Communication PCB mounting defective, Communication PCB defective 6. Controller PCB defective
----------------------------	--

Check Point 1 : Find the indoor unit that the communication is lost.
<input type="checkbox"/> Check system drawing and service tool.

↓ **OK**

Check Point 2 : Check the indoor unit or RB unit power supply
<input type="checkbox"/> Main power ON check <input type="checkbox"/> Power cable connection and open check

↓ **OK**

Check Point 2 : Noise, momentary open, voltage drop
<input type="checkbox"/> Check if temporary voltage drop was not generated. <input type="checkbox"/> Check if momentary open was not generated. <input type="checkbox"/> Check if ground is connection correctly or there are no related cables near the power line.

↓ **OK**

Check Point 3 : Check the communication line connection
<input type="checkbox"/> Communication line connection, open check Refer to SERVICE INFORMATION Network communication Abnormal

↓ **OK**

Check Point 4 : Check the Terminal resistor setting
<input type="checkbox"/> Terminal resistor setting check

↓ **OK**

Check Point 5 : Check the communication PCB (indoor unit/ outdoor unit/ RB unit)
<input type="checkbox"/> Communication PCB connection check <input type="checkbox"/> Communication PCB check

↓ **OK**

Check Point 6 : Replace Main PCB and Communication PCB (indoor unit/ outdoor unit/ RB unit)
<input type="checkbox"/> Change Main PCB and Communication PCB, and set up the original address.

Attention!!
 In case of DIP-SW SET4-1 is ON(factory setting), If this error occurs, system stops. In case of DIP-SW SET4-1 is OFF, If this error occurs, system does not stop.

 If the failure indoor unit is pinpointed and it needs to erase the error indication, it can be reset by function setting (F3-41: Maximum memorized indoor unit number reset).

Caution!!
 Even if normal, this error occurs temporarily by the timing of the power ON of outdoor unit, indoor unit, RB unit, and signal amplifier.

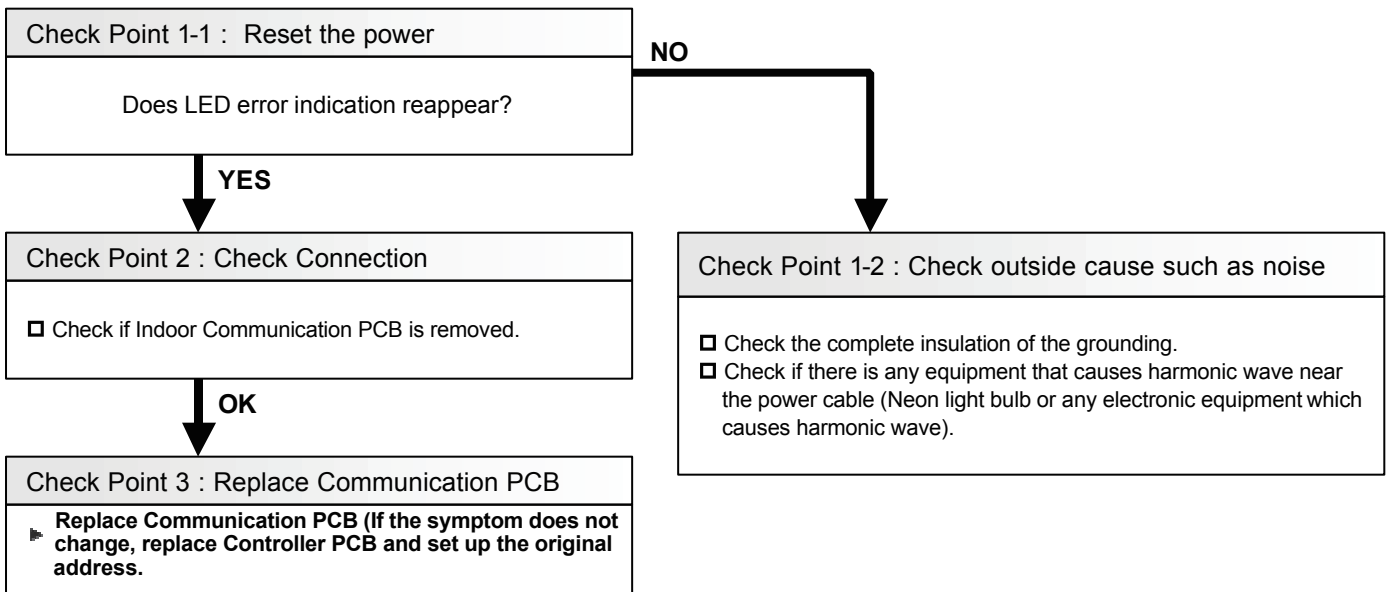
 In this case, please wait for 5 minutes after turning on all the equipments.

Trouble shooting 9 E16. 1 INDOOR UNIT Error Method: Transmission PCB Connection Error	Indicate or Display: Outdoor Unit : E.1 4.1, 1 4.2 * Indoor Unit : Operation LED 1 times Flash, Timer LED 6 Times Flash, Filter LED Continuous Flash. Error Code : 1 6 *
---	---

* Outdoor unit indicates 1 4.1 or 14.2 (No communication from Indoor unit)
Peripheral device indicates 1 6 (1 6.4 Error)
Service Tool indicates 14.3 (Missing Error Indoor unit)

Detective Actuators: Indoor unit Controller PCB circuit Indoor unit Communication PCB	Detective details: When Parallel communication error (Communication reset occurs continuously more than specified times) is detected.
--	---

Forecast of Cause : 1. Connection failure 2. Outside cause 3. Communication PCB failure 4. Controller PCB failure



Trouble shooting 10 INDOOR UNIT Error Method: Communication Error Between Controller and Indoor unit	E16. 4	Indicate or Display: Outdoor Unit : No Display Indoor Unit : No Display Error Code : 1 6 (Peripheral Unit)
---	---------------	--

Detective Actuators: Indoor unit Controller PCB circuit Indoor unit Communication PCB	Detective details: When the cut-off of network communication is detected (more than 90 seconds passed since the last receipt of Outdoor unit signal).
--	---

Forecast of Cause : 1. Outside cause 2. Connection failure 3. Communication PCB failure 4. Controller PCB failure

Check Point 1 : Check if any outside cause such as voltage drop or noise

- Instant voltage drop ----- Check if there is any electric equipment with a large load within the same circuit.
- Momentary power failure ----- Check contact failure or leak current in power supply circuit
>>Check power supply for RB unit and Outdoor Unit as well.
- Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave). And check the complete insulation of grounding.
>>If the same symptom does not reappear after resetting the power, possibility of noise is high.



Check Point 2 : Check the connection

After turning off the power, check and correct followings.

- Is Indoor Communication PCB loose?
- Check loose or removed connection of communication line Indoor unit => RB unit => Outdoor unit.
Refer to the Service Information -Network Abnormal -
- Check the Error indication of RB unit. (Refer to the Trouble shooting 69, 70)
- When the signal amplifier is connected , Check the error indication of signal amplifier - Refer to the Installation manual-



Check Point 3 : Check Communication PCB

- Replace Communication PCB of the Indoor units that have the error.
- If still the error is there, replace the communication PCB of the RB unit which corresponds to the error indicating Indoor unit.



Check Point 4 : Check Controller PCB

- Replace controller PCB of the Indoor units that have the error.
- If still the error is there, replace the controller PCB of the RB unit which corresponds to the error indicating Indoor unit.

Trouble shooting 11 E26. 4 INDOOR UNIT Error Method: Address Duplication in Wired remote controller system	Indicate or Display: Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 2 times Flash, Timer LED 6 Times Flash, Filter LED Continuous Flash. Error Code : 2 6
--	--

Detective Actuators: Wired remote controller (2-Wire) Indoor unit Controller PCB circuit	Detective details: When the duplicated address number exists in one RCgroup
---	---

Forecast of Cause : 1. Wrong wiring of RCgroup 2. Wrong remote address setting 3. Indoor unit controller PCB failure
4. Remote controller failure

Check Point 1 : Wire installation
<input type="checkbox"/> Wrong wire connection in RCgroup (Please refer to the installation manual)



Check Point 2 : Wrong RCgroup setting
<input type="checkbox"/> The duplicated address number is not existing in one RCgroup



Check Point 3 : Check Indoor unit controller PCB
<input type="checkbox"/> Check if controller PCB damage <input type="checkbox"/> Change controller PCB and check the Error after setting remote controller address

Trouble shooting 12 E26. 5 INDOOR UNIT Error Method: Address setting Error in Wired remote controller system	Indicate or Display: Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 2 times Flash, Timer LED 6 Times Flash, Filter LED Continuous Flash. Error Code : 2 6
--	--

Detective Actuators: Wired remote controller (2-Wire) Indoor unit Controller PCB circuit	Detective details: When the address number set by auto setting and manual setting are mixed in one RC group
---	---

Forecast of Cause : 1. Wrong wiring of RCgroup 2. Wrong remote address setting 3. Indoor unit controller PCB failure
4. Remote controller failure

Check Point 1 : Wire installation
<input type="checkbox"/> Wrong wire connection in RCgroup (Please refer to the installation manual)



Check Point 2 : Wrong RCgroup setting
<input type="checkbox"/> The given address number by auto setting (00) and the manual set number (Except 00) were not existing in one RCG. <input type="checkbox"/> The remote controller address setting by U.I. were not existing same address.



Check Point 3 : Check Indoor unit controller PCB
<input type="checkbox"/> Check if controller PCB damage <input type="checkbox"/> Change controller PCB and check the Error after setting remote controller address

Trouble shooting 13	E28. 1	Indicate or Display:
OUTDOOR UNIT Error Method:		Outdoor Unit : E. 28. 1
Auto Address Setting Error		Indoor Unit : No Display
		Error Code : No Display * Service tool does not indicate the Error code

<< After Indoor unit Auto Address setting >>

<u>Detective Actuators:</u> Outdoor unit Main PCB	<u>Detective details:</u> ▪ When none of the connected indoor units answers during auto address And when abnormal answer signal is input.
---	--

<u>Forecast of Cause :</u>	1. Indoor unit power supply defective	2. Indoor unit overconnected
	3. Communication line incorrect connection	4. Noise, momentary open

Check Point 1 : Check the indoor unit power supply
<input type="checkbox"/> Check the indoor unit power supply



Check Point 2 : Check the indoor unit number connection
<input type="checkbox"/> Check if more than 64 indoor units are connected in a refrigerant circuit



Check Point 3 : Check the communication line connection
Check if communication line is correctly connected
<input type="checkbox"/> Is it uncoupled or cut halfway ?
<input type="checkbox"/> Connecting terminal position is correct as the installation manual shows ?



Check Point 4 : Check noise, momentary open, voltage drop
<input type="checkbox"/> Check if power supply temporarily stops by outages or if strong noise is generated from surrounding environment during auto address

<< After RB unit Auto Address setting >>

<u>Detective Actuators:</u> Outdoor unit Main PCB	<u>Detective details:</u> ▪ When there is except 0~63 (64 or more) in the indoor unit address of the indoor unit connected to RB unit. ▪ When the address memorized to RB unit was incorrectly value.
---	--

<u>Forecast of Cause :</u>	1. Indoor unit address setting error
	2. RB unit controller PCB defective

Check Point 1 : Check the indoor unit address setting
<input type="checkbox"/> Check the indoor unit address.



Check Point 2 : Replace RB unit controller PCB
<input type="checkbox"/> Replace RB unit controller PCB.

Trouble shooting 14 E28. 4 OUTDOOR UNIT Error Method: Signal Amplifier Auto Address Error	Indicate or Display: Outdoor Unit : E. 2 8. 4 Indoor Unit : No Display Error Code : No Display *Service tool does not indicate the Error
---	--

Detective Actuators: Outdoor unit Main PCB	Detective details: ▪ When abnormal answer signal is input during signal amplifier auto address
--	--

Forecast of Cause :	1. Signal amplifier power supply defective 2. Signal amplifier overconnected 3. Signal amplifier auto address wrong setting 4. Noise, momentary open.
----------------------------	--

Check Point 1 : Check signal amplifier unit power supply
<input type="checkbox"/> Check signal amplifier unit power supply



Check Point 2 : Check the signal amplifier number connection
<input type="checkbox"/> Check if more than 8 signal amplifiers (filter mode = off) are connected in a network. <input type="checkbox"/> Check if more than 32 signal amplifiers (filter mode = on) are connected in a network.



Check Point 3 : Check the operation of signal amplifier auto address setting
<input type="checkbox"/> Check if signal amplifier auto address is set at the same time from multiple outdoor units (master unit)



Check Point 4 : Check noise, momentary open, voltage drop
<input type="checkbox"/> Check if power supply temporarily stops by outages or if strong noise is generated from surrounding environment during signal amplifier auto address

Trouble shooting 15 E29. 1 INDOOR UNIT Error Method: Connection unit number error (Indoor unit in Wired remote controller system)	Indicate or Display: Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 2 times Flash, Timer LED 9 Times Flash, Filter LED Continuous Flash. Error Code : 2 9
---	--

Detective Actuators: Wired remote controller (2-Wire) Indoor unit Controller PCB circuit	Detective details: When the number of connecting indoor units are out of specified rule.
---	--

Forecast of Cause : 1. Wrong wiring/ Number of I.U, RC in RCgroup 2. Indoor unit controller PCB defective

Check Point 1 : Wire installation
<input type="checkbox"/> Wrong number of connecting indoor unit



Check Point 2 : Check Indoor unit controller PCB
<input type="checkbox"/> Check if controller PCB damage <input type="checkbox"/> Change controller PCB and check the Error after setting remote controller address

Trouble shooting 16 INDOOR UNIT Error Method: Connection unit number error (Remote controller)	E29. 2	Indicate or Display: Outdoor Unit : No Display Indoor Unit : No Display Error Code : 2 9
---	---------------	---

Detective Actuators: Wired remote controller (2-Wire)	Detective details: When the number of connecting remote controller are out of specified rule.
---	---

Forecast of Cause : 1. Wrong wiring / Wrong number of connecting RC in RCgroup 2. Remote controller PCB defective

Check Point 1 : Wire installation
<input type="checkbox"/> Wrong number of connecting remote controller

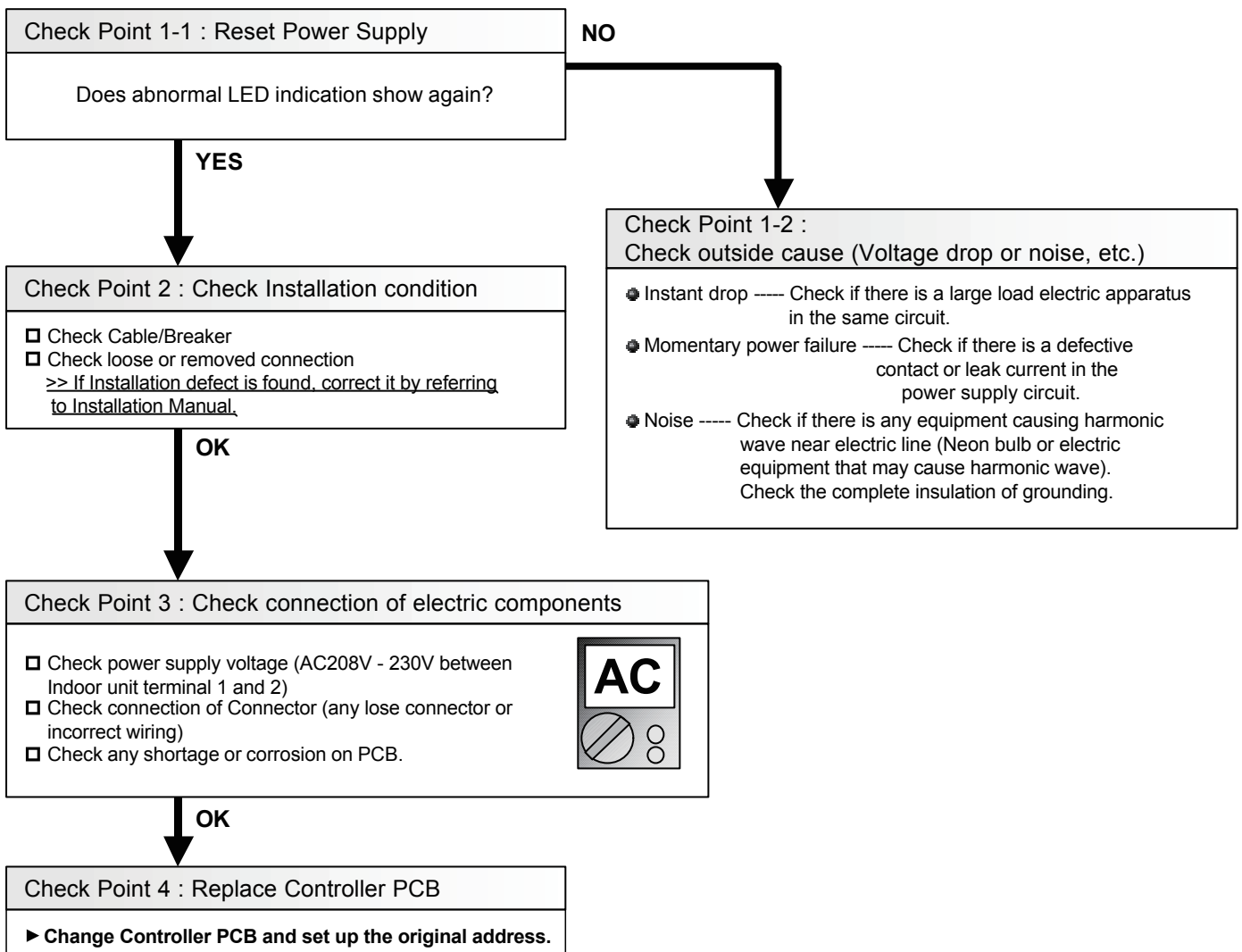


Check Point 2 : Check Indoor unit controller PCB
<input type="checkbox"/> Check if controller PCB damage <input type="checkbox"/> Change controller PCB and check the Error after setting remote controller address

Trouble shooting 17	E31. 3	Indicate or Display: Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 3 times Flash, Timer LED 1 Times Flash, Filter LED Continuous Flash. Error Code : 3 1
INDOOR UNIT Error Method: Indoor unit Power Frequency Abnormal		

Detective Actuators: Indoor Unit Controller PCB Circuit	Detective details: When 5 continuous failures occurred at Power frequency test.
---	---

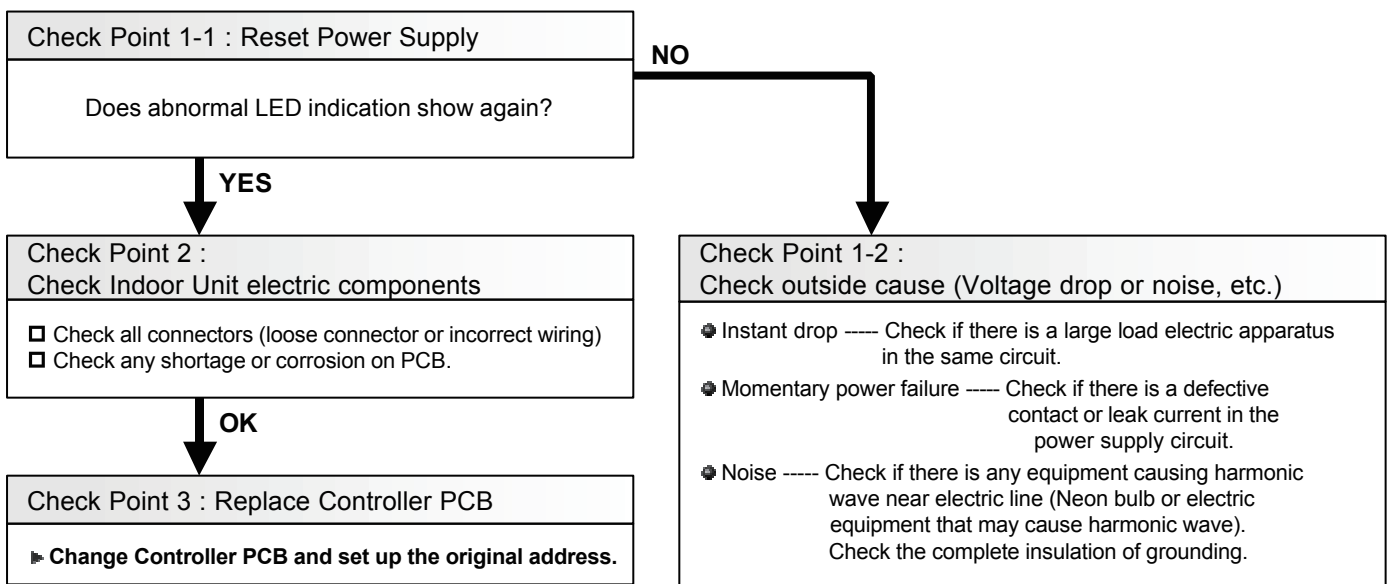
Forecast of Cause : 1. Outside cause 2. Installation failure 3. Defective connection of electric components
4. Controller PCB defective



Trouble shooting 18 INDOOR UNIT Error Method: Indoor unit PCB Model Information Error	E32. 1	Indicate or Display: Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 3 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash. Error Code : 3 2
--	---------------	--

Detective Actuators: Indoor Unit Controller PCB Circuit	Detective details: 3 continuous failure of lead test of EEPROM at Power ON, or Apparent Model information error from EEPROM. Also, Error on Model information upon model information test of EEPROM, or Model information of EEPROM not possible to recover.
---	--

Forecast of Cause : 1. Outside cause 2. Connection failure of electric components 3. Controller PCB defective

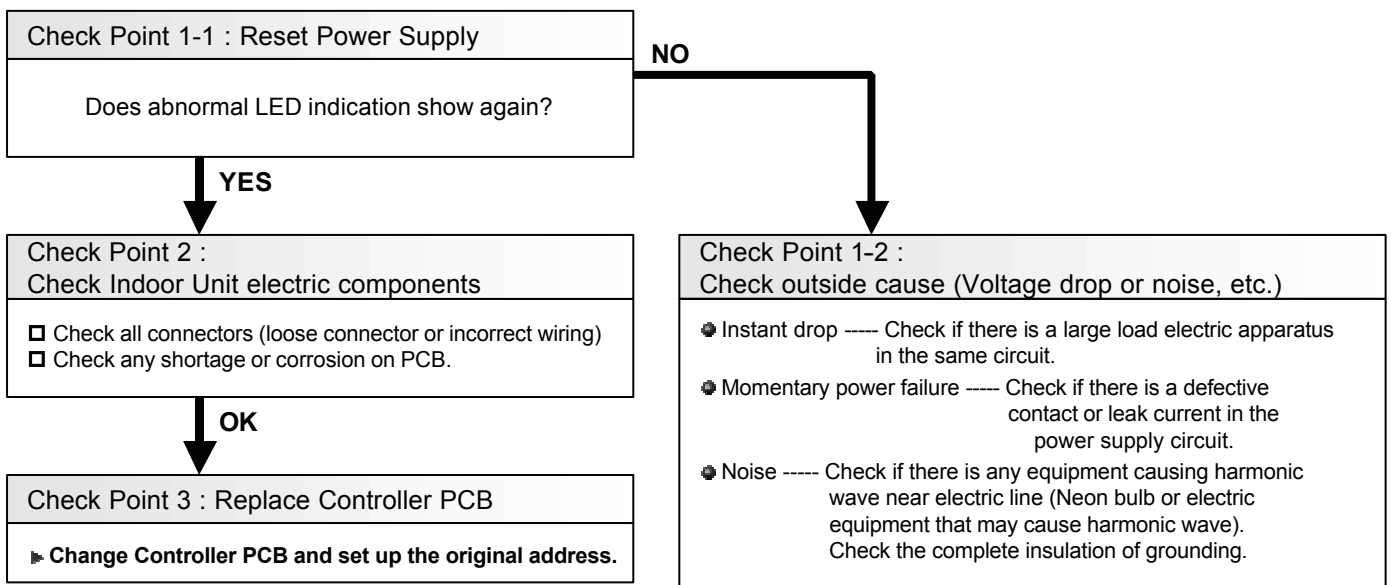


Note : EEPROM
 EEPROM(Electronically Erasable and Programmable Read Only Memory) is a non-volatile memory which keeps memorized information even if power is turned off. It can change the contents electronically. To change the contents, it uses higher voltage than normal, and it can not change a partial contents. (Rewriting shall be done upon erasing the all contents.) There is a limit in a number of rewriting.

Trouble shooting 19 INDOOR UNIT Error Method: Indoor unit EEPROM Access Error	E32. 3	Indicate or Display: Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 3 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash. Error Code : 3 2
--	---------------	--

Detective Actuators: Indoor Unit Controller PCB Circuit	Detective details: When 3 continuous failure occurred on lead test of EEPROM.
---	---

Forecast of Cause : 1. Outside cause 2. Defective connection of electric component 3. Controller PCB defective



Trouble shooting 20 INDOOR UNIT Error Method: Indoor unit communication circuit (WRC) microcomputers communication Error	E3A. 1	Indicate or Display: Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 3 times Flash, Timer LED 10 Times Flash, Filter LED Continuous Flash. Error Code : 3 A
---	---------------	--

Detective Actuators: Wired remote controller (2-Wire) Indoor unit Controller PCB circuit	Detective details: When the indoor unit(s) detects the configuration of RCG abnormal or the indoor unit detects lack of primary -remote controller.
---	--

Forecast of Cause : 1. Terminal connection abnormal 2. Wired remote controller failure
 3. Indoor unit controller PCB defective

Check Point 1 : Check the connection of terminal

After turning off the power supply, check & correct the followings

- Indoor unit - Check the connection of terminal between remote control and indoor unit, or between Indoor units and check if there is a disconnection or short of the cable



Check Point 2 , 3: Check Indoor unit controller PCB

- Check terminal voltage of controller PCB connector CNC01 (Power supply for remote)
 - If DC12V, Remote control failure (Controller PCB is OK) >>> Replace Remote controller
 - If DC0V, Controller PCB failure (Remote is OK) >>> Replace Controller PCB

In case of re-installation is done due to removed connector or incorrect wiring, turn on the power again.

Trouble shooting 21 INDOOR UNIT Error Method: Inlet air temp. Sensor Error	E41. 1	Indicate or Display:
		Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 4 times Flash, Timer LED 1 Times Flash, Filter LED Continuous Flash. Error Code : 4 1

Detective Actuators: Indoor Unit Controller PCB Circuit Inlet air temp Sensor	Detective details: When Inlet air temp. sensor open or shortage is detected
--	---

Forecast of Cause : 1. Connector defective connection 2. Sensor defective 3. Controller PCB defective

Check Point 1 : Check connection of Connector

- Check if connector is loose or removed
- Check erroneous connection
- Check if sensor cable is open

>>Reset Power when reinstalling due to removed connector or incorrect wiring.



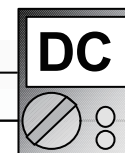
Check Point 2 : Remove connector and check Sensor resistance value

Sensor characteristics (Rough value)

Temperature (°F)	32	41	50	59	68	77	86	95
Temperature (°C)	0	5	10	15	20	25	30	35
Resistance Value (kΩ)	33.6	25.2	20.1	15.8	12.5	10.0	8.0	6.5

Temperature (°F)	104	113	122
Temperature (°C)	40	45	50
Resistance Value (kΩ)	5.3	4.3	3.5

► If Sensor is either open or shorted, replace it and reset the power.



Check Point 3 : Check voltage of Controller PCB (DC5.0V)

Corresponding connector

Model Type	Room temp. Sensor (Black Wires)
Duct type	CN8
Cassette type	
Compact Wall type	
Wall type	
Floor/Ceiling type	

► If the voltage does not appear, replace Controller PCB and set up the original address.

Trouble shooting 22 INDOOR UNIT Error Method: Indoor unit Heat Ex. inlet temp. sensor Error	E42. 1	Indicate or Display: Outdoor Unit : E.5 U.1
		Indoor Unit : Operation LED 4 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash. Error Code : 4 2

Detective Actuators: Indoor Unit Controller PCB Circuit Heat Exchanger Inlet temp. Sensor	Detective details: When open or shorted Heat Exchanger Inlet temp. sensor is detected
--	---

Forecast of Cause : 1. Connector defective connection 2. Sensor defective 3. Controller PCB defective


Check Point 1 : Check connection of Connector

- Check if connector is loose or removed
- Check erroneous connection
- Check if thermistor cable is open

>>Reset Power when reinstalling due to removed connector or incorrect wiring.

OK

Check Point 2 : Remove connector and check sensor resistance value



Sensor Characteristics (Rough value)

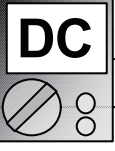
Temperature (°F)	32	41	50	59	68	77	86	95
Temperature (°C)	0	5	10	15	20	25	30	35
Resistance Value (kΩ)	168.6	129.8	100.9	79.1	62.5	49.8	40.0	32.4

Temperature (°F)	104	113	122
Temperature (°C)	40	45	50
Resistance Value (kΩ)	26.3	21.2	17.8

► **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Controller PCB (DC5.0V)



Corresponding connector

Model Type	Heat Ex Inlet temp. Sensor (Black Wires)
Duct type	CN9
Cassette type	
Wall type	
Floor/Ceilling type	CN20
Compact Wall type	

► **If the voltage does not appear, replace Controller PCB and set up the original address.**

Trouble shooting 23 E42. 3 INDOOR UNIT Error Method: Indoor unit Heat Ex. outlet temp. Sensor Error	Indicate or Display: Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 4 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash. Error Code : 4 2

Detective Actuators: Indoor Unit Controller PCB Circuit Heat Exchanger Outlet Temp. Sensor	Detective details: When open or shorted Heat Exchanger outlet temp. sensor is detected
---	--

Forecast of Cause : 1. Connector defective connection 2.Sensor defective 3.Controller PCB defective

Check Point 1 : Check connection of Connector

- Check if connector is loose or removed
- Check erroneous connection
- Check if Sensor cable is open

>>Reset Power when reinstalling due to removed connector or incorrect wiring.



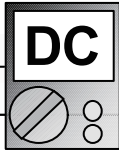
Check Point 2 : Remove connector and check Sensor resistance value

Sensor characteristics (Rough value)

Temperature (°F)	32	41	50	59	68	77	86	95
Temperature (°C)	0	5	10	15	20	25	30	35
Resistance Value (kΩ)	168.6	129.8	100.9	79.1	62.5	49.8	40.0	32.4

Temperature (°F)	104	113	122
Temperature (°C)	40	45	50
Resistance Value (kΩ)	26.3	21.2	17.8

► **If Sensor is either open or shorted, replace it and reset the power.**



Check Point 3 : Check voltage of Controller PCB (DC5.0V)

Corresponding connector

Model Type	Heat Ex Outlet temp. Sensor (Gray Wires)
Duct type	CN9
Cassette type	
Wall type	
Floor/Ceilling type	CN21
Compact Wall type	

► **If the voltage does not appear, replace Controller PCB and set up the original address.**

Trouble shooting 24 E51. 2 INDOOR UNIT Error Method: Indoor Unit Fan Motor 1 rotation speed Error	Indicate or Display: Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 5 times Flash, Timer LED 1 Times Flash, Filter LED Continuous Flash. Error Code : 5 1
---	--

Detective Actuators: Indoor Unit Controller PCB Circuit Indoor Fan Motor	Detective details: When the FAN motor feed back rotation value which is detecting on the controller PCB becomes 0 and lasts for more than 1 minute at motor operation condition. Or, when the feed back rotation value continues at 1/ 3 of target value for more than 1 minute.
---	---

Forecast of Cause : 1. Fan rotation failure 2. Fan motor winding open 3. Motor protection by ambient temp. increase
 4. Capacitor failure 5. Controller PCB failure

Check Point 1 : Check rotation of Fan

- Rotate the fan by hand when operation is off.
 (Check if fan is caught, dropped off or locked motor)
>>If Fan or Bearing is abnormal, replace it.



Check Point 2 : Check Motor winding / Internal PCB circuit

- Check Indoor Fan motor (Refer to the PARTS INFORMATION 20,21)
>>If Fan motor is abnormal, replace it.



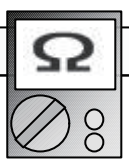
Check Point 3 : Check ambient temp. around motor

- Check excessively high temperature around the motor.
 (If there is any surrounding equipment that causes heat)
>>Upon the temperature coming down, restart operation..



Check Point 4 : Check Motor Capacitor (*)

- Check continuity of motor capacitor
>>If it is shorted, replace the capacitor.



* Applicable indoor unit:
 - ARXA, ARCB, ARXC type



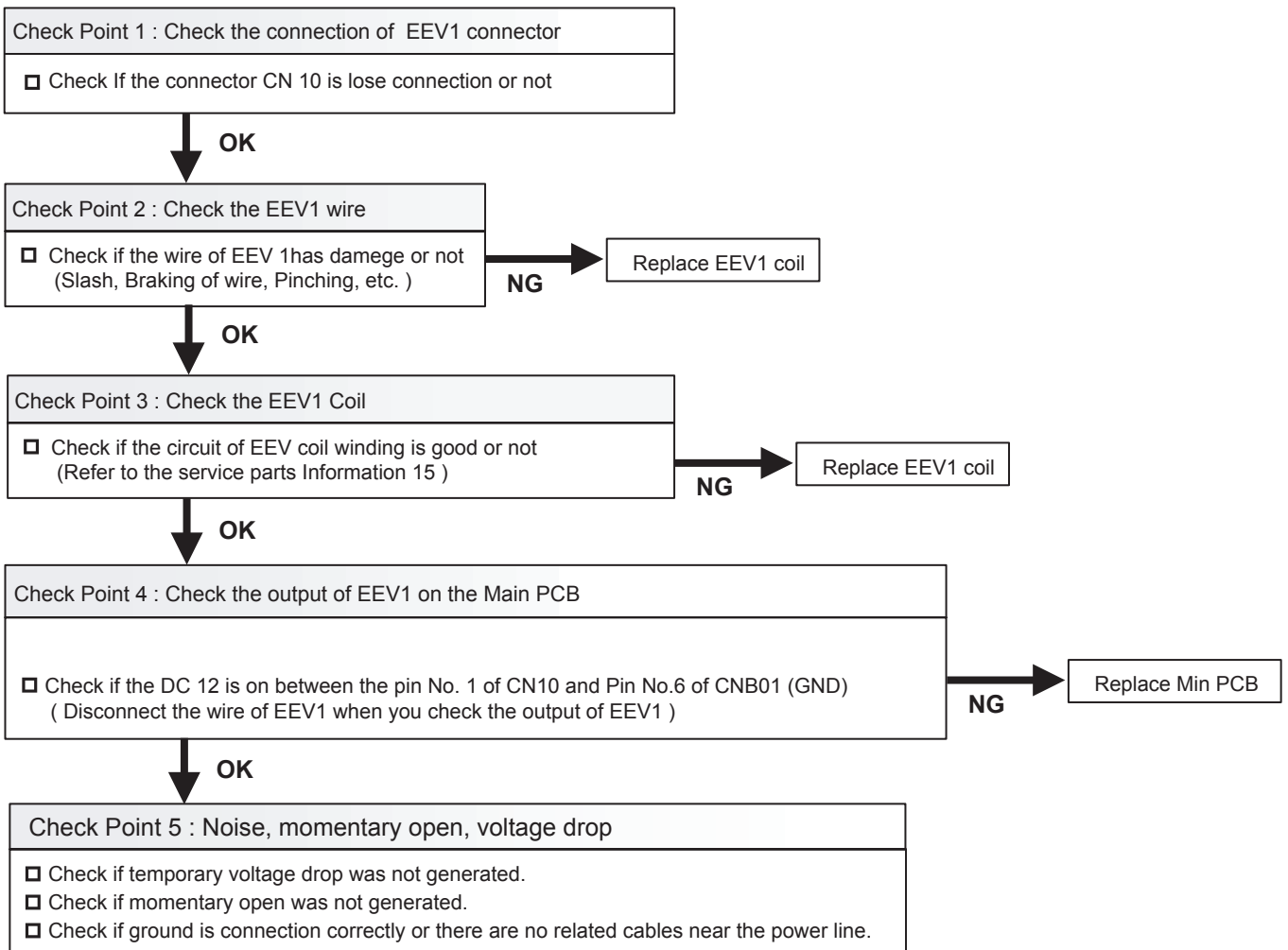
Check Point 5 : Replace Controller PCB

- Change Controller PCB and set up the original address.

Trouble shooting 25 E52. 1 INDOOR UNIT Error Method: Coil 1 (Expansion valve) Error	Indicate or Display: Outdoor Unit : E.5U.1 Indoor Unit : Operation LED 5 times Flash, Timer LED 2 Times Flash, Filter LED Continuous Flash. Error Code : 5 2
--	---

Detective Actuators: Indoor unit controller PCB	Detective details: When the EEV1 drive circuit is open circuit
---	--

Forecast of Cause : 1. EEV1 coil lose connection 2. EEV1 wire(s) cut or pinched 3. Defective EEV1 coil 4. Controller PCB (DC 12V) output abnormal 5. Noise momentary open, voltage drop



Trouble shooting 26 INDOOR UNIT Error Method: Indoor unit Drain pump Error	E53. 1	Indicate or Display: Outdoor Unit : E.5 U.1 Indoor Unit : Operation LED 5 times Flash, Timer LED 3 Times Flash, Filter LED Continuous Flash. Error Code : 5 3
---	---------------	--

Detective Actuators: Indoor Unit Controller PCB Circuit Float Switch	Detective details: When Float switch is ON for more than 3 minutes.
---	---

Forecast of Cause : 1. Drain Installation 2. Drain pipe line blockage 3. Float switch defective 4. Shorted connector/wire 5. Controller PCB defective / Drain pump defective

Check Point 1 : Check Drain pipe installation

Check Drain pipe installation (Refer to the installaion manual)
 The Height limit for Drain pump, The angle of drain pipe, The angle of indoor unit



Check Point 2 : Check Drain pipe blockage

Check Drain pipe line blockage
 The drain pump inlet and outlet, The connecting pipe, The drain pipe outlet



Check Point 3, 4 : Check Float Switch operation, connecting wire shorted.

Check operation of float switch.
 Remove Float switch and check ON/OFF switching operation by using a meter.
>>If Float switch is defective, replace it.



Check Point 5 : Check controller PCB defective / Drain pump defective

Measure power supply (AC208- 230V) for the drain pump on the Power supply PCB (CN106) at the Float SW ON states.
>>If No voltage on the connector, replace the power supply PCB
>>If AC208- 230V on the connector, replace the Drain pump

Trouble shooting 27 E61. 5 OUTDOOR UNIT Error Method: Outdoor Unit Reverse Phase, Missing Phase Wire Error	Indicate or Display: Outdoor Unit : E. 6 1. 5 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 6 1
--	---

Detective Actuators: Outdoor unit Main PCB	Detective details: <ul style="list-style-type: none"> ▪ Reverse phase prevention circuit detected reversed phase input or input was not normal at the time of power ON. ▪ Reverse phase prevention circuit detected open-phase after power ON.
--	--

Forecast of Cause :	1. Noise, momentary open, voltage drop 2. Power supply defective 3. Filter PCB (Main) defective 4. Main PCB defective
----------------------------	--

Check Point 1 : Noise, momentary open, voltage drop
<input type="checkbox"/> Check if temporary voltage drop was not generated. <input type="checkbox"/> Check if momentary open was not generated. <input type="checkbox"/> Check if ground is connection correctly or there are no related cables near the power line.



Check Point 2 : Check the power supply
<input type="checkbox"/> Power cable connection, open check

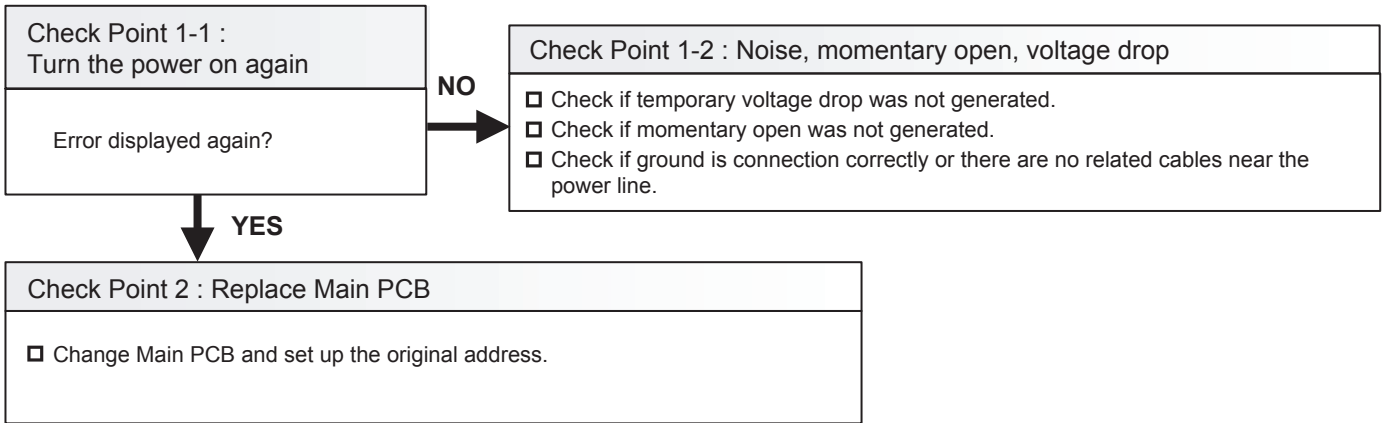


Check Point 3 : Check Filter PCB (Main) and Main PCB
<input type="checkbox"/> Check Filter PCB (Main) and Main PCB. (Refer to "Service Parts Information 3 ".)

Trouble shooting 28 E62. 3 OUTDOOR UNIT Error Method: Outdoor Unit EEPROM Access Error	Indicate or Display: Outdoor Unit : E. 6 2. 3 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 6 2
--	---

Detective Actuators: Outdoor unit Main PCB	Detective details: • Access to EEPROM failed due to some cause after outdoor unit started.
--	--

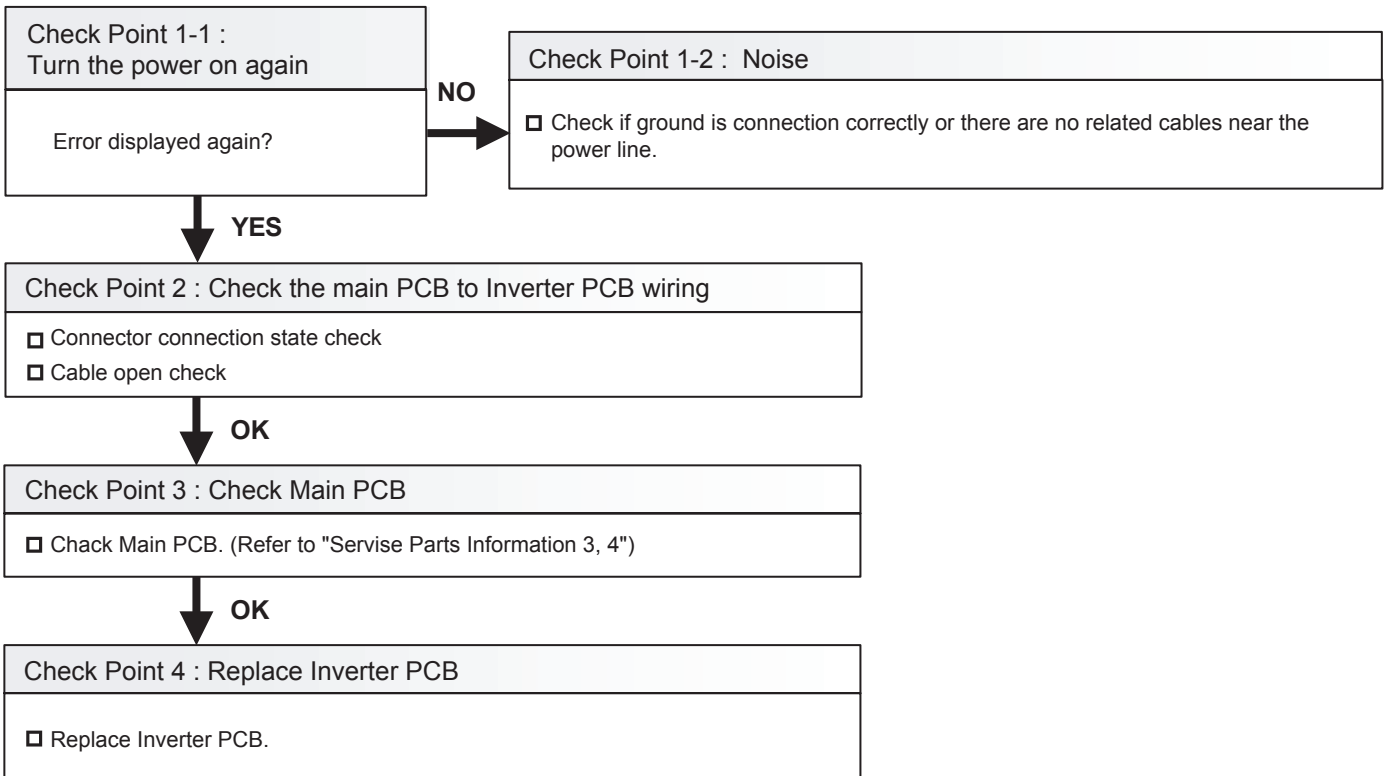
Forecast of Cause : 1. Noise, momentary open, voltage drop 2. Main PCB defective



Trouble shooting 29 OUTDOOR UNIT Error Method: Inverters Communication Error	E62. 6	Indicate or Display: Outdoor Unit : E. 6 2. 6 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 6 2
---	---------------	---

Detective Actuators: Outdoor unit Main PCB	Detective details: •Communication not received from Inverter PCB for 10 seconds or more
--	---

Forecast of Cause :	1. Noise 2. Main PCB to Inverter PCB wiring connection defective 3. Main PCB defective 4. Inverter PCB defective
----------------------------	---

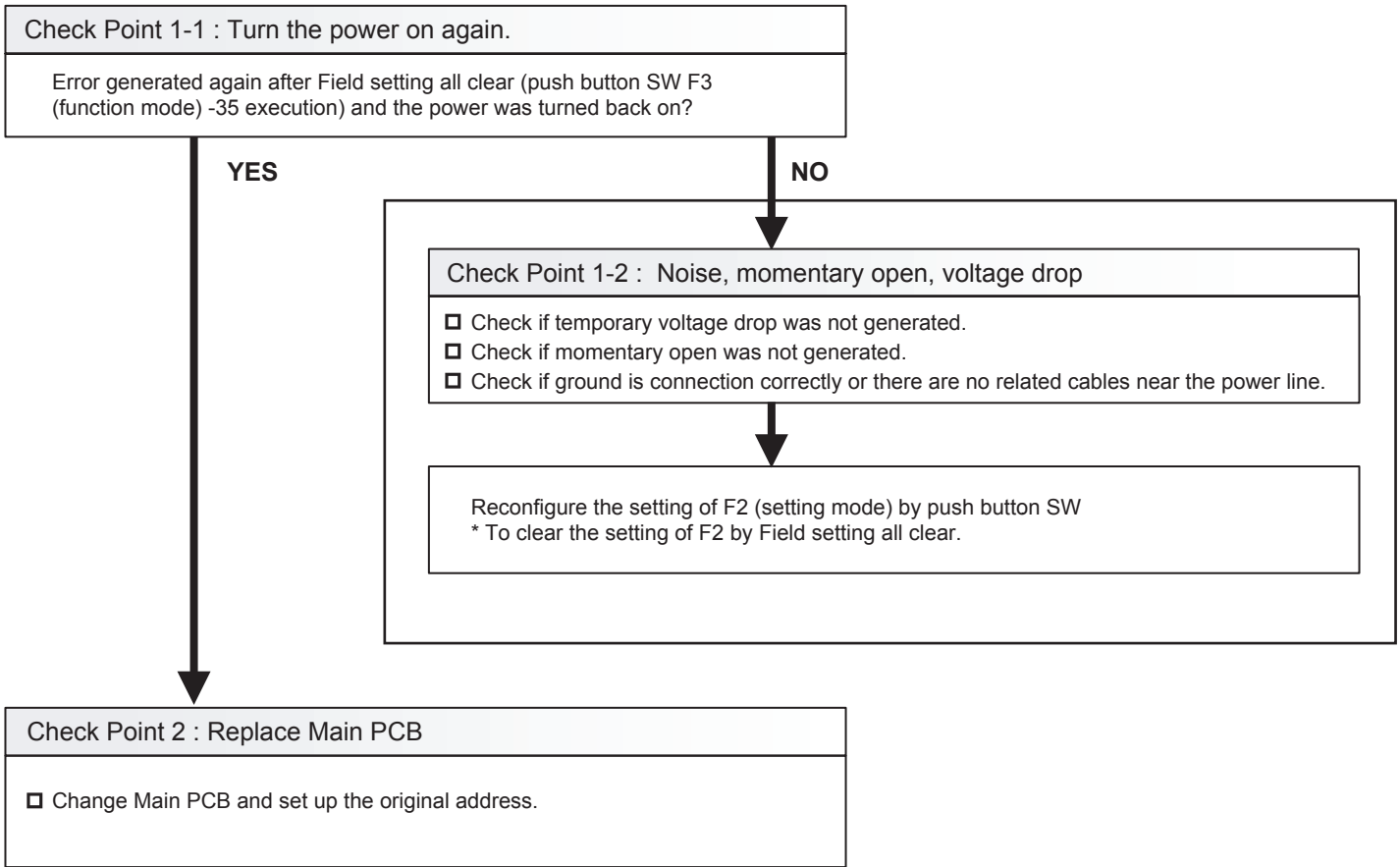


Caution
 By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
 The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)
 - The operating compressor life time becomes shorter.
 - The operating performance may drop due to the limited active compressor(s).
 - The compressor may stop frequently by protection controlling.
 *In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 30	E62. 8	Indicate or Display:
OUTDOOR UNIT Error Method:		Outdoor Unit : E. 6 2. 8
EEPROM data corrupted error		Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.
		Error Code : 9 U / 6 2

<u>Detective Actuators:</u>	<u>Detective details:</u>
Outdoor unit Main PCB	<ul style="list-style-type: none"> ▪ Set contents sum value memorized in EEPROM and sum value calculated based on the set contents read from EEPROM do not match * Regarding the sum value, only the contents set in the push button SW setting mode (F2) shall be the objective.

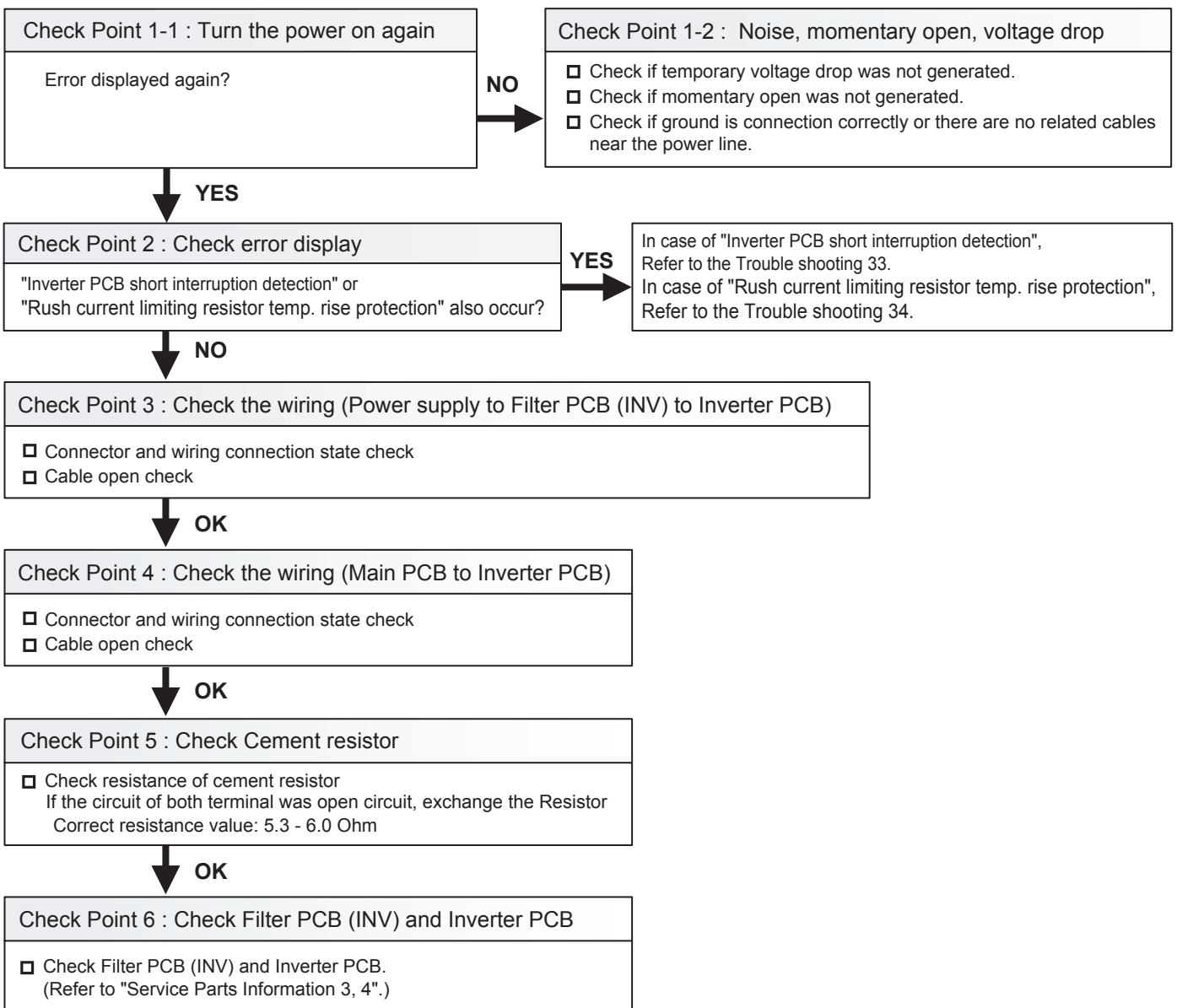
Forecast of Cause : 1. Noise, momentary open, voltage drop 2. Main PCB defective



Trouble shooting 31 E63. 1 OUTDOOR UNIT Error Method: Inverter Error	Indicate or Display: Outdoor Unit : E. 6 3. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 6 3
--	---

Detective Actuators: Inverter PCB	Detective details: <ul style="list-style-type: none"> ▪ Error information received from Inverter PCB. ▪ When "Inverter PCB short interruption detection" or "Rush current limiting resistor temp. rise protection" occurs, Inverter error also occurs.
---	---

Forecast of Cause :	1. Noise, momentary open, voltage drop. 2. Power supply to Filter PCB (INV) to Inverter PCB wiring disconnection, open 3. Main PCB to Inverter PCB wiring disconnection, open 4. Magnetic Relay (for inverter) coil side wiring disconnection, open 5. Magnetic Relay activation circuit defective 6. Main PCB or Filter PCB (INV) or Inverter PCB defective 7. Cement Resistor Open circuit
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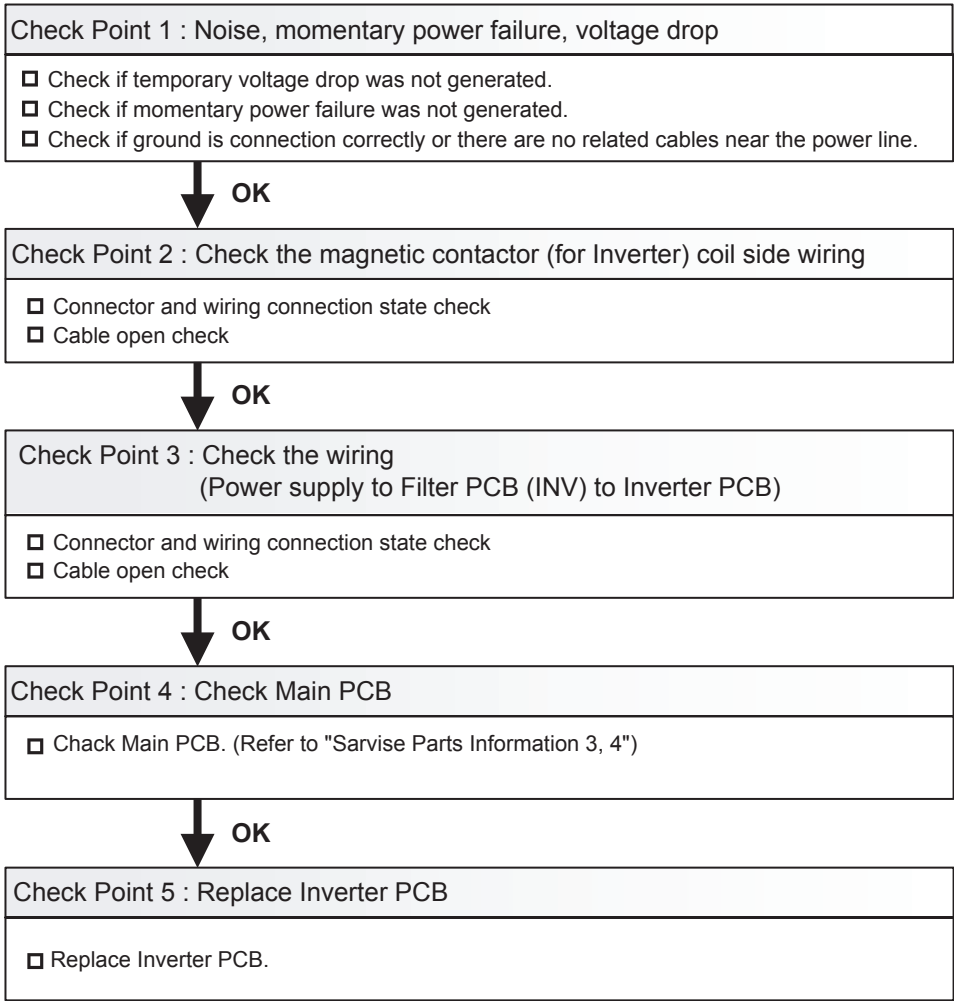


Caution
 By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
 The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)
 - The operating compressor life time becomes shorter.
 - The operating performance may drop due to the limited active compressor(s).
 - The compressor may stop frequently by protection controlling.
 *In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 32 E67. 2 OUTDOOR UNIT Error Method: Inverter PCB short interruption Error	Indicate or Display: Outdoor Unit : E. 6 7. 2 Indoor Unit : No Display Error Code : No display
---	---

<u>Detective Actuators:</u> Inverter PCB	<u>Detective details:</u> <ul style="list-style-type: none"> · "Short interruption" received from Inverter PCB
--	---

<u>Forecast of Cause :</u>	1. Noise, momentary power failure, voltage drop 2. Magnetic Relay (for Inverter) coil side wiring disconnection, open 3. Power supply to Filter PCB (INV) to Inverter PCB wiring disconnection, open 4. Main PCB defective 5. Inverter PCB defective
-----------------------------------	---



Trouble shooting 33 E68. 2 OUTDOOR UNIT Error Method: Rush Current Limiting Resistor Temp Rise Protection	Indicate or Display: Outdoor Unit : E. 6 8. 2 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 6 8
---	---

Detective Actuators: Inverter PCB	Detective details: ▪ "Protection stop by "Rush current limiting resistor temperature rise detection" of inverter PCB" was generated 2 times.
---	--

Forecast of Cause :	1. Magnetic relay (for INV) coil side wiring disconnection, open 2. Power supply to Filter PCB (INV) to Inverter PCB wiring disconnection, open 3. Magnetic relay activation circuit defective 4. Main PCB to Inverter PCB wiring disconnection, open 5. Main PCB output AC208- 230V on CN130 defective Main PCB defective (output AC208- 230V on CN130 for Magnetic relay (INV) defective)
----------------------------	--

Check Point 1 : Check the magnetic relay (for inverter) coil side wiring
<input type="checkbox"/> Connector and wiring connection state check <input type="checkbox"/> Cable open check

↓ **OK**

Check Point 2 : Check Power supply to Filter PCB (INV) to inverter PCB wiring
<input type="checkbox"/> Connector and wiring connection state check <input type="checkbox"/> Cable open check

↓ **OK**

Check Point 3-1 : Magnetic relay activation circuit
<input type="checkbox"/> Check the DC Voltage (12V) of CN330 on INVERTER PCB

NG → **Replace Inverter PCB**

↓ **OK**

Check Point 4 : Check the wiring (Main PCB to Inverter PCB)
<input type="checkbox"/> Check the wiring connection. (CN138 on Main PCB to CN330 on Inverter PCB)

↓ **OK**

Check Point 5 : Main PCB output AC208- 230V for Magnetic relay
<input type="checkbox"/> Check the AC208- 230V of CN130 on Main PCB

↓ **OK**

Check Point 6 : Replace Main PCB
<input type="checkbox"/> Change Main PCB and set up the original address.

After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Caution
By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)

- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.

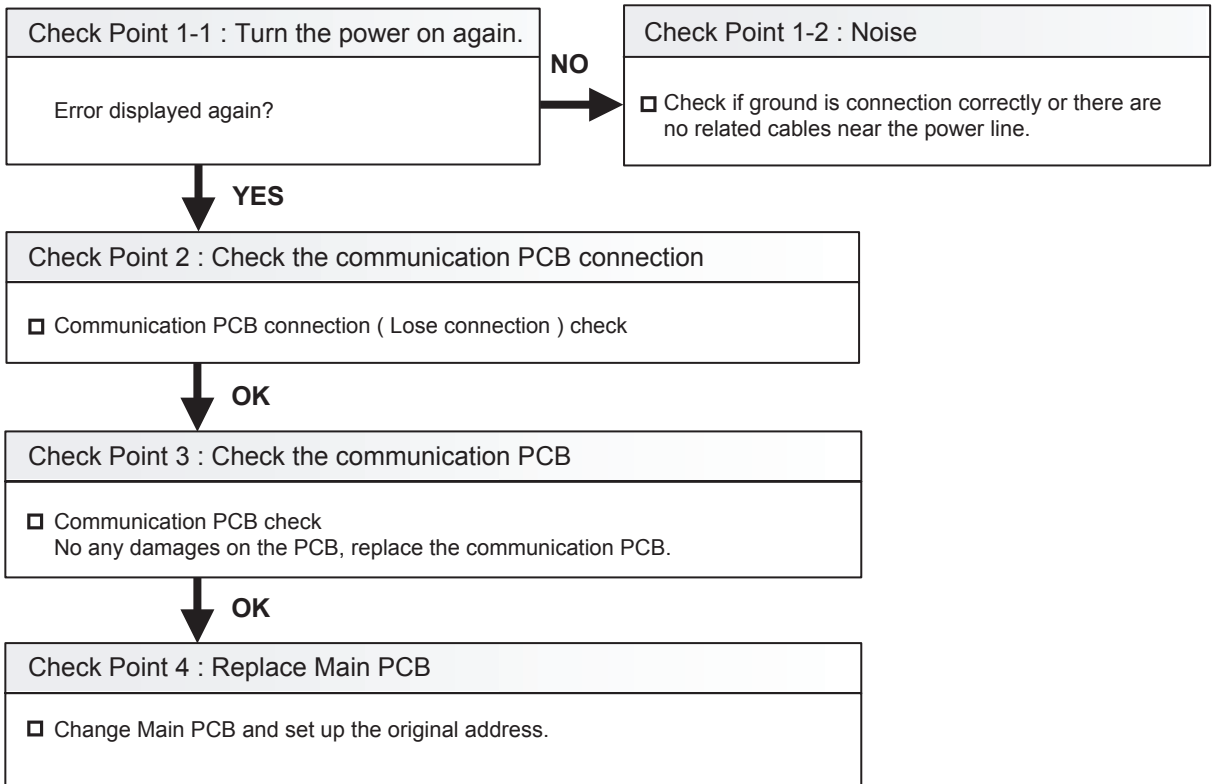
*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 34 E69. 1 OUTDOOR UNIT Error Method: Outdoor Unit Transmission PCB Parallel Communication Error	Indicate or Display: Outdoor Unit : E. 6 9. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. / Operation LED 1 time Flash, Timer LED 4 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 6 9 / 1 4 / 14.1 / 14.3*
--	--

*When this error occurs on the Slave outdoor unit, Error code 69.1 is transferred to each device on the network.
When this error occurs on the Master outdoor unit, the indoor unit on the network indicates 14 (14.3 No communication from Outdoor unit), and Service tool indicates 14.1 (Outdoor unit Network communication Error).

<u>Detective Actuators:</u> Outdoor unit Main PCB	<u>Detective details:</u> ▪When Parallel communication error (Communication reset occurs continuously more than specified times) is detected.
---	---

<u>Forecast of Cause :</u>	1. Noise 2. Communication PCB connection defective 3. Communication PCB defective 4. Main PCB defective
-----------------------------------	--



Trouble shooting 35 E71. 1 OUTDOOR UNIT Error Method: Discharge Temp. Sensor 1 Error	Indicate or Display: Outdoor Unit : E. 7 1. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 7 1
--	---

Detective Actuators: Discharge temp. sensor 1	Detective details: <ul style="list-style-type: none"> • Discharge temp. sensor 1 short detected • Discharge temp. sensor 1 open detected after compressor 1 operated continuously for 5 minutes or more
---	---

Forecast of Cause :

1. Connector connection defective, open
2. Sensor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

Connector connection state check
 Cable open check



Check Point 2 : Check the sensor

Sensor characteristics check (Disconnect the sensor from the PCB and check.)
 * For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check voltage of Main PCB (DC5.0V)

DC

Main PCB (CN162: 1-2) voltage value = 5V
Remove the sensor from Main PCB, check the voltage.

1	1	BLACK	THERMISTOR (DIS.TEMP.1)
2	2	BLACK	
3	3	BLACK	
4	4	BLACK	
5	5		THERMISTOR (COMP SHELL 1)
6	6		
7	7		
8	8		

Discharge temp. sensor 1 (CN162: 1-2)

► **If the voltage does not appear, replace Main PCB and set up original address.**

Caution

By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)

The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)

- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.

*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 36 E72. 1 OUTDOOR UNIT Error Method: Compressor Temp Sensor 1 Error	Indicate or Display: Outdoor Unit : E. 7 2. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 7 2
--	---

Detective Actuators: Compressor temp. sensor 1	Detective details: <ul style="list-style-type: none"> • Compressor temp. sensor 1 short detected • Compressor temp. sensor 1 open detected after compressor 1 operated continuously for 5 minutes or more
--	---

Forecast of Cause :	1. Connector connection defective, open 2. Sensor defective 3. Main PCB defective
----------------------------	---

Check Point 1 : Check the connector connection and cable open
<input type="checkbox"/> Connector connection state check <input type="checkbox"/> Cable open check



Check Point 2 : Check the sensor
<input type="checkbox"/> Thermistor characteristics check (Disconnect the sensor from the PCB and check.) * For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check voltage of Main PCB (DC5.0V)	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> DC </div>																											
<input type="checkbox"/> Main PCB (CN162: 3-4) voltage value = 5V Remove the sensor from Main PCB, check the voltage.																												
<table border="1" style="margin: auto;"> <tr> <td colspan="2"></td> <td style="text-align: center;">THERMISTOR (DIS.TEMP.1)</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">BLACK </td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">2</td> <td style="text-align: center;">BLACK </td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">3</td> <td style="text-align: center;">BLACK </td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">4</td> <td style="text-align: center;">BLACK </td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> <td style="text-align: center;">THERMISTOR (COMP SHELL 1)</td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">6</td> <td></td> </tr> <tr> <td style="text-align: center;">7</td> <td style="text-align: center;">7</td> <td></td> </tr> <tr> <td style="text-align: center;">8</td> <td style="text-align: center;">8</td> <td></td> </tr> </table>				THERMISTOR (DIS.TEMP.1)	1	1	BLACK	2	2	BLACK	3	3	BLACK	4	4	BLACK	5	5	THERMISTOR (COMP SHELL 1)	6	6		7	7		8	8	
		THERMISTOR (DIS.TEMP.1)																										
1	1	BLACK																										
2	2	BLACK																										
3	3	BLACK																										
4	4	BLACK																										
5	5	THERMISTOR (COMP SHELL 1)																										
6	6																											
7	7																											
8	8																											
Compressor temp. sensor 1 (CN162: 3-4)																												
▶ <u>If the voltage does not appear, replace Main PCB and set up original address.</u>																												

Caution
By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)

- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.

*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 37 E73.4 OUTDOOR UNIT Error Method: Heat Ex.1 Gas Temp Sensor Error	Indicate or Display: Outdoor Unit : E. 7 3. 4 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 7 3
--	--

Detective Actuators: Heat ex.1 gas temp. sensor	Detective details: • Heat ex.1 gas temp. sensor short or open detected
---	--

Forecast of Cause :	1. Connector connection defective, open 2. Sensor defective 3. Main PCB defective
----------------------------	---

Check Point 1 : Check the connector connection and cable open
<input type="checkbox"/> Connector connection state check <input type="checkbox"/> Cable open check



Check Point 2: Check the sensor
<input type="checkbox"/> Sensor characteristics check (Disconnect the sensor from the PCB and check.) * For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check voltage of Main PCB (DC5.0V)	<div style="border: 1px solid black; padding: 2px; display: inline-block;">DC</div>
<input type="checkbox"/> Main PCB (CN163: 3-4) voltage value = 5V <u>Remove the sensor from Main PCB, check the voltage.</u>	
Heat ex.1 gas temp. sensor (CN163: 3-4) ► <u>If the voltage does not appear, replace Main PCB and set up original address.</u>	

Caution
By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection.
(Stand alone outdoor unit is impossible)
The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)
- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.
*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 38 E 73. 5 OUTDOOR UNIT Error Method: Heat Ex.1 Liquid Temp Sensor Error	Indicate or Display: Outdoor Unit : E. 7 3. 5 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 7 3
---	---

<u>Detective Actuators:</u>	<u>Detective details:</u>
Heat ex.1 liquid temp. sensor	<ul style="list-style-type: none"> • Heat ex.1 liquid temp. sensor short or open detected

Forecast of Cause :

1. Connector connection defective, open
2. Sensor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

Connector connection state check
 Cable open check



Check Point 2: Check the sensor

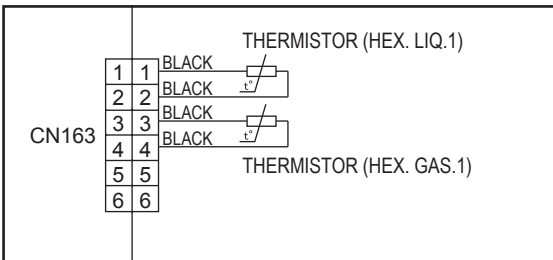
Sensor characteristics check (Disconnect the sensor from the PCB and check.)
* For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check voltage of Main PCB (DC5.0V)



Main PCB (CN163: 1-2) voltage value = 5V
Remove the sensor from Main PCB, check the voltage.



Heat ex.1 liquid temp. sensor (CN163: 1-2)

► If the voltage does not appear, replace Main PCB and set up original address.

Trouble shooting 39 E73. 6 OUTDOOR UNIT Error Method: Heat Ex.2 Gas Temp Sensor Error	Indicate or Display: Outdoor Unit : E. 7 3. 6 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 7 3
--	---

Detective Actuators: Heat ex.2 gas temp. sensor	Detective details: • Heat ex.2 gas temp. sensor short or open detected
---	--

Forecast of Cause :

1. Connector connection defective, open
2. Sensor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

Connector connection state check
 Cable open check



Check Point 2: Check the sensor

Sensor characteristics check (Disconnect the sensor from the PCB and check.)
* For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check voltage of Main PCB (DC5.0V)

Main PCB (CN164: 3-4) voltage value = 5V
Remove the sensor from Main PCB, check the voltage.

DC

CN164	1	1	BLACK	THERMISTOR (HEX. LIQ.2)
	2	2	BLACK	
	3	3	BLACK	
	4	4	BLACK	
	5	5		THERMISTOR (HEX. GAS.2)
	6	6		
	7	7		

Heat ex.2 gas temp. sensor (CN164: 3-4)

► If the voltage does not appear, replace Main PCB and set up original address.

Caution

By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)

The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)

- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.

*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 40 E73. 7 OUTDOOR UNIT Error Method: Heat Ex.2 Liquid Temp Sensor Error	Indicate or Display: Outdoor Unit : E. 7 3. 7 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 7 3
---	---

Detective Actuators: Heat ex.2 liquid temp. sensor	Detective details: • Heat ex.2 liquid temp. sensor short or open detected
--	---

Forecast of Cause :

1. Connector connection defective, open
2. Sensor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

Connector connection state check
 Cable open check



Check Point 2: Check the sensor

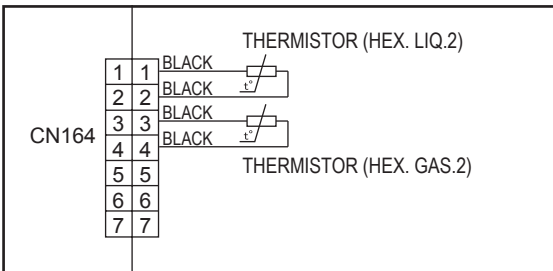
Sensor characteristics check (Disconnect the sensor from the PCB and check.)
* For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check voltage of Main PCB (DC5.0V)



Main PCB (CN164: 1-2) voltage value = 5V
Remove the sensor from Main PCB, check the voltage.



Heat ex.2 liquid temp. sensor (CN164: 1-2)

► **If the voltage does not appear, replace Main PCB and set up original address.**

Trouble shooting 41 E74. 1 OUTDOOR UNIT Error Method: Outdoor Temp Sensor Error	Indicate or Display: Outdoor Unit : E. 7 4. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 7 4
---	---

Detective Actuators: Outdoor temp. sensor	Detective details: • Outdoor temp. sensor short or open detected
---	--

Forecast of Cause :	1. Connector connection defective, open 2. Sensor defective 3. Main PCB defective
----------------------------	---

Check Point 1 : Check the connector connection and cable open
<input type="checkbox"/> Connector connection state check <input type="checkbox"/> Cable open check



Check Point 2: Check the sensor
<input type="checkbox"/> Sensor characteristics check (Disconnect the sensor from the PCB and check.) * For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check voltage of Main PCB (DC5.0V)	<div style="border: 1px solid black; padding: 2px; display: inline-block;">DC</div>
<input type="checkbox"/> Main PCB (CN144:1-3) voltage value = 5V <u>Remove the sensor from Main PCB, check the voltage.</u>	
Outdoor temp. sensor (CN144:1-3) ▶ <u>If the voltage does not appear, replace Main PCB and set up original address.</u>	

Caution By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible) The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.) - The operating compressor life time becomes shorter. - The operating performance may drop due to the limited active compressor(s). - The compressor may stop frequently by protection controlling. *In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 42 E75. 1 OUTDOOR UNIT Error Method: Suction Gas Temp Sensor Error	Indicate or Display: Outdoor Unit : E. 7 5. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 7 5
---	---

Detective Actuators: Suction gas temp. sensor	Detective details: • Suction gas temp. sensor short or open detected
---	--

Forecast of Cause : <ol style="list-style-type: none"> 1. Connector connection defective, open 2. Sensor defective 3. Main PCB defective
--

Check Point 1 : Check the connector connection and cable open <input type="checkbox"/> Connector connection state check <input type="checkbox"/> Cable open check
--



Check Point 2 : Check the sensor <input type="checkbox"/> Sensor characteristics check (Disconnect the sensor from the PCB and check.) * For the sensor characteristics, refer to the "Service Parts Information 25".
--



Check Point 3 : Check voltage of Main PCB (DC5.0V) <input type="checkbox"/> Main PCB (CN165:1-3) voltage value = 5V <u>Remove the sensor from Main PCB, check the voltage.</u>	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> DC </div>
Suction gas temp. sensor (CN165:1-3) ► <u>If the voltage does not appear, replace Main PCB and set up original address.</u>	

Trouble shooting 43 E77. 1 OUTDOOR UNIT Error Method: Heat Sink Temp Sensor Error	Indicate or Display: Outdoor Unit : E. 7 7. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 7 7
---	---

Detective Actuators: Heat sink temp. sensor	Detective details: • Heat sink temp. sensor open/short detected
---	---

Forecast of Cause :

1. Connector connection defective, open
2. Sensor defective
3. Inverter PCB defective

Check Point 1 : Check the connector connection and cable open

Connector connection state check
 Cable open check



Check Point 2 : Check the sensor

Sensor characteristics check (Disconnect the sensor from the PCB and check.)
* For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check voltage of Inverter PCB (DC5.0V)

Inverter PCB (CN360: 1-2) voltage value = 5V
Remove the sensor from Inverter PCB, check the voltage.

DC

Heat sink temp. sensor (CN360: 1-2)

▶ **If the voltage does not appear, replace Inverter PCB.**

Caution
By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)

- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.

*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 44 OUTDOOR UNIT Error Method: Sub-cool Heat EX. Gas outlet Temp Sensor Error	E82. 2	Indicate or Display: Outdoor Unit : E. 8 2. 2 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 8 2
--	---------------	---

Detective Actuators: Sub-cooling heat ex. gas outlet temp. sensor	Detective details: • Sub-cooling heat ex. gas outlet temp. sensor short or open detected.
---	---

Forecast of Cause :	1. Connector connection defective, open 2. Sensor defective 3. Main PCB defective
----------------------------	---

Check Point 1 : Check the connector connection and cable open
<input type="checkbox"/> Connector connection state check <input type="checkbox"/> Cable open check



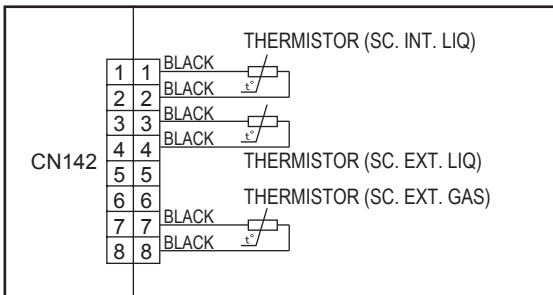
Check Point 2 : Check the sensor
<input type="checkbox"/> Sensor characteristics check (Disconnect the sensor from the PCB and check.) * For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check voltage of Main PCB (DC5.0V)



<input type="checkbox"/> Main PCB (CN142: 7-8) voltage value = 5V <u>Remove the sensor from Main PCB, check the voltage.</u>



Sub-cooling heat ex. gas outlet temp. sensor (CN142: 7-8)

► **If the voltage does not appear, replace Main PCB and set up original address.**

Trouble shooting 45 E83. 1 OUTDOOR UNIT Error Method: Liquid Pipe Temp. Sensor 1 Error	Indicate or Display: Outdoor Unit : E. 8 3. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 8 3

Detective Actuators: Liquid pipe temp. sensor 1	Detective details: • Liquid pipe temp. sensor 1 short or open detected
---	--

Forecast of Cause : <ol style="list-style-type: none"> 1. Connector connection defective, open 2. Sensor defective 3. Main PCB defective
--

Check Point 1 : Check the connector connection and cable open
<input type="checkbox"/> Connector connection state check <input type="checkbox"/> Cable open check



Check Point 2 : Check the sensor
<input type="checkbox"/> Sensor characteristics check (Disconnect the sensor from the PCB and check.) * For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check voltage of Main PCB (DC5.0V)	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> DC </div>																				
<input type="checkbox"/> Main PCB (CN142: 1-2) voltage value = 5V <u>Remove the sensor from Main PCB, check the voltage.</u>																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2"></td> <td style="text-align: center;">THERMISTOR (SC. INT. LIQ)</td> </tr> <tr> <td rowspan="8" style="text-align: center; vertical-align: middle;">CN142</td> <td style="text-align: center;">1</td> <td>BLACK </td> </tr> <tr> <td style="text-align: center;">2</td> <td>BLACK </td> </tr> <tr> <td style="text-align: center;">3</td> <td>BLACK </td> </tr> <tr> <td style="text-align: center;">4</td> <td>BLACK </td> </tr> <tr> <td style="text-align: center;">5</td> <td>THERMISTOR (SC. EXT. LIQ)</td> </tr> <tr> <td style="text-align: center;">6</td> <td>THERMISTOR (SC. EXT. GAS)</td> </tr> <tr> <td style="text-align: center;">7</td> <td>BLACK </td> </tr> <tr> <td style="text-align: center;">8</td> <td>BLACK </td> </tr> </table>			THERMISTOR (SC. INT. LIQ)	CN142	1	BLACK	2	BLACK	3	BLACK	4	BLACK	5	THERMISTOR (SC. EXT. LIQ)	6	THERMISTOR (SC. EXT. GAS)	7	BLACK	8	BLACK	
		THERMISTOR (SC. INT. LIQ)																			
CN142	1	BLACK																			
	2	BLACK																			
	3	BLACK																			
	4	BLACK																			
	5	THERMISTOR (SC. EXT. LIQ)																			
	6	THERMISTOR (SC. EXT. GAS)																			
	7	BLACK																			
	8	BLACK																			
Liquid pipe temp. sensor 1 (CN142: 1-2) ► If the voltage does not appear, replace Main PCB and set up original address.																					

Trouble shooting 46 E83. 2 OUTDOOR UNIT Error Method: Liquid Pipe Temp. Sensor 2 Error	Indicate or Display: Outdoor Unit : E. 8 3. 2 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 8 3

Detective Actuators: Liquid pipe temp. sensor 2	Detective details: • Liquid pipe temp. sensor 2 short or open detected
---	--

Forecast of Cause :

1. Connector connection defective, open
2. Sensor defective
3. Main PCB defective

Check Point 1 : Check the connector connection and cable open

Connector connection state check

Cable open check



Check Point 2 : Check the sensor

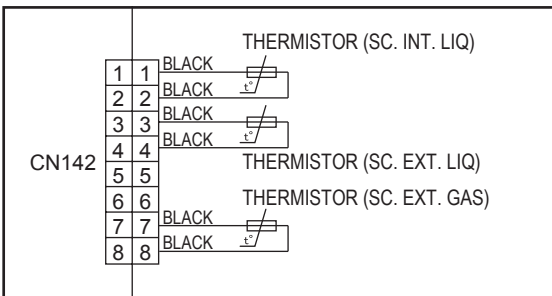
Sensor characteristics check (Disconnect the sensor from the PCB and check.)
* For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check voltage of Main PCB (DC5.0V)



Main PCB (CN142: 3-4) voltage value = 5V
Remove the sensor from Main PCB, check the voltage.



Liquid pipe temp. sensor 2 (CN142: 3-4)

► **If the voltage does not appear, replace Main PCB and set up original address.**

Trouble shooting 47 E84. 1 OUTDOOR UNIT Error Method: Current Sensor 1 abnormal	Indicate or Display: Outdoor Unit : E. 8 4. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 8 4
---	---

Detective Actuators: Judgment from value sensed by current sensor 1 (current sensor for inverter) * Current sensor 1 is mounted on Filter PCB(INV)	Detective details: <ul style="list-style-type: none"> • "Protection stop by "inverter speed ≥ 20rps and sensor value 0A continued for 1 min"" was generated 2 times • Sensor value while inverter stopped = maximum was detected
---	--

Forecast of Cause :	<ol style="list-style-type: none"> 1. Power supply defective 2. Power cable disconnection , open 3. Filter PCB (INV) to Inverter PCB CT system wiring connector disconnection, open 4. Power supply to Filter PCB (INV) to Inverter PCB wiring disconnection, open 5. Filter PCB(INV) defective (Power supply section, current sensor section) 6. Inverter PCB defective
----------------------------	--

Check Point 1 : Check the power supply
<input type="checkbox"/> Main power ON/OFF state check <input type="checkbox"/> Power cable connection, open check



Check Point 2 : Filter PCB(INV) to Inverter PCB CT system wiring connection state
<input type="checkbox"/> Connector and wiring connection state check <input type="checkbox"/> Cable open check



Check Point 3 : Check the wiring (Power supply to Filter PCB (INV) to Inverter PCB)
<input type="checkbox"/> Connector connection state check <input type="checkbox"/> Cable open check



Check Point 4 : Check Filter PCB (INV) and Inverter PCB
<input type="checkbox"/> Chack Filter PCB (INV) and Inverter PCB. (Refer to "Service Parts Information 4")

After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Caution
 By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
 The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)

- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.

*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 48 OUTDOOR UNIT Error Method: Discharge Pressure Sensor Error	E86. 1	Indicate or Display: Outdoor Unit : E. 8 6. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 8 6
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Detective Actuators: Discharge pressure sensor	Detective details: • When any of the following conditions is satisfied, a discharge pressure sensor error is generated. <ol style="list-style-type: none"> 1. 30 seconds or more have elapsed since the outdoor unit power was turned on and pressure sensor detected value < 0.3V continued for 30 seconds or more 2. 30 seconds or more have elapsed since the outdoor unit power was turned on and pressure sensor detected value \geq 5.0V was detected.
--	--

Forecast of Cause :	<ol style="list-style-type: none"> 1. Discharge pressure sensor connector disconnection, open 2. Discharge pressure sensor defective 3. Main PCB defective
----------------------------	---

Check Point 1 : Check the discharge pressure sensor connection state
<input type="checkbox"/> Connector connection state check <input type="checkbox"/> Cable open check



Check Point 2 : Check the discharge pressure sensor
<input type="checkbox"/> Sensor characteristics check * For the characteristics of the discharge pressure sensor, refer to the "Service Parts Information 23".



Check Point 3 : Check voltage of Main PCB (DC5.0V)	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> DC </div>
<input type="checkbox"/> Main PCB (CN118:1-3) voltage value = 5V <u>Remove the sensor from Main PCB, check the voltage.</u>	
Discharge pressure sensor (CN118:1-3)	
► If the voltage does not appear, replace Main PCB and set up original address.	

Caution By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible) The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.) <ul style="list-style-type: none"> - The operating compressor life time becomes shorter. - The operating performance may drop due to the limited active compressor(s). - The compressor may stop frequently by protection controlling. *In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 49 E86. 3 OUTDOOR UNIT Error Method: Suction Pressure Sensor Error	Indicate or Display: Outdoor Unit : E. 8 6. 3 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 8 6
---	---

Detective Actuators: Suction pressure sensor	Detective details: <ul style="list-style-type: none"> • When any of the following conditions is satisfied, a suction pressure sensor error is generated. <ol style="list-style-type: none"> 1. 30 seconds or more have elapsed since the outdoor unit power was turned on and pressure sensor detected value < 0.06V continued for 30 seconds or more. 2. 30 seconds or more have elapsed since the outdoor unit power was turned on and pressure sensor detected value \geq 5.0V was detected.
--	--

Forecast of Cause :

1. Suction pressure sensor connector disconnection, open
2. Suction pressure sensor defective
3. Main PCB defective

Check Point 1 : Check the suction pressure sensor connection state

Connector connection state check
 Cable open check



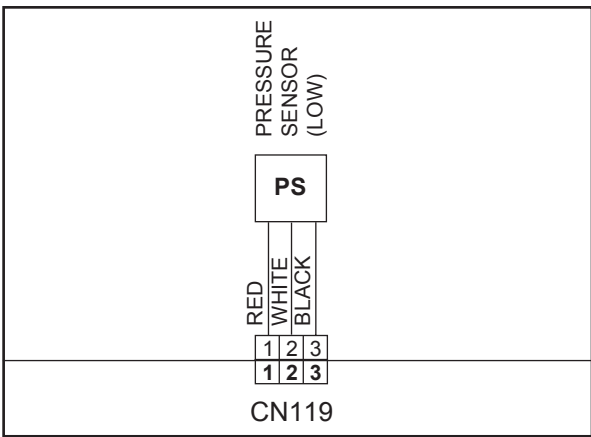
Check Point 2 : Check the suction pressure sensor

Sensor characteristics check
 * For the characteristics of the suction pressure sensor, refer to the "Service Parts Information 23".



Check Point 3 : Check voltage of Main PCB (DC5.0V)

- Main PCB (CN119:1-3) voltage value = 5V
 Remove the sensor from Main PCB, check the voltage.



Suction pressure sensor (CN119:1-3)

► If the voltage does not appear, replace Main PCB and set up original address.

Caution
 By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
 The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)

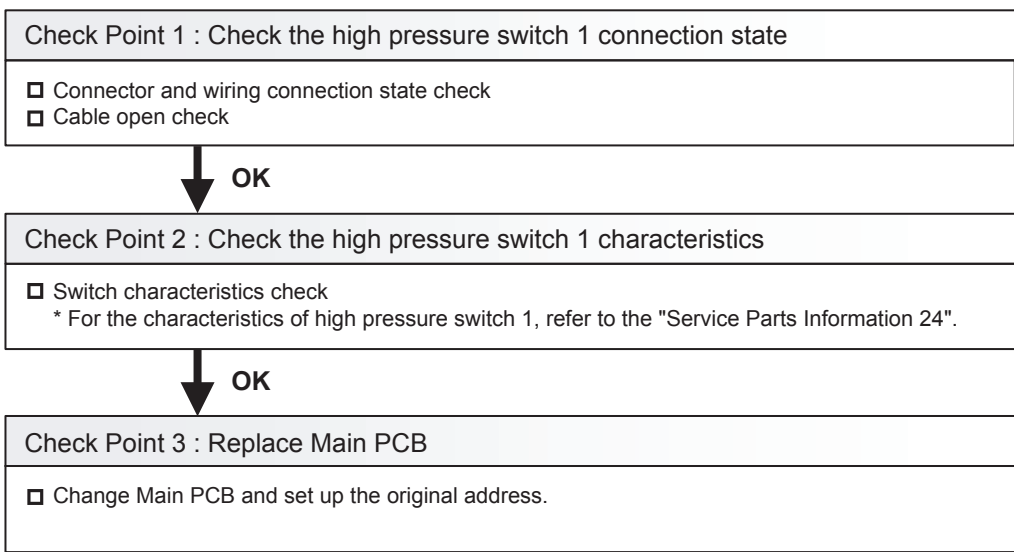
- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.

*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 50 OUTDOOR UNIT Error Method: High Pressure Switch 1 Error	E86. 4	Indicate or Display: Outdoor Unit : E. 8 6. 4 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 8 6
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Detective Actuators: High pressure switch 1	Detective details: · When the power was turned on, "high pressure switch 1: open" was detected.
---	---

Forecast of Cause :	1. High pressure switch 1 connector disconnection, open 2. High pressure switch 1 characteristics defective 3. Main PCB defective
----------------------------	---



Caution
 By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
 The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)

- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.

*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 51 E93. 1 OUTDOOR UNIT Error Method: Inverter Compressor Start UP Error	Indicate or Display: Outdoor Unit : E. 9 3. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 9 3
--	---

<u>Detective Actuators:</u> Inverter PCB	<u>Detective details:</u> <ul style="list-style-type: none"> ▪ "Protection stop by "overcurrent generation at inverter compressor starting" ⇒ restart" generated consecutively 60 times x 2 sets (total 120 times) * The shortest time up to error generation is about 130 minutes * Restart is not performed if an indoor unit in the same refrigerant system is not turned ON by thermostat. * After the end of the 1st set, the 2nd set is not started if all the compressors in the same refrigerant system are not temporarily stopped.
--	--

<u>Forecast of Cause :</u>	1. Inverter PCB to inverter compressor wiring disconnection, open 2. Inverter PCB defective 3. Inverter compressor defective (lock, winding short)
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Check Point 1 : Check the Inverter PCB to inverter compressor connection state
<input type="checkbox"/> Wiring connection state check <input type="checkbox"/> Cable open check



Check Point 2 : Check the Inverter PCB
<input type="checkbox"/> Inverter PCB check (Refer to Service Parts Information 4)



Check Point 3 : Replace the Inverter compressor
<input type="checkbox"/> Inverter compressor replacement

After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

<p>Caution</p> <p>By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)</p> <p>The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)</p> <ul style="list-style-type: none"> - The operating compressor life time becomes shorter. - The operating performance may drop due to the limited active compressor(s). - The compressor may stop frequently by protection controlling. <p>*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.</p>

Trouble shooting 52 OUTDOOR UNIT Error Method: Trip Detection	E94. 1	Indicate or Display: Outdoor Unit : E. 9 4. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 9 4
--	---------------	---

<u>Detective Actuators:</u> Inverter PCB	<u>Detective details:</u> <ul style="list-style-type: none"> ▪ "Protection stop by "overcurrent generation after inverter compressor start processing completed"" generated consecutively 5 times. * The number of generations is reset if protection stop is not generated again within 40 seconds after restarting.
--	---

<u>Forecast of Cause :</u>	<ol style="list-style-type: none"> 1. Outdoor unit fan operation defective, foreign matter on hear exchanger, excessive rise of ambient temperature 2. Inverter PCB defective 3. Inverter compressor defective (lock, winding short)
-----------------------------------	---

Check Point 1 : Check the outdoor unit fan operation, heat exchanger, ambient temperature

- No obstructions in air passages?
- Heat exchange fins clogged
- Outdoor unit fan motor check
- Ambient temperature not raised by the effect of other heat sources?
- Discharged air not sucked in?

↓
OK

Check Point 2 : Check the Inverter PCB

- Inverter PCB check (Refer to Service Parts Information 4)

↓
OK

Check Point 3 : Replace the Inverter compressor

- Inverter compressor replacement

After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Caution
 By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
 The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)

- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.

*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 53 OUTDOOR UNIT Error Method: Compressor Motor Loss of Synchronization	E95. 5	Indicate or Display: Outdoor Unit : E. 9 5. 5 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 9 5
--	---------------	---

Detective Actuators: Inverter PCB	Detective details: <ul style="list-style-type: none"> ▪ "Protection stop by "loss of synchronization detection"" generated consecutively 5 times * The number of generations is reset if protection stop is not generated again within 40 seconds after restarting.
---	---

Forecast of Cause :	1. Inverter PCB defective 2. Inverter compressor defective (lock)
----------------------------	--

Check Point 1 : Check the Inverter PCB
<input type="checkbox"/> Inverter PCB check (Refer to Service Parts Information 4)



Check Point 2 : Replace the Inverter compressor
<input type="checkbox"/> Inverter compressor replacement

After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Caution
 By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
 The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)
 - The operating compressor life time becomes shorter.
 - The operating performance may drop due to the limited active compressor(s).
 - The compressor may stop frequently by protection controlling.
 *In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 54 E97. 1 OUTDOOR UNIT Error Method: Outdoor Unit Fan Motor Lock Error	Indicate or Display: Outdoor Unit : E. 9 7. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 9 7
---	---

Detective Actuators: Outdoor unit fan motor	Detective details: 1. When outdoor fan rotation speed is less than 100rpm in 20 seconds after fan motor starts, fan motor and compressor stops. 2. After fan motor restarts, if the same operation is repeated consecutively 4 times, fan motor and compressor stops permanently.
---	--

Forecast of Cause :	1. Rotation obstruction by foreign matter 2. Main PCB to Driver PCB to Fan motor wiring, disconnection, open 3. Fan motor defective (winding open, lock) 4. Driver PCB defective 5. Main PCB defective
----------------------------	--

Check Point 1 : Fan rotation state check
<input type="checkbox"/> Check for the absence of foreign matter around the fan.



Check Point 2 : Main PCB to Driver PCB to Fan motor wiring connection state
<input type="checkbox"/> Connector and wiring connection state check. <input type="checkbox"/> Check blown fuse of DC FAN motor (5A FUSE) <input type="checkbox"/> Cable open check. Refer to the service parts information 5



Check Point 3 : Fan motor defective
<input type="checkbox"/> Check if fan can be rotated by hand. <input type="checkbox"/> Motor winding resistance check <input type="checkbox"/> Motor operation check Refer to the service parts information 22



Check Point 4 : Replace Driver PCB
<input type="checkbox"/> Check the appearance of Driver PCB. <input type="checkbox"/> Change Driver PCB and release the error. Check if the error reoccurs on a test run.



Check Point 5 : Replace Main PCB
<input type="checkbox"/> Change Main PCB and release the error. Check if the error reoccurs on a test run. >> If it is abnormal, replace Main PCB. (When Main PCB is replaced, set up the original setting by Rotary, Dip, and Push SW)

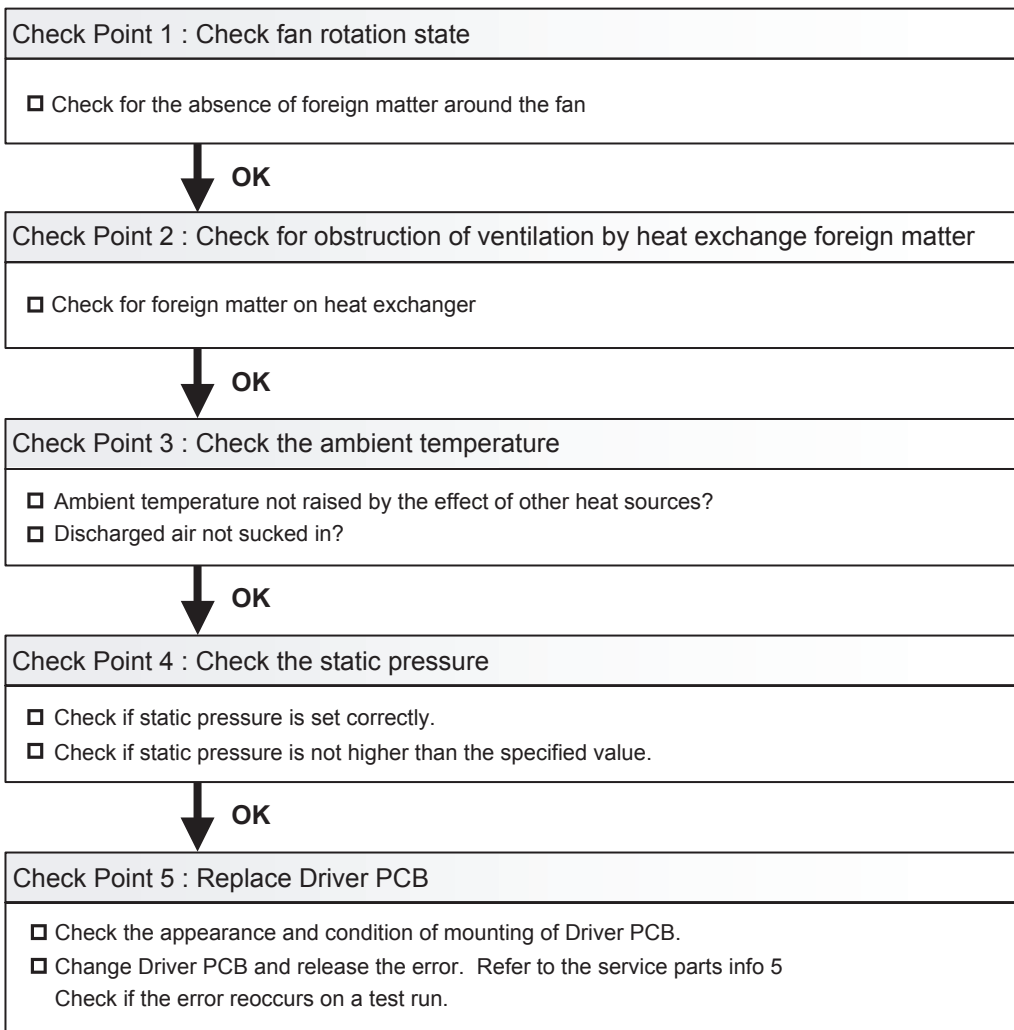
After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Caution
By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)
- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.
*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 55 E97. 5 OUTDOOR UNIT Error Method: Outdoor Unit Fan Motor Temp. Abnormal	Indicate or Display: Outdoor Unit : E. 9 7. 5 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 9 7
---	---

Detective Actuators: Driver PCB	Detective details: 1. When outdoor fan motor cannot operate more than 470rpm, fan motor and compressor stops. 2. After fan motor restarts, if fan motor cannot operate at 470rpm or more, or the same operation is repeated consecutively 3 times within 60 minutes, fan motor and compressor stops permanently.
---	---

Forecast of Cause :	1. Rotation obstructed by foreign matter 2. Ventilation obstructed by heat exchange foreign matter 3. Excessive ambient temperature rise 4. Static pressure setting incorrect, specified static pressure value exceeded 5. Driver PCB defective
----------------------------	---



After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Caution
By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)
- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.
*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 56 OUTDOOR UNIT Error Method: Outdoor Unit Fan Motor Driver Abnormal	E97. 9	Indicate or Display: Outdoor Unit : E. 9 7. 9 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 9 7
--	---------------	---

<u>Detective Actuators:</u> Driver PCB Fan motor Main PCB	<u>Detective details:</u> When Driver PCB detects the following abnormalities, the error signal is output. <ul style="list-style-type: none"> ▪ Driver PCB defective ▪ Fan motor defective (Layer short) ▪ Main PCB defective (DC output abnormal) ▪ Lose connection or disconnecting wire
---	--

<u>Forecast of Cause :</u>	1. Driver PCB defective 2. Fan motor defective 3. Main PCB defective 4. Lose connection or disconnecting wire
-----------------------------------	--

Check Point 1 : Check the wiring connection
<input type="checkbox"/> Check Fan motor to Driver PCB wiring connector disconnection, open <input type="checkbox"/> Check blown fuse of DC FAN motor (5A FUSE) <input type="checkbox"/> Check Driver PCB to Capacitor wiring connector disconnection, open <input type="checkbox"/> Check Main PCB to Driver PCB wiring connector disconnection, open



Check Point 2 : Check DC input power of Driver PCB
<input type="checkbox"/> Check the DC voltage of CN759 is within 15V± 10%. Refer to the service parts info 5 >> If it is abnormal, replace Main PCB. (When Main PCB is replaced, set up the original setting by Rotary, Dip, and Push SW)



Check Point 3 : Replace Driver PCB
<input type="checkbox"/> Check the appearance and condition of mounting of Driver PCB. <input type="checkbox"/> Change Driver PCB and release the error. Check if the error reoccurs on a test run.



Check Point 4 : Replace Fan motor
<input type="checkbox"/> Check the winding resistance of Fan motor. <input type="checkbox"/> Change Fan motor and check if the error reoccurs on a test run.

After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Caution
By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)
- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.
*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 57 E9A.1 OUTDOOR UNIT Error Method: Coil 1 (EEV) Error	Indicate or Display: Outdoor Unit : E. 9 A. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 9 A
---	---

Detective Actuators: Main PCB	Detective details: Coil 1(Expansion valve 1) driver circuit open detected.
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Forecast of Cause :	1. EEV1 coil loose connection 2. EEV1 wires cut or pinched. 3. Defective EEV1 coil 4. Main PCB (DC12V) output abnormal
----------------------------	---

Check Point 1 : Check the connection of EEV connector

Check if the connector CN116 is loose connection or not.

↓
OK

Check Point 2 : Check the EEV wire

Check if the wire of EEV1 has damage or not.
(Slash, Braking of wire, Pinching, etc.)

NG → Replace EEV1 Coil

↓
OK

Check Point 3 : Check the EEV Coil

Check if the circuit of EEV1 coil winding is good or not.
(Refer to the service parts information 15.)

NG → Replace EEV1 Coil

↓
OK

Check Point 4 : Check the output of EEV on the Main PCB

Check if the DC12V is on between the Pin No.1 of CN116 and Pin No.2 of CN132 (GND).
(Disconnect the wire of EEV1 when you check the output of EEV1)

↓
OK

↓ **NG**
Replace Main PCB

Check Point 5 : Noise, momentary open, voltage drop

Check if temporary voltage drop was not generated.
 Check if momentary open was not generated.
 Check if ground is connection correctly or there are no related cables near the power line.

Trouble shooting 58 E9A.2 OUTDOOR UNIT Error Method: Coil 2 (EEV) Error	Indicate or Display: Outdoor Unit : E. 9 A. 2 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 9A
---	--

Detective Actuators: Main PCB	Detective details: Coil 2(Expansion valve 2) driver circuit open detected.
---	--

Forecast of Cause :	1. EEV2 coil loose connection 2. EEV2 wires cut or pinched. 3. Defective EEV2 coil 4. Main PCB (DC12V) output abnormal
----------------------------	---

Check Point 1 : Check the connection of EEV connector

Check if the connector CN117 is loose connection or not.

↓ **OK**

Check Point 2 : Check the EEV wire

Check if the wire of EEV2 has damage or not. (Slash, Braking of wire, Pinching, etc.)

NG → Replace EEV2 Coil

↓ **OK**

Check Point 3 : Check the EEV Coil

Check if the circuit of EEV2 coil winding is good or not. (Refer to the service parts information 16.)

NG → Replace EEV2 Coil

↓ **OK**

Check Point 4 : Check the output of EEV on the Main PCB

Check if the DC12V is on between the Pin No.1 of CN117 and Pin No.2 of CN132 (GND). (Disconnect the wire of EEV2 when you check the output of EEV2)

↓ **OK**

↓ **NG** → Replace Main PCB

Check Point 5 : Noise, momentary open, voltage drop

Check if temporary voltage drop was not generated.
 Check if momentary open was not generated.
 Check if ground is connection correctly or there are no related cables near the power line.

Trouble shooting 59 OUTDOOR UNIT Error Method: Coil 3 (EEV) Error	E9A.3	Indicate or Display: Outdoor Unit : E. 9 A. 3 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / 9 A
--	--------------	---

Detective Actuators: Main PCB	Detective details: Coil 3(Expansion valve 3) driver circuit open detected.
---	--

Forecast of Cause :	1. EEV3 coil loose connection 2. EEV3 wires cut or pinched. 3. Defective EEV3 coil 4. Main PCB (DC12V) output abnormal
----------------------------	---

Check Point 1 : Check the connection of EEV connector

Check if the connector CN160 is loose connection or not.

↓
OK

Check Point 2 : Check the EEV wire

Check if the wire of EEV3 has damage or not.
(Slash, Braking of wire, Pinching, etc.)

→ **NG** → **Replace EEV3 Coil**

↓
OK

Check Point 3 : Check the EEV Coil

Check if the circuit of EEV3 coil winding is good or not.
(Refer to the service parts information 17.)

→ **NG** → **Replace EEV3 Coil**

↓
OK

Check Point 4 : Check the output of EEV on the Main PCB

Check if the DC12V is on between the Pin No.1 of CN160 and Pin No.2 of CN132 (GND).
(Disconnect the wire of EEV3 when you check the output of EEV3)

↓ **NG** → **Replace Main PCB**

↓
OK

Check Point 5 : Noise, momentary open, voltage drop

Check if temporary voltage drop was not generated.
 Check if momentary open was not generated.
 Check if ground is connection correctly or there are no related cables near the power line.

Trouble shooting 60 E9U.2 <u>OUTDOOR UNIT Error Method:</u> Slave Outdoor Unit Error	<u>Indicate or Display:</u> Outdoor Unit : E. 9 U. 2 (Only for master outdoor unit) Indoor Unit : No display / Operation LED 9 times Flash, Timer LED 15 time Flash Filter LED Continuous Flash Error Code : *
--	--

* Master Outdoor unit : 9 U. 2 /

Slave Outdoor unit and Service Tool indicate applicable Error code

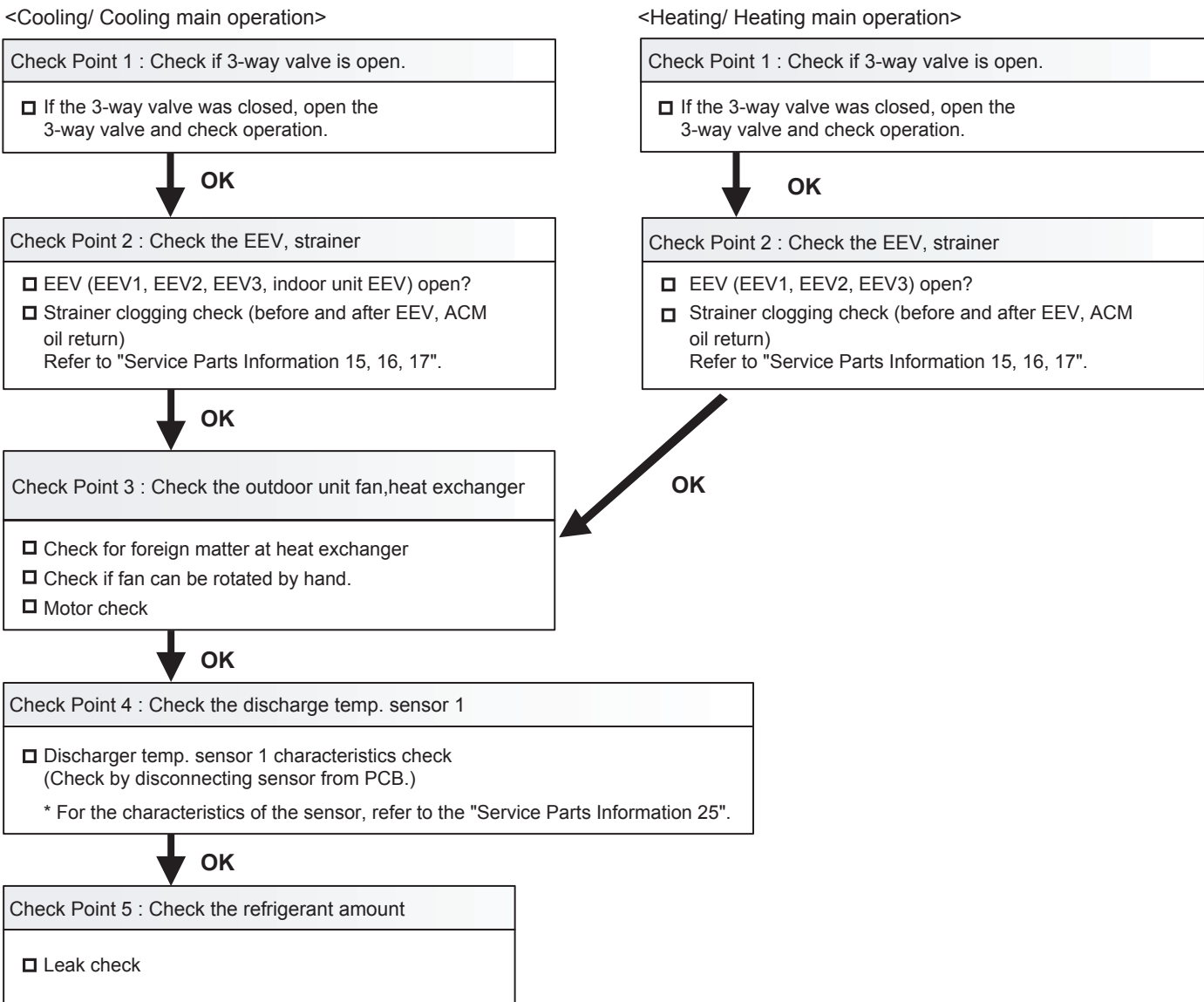
<u>Detective Actuators:</u> Slave Unit	<u>Detective details:</u> <ul style="list-style-type: none"> ▪ Error signal received from slave unit of same refrigerant system
--	--

Check Point 1 : Check the slave unit
<input type="checkbox"/> Slave unit 7 seg display check ⇒ Check by troubleshooting based on displayed error code.

Trouble shooting 61 EA1. 1 OUTDOOR UNIT Error Method: Discharge Temperature 1 Abnormal	Indicate or Display: Outdoor Unit : E. A 1. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / A 1

Detective Actuators: Discharge temp. sensor 1	Detective details: ▪ "Protection stop by "discharge temp. 1 $\geq 115^{\circ}\text{C}$ (239°F) during compressor 1 operation"" generated 2 times within 40 minutes.
---	---

Forecast of Cause : <ol style="list-style-type: none"> 1. 3-way valve not opened 2. EEV defective, strainer clogged 3. Outdoor unit operation defective, foreign matter on heat exchanger 4. Discharge temp. sensor 1 defective 5. Insufficient refrigerant



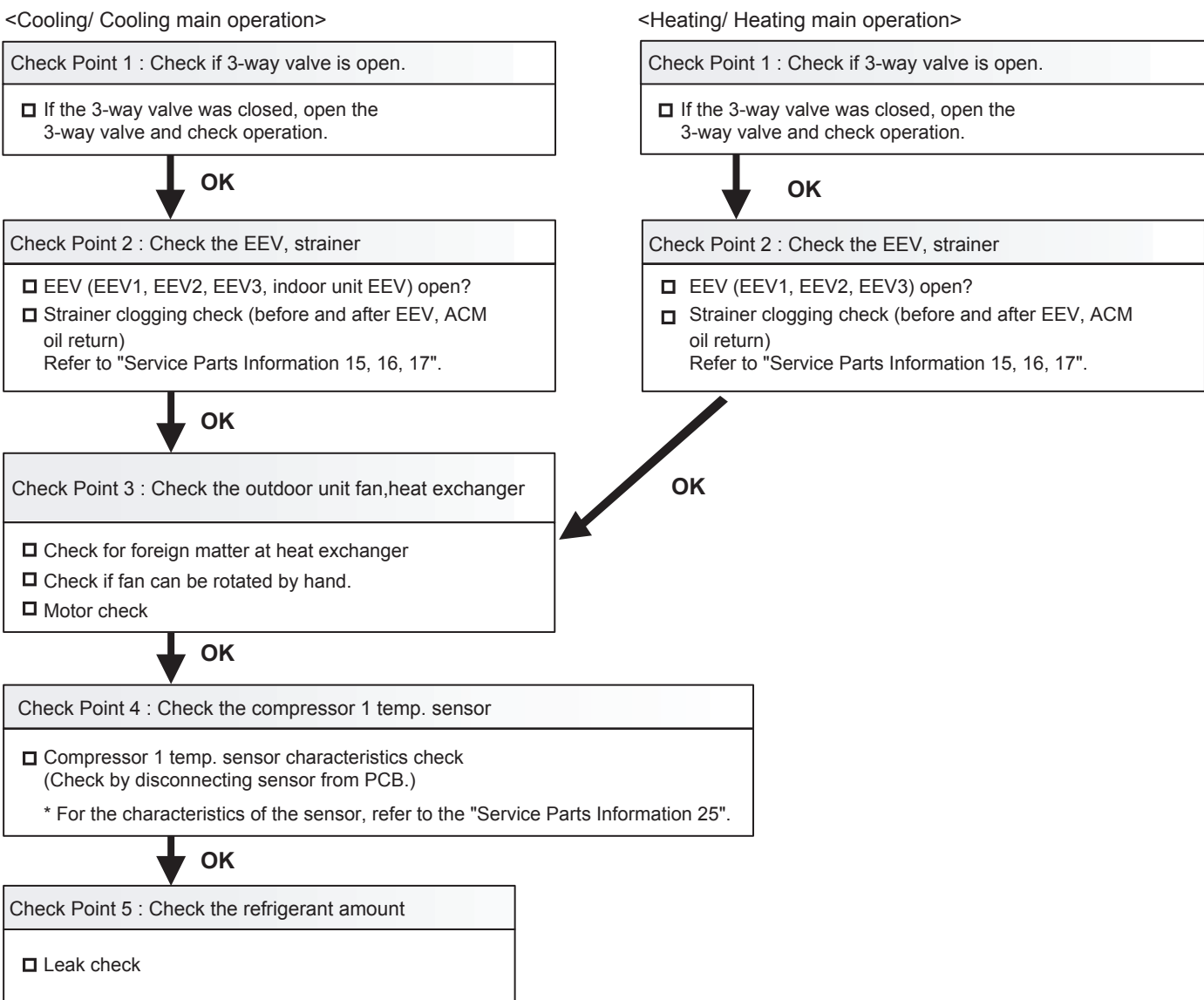
After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Caution
 By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
 The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)
 - The operating compressor life time becomes shorter.
 - The operating performance may drop due to the limited active compressor(s).
 - The compressor may stop frequently by protection controlling.
 *In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 62 EA3. 1 OUTDOOR UNIT Error Method: Compressor 1 Temperature Abnormal	Indicate or Display: Outdoor Unit : E. A 3. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / A 3

Detective Actuators: Compressor temp. sensor 1	Detective details: ▪ "Protection stop by "compressor 1 temp. $\geq 15^{\circ}\text{C}$ (239°F)during compressor 1 operation"" generated 2 times within 40 minutes.
--	--

Forecast of Cause :	1. 3-way valve not opened 2. EEV defective, strainer clogged 3. Outdoor unit operation defective, foreign matter on heat exchanger 4. Compressor 1 temp. sensor defective 5. Insufficient refrigerant
----------------------------	---



After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Caution
By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)
- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.
*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 63	EA4. 1	Indicate or Display:
OUTDOOR UNIT Error Method:		Outdoor Unit : E. A 4. 1
High Pressure Abnormal		Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash.
		Error Code : 9 U / A 4

Detective Actuators:	Detective details:
Judgment from value sensed by discharge pressure sensor	▪ "Protection stop by "discharge pressure \geq 580psi(4.00MPa)during operation of any compressor"" generated 3 times within 60 minutes

Forecast of Cause :	1. 3-way valve not opened 2. Outdoor unit fan operation defective, foreign matter at heat exchanger, excessive ambient temperature rise 3. EEV defective, strainer clogged 4. Solenoid valve defective 5. 4-way valve (including a coil) defective 6. Discharge pressure sensor defective 7. Refrigerant overcharged
----------------------------	--

<Cooling/ Cooling main operation>

Check Point 1 : Check if 3-way valve is open.
<input type="checkbox"/> If the 3-way valve was closed, open the 3-way valve and check operation.

↓ **OK**

Check Point 2 : Check the outdoor unit fan operation, heat exchanger, ambient temperature
<input type="checkbox"/> No foreign matter in air passage? <input type="checkbox"/> Heat exchange fins clogged <input type="checkbox"/> Outdoor unit fan motor check <input type="checkbox"/> Ambient temperature not raised by effect of other heat sources? <input type="checkbox"/> Discharged air not sucked in?

↓ **OK**

Check Point 3 : Check the EEV, strainer
<input type="checkbox"/> EEV (EEV1, EEV2) open? <input type="checkbox"/> Strainer clogging check (before and after EEV, ACM, oil return) Refer to "Service Parts Information 15, 16".

↓ **OK**

Check Point 4 : Check the 4-way valve (4WV1, 4WV2)
<input type="checkbox"/> 4-way valve operation check. Refer to "Service Parts Information 19".

↓ **OK**

Check Point 5 : Check the solenoid valve (SV1, SV2, SV4)
<input type="checkbox"/> Solenoid valve operation check. Refer to "Service Parts Information 18".

↓ **OK**

Check Point 6 : Check the discharge pressure sensor
<input type="checkbox"/> Discharge pressure sensor characteristics check * For the characteristics of the discharge pressure sensor, refer to "Service Parts Information 23".

↓ **OK**

Check Point 7 : Check the refrigerant amount
<input type="checkbox"/> Refrigerant charged amount check

<Heating/ Heating main operation>

Check Point 1 : Check if 3-way valve is open.
<input type="checkbox"/> If the 3-way valve was closed, open the 3-way valve and check operation.

↓ **OK**

Check Point 4 : Check the EEV, strainer (indoor unit)
<input type="checkbox"/> EEV operation check <input type="checkbox"/> Check of strainers before and after EEV Refer to "Service Parts Information 14".

OK

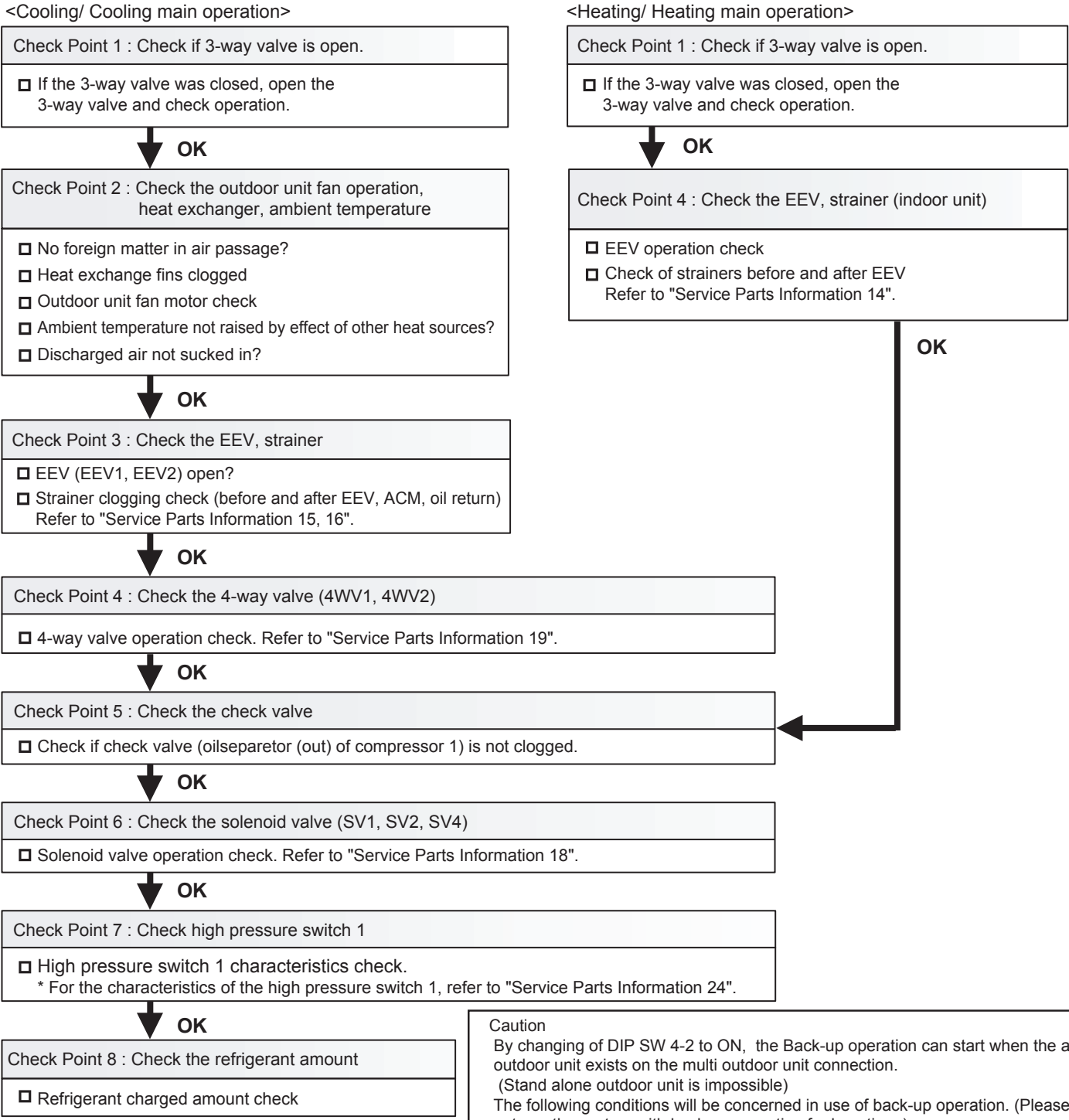


Caution
 By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
 The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)
 - The operating compressor life time becomes shorter.
 - The operating performance may drop due to the limited active compressor(s).
 - The compressor may stop frequently by protection controlling.
 *In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 64 EA4. 2 OUTDOOR UNIT Error Method: High Pressure Protection 1	Indicate or Display: Outdoor Unit : E. A 4. 2 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9U / A 4

Detective Actuators: High pressure switch 1	Detective details: ▪ "Protection stop by "high pressure switch 1 operated during compressor 1 operation"" generated 3 times within 60 minutes
---	---

Forecast of Cause :	1. 3-way valve not opened 2. Outdoor unit fan operation defective, foreign matter at heat exchanger, excessive ambient temperature rise 3. Check valve clogge 4. EEV defective, strainer clogged 5. Solenoid valve defective 6. 4-way valve (including a coil) defective 7. High pressure switch 1 defective 8. Refrigerant overcharged
----------------------------	--

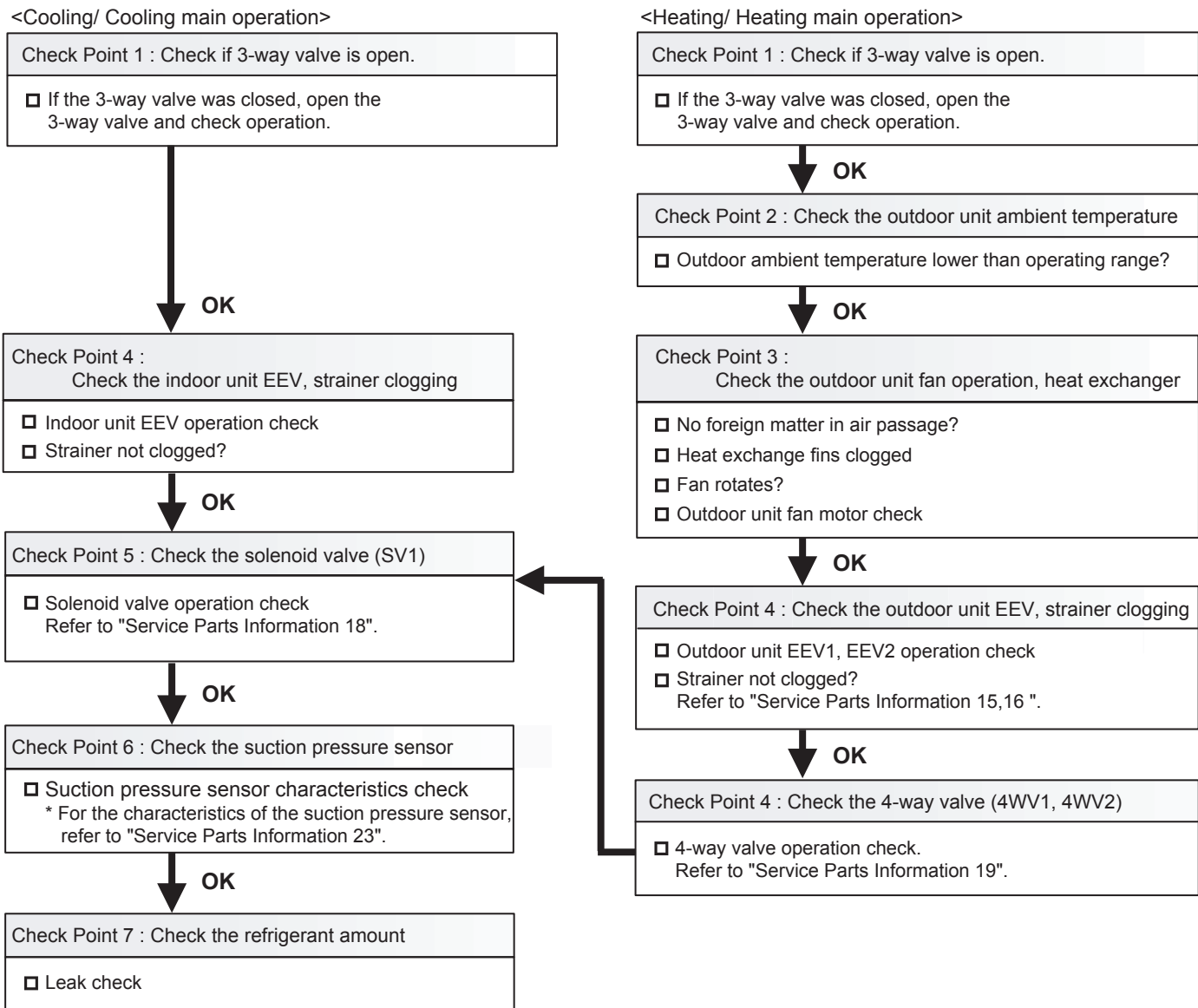


Caution
 By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection.
 (Stand alone outdoor unit is impossible)
 The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)
 - The operating compressor life time becomes shorter.
 - The operating performance may drop due to the limited active compressor(s).
 - The compressor may stop frequently by protection controlling.
 *In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 65 OUTDOOR UNIT Error Method: Low Pressure Abnormal	EA5. 1 Indicate or Display: Outdoor Unit : E. A 5. 1 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / A 6
---	--

Detective Actuators: Suction pressure sensor	Detective details: ▪ "Protection stop by "suction pressure \leq 15psi (0.10MPa) continued for 10 minutes" or "suction pressure \leq 7.25psi(0.05MPa)" during operation of any compressor"" was generated 5 times within 3 hours
--	---

Forecast of Cause :	1. 3-way valve not opened 2. Outdoor unit ambient temperature too low 3. Outdoor unit fan operation defective, foreign matter at heat exchanger 4. EEV defective, strainer clogged 5. Solenoid valve defective 6. 4-way valve defective 7. Low pressure sensor characteristics defective 8. Insufficient refrigerant
----------------------------	---



After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Trouble shooting 66 EA6. 3 OUTDOOR UNIT Error Method: Heat Ex.1 gas temp. Error	Indicate or Display: Outdoor Unit : E. A 6. 3 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / A 6

Detective Actuators: Heat Ex.1 gas temp. sensor (TH7)	Detective details: <ul style="list-style-type: none"> Heat Ex.1 gas temp. sensor (TH7) for use as condenser (4way valve1:Off, EEV1:Open) is detected abnormally-low to High pressure saturated temp. for 4 minutes or more.
---	--

Forecast of Cause :	<ol style="list-style-type: none"> Heat Ex.1 gas temp. sensor (TH7) not installed correct position. Heat Ex.1 gas temp. sensor (TH7) defective 4-way valve1 (including a coil) defective EEV1 (including a coil) defective Main PCB defective
----------------------------	--

Check Point 1 : Check the condition of Heat Ex.1 gas temp. sensor (TH7)

Check the condition of mounting of Heat Ex.1 gas temp. sensor (TH7).



Check Point 2 : Check the Heat Ex.1 gas temp. sensor (TH7)

Check characteristics check. (Disconnect the Heat Ex.1 gas temp. sensor from PCB and check.)
 * For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check the condition of 4-way valve1 coil

Check the condition of mounting of 4-way valve1 coil and 4-way valve2 coil.



Check Point 4 : Check the EEV

Check the condition of mounting of EEV1 coil.
 Check the connector connection state of EEV1, EEV2, EEV3 coil.



Check Point 5 : Replace Main PCB

Check the appearance and condition of mounting of Main PCB.
 >> If it is abnormal, replace Main PCB.
 (When Main PCB is replaced, set up the original setting by Rotary, Dip, and Push SW.)



Check Point 6 : Replace 4-way valve1

1. Fully close the 3-way valve, and the refrigerant is recovered. 2. 4-way valve1 is replaced.
 3. Perform vacuuming of repaired outdoor unit thoroughly, and add the refrigerant with the recovered amount.
 4. Check if the error reoccurs on a test run.

After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Caution
 By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
 The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)

- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.

*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 67 EA6. 4 OUTDOOR UNIT Error Method: Heat Ex.2 gas temp. Error	Indicate or Display: Outdoor Unit : E. A 6. 4 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / A 6

Detective Actuators: Heat Ex.2 gas temp. sensor (TH8)	Detective details: <ul style="list-style-type: none"> Heat Ex.2 gas temp. sensor (TH8) for use as condenser (4way valve2:Off, EEV2:Open) is detected abnormally-low to High pressure saturated temp. for 4 minutes or more.
---	--

Forecast of Cause :	1. Heat Ex.2 gas temp. sensor (TH8) not installed correct position 2. Heat Ex.2 gas temp. sensor (TH8) defective 3. 4-way valve2 (including a coil) defective 4. EEV2 (including a coil) defective 5. Main PCB defective
----------------------------	--

Check Point 1 : Check the condition of Heat Ex.2 gas temp. sensor (TH8)

Check the condition of mounting of Heat Ex.2 gas temp. sensor (TH8).



Check Point 2 : Check the Heat Ex.2 gas temp. sensor (TH8)

Check characteristics check. (Disconnect the Heat Ex.2 gas temp. sensor from PCB and check.)
* For the sensor characteristics, refer to the "Service Parts Information 25".



Check Point 3 : Check the condition of 4-way valve2 coil

Check the condition of mounting of 4-way valve1 coil and 4-way valve2 coil.



Check Point 4 : Check the EEV2

Check the condition of mounting of EEV2 coil.
 Check the connector connection state of EEV1, EEV2, EEV3 coil.



Check Point 5 : Replace Main PCB

Check the appearance and condition of mounting of Main PCB.
>> If it is abnormal, replace Main PCB.
(When Main PCB is replaced, set up the original setting by Rotary, Dip, and Push SW.)



Check Point 6 : Replace 4-way valve2

1. Fully close the 3-way valve, and the refrigerant is recovered. 2. 4-way valve2 is replaced.
3. Perform vacuuming of repaired outdoor unit thoroughly, and add the refrigerant with the recovered amount.
4. Check if the error reoccurs on a test run.

After fixing the problem and for canceling the Error, Error Reset (F3-40) will be required after power reset

Caution
By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible)
The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.)

- The operating compressor life time becomes shorter.
- The operating performance may drop due to the limited active compressor(s).
- The compressor may stop frequently by protection controlling.

*In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.

Trouble shooting 68 EAC. 4 OUTDOOR UNIT Error Method: Outdoor unit Heat Sink Temperature Abnormal	Indicate or Display: Outdoor Unit : E. A C. 4 Indoor Unit : Operation LED 9 times Flash, Timer LED 15 Times Flash, Filter LED Continuous Flash. Error Code : 9 U / A C
---	---

Detective Actuators: Heat sink temp. sensor	Detective details: <ul style="list-style-type: none"> ▪ "Protection stop by "heat sink temp. $\geq 91^{\circ}\text{C}(195.8^{\circ}\text{F})$ " occurred 3 times within 60 minutes.
---	---

Forecast of Cause :	1. Foreign matter on heat sink, heat sink dirty 2. Foreign matter on heat exchanger, excessive ambient temperature rise 3. Heat sink temp. sensor defective
----------------------------	---

Check Point 1 : Check the heat sink state
<input type="checkbox"/> Heat sink foreign matter, soiling check



Check Point 2 : Check the foreign matter and ambient temperature of heat exchanger
<input type="checkbox"/> Heat exchange foreign matter check <input type="checkbox"/> Ambient temperature not raised by effect of other heat sources? <input type="checkbox"/> Discharged air not sucked in?



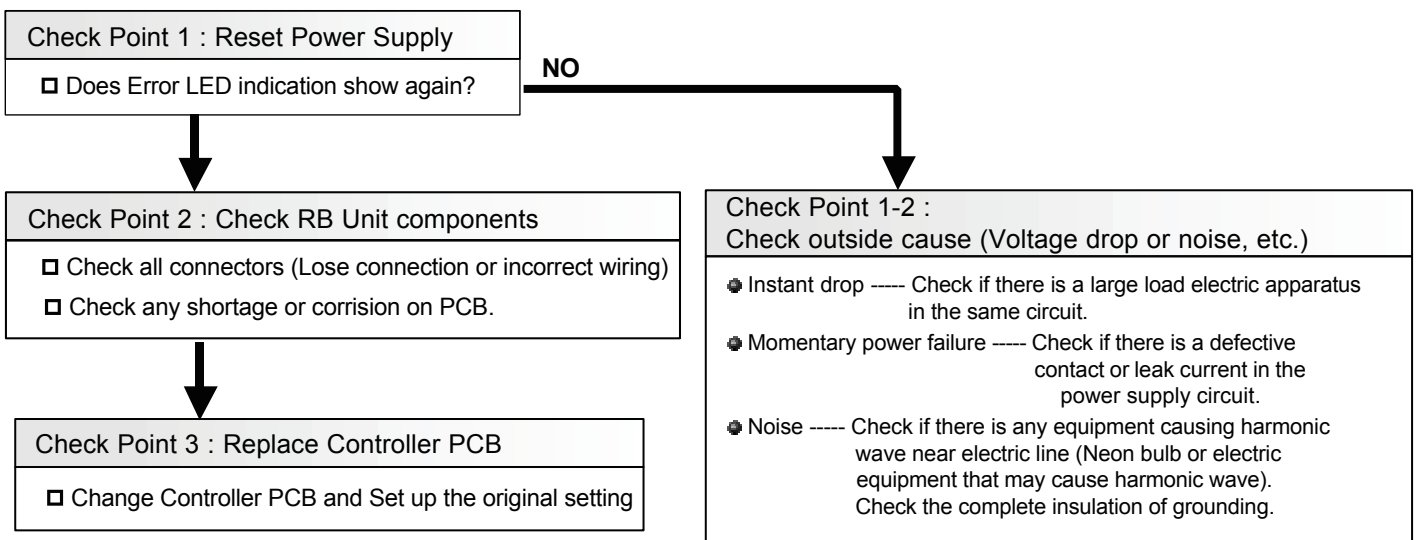
Check Point 3 : Check the heat sink temp. sensor
<input type="checkbox"/> Heat sink temp. sensor characteristics check (Check by disconnecting sensor from PCB.) * For the characteristics of the thermistor, refer to "Service Parts Information 25".

Caution By changing of DIP SW 4-2 to ON, the Back-up operation can start when the active outdoor unit exists on the multi outdoor unit connection. (Stand alone outdoor unit is impossible) The following conditions will be concerned in use of back-up operation. (Please do not use the system with back-up operation for long time.) - The operating compressor life time becomes shorter. - The operating performance may drop due to the limited active compressor(s). - The compressor may stop frequently by protection controlling. *In order to keep the operating capacity, the release of the Low noise mode setting might be necessary.
--

Trouble shooting 69 RB UNIT Error Method: RB Unit EEPROM Access Abnormal	EJ1. 1	Indicate or Display: Outdoor Unit : E. 5 U.1 Indoor Unit : Operation LED 14 times Flash, Timer LED 1 Times Flash, Filter LED Continuous Flash. Error Code : J 1 RB Unit : Power LED ON, Error LED Continuous Flash
---	---------------	--

Detective Actuators: RB Unit Controller PCB	Detective details: When the EEPROM Lead Test failed 3 times at the testing process
---	--

Forecast of Cause : 1. Outside cause 2. Defective connection of electric component 3. Controller PCB defective

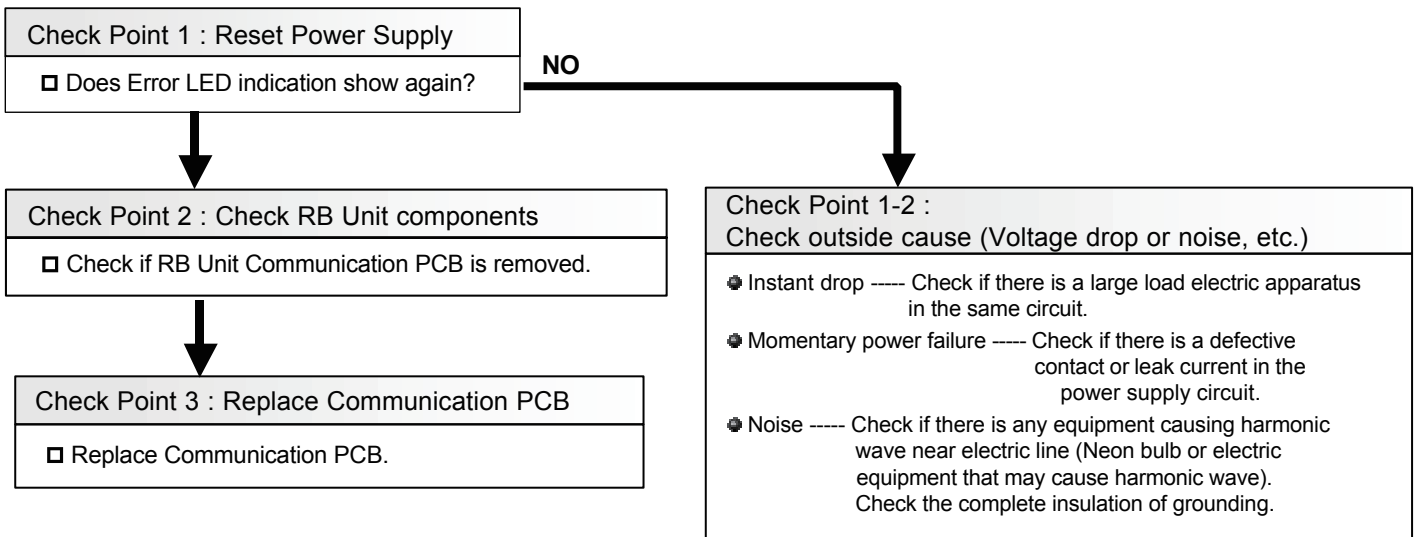


Trouble shooting 70 RB UNIT Error Method: RB Unit transmission PCB2 parallel communication Error	EJ1. 4 Indicate or Display: Outdoor Unit : E. 1 4.1 / 1 4.2* Indoor Unit : 1st: Operation LED 13 times Flash, Timer LED 1 Times Flash, Filter LED Continuous Flash. 2nd: Operation LED 1 time Flash, Timer LED 4 Times Flash Error Code : J 1 / 1 4 RB Unit : Power LED ON, Error LED Continuous Flash
---	---

* Outdoor unit indicates 1 4.1 or 1 4.2 (No communication from Indoor unit)
Service tool indicates Error 1 4.3 or J 1.1, when the service tool detects No communication of outdoor unit or the communication Error of RB unit.

Detective Actuators: RB Unit Controller PCB Circuit RB Unit Communication PCB	Detective details: When Parallel Communication Error (Communication reset occurs continuously more than specified times) is detected.
--	---

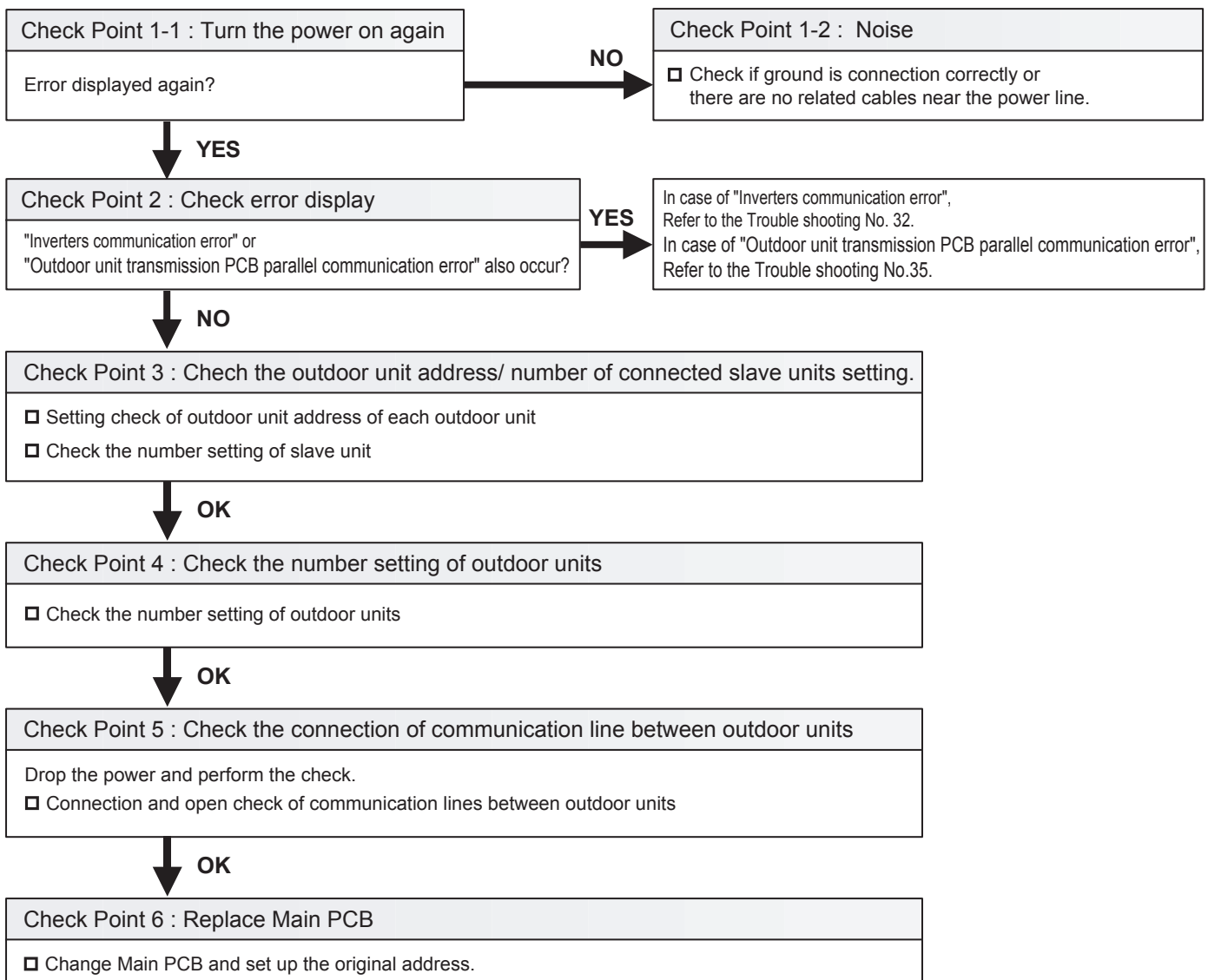
Forecast of Cause : 1. Connection failure 2. Outside cause 3. Communication PCB failure 4. Controller PCB defective



Trouble shooting 71 OUTDOOR UNIT Error Method: Initial Setting Error	Indicate or Display: Outdoor Unit : - - - - Indoor Unit : No Display Error Code : No Display * Service tool does not indicate the Error code
---	---

Detective Actuators: Outdoor unit main PCB	Detective details: <ul style="list-style-type: none"> ▪ When no communication data can be received from the Inverter PCB at the time of power ON. (In this case, "Inverters communication error" also occurs.) ▪ When no communication data can be received from the Transmission PCB at the time of power ON. (In this case, "Outdoor unit transmission PCB parallel communication error" also occurs.) <p>Master unit: When the power is turned on, the number of connected slave units set at the master unit and the number of slave units received by communication do not match.</p> <p>Slave unit: When the power is turned on, not even one master unit communication data can be received.</p>
--	--

Forecast of Cause :	<ol style="list-style-type: none"> 1. Power supply defective 2. Outdoor unit address/number of connected slave units setting mistake 3. The number setting mistake of outdoor unit 4. Connection of communication line between outdoor units defective 5. Noise 6. Main PCB defective 7. Inverter PCB defective 8. Transmission PCB defective
----------------------------	---



4-2-10 TROUBLE SHOOTING NO ERROR CODE

Trouble shooting 72

**Indoor Unit - No Power
(Except wall mounted type)**

Forecast of Cause :

1. Power Supply failure 2. Outside cause 3. Electrical Component defective

Check Point 1 : Power supply

- Is not the breaker down?
- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).
Check the complete insulation of grounding.

OK

Check Point 2 : Fuse of Indoor unit

- Is not open circuit ?
If the fuse was open state, check the cause of short circuit on the AC circuit before replacing the spare parts.

NG (Short circuit on AC circuit)

Check Point 3 : Short circuit check on AC circuit

- Check on short circuit state step by step
1. Disconnect AC input wire on the terminal board.
 2. Disconnect Drain pump AC input connector
 3. Disconnect FAN motor AC input connector

NG (Short circuit on AC circuit)

Replace power supply PCB

Check Point 4 : Resistor R101

- Check Resistor R101, Open / Short circuit check

NG (Open circuit on R101)

OK (Not Open)
3.3 Ohm ± 5%

Check Point 5 : Short circuit check on DC supply circuit

- Disconnect CN102 and check short circuit step by step.
1. Check short circuit between the pin No. 1 and the pin No.6
 2. Check short circuit between the pin No. 2 and the pin No.6

NG (Short circuit)

OK (Open circuit)

Check Point 6 : Short circuit check on DC13.5V circuit

- Disconnect CN 4 (DC power supply) , and check short circuit between the pin No. 1 and the pin No.6 step by step
1. Disconnect EEV connector
 2. Disconnect SP motor
 3. Disconnect Wired Remote Controller
 4. Disconnect Transmission PCB

OK (Open circuit)

Check Point 7 : Short circuit check on DC5.0V circuit

- Disconnect CN 4 (DC power supply) , and check short circuit between the pin No. 2 and the pin No.6 step by step
1. Disconnect Indicatopr PCB
 2. Disconnect SW PCB
 3. Disconnect Transmission PCB

NG (Short circuit)

ReplaceMain PCB

NG (Short circuit)

Trouble shooting 73

Indoor Unit - No Power (Wall mounted type)

Forecast of Cause :

1. Power Supply failure
2. Outside cause
3. Electrical Component defective

Check Point 1 : Power supply

- Is not the breaker down?
- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).
Check the complete insulation of grounding.

OK

Check Point 2 : Fuse or Thermal fuse of Indoor unit

- Is not open circuit ?
If the fuse was open state, check the cause of short circuit on the AC circuit before replacing the spare parts.

NG (Short circuit on AC circuit)

Check Point 3 : Short circuit check on AC circuit

- Disconnect AC power input wires and check short circuit

NG (Short circuit on AC circuit)

OK

Check Point 4 : Power supply circuit of FAN Motor

- Disconnect FAN motor and Check short circuit

NG (Short circuit)

Check Point 5 : Resistor R101

- Check Resistor R101, Open / Short circuit check

NG (Open circuit on R101)

OK (Not Open)
2.2 Ohm \pm 5%

ReplaceMain PCB

NG (Short circuit)

Check Point 6 : Short circuit check on DC13.5V circuit

- Check short circuit between Pin No.1 and Pin No. 6 of CNB01 (DC 13.5V circuit)
1. Disconnect EEV connector
 2. Disconnect SP motor
 3. Disconnect Wired Remote Controller
 4. Disconnect Transmission PCB

OK (Open circuit)

Check Point 7 : Short circuit check on DC5.0V circuit

- Check short circuit between Pin No.5 and Pin No. 7 of CN3 (TEST) (DC 5.0V circuit)
or
Pin No.1 and Pin No.7 of CN18
1. Disconnect Indicator PCB
 2. Disconnect SW PCB
 3. Disconnect Transmission PCB

NG (Short circuit)

Trouble shooting 74
Outdoor Unit - No Power

Forecast of Cause :

1. Power Supply failure
2. Outside cause
3. Electrical Components defective

Check Point 1 : Check Installation Condition

- Isn't the breaker down?
 - Check loose or removed connection cable.
- >>If abnormal condition is found, correct it by referring to Installation Manual or Design ta & Technical Manual.**

OK

Check Point 2 : Check Outside Cause such as Voltage drop or Noise

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).
 Check the complete insulation of grounding.

OK

Check Point 3 : Check Electrical Components



- Check the voltage of power supply.
- >> Check if AC208- 230V appears at Outdoor Unit Terminal L1-L2, L2-L3, L3-L1.**

NO

OK

- Check the fuse on the Filter PCB(Main).

OK

NG

- Replace the fuse.
 - Recheck if the power supply terminals section is shorted.
- (Note) Always check in the power off state.

OK

NG

- Disconnect connecting cable of the Filter PCB(Main) and Main PCB and recheck. if the power supply terminals section is not shorted.
- (Note) Always check in the power off state.

OK

NG

- Disconnect the connector for the AC power input devices and check short circuit on power input cable one by one.
- Solenoid valve, 4 way valve, Heater, Mg-Relay -

- Replace the Filter PCB

NG

- Replace the defective device

OK

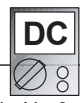
- Check short circuit on EEV's internal circuit
- Disconnect EEV from Main PCB, and check the short circuit of EEV internal circuit. Check Short circuit (0 Ohm) between pin No.1 and other pin No..

NG

OK

- Replace the defective device

- Check DC (5.0V) circuit on CN118
- Check DC voltage 5.0 V between pin No.1 and pin No.3



NG (No DC5.0V)

OK

- Replace Main PCB

- Check Pressure Sensor open / short after remove Transmission PCB from the Main PCB

- Replace the Pressure sensor

OK (No Short Circuit 0 Ohm)

NG (Open Circuit)

Trouble shooting 75

RB Unit - No Power

Forecast of Cause :

1. Power Supply failure 2. Outside cause 3. Electrical Component defective

Check Point 1 : Power supply

- Is not the breaker down?
- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).
Check the complete insulation of grounding.

OK

Check Point 2 : Fuse on the PCB

- Is not open circuit ?
If the fuse was open state, check the cause of short circuit on the AC circuit before replacing the spare parts.

OK

NG (Short circuit on AC circuit)

Check Point 3 : Short circuit check on AC circuit

Disconnect AC Power input wires (W101,W102) and Check short circuit

NG (Short circuit on AC circuit)

Replace Main PCB

Check Point 4 : Short circuit on SV coil

- Check Short circuit between Pin No.1 and Pin No.2 of SV coil

NG (Short circuit between Earth)

OK

Replace SV Coil with Connector

Check Point 5-1 : Short circuit check on DC circuit

Check the DC (5.0V) on C1

NG (No voltage)

NG (No Voltage DC 5.0V)

Check Point 5-2 : Short circuit check on DC circuit

Disconnect transmission PCB and check DC 5.0V on C1

OK (DC 5.0V)

Replace Main PCB

Replace Transmission PCB

Trouble shooting 76

No Operation (Power is ON)

Forecast of Cause :

1. Setting/Connection failure
2. Outside cause
3. Electrical Component defective

Check Point 1 : Check indoor, RB Unit and outdoor installation condition

- Indoor Unit - Check incorrect wiring between Indoor Unit- Remote Control, or terminals between Indoor Units.
Or, check if there is an open cable connection.
 - Check address setting (Are all the address of Indoor unit, Outdoor unit and RB unit correct?)
 - Are these Indoor Unit, RB Unit, Outdoor Unit, and Remote Control suitable model numbers to connect?
- >> If there is some abnormal condition, correct it by referring to Installation manual and Design & Technical Manual.**



Turn off Power and check/correct followings.

- Isn't Communication PCB of Indoor Unit removed?
- Is there loose or removed communication line of Indoor Unit and Outdoor Unit?
- Check Terminator (DIP-SW SET 5) is installed on Outdoor Main PCB.
- Check loose or removed communication line between each Outdoor Unit.
- Check loose Communication PCB of each Outdoor Unit.
- Check network cable connection between Indoor unit - Outdoor unit - RB Unit.
- Check loose Communication PCB of each controller PCB inside RB Unit.



Check Point 2 : Check outside cause at Indoor unit, RB Unit, and Outdoor unit (Voltage drop or Noise)

- Instant drop -----Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).
Check the complete insulation of grounding.



Check Point 3 : Check Electrical Components at Indoor unit, Outdoor unit and RB Unit



- Indoor Unit - Check the voltage between pins 1-3 of the connector (on the control PCB) for connection with the remote controller.
In case of 2 wires WRC, Check the voltage between pins 1-2.
>> If it is DC12V, Remote Control is defective (Controller PCB is normal) >> Replace Remote Control
>> If it is DC 0V, Controller PCB is defective (Check Remote Control once again) >> Replace Controller PCB
- If some of Indoor unit does not operate, replace the Communication PCB of the non-operative Indoor Unit.
>> If the symptom does not change, replace Controller PCB of Indoor Unit.
>> If the symptom does not change, replace Transmission PCB of RB Unit.
>> If the symptom does not change, replace Controller PCB of RB Unit.
- If all of Indoor Units do not operate, check the connection between Main PCB and Communication PCB of Outdoor Unit (Main Unit).
>> If the symptom does not change, replace Communication PCB of Outdoor Unit (Main Unit).
(If it did not work, replace Main PCB.)

Trouble shooting 77

No Cooling / No Heating

Forecast of Cause :

1. Indoor Unit error
2. Outdoor Unit error
3. Effect by Surrounding environment
4. Connection Pipe / Connection Wire failure
5. Refrigeration cycle failure

Check Point 1 : Check Indoor Unit

- Does Indoor Unit FAN run on HIGH FAN?
- Is Air Filter dirty?
- Is Heat Exchanger clogged?

OK

Check Point 2 : Check Outdoor Unit Operation

- Check if Outdoor Unit is operating
- Check any objects that obstruct the air flow route.
- Check clogged Heat Exchanger.
- Is the pipe length setting (Push Switch "MODE/EXIT", "SELECT", "ENTER") suitable?
- Is the Valve open?

OK

Check Point 3 : Check Site Condition

- Is capacity of Indoor Unit fitted to Room size?
- Any windows open? Or direct sunlight ?

OK

Check Point 4 : RB Unit installation Condition

- Check Error LED on RB Unit controller PCB
==> Wrong wire connection of Network cable
(Network cable for O.U. was installed on the terminal for I.U.)
 - Check wire connection between I.U. and applical terminal of RB unit.
==> Cross over connection, Lose connection
 - Check Solenoid valve wrong connection on the PCB
==> Check the color of connector on the controller PCB
 - Check Solenoid valve defective
==> AC Power input and check the operation
 - Check pipe connection
==> Pipe Diameter, pipe length
- >> **If there is an abnormal condition, correct it by referring to RB Unit Trouble shooting**

OK

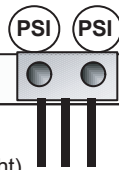
Check Point 5 : Check Indoor/Outdoor Installation Condition

- Check connection pipe (specified pipe length & Pipe diameter?)
 - Check any loose or removed communication line.
- >> **If there is an abnormal condition, correct it by referring to Installation Manual or Design & Technical Manual.**

OK

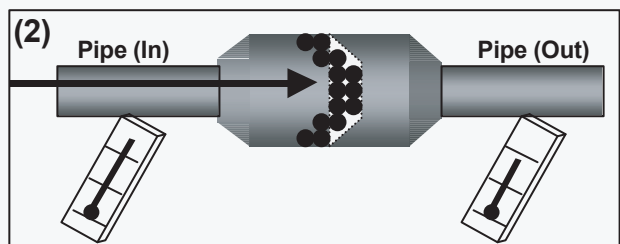
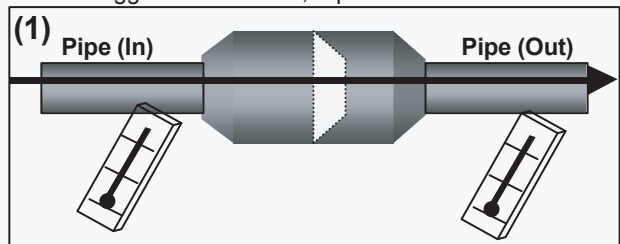
Check Point 6 : Check Refrigeration Cycle

- Check if Strainer is clogged (Refer to the figure at right).
 - Measure Gas Pressure and if there is a leakage, correct it.
- >> **When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.**
- ▶ Check EEV (Refer to the Service Parts Information)
 - ▶ Check Solenoid Valve (Refer to the See Service Parts Information)
 - ▶ Check Compressor (Refer to theSee Service Parts Information)
 - ▶ Check 4 way valve (Refer to theSee Service Parts Information)



Attention!!

Strainer normally does not have temperature difference between inlet and outlet as shown in (1), but if there is a difference like shown in (2), there is a possibility of inside clogged. In this case, replace Strainer.



Trouble shooting 78

Abnormal Noise

Forecast of Cause :

1. Abnormal installation (Indoor/Outdoor / RB Unit)
2. Fan failure(Indoor/Outdoor)
3. EEV failure (Indoor)
4. Compressor failure (Outdoor)

Diagnosis method when Abnormal Noise is occurred

Abnormal noise is coming from Indoor Unit
(Check and correct followings)

- Is Main Unit installed in stable condition?
- Is the installation of Air suction grille and front panel normal?
- In case of Duct type : Is Static Pressure range normal?
(Refer to Data & Technical Manual)

OK

- Is Fan broken or deformed?
- Is the screw of Fan loose?
- Is there any object which obstruct the Fan rotation?

Attention!!

If Refrigerant Noise is occurring, Check if the Indoor and Outdoor Thermistor is wrongly installed. Check and correct the thermistor.

Abnormal noise is coming from Outdoor Unit
(Check and correct followings)

- Is Main Unit installed in stable condition?
- Is Bell Mouth installed normally?

OK

- Is Fan broken or deformed?
- Is the screw of Fan loose?
- Is there any object which obstruct the Fan rotation?

OK

- Check if vibration noise by loose bolt or contact noise of piping is happening.

OK

- Is Compressor locked?
>> Check Compressor (Service Parts Information 2,3)

Diagnosis method when Abnormal Noise is occurred

Abnormal noise is coming from RB Unit
(Check and correct followings)

- Is Main Unit installed in stable condition?
- Is the limitation of connectable number of indoor unit and connectable total capacity of indoor unit correct?
- Is Pipe connection correct?
(Wrong pipe connection - Gas pipe, Suction pipe, Liquid pipe -
Check pipe size, Crossover connection between pipe and Network cable)

OK

- Are solenoid valve connectors correct position ?
(Check the color of connectors)
- Are solenoid valves operation correct ?
(Check the coil of SV's, Open / Short, Click sound at ON state)

Trouble shooting 79

Water Leaking

Forecast of Cause :

1. Erroneous installation 2. Drain hose failure 3. Float Switch failure

Diagnosis method when water leak occurs

- Is Main Unit installed in stable condition?
- Is Main Unit broken or deformed at the time of transportation or maintenance?

↓ **OK**

- Is Drain Hose connection loose?
- Is there a trap in Drain Hose?
- Is Drain Hose clogged?

↓ **OK**

- Is Fan rotating?
- >> Check Fan Motor (Service Parts Information 19)

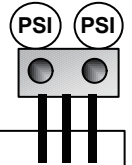
↓ **OK**

- Is Float Switch defective?
- >> Check Float Switch (Refer to Trouble Shooting)

Diagnosis method when water is spitting out

- Is the filter clogged?

↓ **OK**



- Check Gas Pressure and correct it if there was a gas leak.

Attention!!

If water is leaking from the Indoor Unit that is not in operation, there is a possibility of Indoor EEV is not closed.

=> Check EEV (Service Parts Information)

Trouble shooting 80

Outdoor air unit - No Power

Forecast of Cause :

1. Power Supply failure
2. Outside cause
3. Electrical Component defective

Check Point 1 : Power supply

- Is not the breaker down?
 - Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
 - Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
 - Noise ----- Check if there is any equipment causing harmonic wave near electric line (Neon bulb or electric equipment that may cause harmonic wave).
Check the complete insulation of grounding.

↓ **OK**

Check Point 2 : Check Protector (20A)

- Check protector open / short
If the protector is open circuit, replace it.

↓ **OK (No short circuit)**

Check Point 3 : Check AC line

- Check AC line (L-N) open / short

↓ **NG (Short circuit)**

Check Point 4 : Check short circuit Filter PCB

- Disconnect the wire between Filter PCB and reactor, check short circuit of AC line.
If there is short circuit, replace the Filter PCB.

↓ **OK (No short circuit)**

Check Point 5 : Check short circuit Diode bridge

- Connect the disconnected wire(s) on the check point 4, disconnect the wire between Diode bridge and Capacitor, check short circuit of AC line.
If there is short circuit, replace the Diode bridge.

↓ **OK (No short circuit)**

Check Point 6 : Check short circuit Capacitor

- Connect the disconnected wire(s) on the check point 5, disconnect the wire between Capacitor and Filter PCB, check short circuit of AC line.
If there is short circuit, replace the Capacitor.

↓ **OK (No short circuit)**

Check Point 7 : Check short circuit Power supply PCB

- Connect the disconnected wire(s) on the check point 6, disconnect the wire of Fan motor, check short circuit of AC line.
If there is short circuit, replace the Power supply PCB.

↓ **OK (No short circuit)**

Check Point 8 : Check Fan Motor

- Check open / short of FAN motor
Refer to the Service Parts Information 21
If there is short circuit, replace FAN motor.

↓ **OK (No short circuit)**

Check Point 9 : Short circuit check on DC circuit

- Disconnect the connector (CN200) on the Power supply PCB and check the short circuit
1. DC12V line (CN200 Pin 1 - 5)
 2. DC 5V Line (CN200 Pin 1 - 3)
 3. DC 15V-1 Line (CN500 Pin 3 - 4)
 4. DC 15V-2 Line (CN530 Pin 3 - 4)
- If one of them is short circuit, replace the Power supply PCB

↓ **OK (No short circuit)**

Check Point 10 : Check short circuit of actuators (for DC12V)

- Disconnect the CN10 (EEV1) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 5.
If the short circuit disappears, replace the EEV coil.
- Disconnect the CNC01 (WRC) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 5.
If the short circuit disappears, check the WRC wire, WRC.
- Disconnect the CNB01 (Ext.Out) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 5.
If the short circuit disappears, check the Ext. device or wiring.
- Disconnect the CN2 (TransmissionPCB) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 5.
If the short circuit disappears, replace the Transmission PCB.
- Disconnect the CN22 (Interconnecting wire) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 5.
If the short circuit disappears, replace the Filter PCB.
- If the short circuit appears after disconnecting actuators, replace the Main PCB.

↓ **OK (No short circuit)**

Check Point 11 : Check short circuit of actuators (for DC5V)

- Disconnect the CN14 (SW PCB) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 3.
If the short circuit disappears, replace the SW PCB.
- Disconnect the CN18 (Receiver unit *Option) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 3.
If the short circuit disappears, check the wire, Receiver unit.
- Disconnect the CN2 (Transmission PCB) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 3.
If the short circuit disappears, replace the Transmission PCB.
- Disconnect the CN21 (Interconnecting wire) on the Main PCB, and check short circuit on Main PCB CN 4 Pin 1 - 3.
If the short circuit disappears, replace the Power supply PCB.
- If the short circuit appears after disconnecting actuators, replace the Main PCB.

<p>Trouble shooting 81 E39. 1 INDOOR UNIT Error Method: (E39. 2) Indoor Unit power supply error for FAN motor 1 (2)</p>	<p>Indicate or Display: Outdoor Unit : E.5 U.1 Error Code : 3 9 , 3 9 . 1 (2)</p>
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<p>Detective Actuators: Indoor Unit Controller PCB Circuit Indoor Unit Power supply PCB Circuit</p>	<p>Detective details: When the DC power input for Fan motor < W500 - W501 (W530 - W531) on the Power supply PCB > becomes lower voltage than the specified voltage.</p>
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<p>Forecast of Cause : 1. Noise momentary open, voltage drop 2. Wire connection 3. Fan motor 4. Peripheral electric devices 5. Power supply PCB 6. Controller PCB</p>

<p>Check Point 1 : Check if any outside cause such as voltage drop or noise</p> <ul style="list-style-type: none"> ● Instant voltage drop ----- Check if there is any electric equipment with a large load within the same circuit. ● Momentary power failure ----- Check contact failure or leak current in power supply circuit ● Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave). And check the complete insulation of grounding. <p>>>If the same symptom does not reappear after resetting the power, possibility of noise is high.</p>



<p>Check Point 2 : Check wire connection</p> <ul style="list-style-type: none"> ❑ Wire lose connection / damage between the CN21 on the Controller PCB and CN250 on the Power supply PCB. In case of Model 72, between W530 (W531) on the Power supply PCB and Capacitor. <p>>>If there is abnormal on the wire, replace it</p>
--



<p>Check Point 3 : Check rotation of Fan / wire resistance</p> <ul style="list-style-type: none"> ❑ Rotate the applicable fan by hand when operation is off. ❑ Disconnect the connector from the Power supply PCB and Check resistance value of Motor connector. (Refer to the service parts information 21)



<p>Check Point 4 : Check peripheral devices, Posistor, Capacitor, Diode bridge</p> <ul style="list-style-type: none"> ❑ Check resistance value, short circuit, visible damage <p>>>If there is abnormal , replace it</p>



<p>Check Point 5 : Replace Power supply PCB</p> <ul style="list-style-type: none"> ❑ Change Power supply PCB
--



<p>Check Point 6 : Replace Controller PCB</p> <ul style="list-style-type: none"> ❑ Change Controller PCB and set up the original address.

Trouble shooting 82 INDOOR UNIT Error Method: Indoor unit suction air temp. thermistor error	E 4A.1	Indicate or Display: Outdoor Unit : E.5 U.1 Error Code : 4 A, 4 A. 1
--	---------------	---

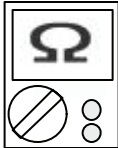
Detective Actuators: Indoor Unit Controller PCB Circuit Suction air temp. thermistor	Detective details: When Indoor unit suction air temp. thermistor open or shortage is detected
---	---

Forecast of Cause : 1. Connector defective connection 2. Thermistor defective 3. Controller PCB defective

Check Point 1 : Check connection of Connector
<input type="checkbox"/> Check if connector is loose or removed <input type="checkbox"/> Check erroneous connection <input type="checkbox"/> Check if thermistor cable is open >>Reset Power when reinstalling due to removed connector or incorrect wiring.



Check Point 2 : Remove connector and check sensor resistance value									
Sensor Characteristics (Rough value)									
Temperature (°F)	32	41	50	59	68	77	86	95	
Temperature (°C)	0	5	10	15	20	25	30	35	
Resistance Value (kΩ)	33.6	25.2	20.1	15.8	12.5	10.0	8.0	6.5	
Temperature (°F)	104	113	122						
Temperature (°C)	40	45	50						
Resistance Value (kΩ)	5.3	4.3	3.5						
► If Thermistor is either open or shorted, replace it and reset the power.									



Check Point 3 : Check voltage CN9 of Controller PCB (DC5.0V)
► If the voltage does not appear, replace Controller PCB and set up the original address.



Trouble shooting 83 INDOOR UNIT Error Method: E 4A.2 Indoor unit discharge air temp. thermistor error	Indicate or Display: Outdoor Unit : E.5 U.1 Error Code : 4 A, 4 A. 2
---	---

Detective Actuators: Indoor Unit Controller PCB Circuit Discharge air temp. thermistor	Detective details: When Indoor unit discharge air temp. thermistor open or shortage is detected
---	---

Forecast of Cause : 1. Connector defective connection 2. thermistor defective 3. Controller PCB defective

Check Point 1 : Check connection of Connector
<input type="checkbox"/> Check if connector is loose or removed <input type="checkbox"/> Check erroneous connection <input type="checkbox"/> Check if thermistor cable is open >>Reset Power when reinstalling due to removed connector or incorrect wiring.



Check Point 2 : Remove connector and check sensor resistance value									
Sensor Characteristics (Rough value)									
Temperature (°F)	32	41	50	59	68	77	86	95	
Temperature (°C)	0	5	10	15	20	25	30	35	
Resistance Value (kΩ)	33.6	25.2	20.1	15.8	12.5	10.0	8.0	6.5	
Temperature (°F)	104	113	122						
Temperature (°C)	40	45	50						
Resistance Value (kΩ)	5.3	4.3	3.5						
▶ If Thermistor is either open or shorted, replace it and reset the power.									



Check Point 3 : Check voltage CN9 of Controller PCB (DC5.0V)
▶ If the voltage does not appear, replace Controller PCB and set up the original address.



Trouble shooting 84 E59. 2 INDOOR UNIT Error Method: Indoor Unit Fan Motor 2 rotation speed Error	Indicate or Display: Outdoor Unit : E.5 U.1 Error Code : 59, 59.2
---	--

Detective Actuators: Indoor Unit Controller PCB Circuit Indoor Fan Motor 2	Detective details: When the FAN motor feed back rotation value which is detecting on the controller PCB becomes 0 and lasts for more than 1 minute at motor operation condition. Or, when the feed back rotation value continues at 1/3 of target value for more than 1 minute.
---	--

Forecast of Cause : 1. Fan rotation failure 2. Fan motor winding open 3. Motor protection by ambient temp. increase
4. Capacitor failure 5. Controller PCB failure

Check Point 1 : Check rotation of Fan

Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)
>>If Fan or Bearing is abnormal, replace it.



Check Point 2 : Check Motor winding / Internal PCB circuit

Check Indoor Fan motor (Refer to the PARTS INFORMATION 21)
>>If Fan motor is abnormal, replace it.



Check Point 3 : Check ambient temp. around motor

Check excessively high temperature around the motor.
(If there is any surrounding equipment that causes heat)
>>Upon the temperature coming down, restart operation..



Check Point 4 : Check Motor Capacitor

Check continuity of motor capacitor
>>If it is shorted, replace the capacitor.



Check Point 5 : Replace Controller PCB

Change Controller PCB and set up the original address.

Trouble shooting 85 E39. 3 <u>INDOOR UNIT Error Method:</u> Indoor Unit Power Supply Error of AC24V System	<u>Indicate or Display:</u> Outdoor Unit : E.5 U.1 Error Code : 3 9
--	---

<u>Detective Actuators:</u> Indoor Unit Power Supply PCB Circuit Indoor Unit Power Trans Indoor Unit Controller PCB	<u>Detective details:</u> When the AC voltage of the Power Trans output , Is lower than 24V.
---	--

<u>Forecast of Cause :</u> 1. Terminal Connection Abnormal 2. Power Supply Abnormal 3. Power Trans 4. Power Supply PCB 5. Controller PCB 6. Cable Connection failure
--

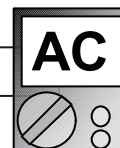
Check Point 1 : Check the Power Supply PCB and Controller PCB
<input type="checkbox"/> Check the connection of connection terminal between Power Supply PCB(CN24) and Controller PCB(CN114) and check if there is a disconnection or short of the cable.



Check Point 2 : Check the connection of terminal
<input type="checkbox"/> After turning off the power, check & correct of followings. >>Check the connection of terminal between Power Trans and Power Supply PCB(CN113), and Check if there is a disconnection or short of the cable.



Check Point 3 : Check the Power Trans and Power Supply PCB
<input type="checkbox"/> Check terminal voltage of Power Trans and Power Supply PCB connector CN113 (AC24V IN). If AC 0V, Power Trans is failure >> <u>Replace Power Trans</u> . If AC24V, To the Check Point 4.



Check Point 4 : Replace the Power Supply PCB
▶ Replace Power Supply PCB.



Check Point 5 : Replace the Controller PCB
▶ Replace Controller PCB and set up the original address.

4-3 SERVICE INFORMATION

SERVICE INFORMATION

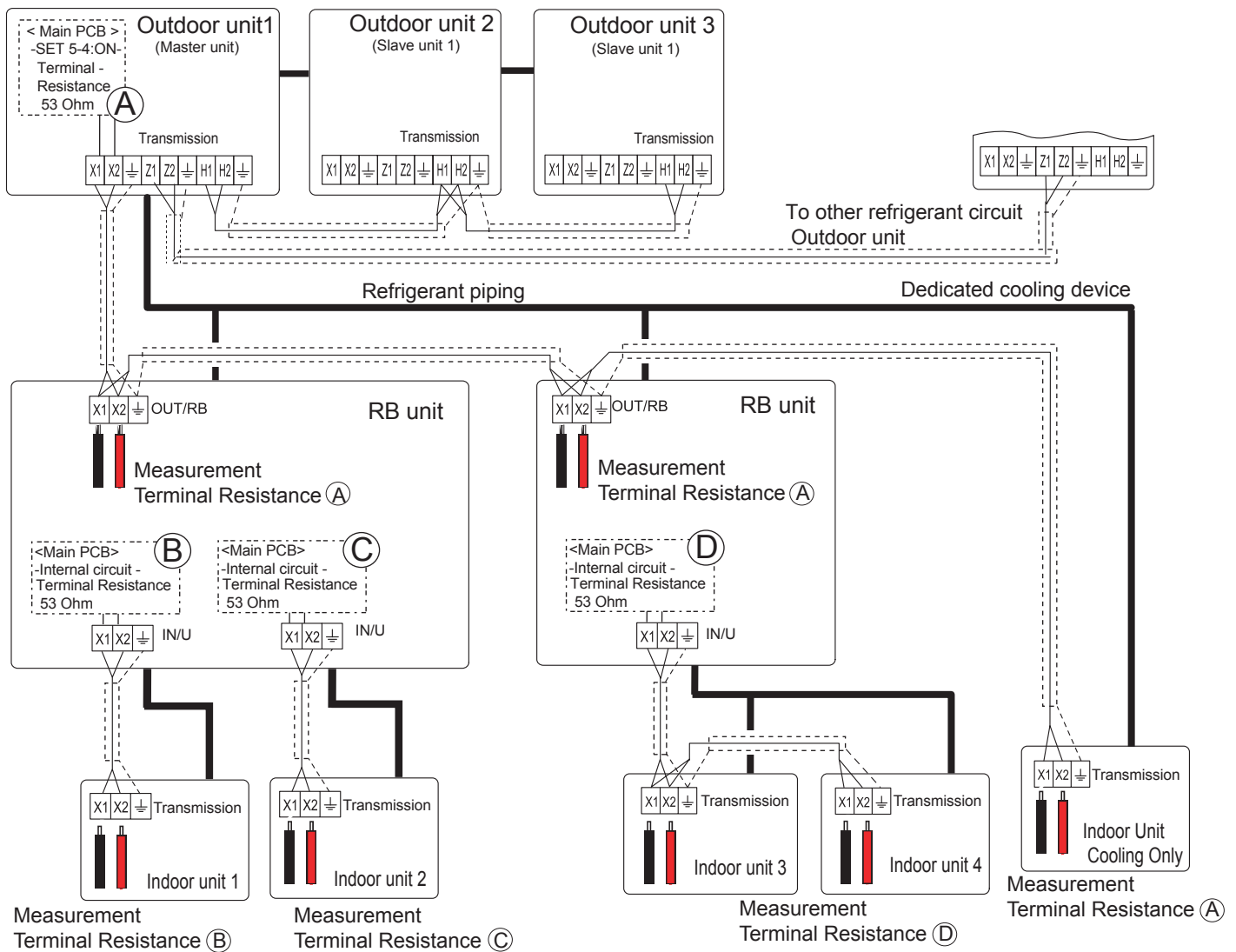
Network communication Abnormal

- Basic trouble shooting procedure -

1. Check Error code in one network segment separately, and check the Error code of (OU, IU, RB Error LED, RC, ST)
< If the system has more than 2 Network segments, disconnect the other Network segment.>
2. Connect Service tool to the Outdoor unit, and try out "**Address checker**" Function by the Service toll.
< Check missing indoor unit or RB unit or outdoor unit by using Address checker function of Service tool>
3. Check terminal resistance value $53 \text{ Ohm} \pm 5\%$ + Line Resistance on the terminal board one by one.
< Terminal Resistance is located on the Outdoor unit PCB(activated SET 5-4 ON), and the Main PCB of RB Unit each >
*Refer to the wiring diagram of Network cable

Example

Terminal Resistance (A) is located on the controller PCB of Outdoor unit as the Network for RB unit, Cooling only Indoor unit
Terminal Resistance (B) is located on the Main PCB of RB unit as the Network for Indoor unit 1
Terminal Resistance (C) is located on the Main PCB of RB unit as the Network for Indoor unit 2
Terminal Resistance (D) is located on the Main PCB of RB unit as the Network for Indoor unit 3 and Indoor unit 4



SERVICE INFORMATION

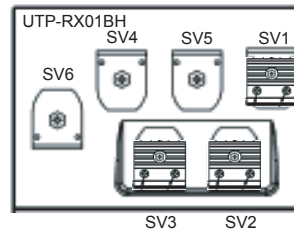
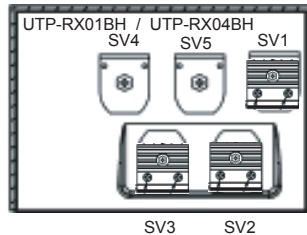
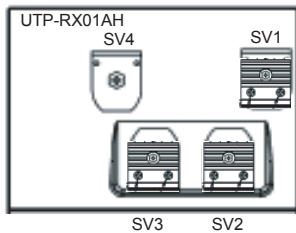
RB Unit Abnormal (No Cooling, No Heating, Abnormal Noise)

- Check functioning of Solenoid Valve * Valve or Pipe Blockage , Opposite operation of Valves can be the cause of Noise problem.
- Check Solenoid coil position / connection
- Check pipe temperature difference during operation

Solenoid valve Controlling

SV No. (Indication on Service Tool)	Function	Cooling / Dry mode	Heating mode	Fan mode / Stop
SV1 (SVD1)	Discharge Valve	Close	Open	Close
SV4 - 6 (SVS)	Suction Valve	Open	Close	Close
SV2 (SVB2)	Equalization Valve (Pressurization)	Close	Open	Close
SV3 (SVB1)	Equalization Valve (Decompression)	Open	Close	Open

Position of Solenoid coil



Color of Connector

SV1	Green
SV2	Blue
SV3	Black
SV4	White
SV5	Red
SV6	Yellow

Solenoid Coil resistance

<Refer to the Parts information 26>

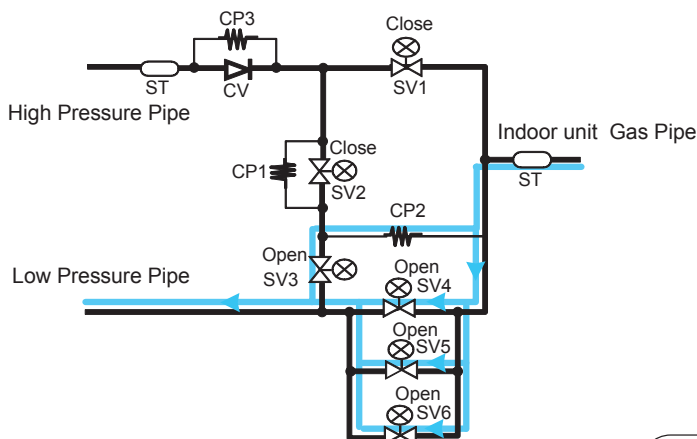
CAUTION: The solenoid coil which has a heat sink is hot.

When you approach the solenoid coil, turn off the power supply for the RB unit and wait until the temperature of coil becomes low.

Pipe temperature in Cooling mode

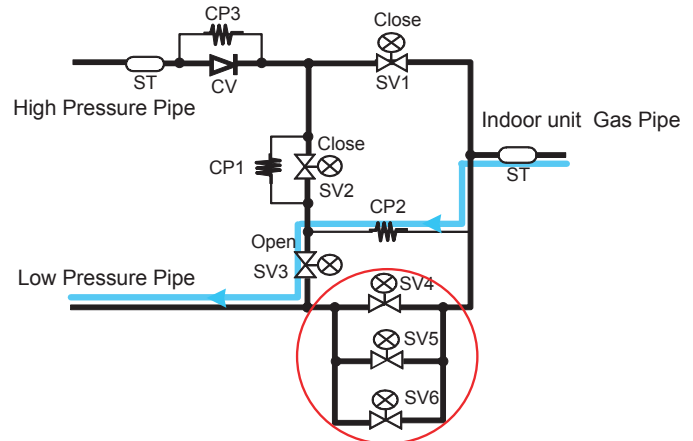
Normal Operation

	Low Pressure Pipe	Indoor unit Gas Pipe
Pipe Temp.	COLD	COLD



Possible Cause

	Low Pressure Pipe	Indoor unit Gas Pipe
Pipe Temp.	COLD	Less COLD

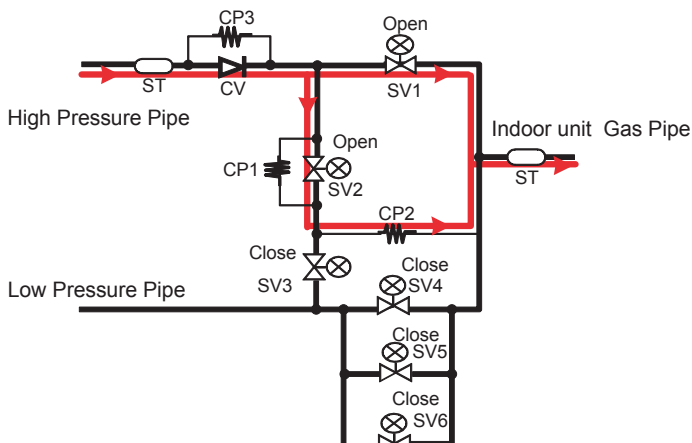


When SV4, SV5 SV6 internal blockage or Close position, the refrigerant flow will be lessened, Indoor unit Gas pipe Temp. > Low pressure pipe temp

Pipe temperature in Heating mode

Normal Operation

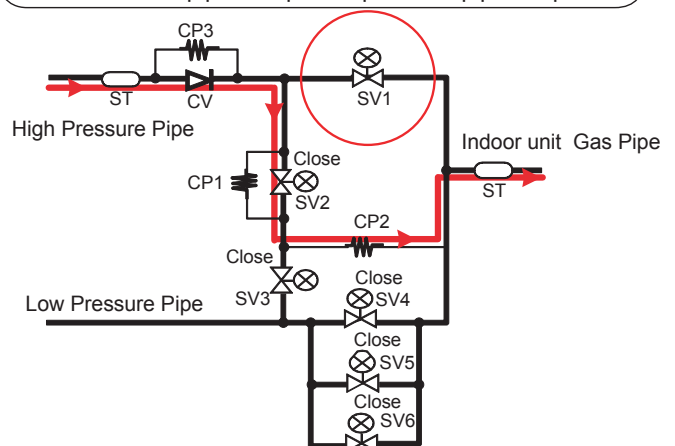
	High Pressure Pipe	Indoor unit Gas Pipe
Pipe Temp.	HOT	HOT



Possible Cause

	High Pressure Pipe	Indoor unit Gas Pipe
Pipe Temp.	HOT	Less HOT

When SV1, blockage or Close position, the refrigerant flow will be lessened, Indoor unit Gas pipe Temp. < Hi pressure pipe temp



4-4 SERVICE INFORMATION

SERVICE INFORMATION

Backup Operation

Details :

- Backup operation is the operating method of replacing compressor while the system is running. Compressor can be replaced without stopping the system.
- In backup operation, cooling and heating capacity is decreased by the capacity of the separated outdoor unit.
- The work procedure is as follows.

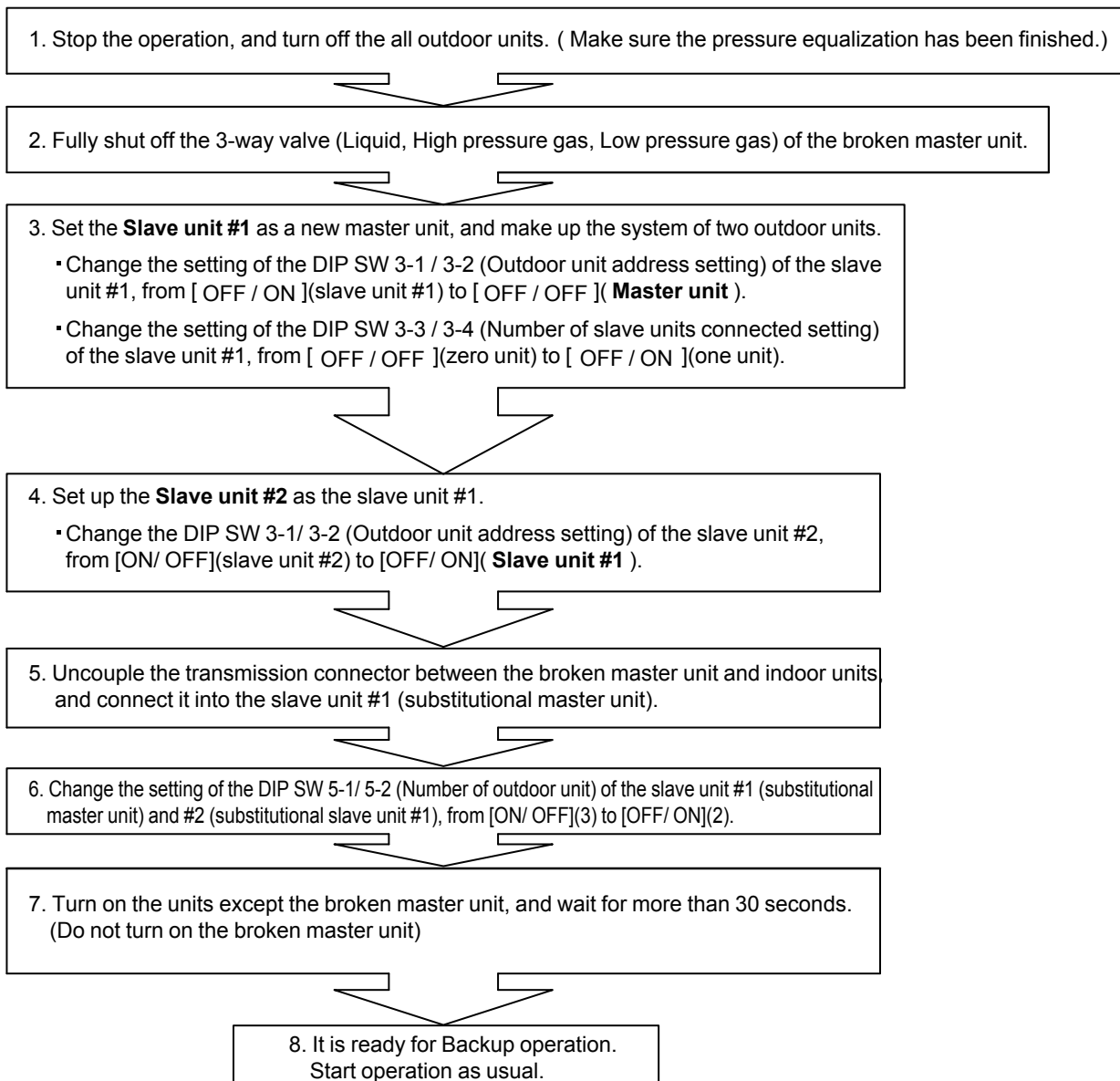
4-4-1 Backup operation

1. Method of backup operation

1-1. Backup operation when compressor of the master unit is defective.

[Procedure]

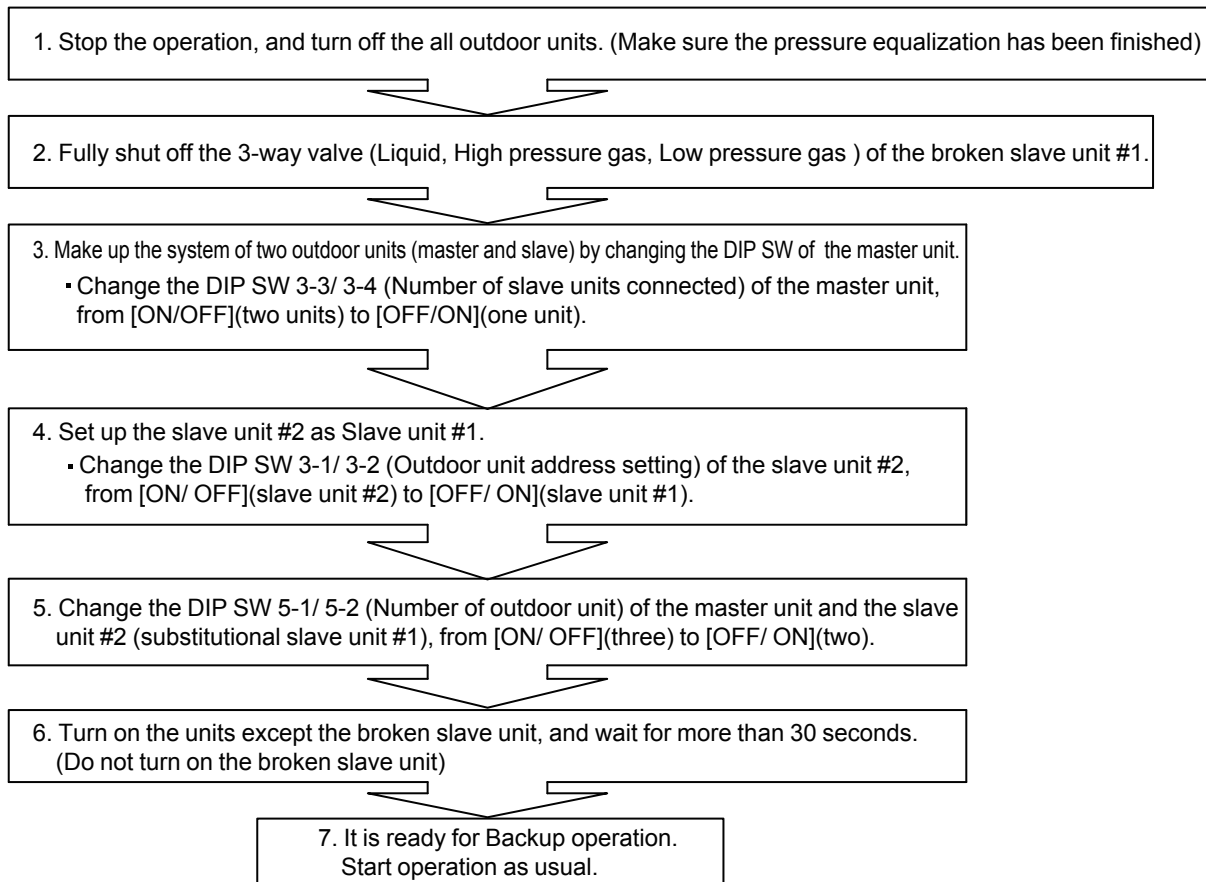
(Example: Three outdoor units are connected.)



1-2. Backup operation when compressor of the slave unit #1 is broken.

[Procedure]

(Example: Three outdoor units are connected. the slave unit #1 is broken.)



4-4-2 Work procedure after the backup operation

1. Refrigerant shortage at the backup operation

When excessive refrigerant accumulates in the defective outdoor unit during the backup operation, it becomes capacity shortage by refrigerant shortage.

The meaning of the sign

- LPS : Low pressure sensor detection value
- EEV1 : Expansion valve #1
- EEV2 : Expansion valve #2
- TH2 : Outdoor temperature sensor detection value
- TH3 : Suction temperature sensor detection value
- TH7 : Heat -Ex.1 gas temparture sensor detection value
- TH8 : Heat -Ex.2 gas temparture sensor detection value
- TH9 : Heat -Ex.1 liquid temparture sensor detection value
- TH10 : Heat -Ex.2 liquid temparture sensor detection value

<How to judge, when refrigerant is deficient>

Refrigerant shortage is judged by the information from "Service tool" during backup operation. The outdoor unit shall enter the Cooling Main mode or Heating Main mode.

1. On Cooling operation

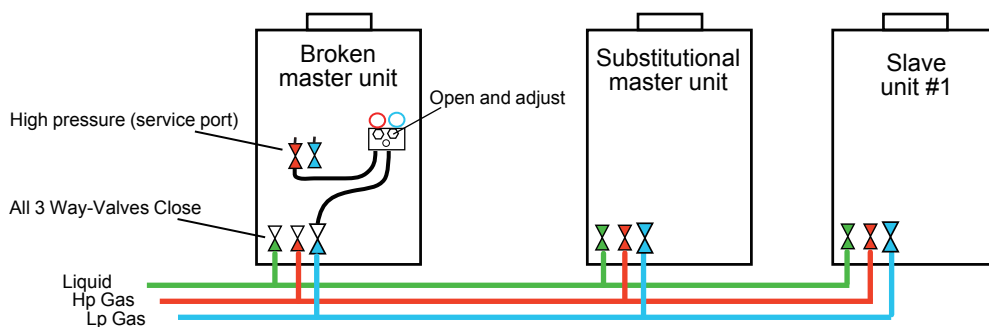
- ① It often creates "Low pressure protection stop".
>>> When LPS < 14.5psi(0.1MPa) for 10 minutes or When LPS < 7.25psi(0.05Mpa)
If one of this condition happens 5 times within 180 minutes, the system stops permanently.
- ② Running indoor unit's EEV is fully open condition.
>>> It displays corresponding indoor unit's EEV on the chart at the bottom of the monitor.
If there is no sign of closing the EEV from fully opened condition.

2. On Heating operation

- ① It often creates "Low pressure protection stop".
>>> When LPS < 14.5psi(0.1MPa) for 10 minutes or When LPS < 7.25psi(0.05Mpa)
If one of this condition happens 5 times within 180 minutes, the system stops permanently.
- ② EEV1 opens at 480 pulse. (fully open)
EEV2 opens at 480 pulse. (fully open)
- ③ Suction superheat is too high, when the condition is following
TH9 < Th7, TH10 < TH8, TH2 ≧ TH3
Note: The suctin SH can be larger temprary at the start up, oil recovery, defrosting.
Even if the lowpressure protection does not occur, keep watching the operating condition for a while.

<How to respond, when refrigerant is deficient>

- ① Reuse the refrigerant of the broken master unit.



Connect the high pressure service port of the broken master unit and the low pressure pipe of the broken master unit by pressure gauge.

>>> Refrigerant release from the heat exchanger of the broken master unit.
(Refrigerant is removed until refrigerant shortage is resolved)

When new refrigerant is added to the operating system, check the weight of additional refrigerant, and adjust the total refrigerant amount after repairing.

- ② Recover the remaining refrigerant in the broken master unit from the service port(s).

2. Refrigerant charging after the compressor replacement.

- ① If the amount of recovered refrigerant is available that was pulled out of outdoor unit which compressor was replaced.

(When the refrigerant is recovered by refrigerant recovery machine, and its weight is measured.)

>>> Perform vacuuming of repaired outdoor unit thoroughly, and add the refrigerant with the recovered amount.

- ② If the amount of recovered refrigerant from outdoor unit that compressor was replaced is not sure.
(When the refrigerant leakage was the case.)

>>> Once recover all units' refrigerant, and recharge the calculated amount of refrigerant (Original amount and additional amount) again after vacuuming.

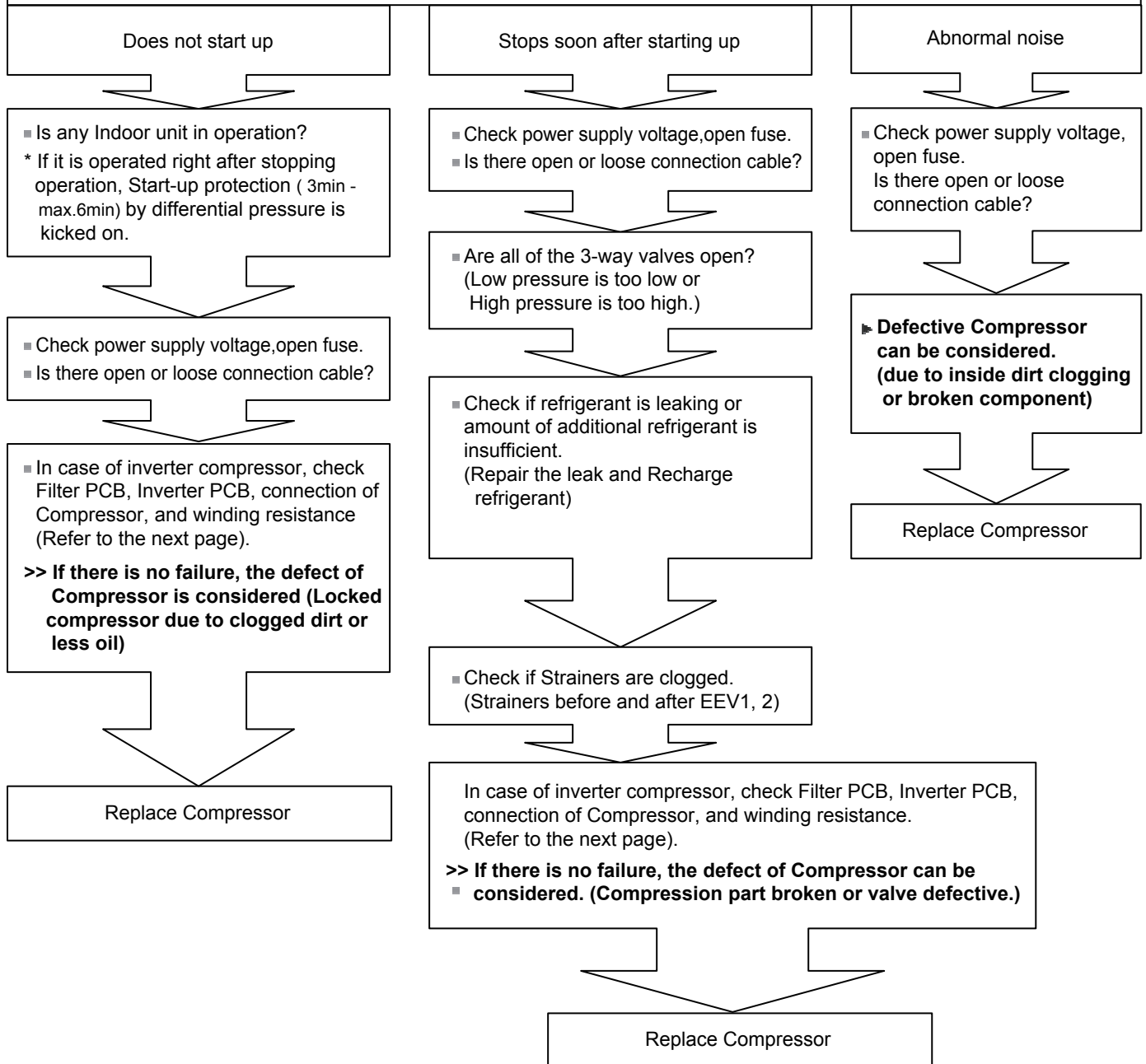
Note: To use the recovered refrigerant is not recommended in case of refrigerant leakage.
Always charge fresh refrigerant with correct amount for the system after repairing.

4-5 SERVICE PARTS INFORMATION

SERVICE PARTS INFORMATION 1

Compressor

Diagnosis method of Compressor (If Outdoor Unit 7 segment LED displays Error, refer to Trouble shooting)



Note

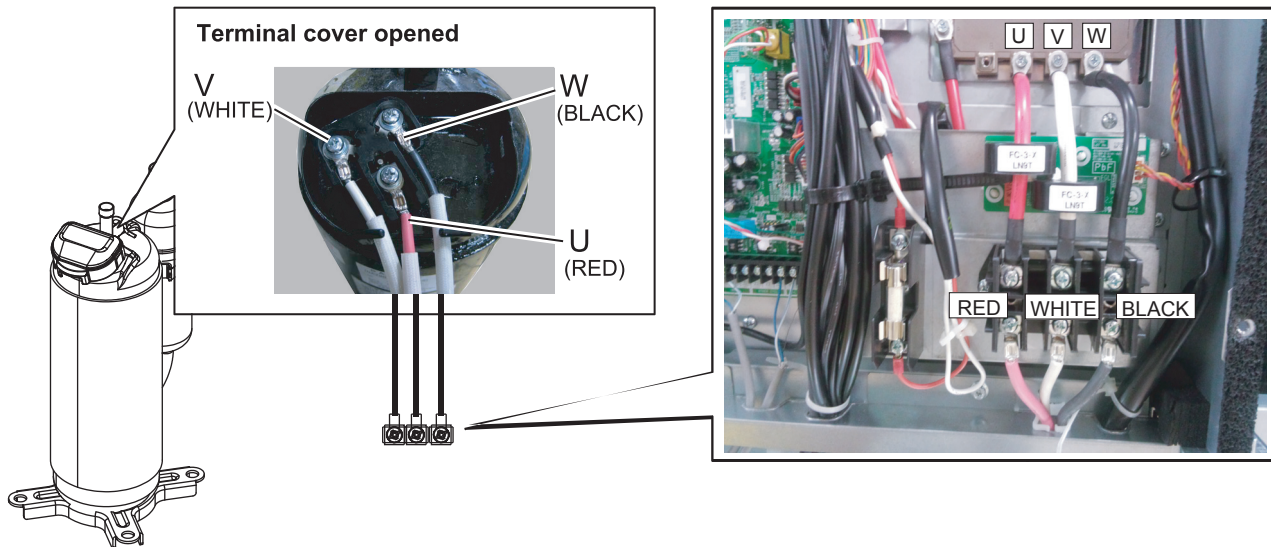
If it is suspected of lack of oil, we recommend also replacing OIL RETURN VALVE A ASSY(P/N 9378745032) together with Compressor.

SERVICE PARTS INFORMATION 2

Inverter Compressor

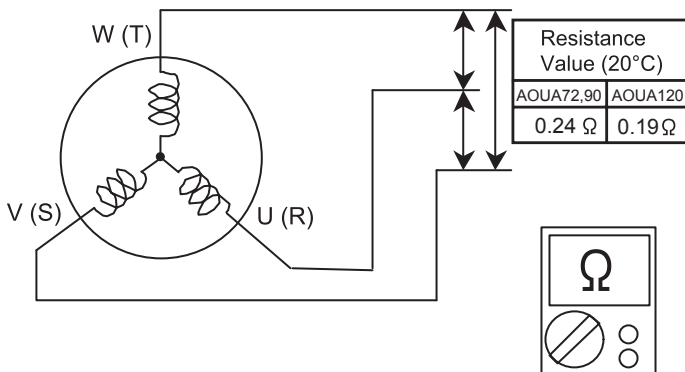
Check Point 1 : Check Connection

- ❑ Check terminal connection of Compressor (loose or incorrect wiring)
- ❑ Check connection of magnet relay (Loose or incorrect wiring)



Check Point 2 : Check Winding Resistance

- ❑ Check winding resistance of each terminal
- ▶ **If the resistance value is 0Ω or infinite, replace Compressor.**



Attention!!

If Check 1, 2 are normal, make sure the following points.

- (1) Check AC voltage among each terminals from filter PCB(INV) to Diode Bridge.
(AC 208 - 230 V , voltage among L1, L2 and L3).

▶ **If it does not appear, check the power supply terminal.**

- (2) Check Voltage from Main PCB to Inverter PCB.
(DC16.0 - 20.0V between terminals of CN126 (1-2) connector of Main PCB).

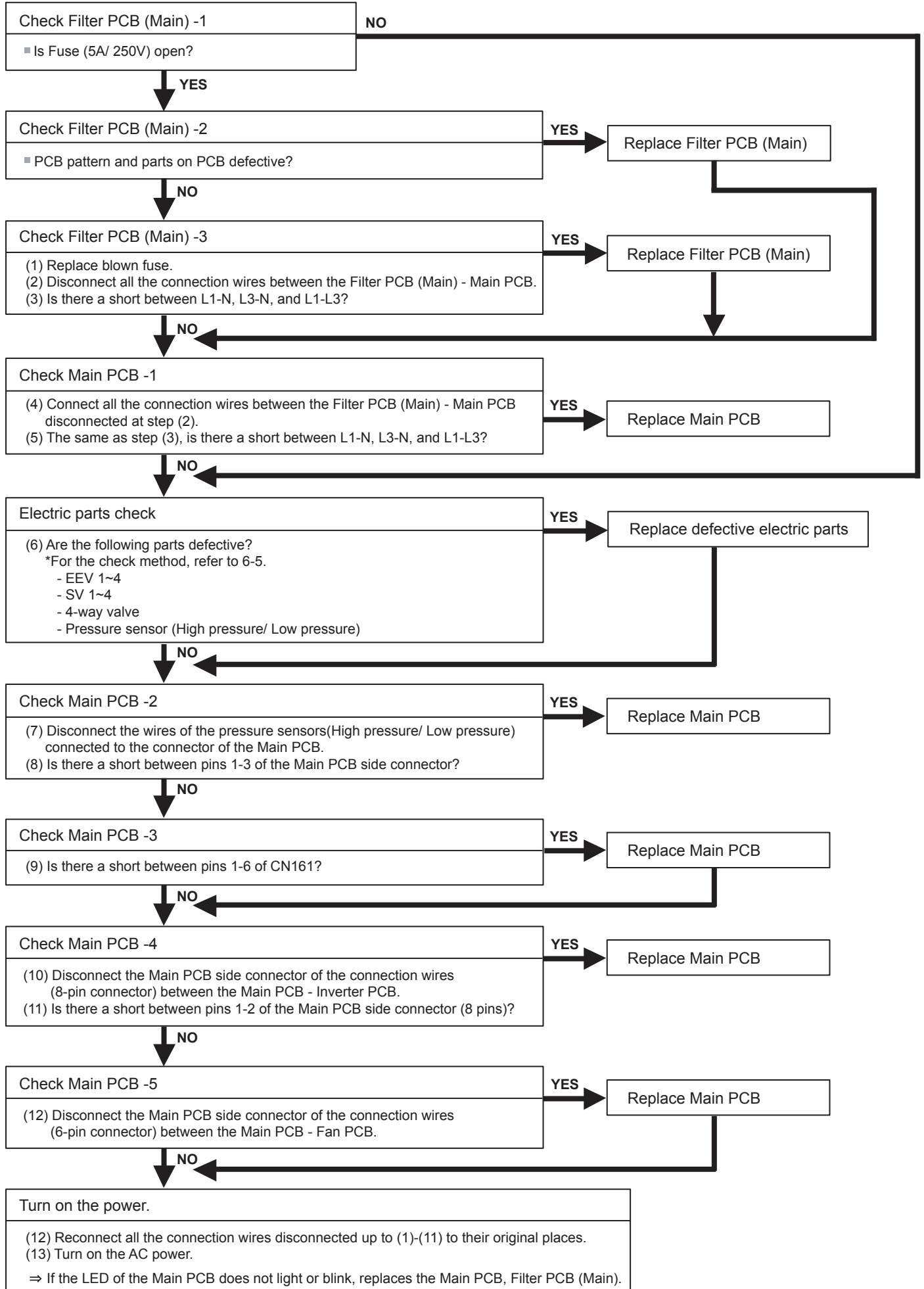
▶ **If it does not appear, replace Main PCB.**

- ◆ **If both of above voltages appear, it is considered to be Inverter PCB circuit failure.
Replace Inverter PCB and check operation.**



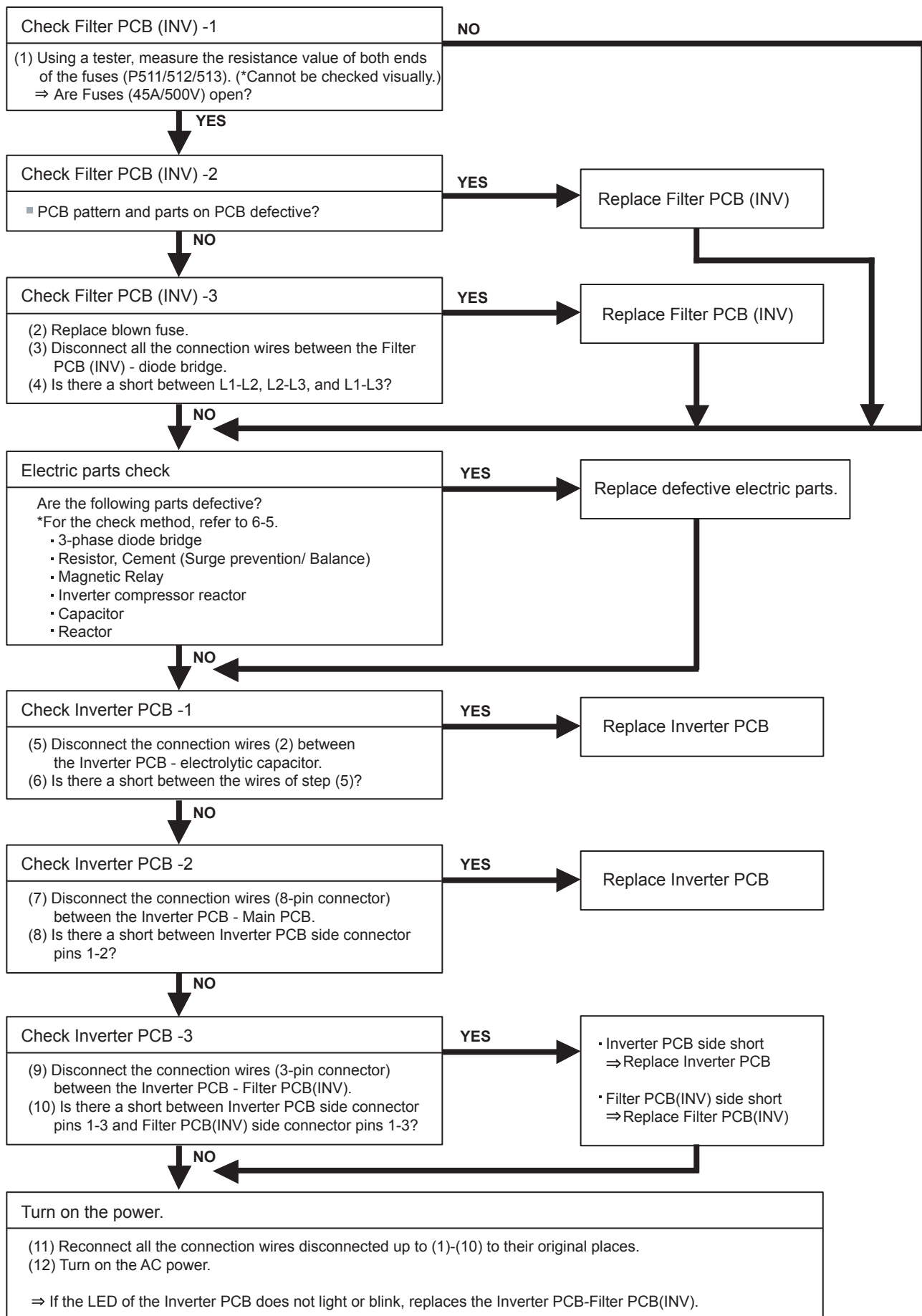
SERVICE PARTS INFORMATION 3

Main PCB
Filter PCB (Main)

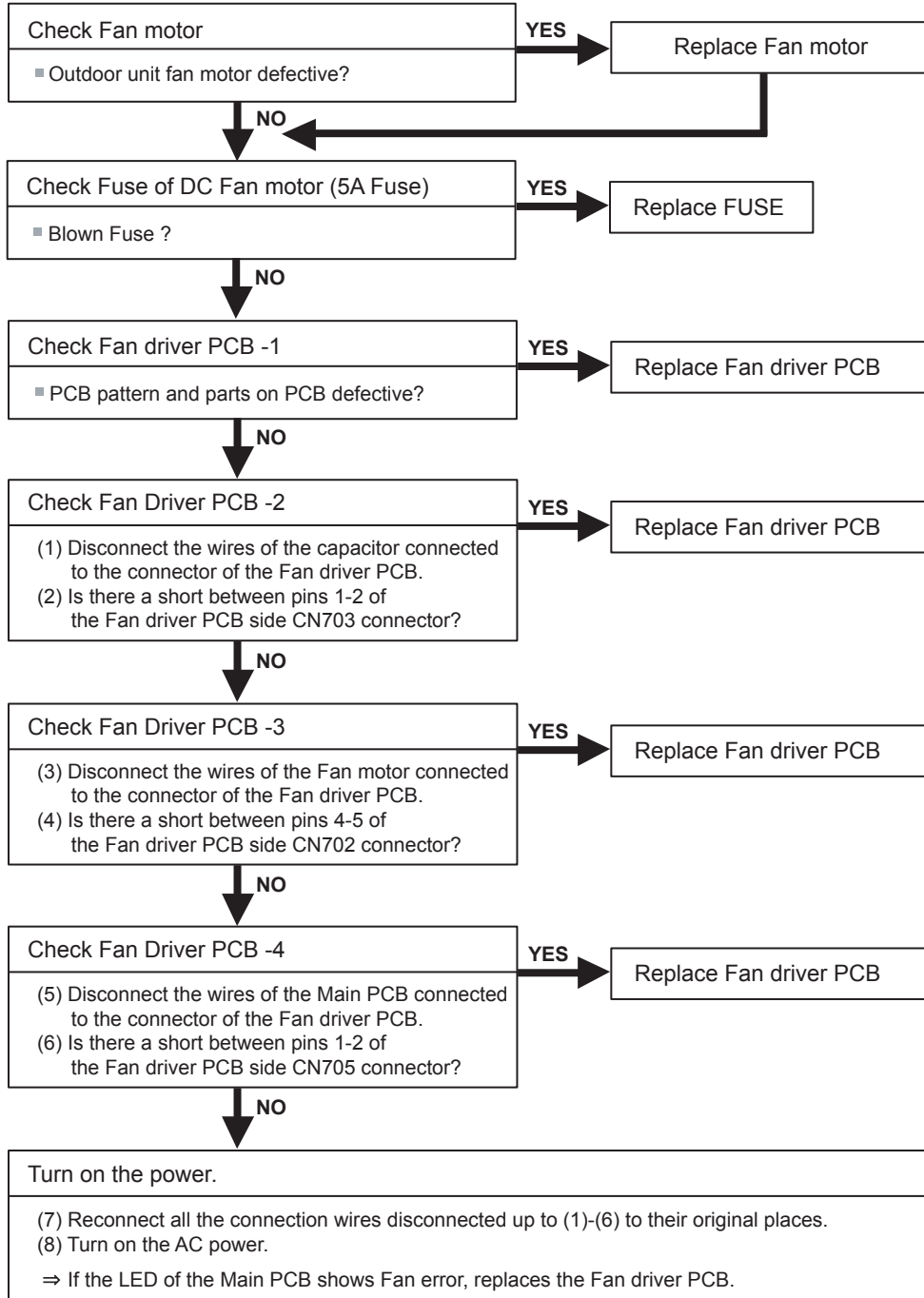


SERVICE PARTS INFORMATION 4

Inverter PCB Filter PCB (INV)



SERVICE PARTS INFORMATION 5
Fan Driver PCB



SERVICE PARTS INFORMATION 6

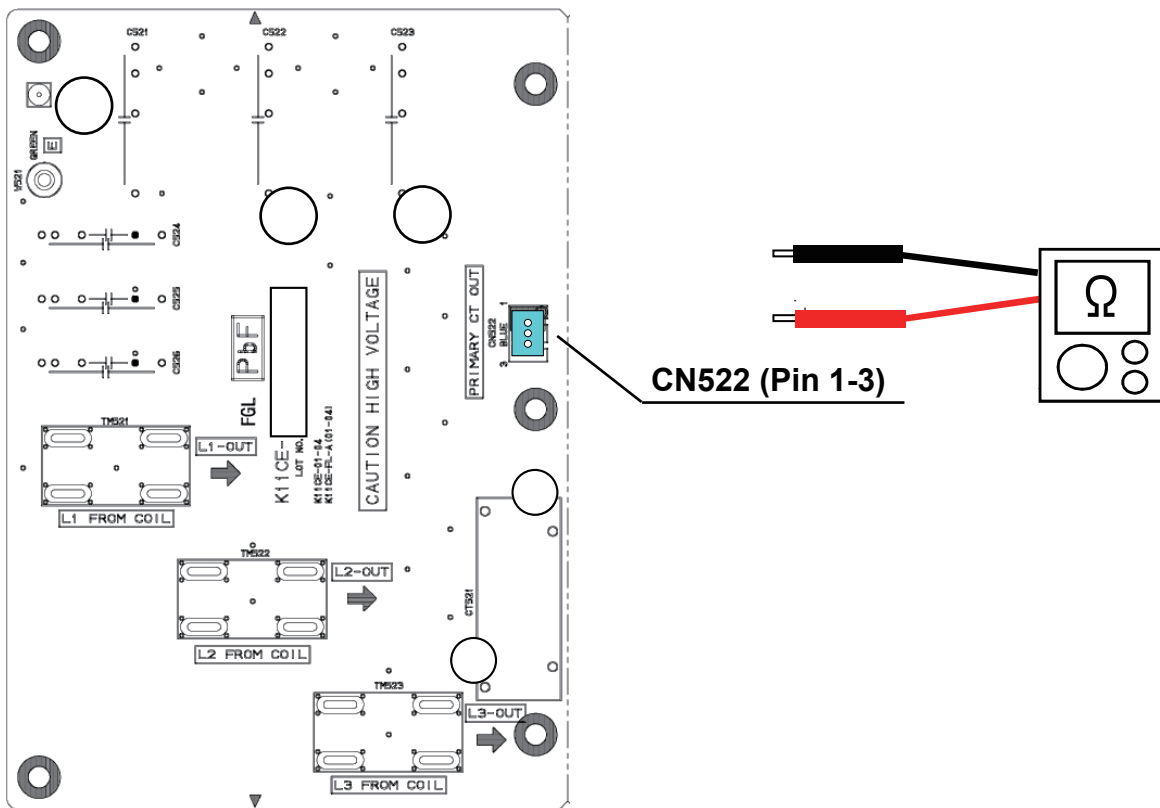
Filter PCB(INV)

Check Point 1

- Measure the resistance of Filter PCB(INV) by following procedure.
 1. Turn OFF the Outdoor unit(s) power supply
 2. Disconnect the connection wires between the Filter PCB(INV) - Inverter PCB.
 3. Measure the resistance value

Good : Less than 150 Ohm NG: More than 150 Ohm

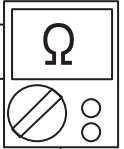
Filter PCB(INV) [K11CE-1100HUE-FL0]



SERVICE PARTS INFORMATION 7

IPM (Mounted on Inverter PCB)

Check Point 1



① Disconnect the connection wires between the Inverter PCB - electrolytic capacitor and Inverter PCB - Inverter Compressor.

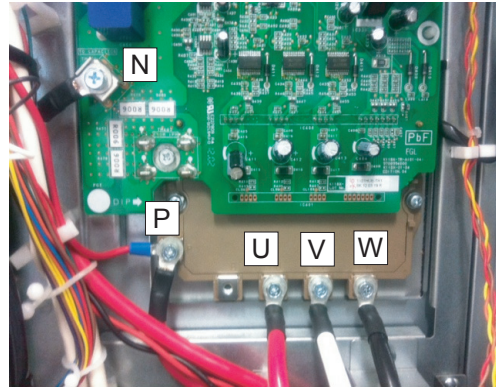
② Set the tester to the "Resistance" mode, and measure the resistance between the following terminals.

Red wire (P) - screw terminals U/V/W
White wire (N) - screw terminals U/V/W

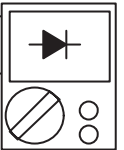
③ Judge the result of ② as follows:

All 6 points several MΩ or greater	: Normal
1 or more points several kΩ to short	: Defective

Inverter PCB



Check Point 2



④ Set the tester to the "Diode" mode, and measure the voltage value between the following terminals.

Tester +side (red)	Tester - side (black)	Tester display [V]
Terminal U	Red wire (P)	
Terminal V		
Terminal W		
White wire (N)	Terminal U	
	Terminal V	
	Terminal W	

⑤ Judge the result of ④ as follows:

All 6 points several 0.3V to 0.7V	: Normal
1 or more points under 0.1V or over load	: Defective

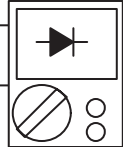
SERVICE PARTS INFORMATION 9

3-Phase Diode Bridge

Check Point 1 : Appearance check

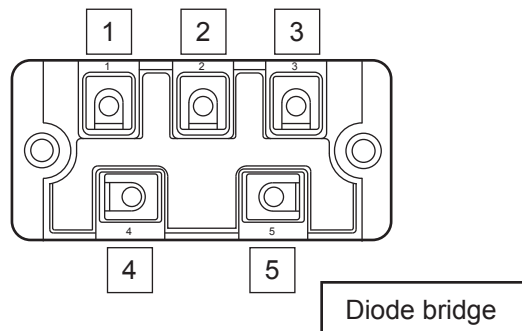
- No fissures, breaks, damage, etc. at body and terminal section?
- Is the rear of the body coated with silicone grease?
- Are there no abnormalities at threaded parts (stripped threads, deformation, damage, etc.)?

Check Point 2 : Electric check



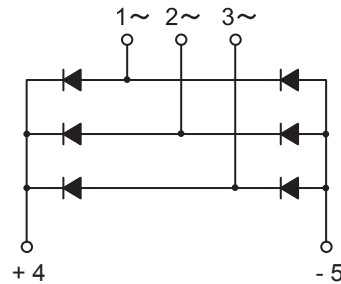
- ① In the 3-phase diode bridge single part state, set the tester to the "Diode" mode, and measure the voltage value between the following terminals.

Tester + side (red)	Tester - side (black)
Pin 1	Pin 4
Pin 2	
Pin 3	
Pin 5	Pin 1
	Pin 2
	Pin 3



- ② Judge the result of ① as follows:

All 6 points several 0.3V to 0.7V	Normal
1 or more points under 0.1V or over load	Defective



- ③ Set the tester to the "Diode" mode, and measure the voltage value between the following terminals.

Tester + side (red)	Tester - side (black)
Pin 4	Pin 1
	Pin 2
	Pin 3
Pin 1	Pin 5
Pin 2	
Pin 3	

- ④ Judge the result of ③ as follows:

All 6 points over load	Normal
1 or more points except over load	Defective

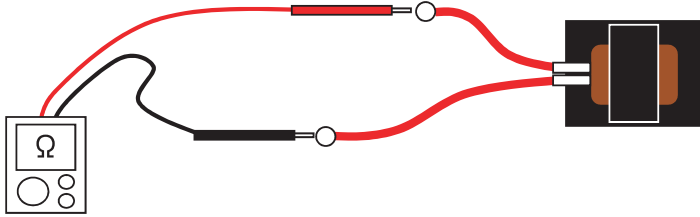
SERVICE PARTS INFORMATION 10

Reactor

Check Point 1 : Appearance check

- No fissures, breaks, damage, etc. at the body and winding section, terminals section?

Check Point 2 : Electric check



- ① Set the tester to the "Resistance" mode, and check for open/short between both ends of the reactor wire (or connector).
- ② Judge the result of ① as follows:

Short	: Normal
Open	: Abnormal (open)

SERVICE PARTS INFORMATION 11

Resistor, Cement

Check Point 1 : Appearance check

- No fissures, breaks, damage, etc. at the body and terminals section?

Check Point 2 : Electric check



1. Surge prevention resistor (connected to magnetic contactor)

- ① Set the tester to the "Resistance" mode, and measure the resistance value between the terminals. (No polarity)

- ② Judge the result of ① as follows:

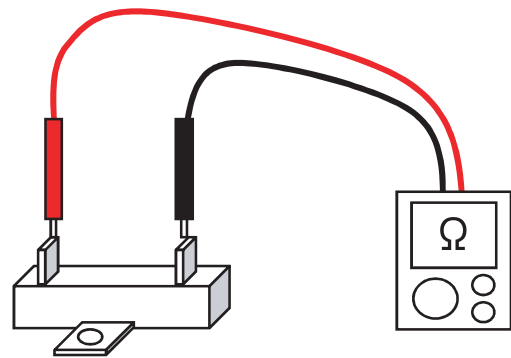
9.9Ω to 10.1 Ω	Normal
Other than the above	Deteriorated, defective

2. Discharge resistor (connected to electrolytic capacitor)

- ① Set the tester to the "Resistance" mode, and measure the resistance value between the terminals. (No polarity)

- ② Judge the result of ① as follows:

53.2kΩ to 58.8kΩ	Normal
Other than the above	Deteriorated, defective



SERVICE PARTS INFORMATION 12

Terminal

Check Point 1 : Appearance check

- No fissures, breaks, damage, etc. at the body and terminals section?
- Not clogged with foreign matter?
- Are there no abnormalities at threaded parts (Stripped threads, deformation, damage, etc.) ?

Check Point 2 : Electric check

- No short between adjacent terminals?
- Conducts before and after same terminal?



SERVICE PARTS INFORMATION 13

Magnetic Relay

Check Point 1 : Appearance check

- No fissures, breaks, damage, etc. at the body and terminals section?
- Are there no abnormalities at threaded parts (Stripped threads, deformation, damage, etc.) ?

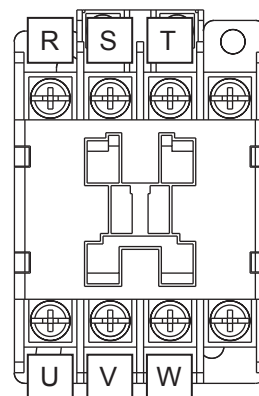
Check Point 2 : Electric check

① Set the tester to the "Resistance" mode, and check for open/short between the following terminals. (No polarity)

- Between R to U
- Between S to V
- Between T to W

② Judge the result of ① as follows:

Open	: Normal
Short	: Abnormal (contacts fused)



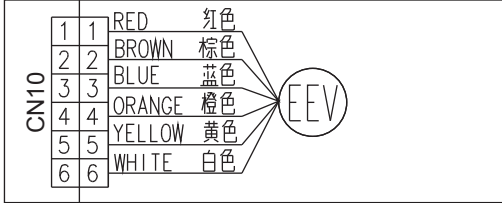
SERVICE PARTS INFORMATION 14

Indoor Unit Electronic Expansion Valve (EEV)

Check Point 1 : Check Connections

- Check Connectors (Loose connector or open cable.)

Duct, Cassette, Wall mount



Floor/ Ceiling, Ceiling, Small Wall mount



Check Point 2 : Check Coil of EEV

- Remove connector, check each winding resistance of Coil.

Read wire	Resistance value 68°F(20°C)
White - Red	200 ± 10% Ω
Yellow - Brown	
Orange - Red	
Blue - Brown	

- If Resistance value is abnormal, replace EEV.

Check Point 3 : Check Voltage from Controller PCB

- Remove Connector and check Voltage (DC12V).
 >> If it does not appear, replace Controller PCB.

Check Point 4 : Check Noise at start up

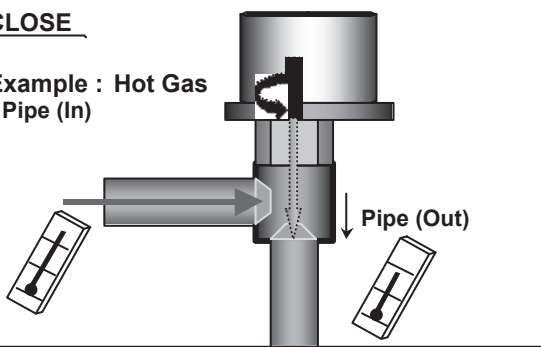
- Turn on Power and check operation noise.
 >> If an abnormal noise does not show, replace Controller PCB.

Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed, it has a temp. difference between Inlet and Outlet.

CLOSE

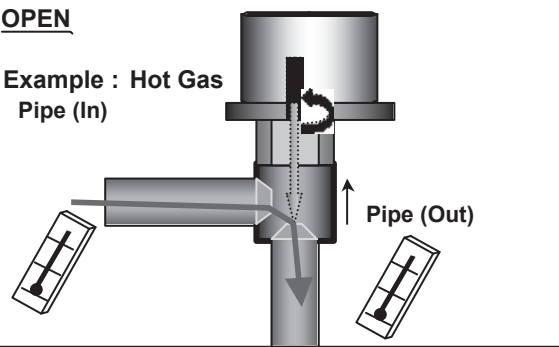
Example : Hot Gas Pipe (In)



If it is open, it has no temp. difference between Inlet and Outlet.

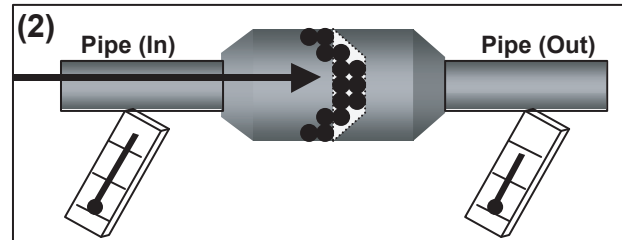
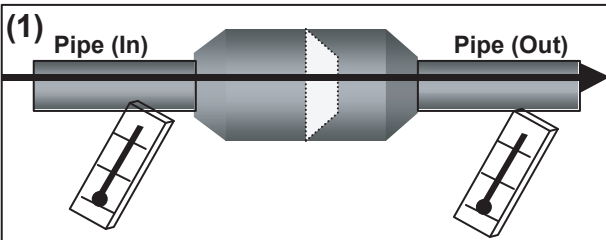
OPEN

Example : Hot Gas Pipe (In)



Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between inlet and outlet as shown in (1), but if there is a difference as shown in (2), there is a possibility of inside clogged. In this case, replace Strainer.

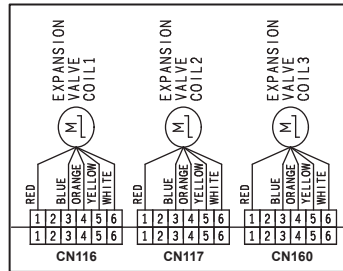


SERVICE PARTS INFORMATION 15

Outdoor Unit Electronic Expansion Valve (EEV1)

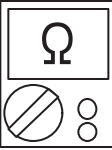
Check Point 1 : Check Connections

- Check connection of connector (CN116) (Loose connector or open cable)



Check Point 2 : Check Coil of EEV1

- Remove connector, check each winding resistance of Coil.

Read wire	Resistance value 68°F(20°C)
White - Red	$46 \pm 4 \% \Omega$ 
Yellow - Red	
Orange - Red	
Blue - Red	

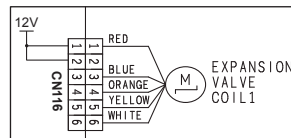
- If Resistance value is abnormal, replace EEV1.

Check Point 3 : Check Noise at start up

- Turn on Power and check operation noise.
>> If an abnormal noise does not show, replace Controller PCB.

Check Point 4 : Check Voltage from Controller PCB

- Remove Connector and check Voltage (DC12V).
>> If it does not appear, replace Controller PCB.

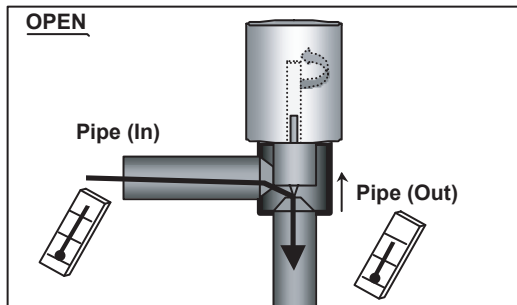
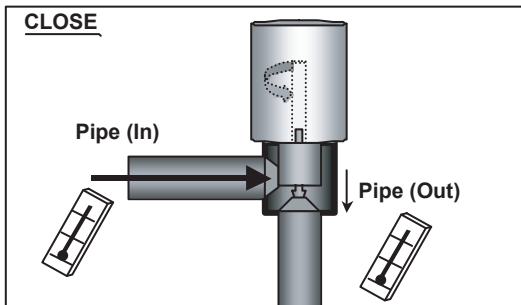


Check Point 5 : Check Opening and Closing Operation of Valve

Note : Check the EEV1 in the state of 4-way1 valve is ON.

When EEV1 is closed, it has no temp. difference between Inlet and Outlet.

If it is open, it has a temp. difference between Inlet and Outlet. Outlet temp. is near Low-pressure saturated temp.

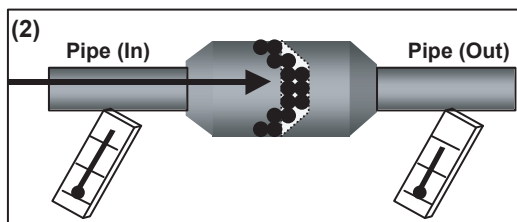
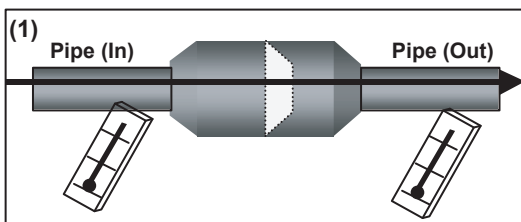


- In the following cases, even if EEV1 is closed, there may be a difference in temp.
- On comp. start-up
 - Just after switching the 4-way valve
 - Just after switching the EEV1 (Open --> Close)

Note
 If valve opening is 12~51pls, the check of temp. cannot be performed. Check temp. at the other valve opening.

Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between inlet and outlet as shown in (1), but if there is a difference as shown in (2), there is a possibility of inside clogged. In this case, replace Strainer.

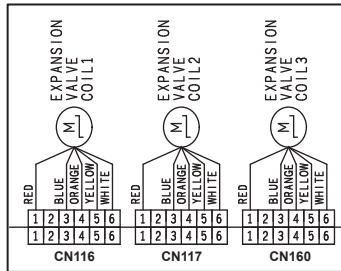


SERVICE PARTS INFORMATION 16

Outdoor Unit Electronic Expansion Valve (EEV2)


Check Point 1 : Check Connections

- Check connection of connector (CN117) (Loose connector or open cable)



Check Point 2 : Check Coil of EEV2

- Remove connector, check each winding resistance of Coil.

Read wire	Resistance value 68°F(20°C)
White - Red	$46 \pm 4 \% \Omega$ 
Yellow - Red	
Orange - Red	
Blue - Red	

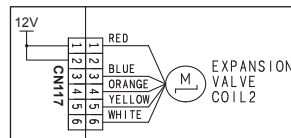
- If Resistance value is abnormal, replace EEV2.

Check Point 3 : Check Noise at start up

- Turn on Power and check operation noise.
- >> If an abnormal noise does not show, replace Controller PCB.

Check Point 4 : Check Voltage from Controller PCB

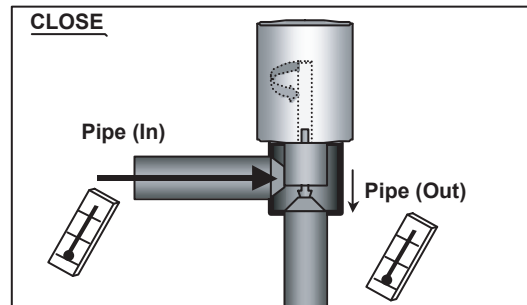
- Remove Connector and check Voltage (DC12V).
- >> If it does not appear, replace Controller PCB.



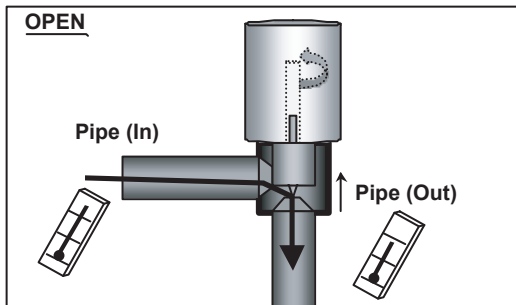
Check Point 5 : Check Opening and Closing Operation of Valve

Note : Check the EEV2 in the state of 4-way valve2 is ON.

When EEV2 is closed, it has no temp. difference between Inlet and Outlet.



If it is open, it has a temp. difference between Inlet and Outlet. Outlet temp. is near Low-pressure saturated temp.

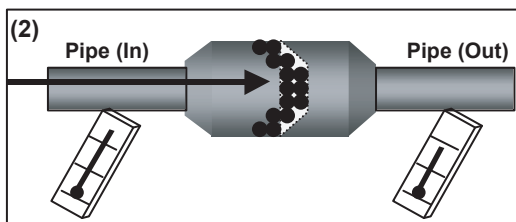
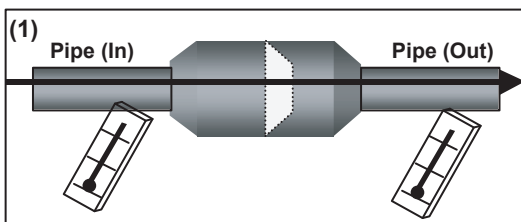


- In the following cases, even if EEV2 is closed, there may be a difference in temp.
- On comp. start-up
 - Just after switching the 4-way valve2
 - Just after switching the EEV2 (Open --> Close)

Note
If valve opening is 12~51pls, the check of temp. cannot be performed. Check temp. at the other valve opening.

Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between inlet and outlet as shown in (1), but if there is a difference as shown in (2), there is a possibility of inside clogged. In this case, replace Strainer.

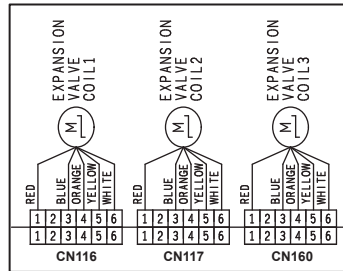


SERVICE PARTS INFORMATION 17

Outdoor Unit Electronic Expansion Valve (EEV3)

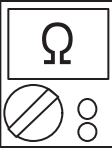
Check Point 1 : Check Connections

- Check connection of connector (CN160) (Loose connector or open cable)



Check Point 2 : Check Coil of EEV3

- Remove connector, check each winding resistance of Coil.

Read wire	Resistance value 68°F(20°C)
White - Red	$46 \pm 4 \% \Omega$ 
Yellow - Red	
Orange - Red	
Blue - Red	

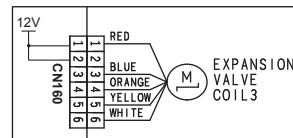
- If Resistance value is abnormal, replace EEV3.

Check Point 3 : Check Noise at start up

- Turn on Power and check operation noise.
- >> If an abnormal noise does not show, replace Controller PCB.

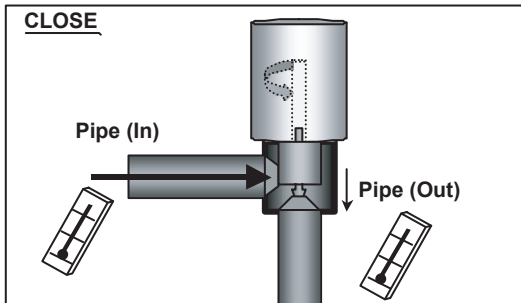
Check Point 4 : Check Voltage from Controller PCB

- Remove Connector and check Voltage (DC12V).
- >> If it does not appear, replace Controller PCB.

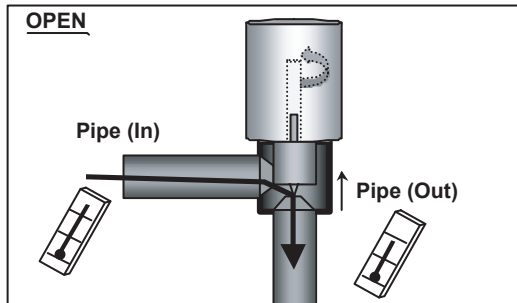


Check Point 5 : Check Opening and Closing Operation of Valve

When EEV3 is closed, it has no temp. difference between Inlet and Outlet.



If it is open, it has a temp. difference between Inlet and Outlet. Outlet temp. is near Low-pressure saturated temp.

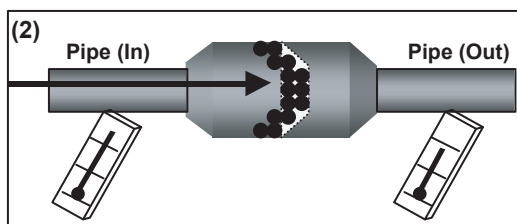
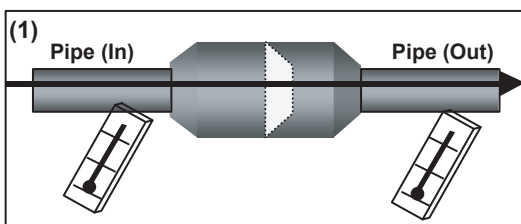


- In the following cases, even if EEV3 is closed, there may be a difference in temp.
- On comp. start-up
 - Just after switching the EEV3 (Open --> Close)

Note
If valve opening is 12~51pls, the check of temp. cannot be performed. Check temp. at the other valve opening.

Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between inlet and outlet as shown in (1), but if there is a difference as shown in (2), there is a possibility of inside clogged. In this case, replace Strainer.

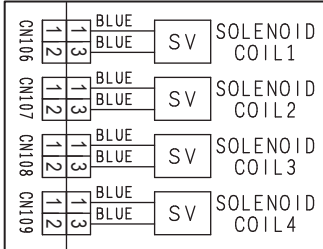


SERVICE PARTS INFORMATION 18

Outdoor Unit Solenoid Valve (SV1, SV2, SV3, SV4)

Check Point 1 : Check connections

- Check connection of connector.
(Loose connector or open cable)



Check Point 2 : Check Solenoid Coil

- Remove connector and check if coil is open.

Solenoid Coil	Resistance value	Resistance value 68°F(20°C)
SV1	1324Ω ±7%	
SV2, SV3	1495Ω ±7%	
SV4	1434.5Ω ±10%	

>> **If Resistance value is abnormal, replace Solenoid Coil.**

Check Point 3 : Check Voltage from Main PCB

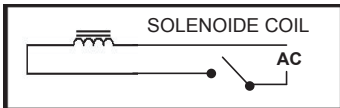
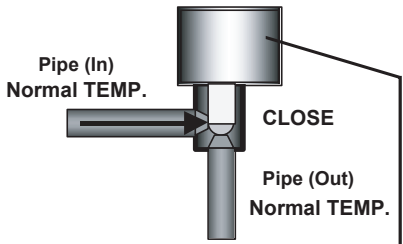
- Remove connector and check the voltage (AC208- 230V).

>> **If the voltage does not appear, replace Main PCB.**

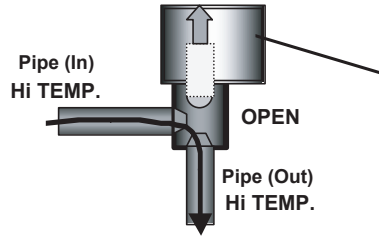
Check Point 4-1 : Check opening & closing operation of SV1, SV2

- Depending on either during operation or protection control, check if Valve is operating normally.
(When Valve opens, Inlet and Outlet temperature is raised.)

Normal Operation
Pipe (In) TEMP. Normal,
Pipe (Out) TEMP. Normal

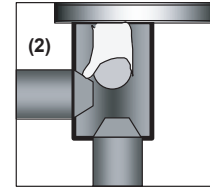
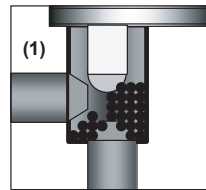


**Protection Function (Refer to 2-6-1),
Special Operation (Defrost, Oil recovery, Start-up)**
Pipe (In) TEMP. Hi,
Pipe (Out) TEMP. Hi



- If the valve closes by removing the connector of the valve which does not close, it is considered to be Main PCB failure. Replace Main PCB.

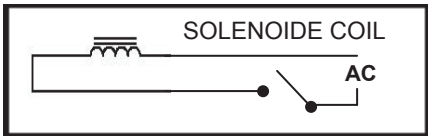
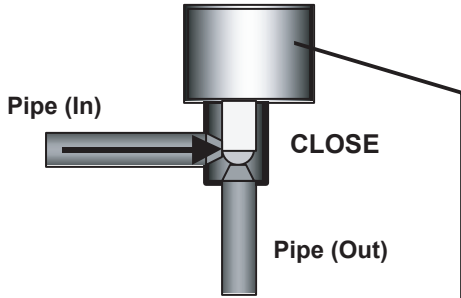
- If it does not close by removing connector, there is a possibility of (1) clogging by dirt, or (2) deformation by the heat at the time of Solenoid Valve installation. In this case, replace Solenoid Valve.



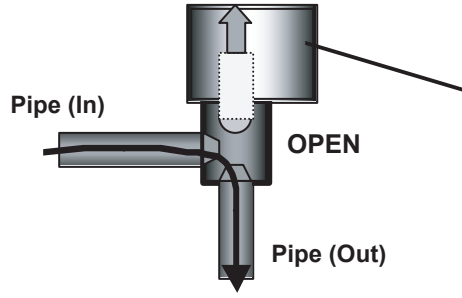
Check Point 4-2 : Check operation of SV3

- Check the operation noise when the connector of SV3 is removed.
 - When SV3 is open
 - The sound of operation noise is heard ---> Normal
 - The sound of operation noise is not heard. ---> Replace SV3
 - When SV3 is closed
 - The sound of operation noise is heard ---> Replace Main PCB
 - The sound of operation noise is not heard. ---> Normal

Comp. OFF
 or Discharge temp. $\leq 50^{\circ}\text{F}(10^{\circ}\text{C})$
 or Discharge temp. - High pressure saturated temp. $< 41^{\circ}\text{F}(5^{\circ}\text{C})$



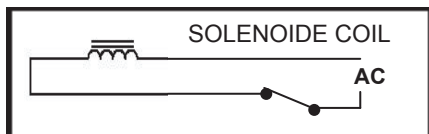
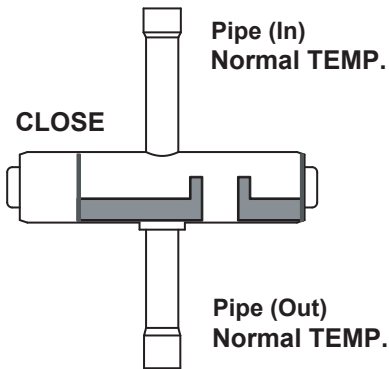
Comp. ON
 and Discharge temp. $> 50^{\circ}\text{F}(10^{\circ}\text{C})$
 and Discharge temp. - High pressure saturated temp. $\geq 46.4^{\circ}\text{F}(8^{\circ}\text{C})$



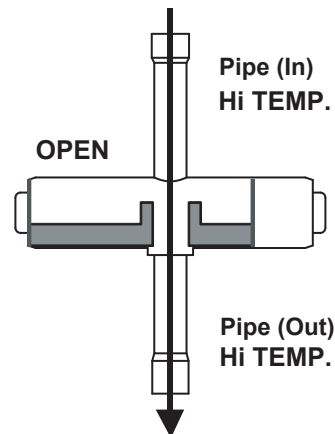
Check Point 4-3 : Check opening & closing operation of SV4

- Check if Valve is operating normally.
 (When Valve opens, Inlet and Outlet temperature is raised.)

Cooling operation at outside air temperature $\geq 87.8^{\circ}\text{F}(31^{\circ}\text{C})$
 and continuous operation time is more than 30min.
 and when it has passed more than 60min.
 since the last SV4 close condition.



Except cooling operation
 or Cooling operation at outside air temperature $\leq 84.2^{\circ}\text{F}(29^{\circ}\text{C})$



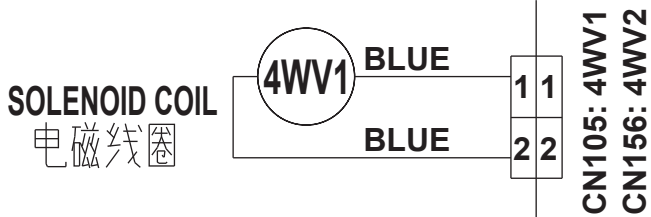
- If the valve does not open when the connector of SV4 is removed from Main PCB,
 Replace SV4.

SERVICE PARTS INFORMATION 19

4-WAY VALVE 1 (2)

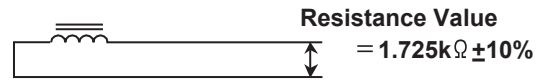
Check Point 1 : Check Circuit connection

- Check the connection of connector CN105 (CN156)



Check Point 2 : Check Solenoid Coil

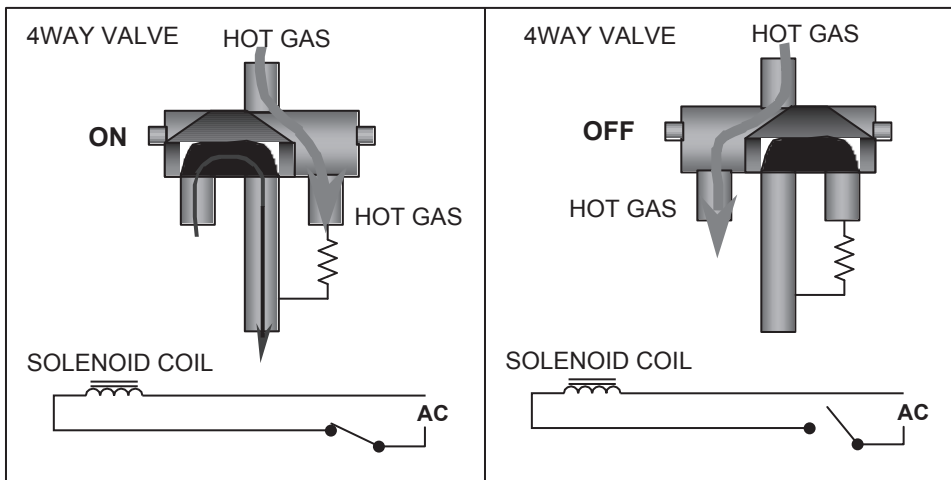
- Remove CN105 (CN156) from PCB and check the resistance value of coil



- ☆ If it is Open or abnormal resistance value, replace Solenoid Coil

Check Point 3: Check Operation of 4 Way Valve

- Check each piping temperature, and confirm the location of the valve by the temperature difference.



- ☆ If the valve location is not proper, replace 4 way valve.

Check Point 4: Check Voltage of Solenoid Coil

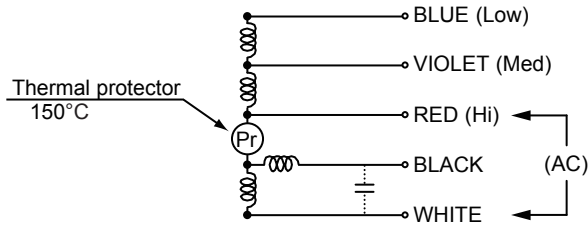
- If CN105 (CN156) of Control PCB dose not Show (AC208- 230V) during Heating operation (Compressor is in operation), replace Main PCB.

SERVICE PARTS INFORMATION 20

Indoor Unit AC Fan Motor

Check Point : ARUH36TLAV (High Static Pressure Duct Type)

- Check each winding resistance of the motor
- ▶ **If Resistance value is abnormal, replace motor.**

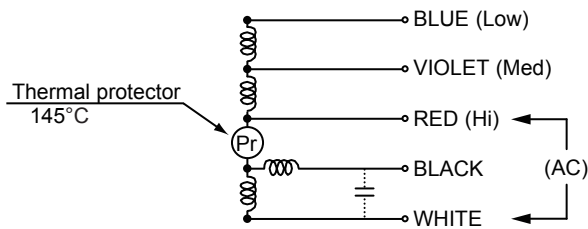


Lead wire	Resistance value
White – Red	19.8 Ω \pm 7%
Red – Black	23.4 Ω \pm 7%
Red – Violet	8.75 Ω \pm 7%
Violet – Blue	8.75 Ω \pm 7%

at 20°C

Check Point : ARUH48/ 60TLAV (High Static Pressure Duct Type)

- Check each winding resistance of the motor
- ▶ **If Resistance value is abnormal, replace motor.**



Lead wire	Resistance value
White – Red	8.94 Ω \pm 7%
Red – Black	9.56 Ω \pm 7%
Red – Violet	3.41 Ω \pm 7%
Violet – Blue	2.65 Ω \pm 7%

at 20°C

SERVICE PARTS INFORMATION 21

Indoor unit fan motor < DC motor >

⚠ When you approach this part, please cut off the power supply and wait for a while until DC voltage has been discharged.

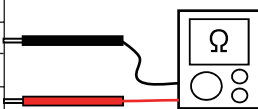
Check Point 1 : Check rotation of Fan

- Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)
- >>If Fan or Bearing is abnormal, replace it.**

Check Point 2 : Check resistance of Indoor Fan Motor

- Refer to below. Circuit-test "Vm" and "GND" terminal.
(Vm: DC voltage, GND: Earth terminal)
- >>If they are short-circuited (below 300 kΩ), replace Indoor fan motor**

Pin number (wire color)	Terminal function (symbol)
1 (Brown or Blue)	Feed back (FG)
2 (Yellow)	Speed command (Vsp)
3 (White)	Control voltage (Vcc)
4 (Black)	Earth terminal (GND)
5	No function
6 (Red)	DC voltage (Vm)



SERVICE PARTS INFORMATION 22

Outdoor unit fan motor

⚠ When you approach this part, please cut off the power supply and wait for a while until DC voltage has been discharged.

Check Point 1 : Check rotation of Fan

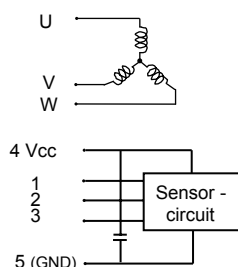
- Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)
- >>If Fan or Bearing is abnormal, replace it.**

Check Point 2 : Check resistance of Outdoor Fan Motor

- Refer to below. Circuit-test " Winding coil resistance U, V, W." and the Location sensor Circuit test

>>If they are other resistance value, replace Outdoor fan motor.

Pin number (wire color)	Terminal function (symbol)	Resistance Value
U (Red) - W (Black)	2.8 Ω	
V (white) - U (Red)		
W (Black) - V (White)		
1 (Yellow) - 4 (Pink)	9.3 K Ω	
2 (Blue) - 4 (Pink)		
3 (Orange) - 4 (Pink)		
4 (Pink) - 5 (Gray)	More than 1.2 K Ω	
1 or 2 or 3 - 5 (Gray)	More than 10 K Ω	



SERVICE PARTS INFORMATION 23

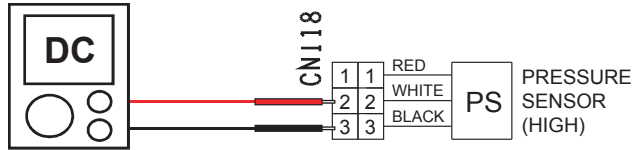
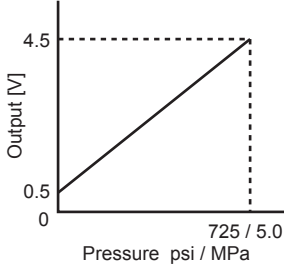
Discharge Pressure Sensor Suction Pressure Sensor

1. Discharge Pressure Sensor

Check Point : Check Voltage from Main PCB

- With the connector connected to the PCB, measure the voltage between CN118:2-3 of the Main PCB.

• Characteristics of pressure sensor



psi	0.0	14.5	29.0	43.5	58.0	72.5	101.5	116.0	130.5	145.0	174.0	203.0	232.0	261.0	290.0
MPa	0.00	0.10	0.20	0.30	0.40	0.50	0.70	0.80	0.90	1.00	1.20	1.40	1.60	1.80	2.00
Output (V)	0.50	0.58	0.66	0.74	0.82	0.90	1.06	1.14	1.22	1.30	1.46	1.62	1.78	1.94	2.10

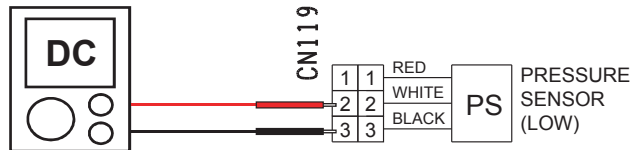
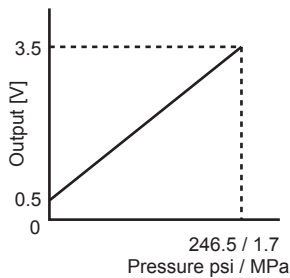
psi	319.0	348.0	377.0	406.0	435.0	464.0	493.0	522.0	551.0	580.0	609.0	638.0	667.0	696.0	725.0
MPa	2.20	2.40	2.60	2.80	3.00	3.20	3.40	3.60	3.80	4.00	4.20	4.40	4.60	4.80	5.00
Output (V)	2.26	2.42	2.58	2.74	2.90	3.06	3.22	3.38	3.54	3.70	3.86	4.02	4.18	4.34	4.50

2. Suction Pressure Sensor

Check Point : Check Voltage from Main PCB

- With the connector connected to the PCB, measure the voltage between CN119:2-3 of the Main PCB.

• Characteristics of pressure sensor



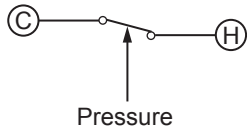
psi	0.0	14.5	29.0	43.5	58.0	72.5	101.5	116.0	130.5	145.0	159.5	174.0	188.5	203.0	217.5
MPa	0.00	0.10	0.20	0.30	0.40	0.50	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50
Output (V)	0.50	0.68	0.85	1.03	1.21	1.38	1.74	1.91	2.09	2.27	2.44	2.62	2.79	2.97	3.15

psi	232.0	246.5
Mpa	1.60	1.70
Output (V)	3.32	3.50

SERVICE PARTS INFORMATION 24

Pressure Switch

• Type of contact



• Characteristics of pressure switch

Contact : Short ⇒ Open	4.2±0.1MPa (609±14.5 psi)
Contact : Open ⇒ Short	3.2±0.15MPa (464±21.8 psi)

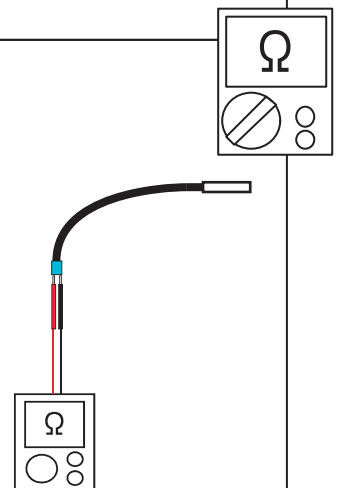
SERVICE PARTS INFORMATION 25

Thermistor

Check Point : Check Thermistor resistance value

- Remove connector and check Thermistor resistance value.

Temperature [°F]	Temperature [°C]	Resistance Value [kΩ]			
		Thermistor A	Thermistor B	Thermistor C	Thermistor D
- 4	- 20	---	---	105.4	---
14	- 10	---	27.8	58.2	27.4
23	- 5	---	21.0	44.0	20.7
32	0	168.6	16.1	33.6	15.8
41	5	129.8	12.4	25.9	12.2
50	10	100.9	9.6	20.2	9.5
59	15	79.1	7.6	15.8	7.5
68	20	62.6	6.0	12.5	5.9
77	25	49.8	4.8	10.0	4.7
86	30	40.0	3.8	8.0	3.8
104	40	26.3	2.5	5.3	2.5
122	50	17.8	1.7	3.6	1.7
140	60	12.3	1.2	---	1.2
158	70	8.7	---	---	0.8
176	80	6.3	---	---	0.6
194	90	4.6	---	---	0.4
212	100	3.4	---	---	0.3
230	110	2.6	---	---	---
248	120	2.0	---	---	---
Applicable Thermistors	Discharge temp. TH1 Comp.1 temp. TH	Outdoor temp. TH Suction temp. TH Liquid temp. TH 1 Liquid temp. TH 2 Sub-cool heat-ex (outlet) TH Heat-ex 1 gas TH Heat-ex 2 gas TH Heat-ex 1 liquid TH Heat-ex 2 liquid TH	Outdoor temp. TH	Heat sink temp. TH	



SERVICE PARTS INFORMATION 26

**RB Unit Solenoid Valve
(SV1, SV2, SV3, SV4, SV5, SV6)**

Check Point 1 : Check Solenoid Coil

- Remove connector and check if coil is open.

Solenoid Coil	Resistance value
SV1,SV2,SV3,SV4,SV5,SV6	1.35K Ω \pm 7%

>> If Resistance value is abnormal, replace Solenoid Coil.



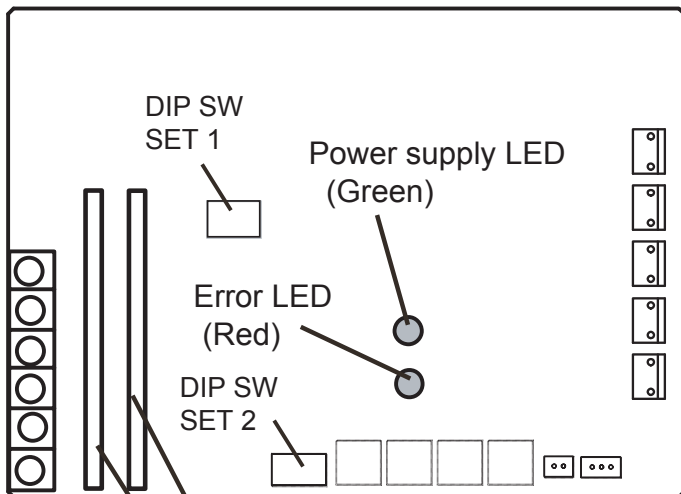
Check Point 2: Check Voltage from Main PCB

- Remove connector and check the voltage (AC208- 230V).

>> If the voltage does not appear, replace Main PCB.



-Upper side-



SV No.	Color of CN	SV Name on ST
SV1	Green	SVD1
SV2	Blue	SVB2
SV3	Black	SVS
SV4	White	SVS
SV5	Red	SVS
SV6	Yellow	SVS

Transmission PCB1

Transmission PCB2

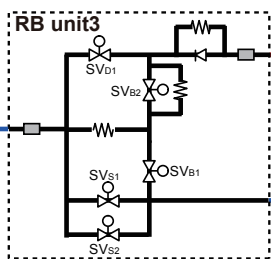
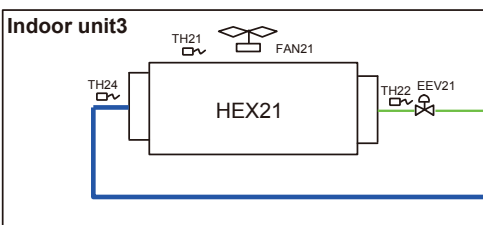
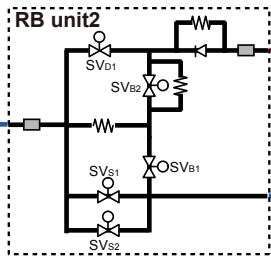
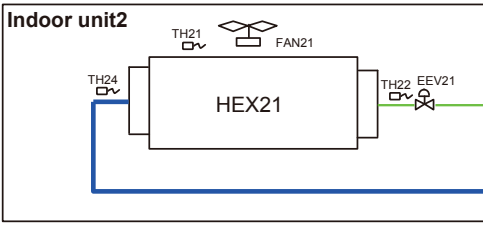
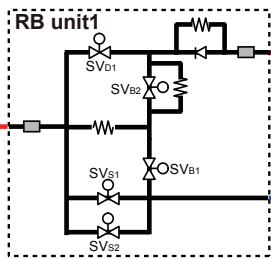
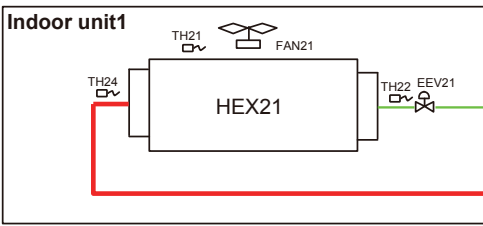
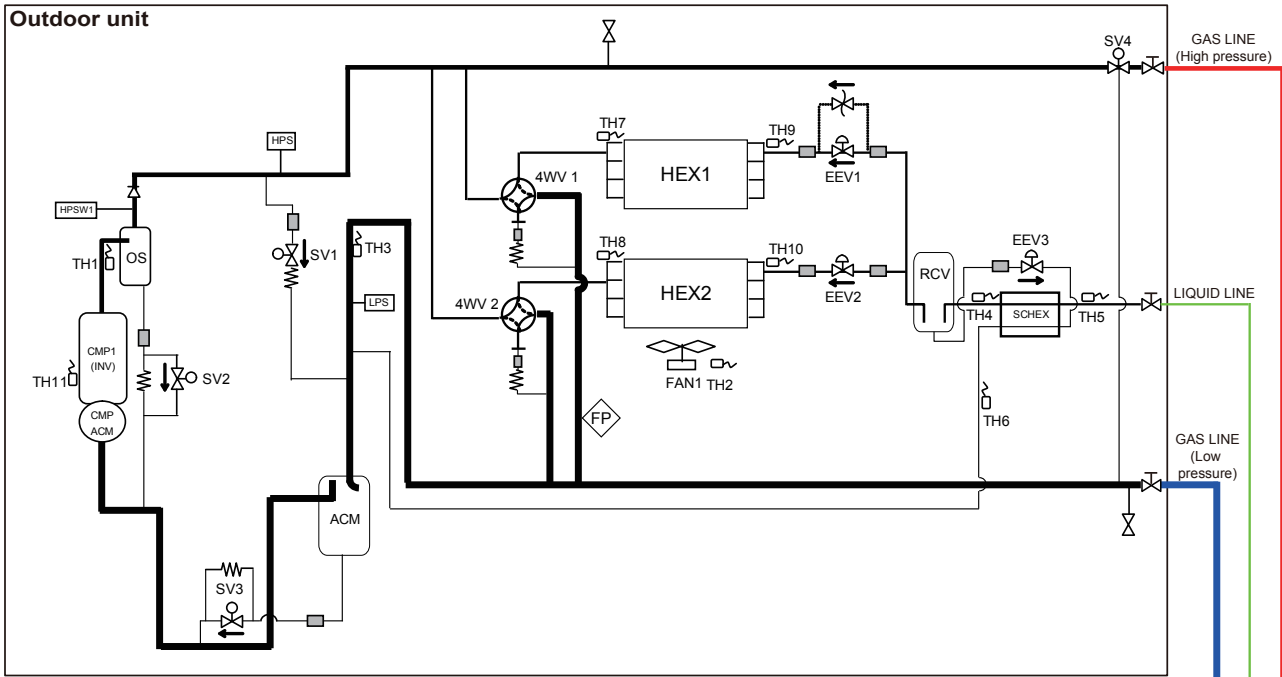
AIRSTAGE[™] *VR-II*

Variable Refrigerant Flow System

5. APPENDING DATA (UNIT)

5-1 REFRIGERANT CIRCUIT

MODELS : AOUA72TLBV, AOUA96TLBV, AOUA120TLBV



- ▷ : Check valve
- ⊗ : 3-way valve
- ⊞ : Capillary
- ⊘ : Service port
- ▣ : Strainer
- ↔ : Pressure regulation valve
- ◇ (with FP) : Fusible plug

SYMBOL DESCRIPTION

Outdoor unit

MARK	DESCRIPTION
CMP1	Compressor 1 (Inverter type)
HEX1	Heat exchanger 1
HEX2	Heat exchanger 2
FAN1	Fan 1
ACM	Accumulator
RCV	Receiver tanker
OS	Oil separator
SCHEX	Sub-cool heat exchanger
HPS	High pressure sensor
LPS	Low pressure sensor
HPSW1	High pressure sensor switch 1
4WV1	4-way valve 1
4WV2	4-way valve 2
EEV1	Electric expansion valve 1
EEV2	Electric expansion valve 2
EEV3	Electric expansion valve 3
SV1	Solenoid valve 1
SV2	Solenoid valve 2
SV3	Solenoid valve 3
SV4	Solenoid valve 4
TH1	Discharge temperature thermistor 1
TH2	Outdoor temperature thermistor
TH3	Suction temperature thermistor
TH4	Liquid temperature thermistor 1
TH5	Liquid temperature thermistor 2
TH6	Sub-cool heat exchanger (outlet) thermistor
TH7	Heat exchanger 1 gas thermistor
TH8	Heat exchanger 2 gas thermistor
TH9	Heat exchanger 1 liquid thermistor
TH10	Heat exchanger 2 liquid thermistor
TH11	Compressor 1 temperature thermistor 1

Marking color
BLUE
–
RED
WHITE
BROWN
GREEN
BLACK
YELLOW
PINK
GRAY
ORANGE

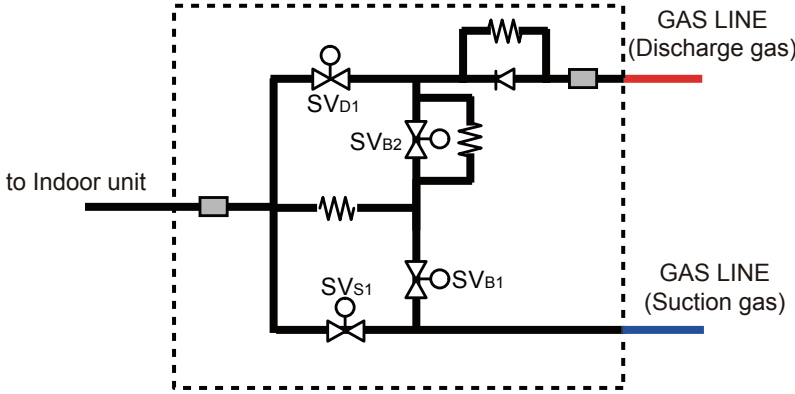
Indoor unit

MARK	DESCRIPTION
HEX21	Heat exchanger
FAN21	Fan
EEV21	Electric expansion valve
TH21	Room temperature thermistor
TH22	Heat exchanger (inlet) thermistor
TH24	Heat exchanger (outlet) thermistor

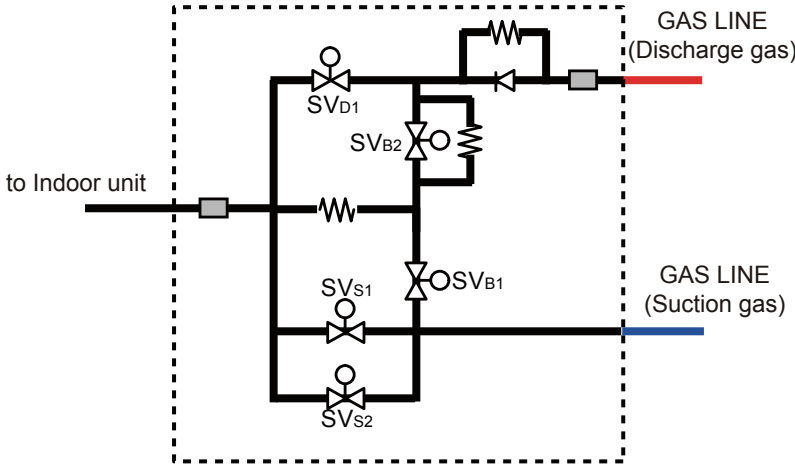
RB unit

MARK	DESCRIPTION
SV _{S1}	Solenoid valve (Suction 1)
SV _{S2}	Solenoid valve (Suction 2)
SV _{B1}	Solenoid valve (Bypass 1)
SV _{B2}	Solenoid valve (Bypass 2)
SV _{D1}	Solenoid valve (Discharge 1)

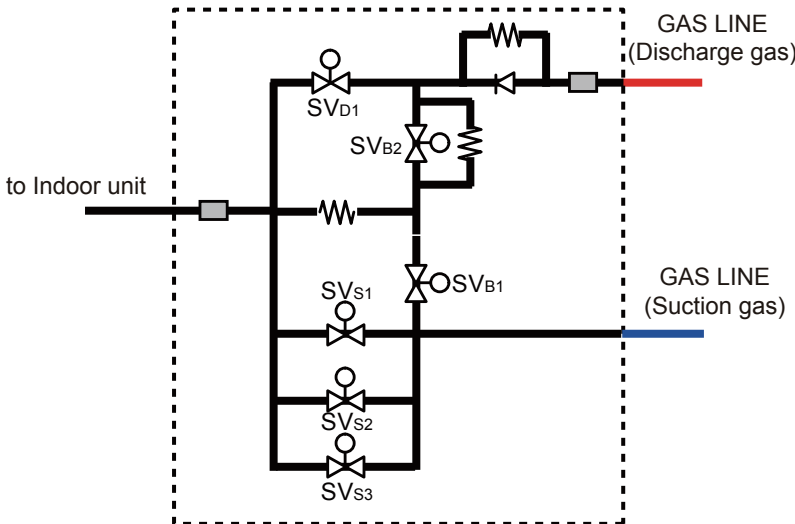
MODEL : UTP-RU01AH



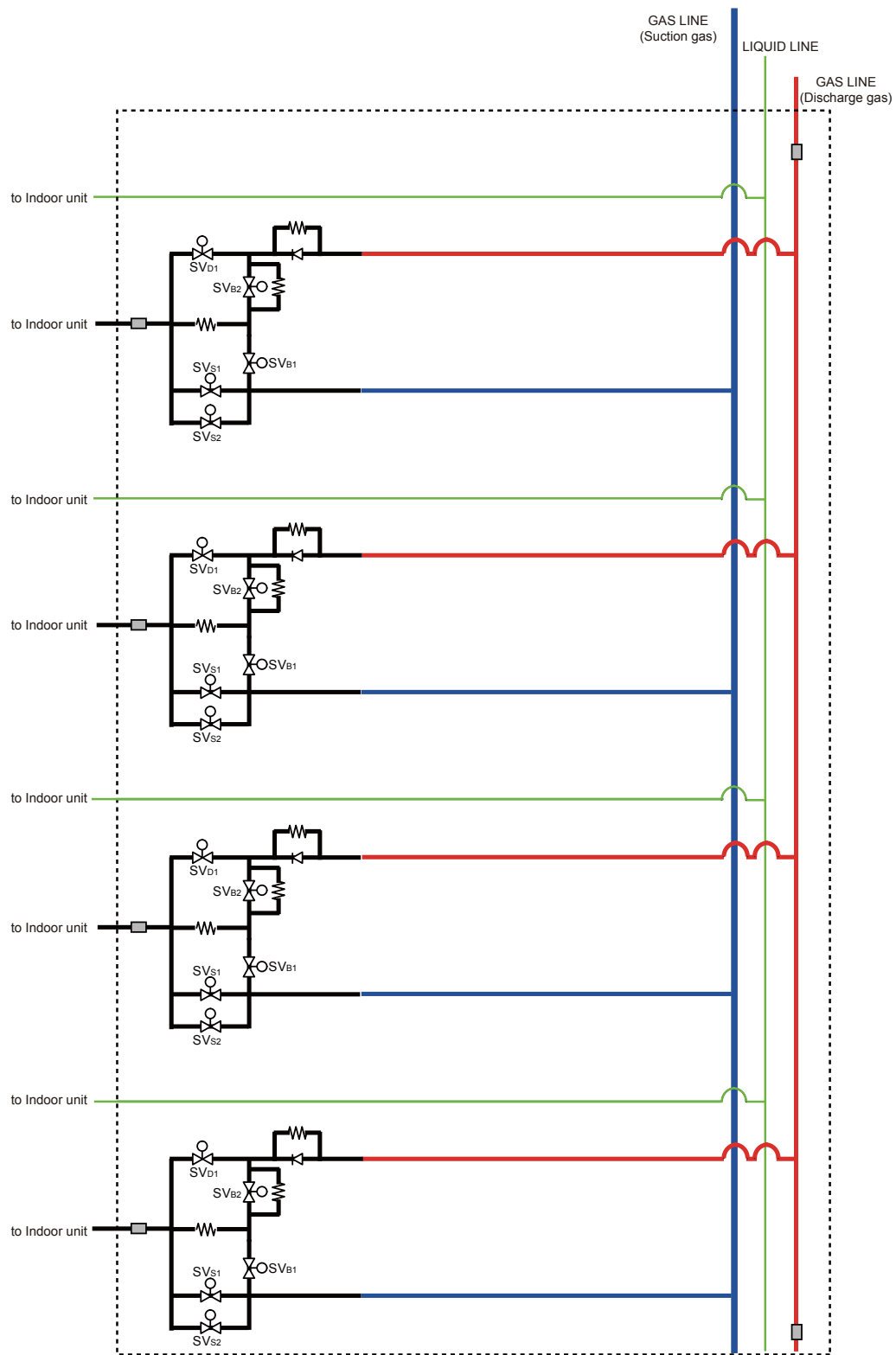
MODEL : UTP-RU01BH



MODEL : UTP-RU01CH



MODEL : UTP-RU04BH



SYMBOL DESCRIPTION

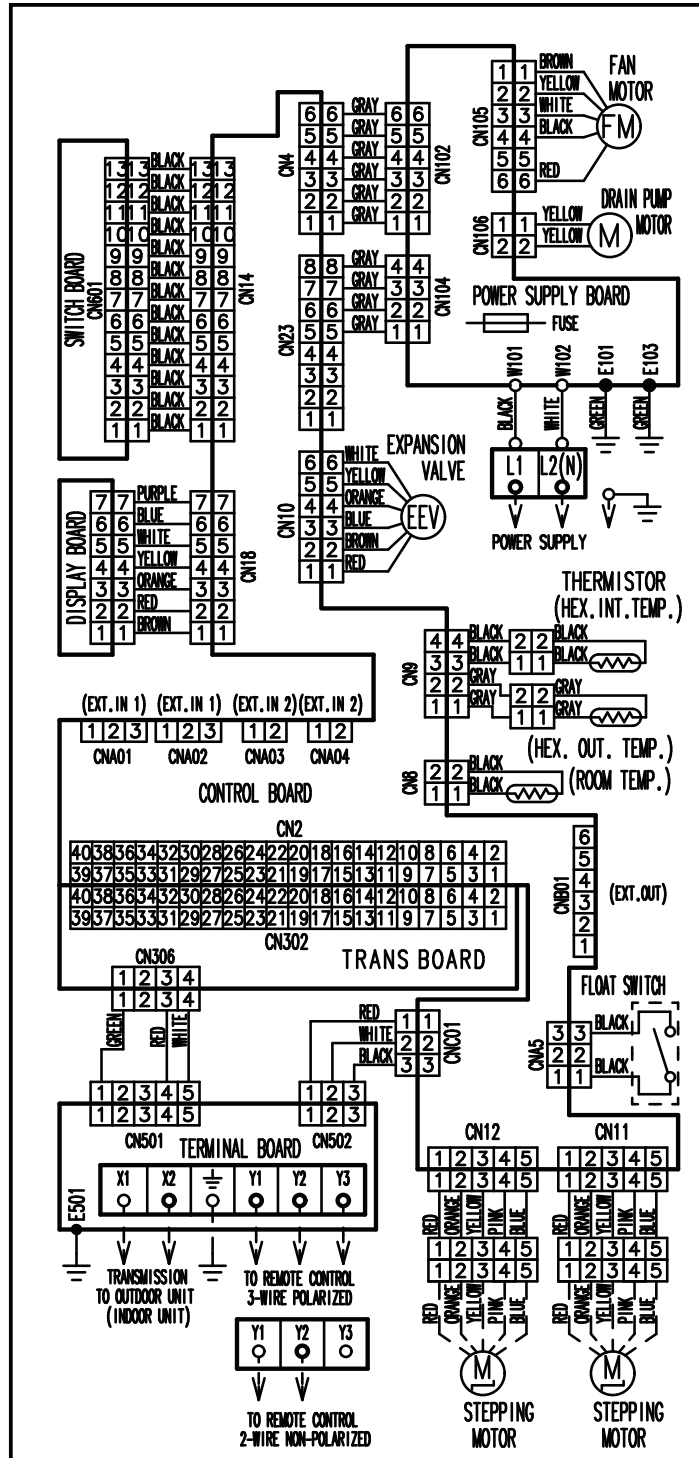
MARK	DESCRIPTION
SVs1	Solenoid valve (Suction 1)
SVs2	Solenoid valve (Suction 2)
SVs3	Solenoid valve (Suction 3)
SVB1	Solenoid valve (Bypass 1)
SVB2	Solenoid valve (Bypass 2)
SVd1	Solenoid valve (Discharge 1)

5-2 WIRING DIAGRAM

5-2-1 Indoor Unit

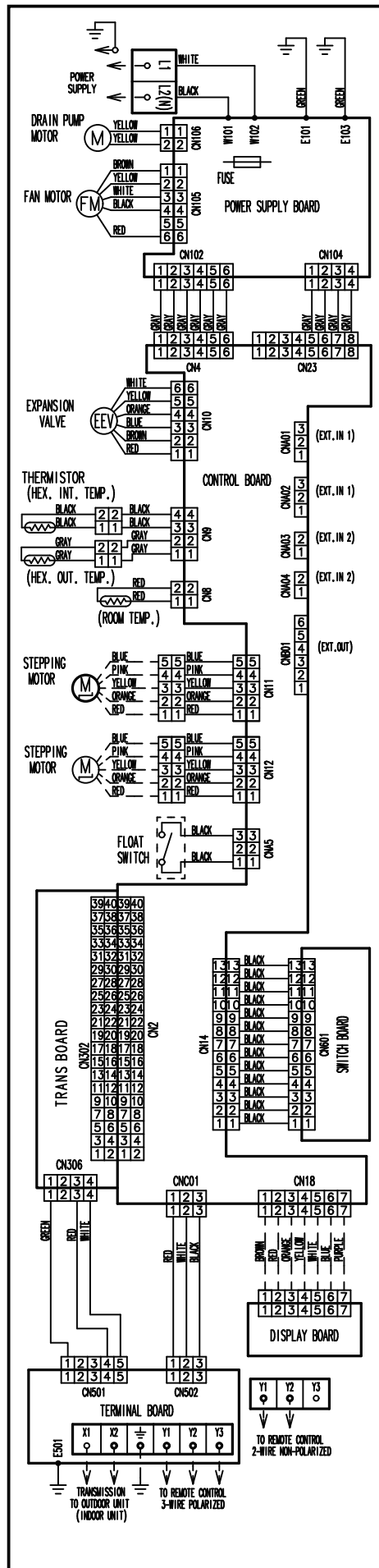
COMPACT CASSETTE TYPE

MODELS : AUUA7TLAV, AUUA9TLAV, AUUA12TLAV, AUUA14TLAV, AUUA18TLAV, AUUA24TLAV



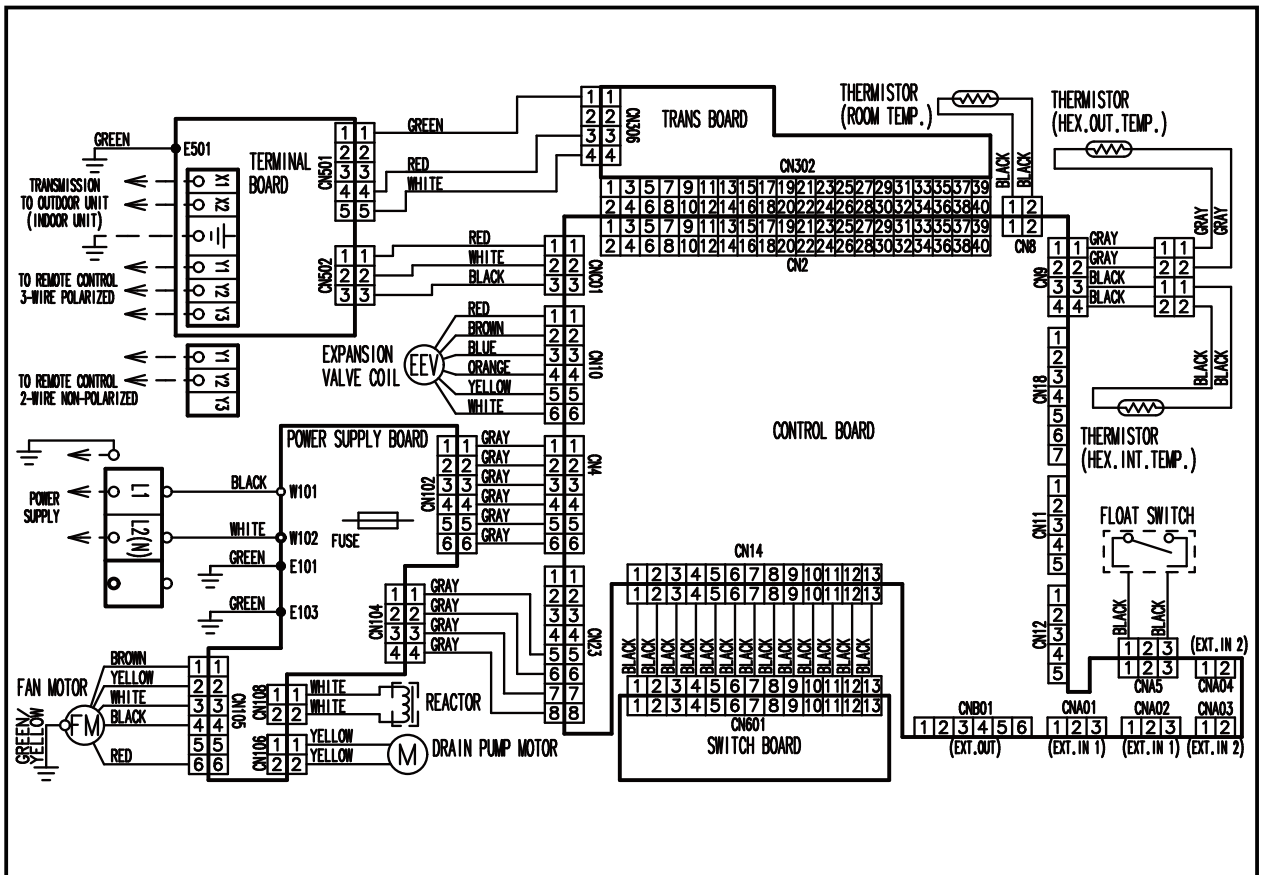
CASSETTE TYPE

MODELS : AUUB18TLAV, AUUB24TLAV, AUUB30TLAV,
AUUB36TLAV



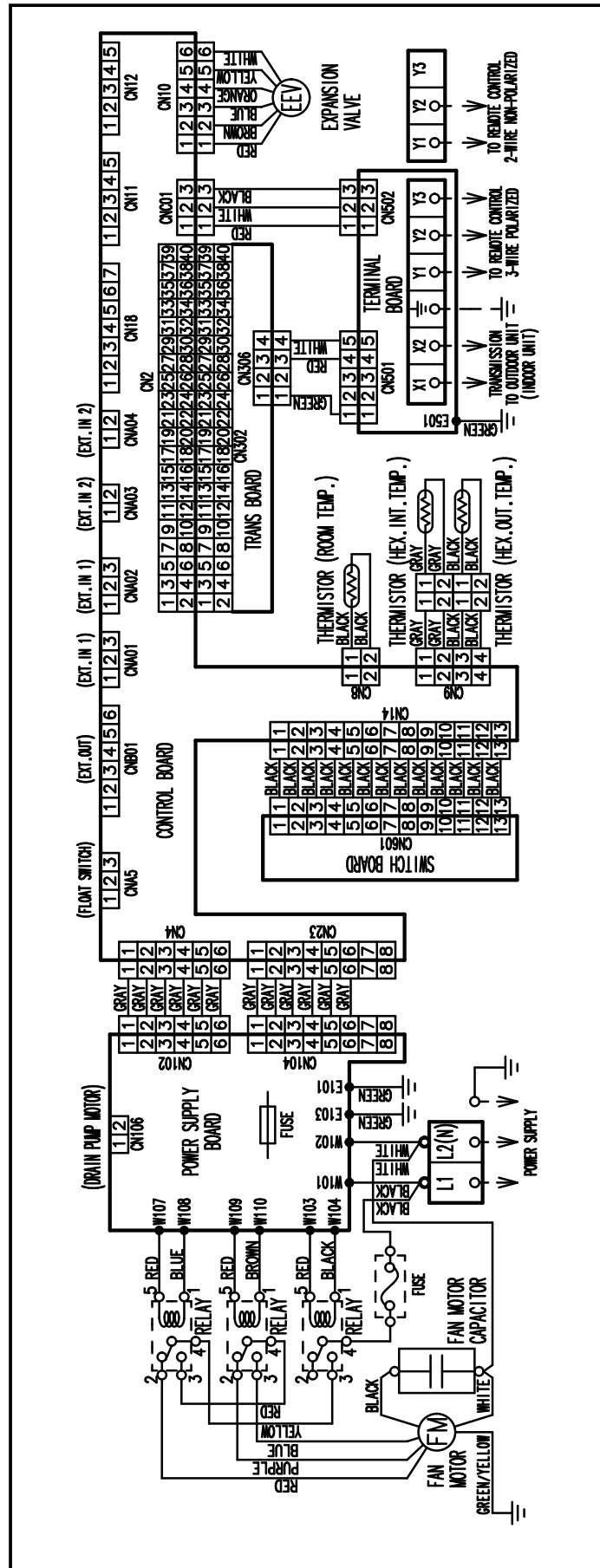
SLIM DUCT / SLIM CONCEALED FLOOR TYPE

MODELS : ARUL7TLAV, ARUL9TLAV, ARUL12TLAV, ARUL14TLAV, ARUL18TLAV



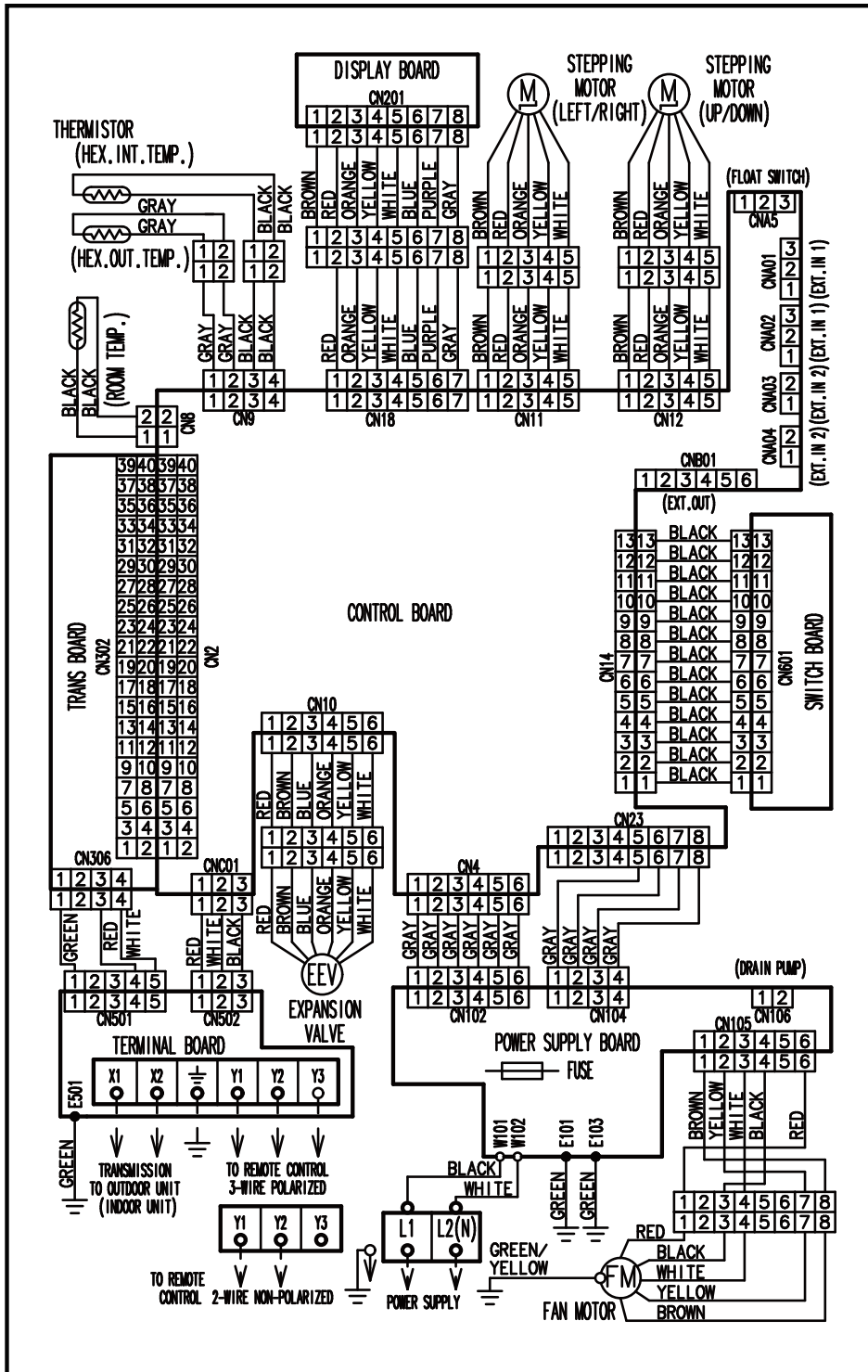
HIGH STATIC PRESSURE DUCT TYPE

MODELS : ARUH36TLAV, ARUH48TLAV, ARUH60TLAV



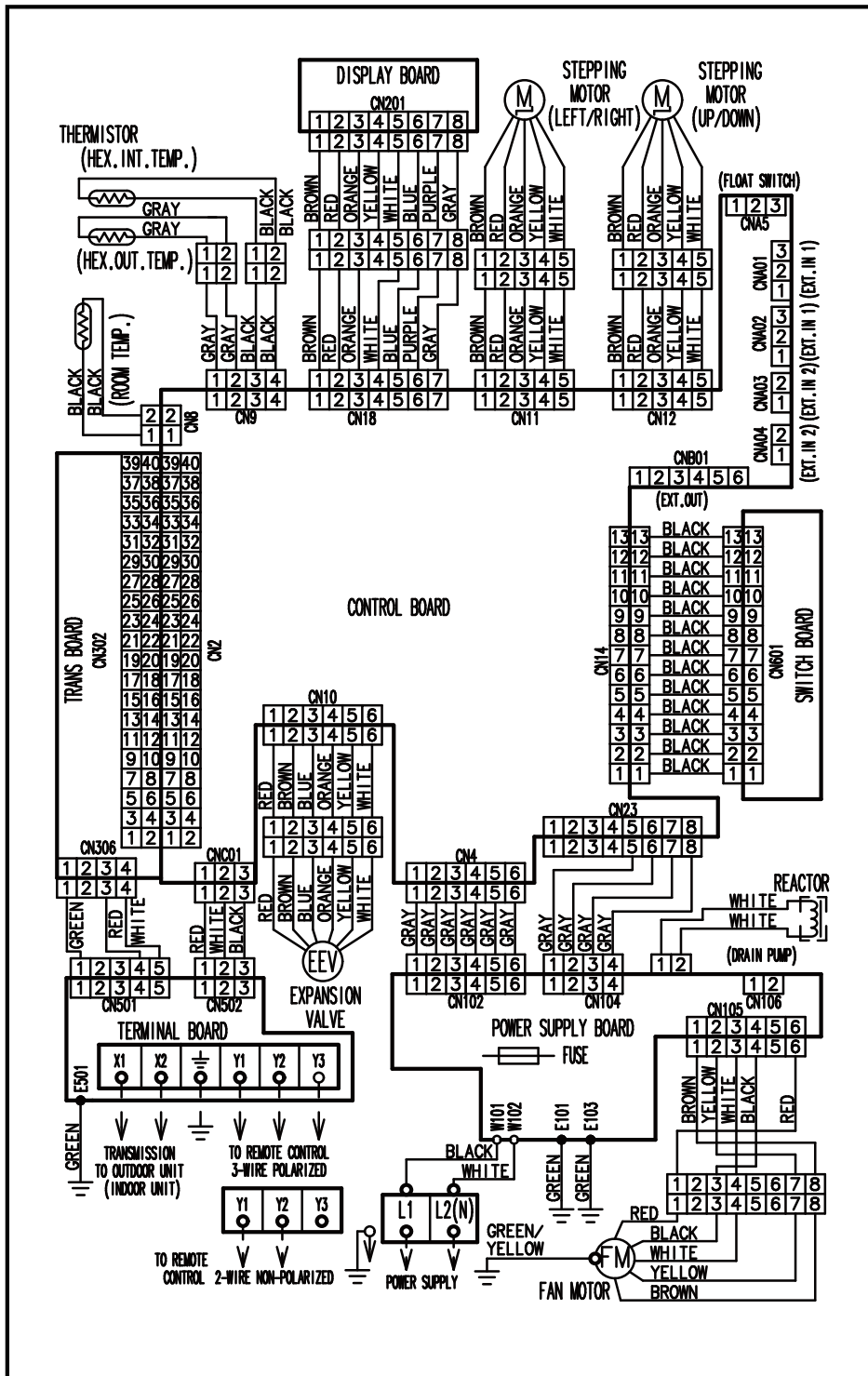
FLOOR / CEILING TYPE

MODELS : ABUA12TLAV, ABUA14TLAV, ABUA18TLAV, ABUA24TLAV



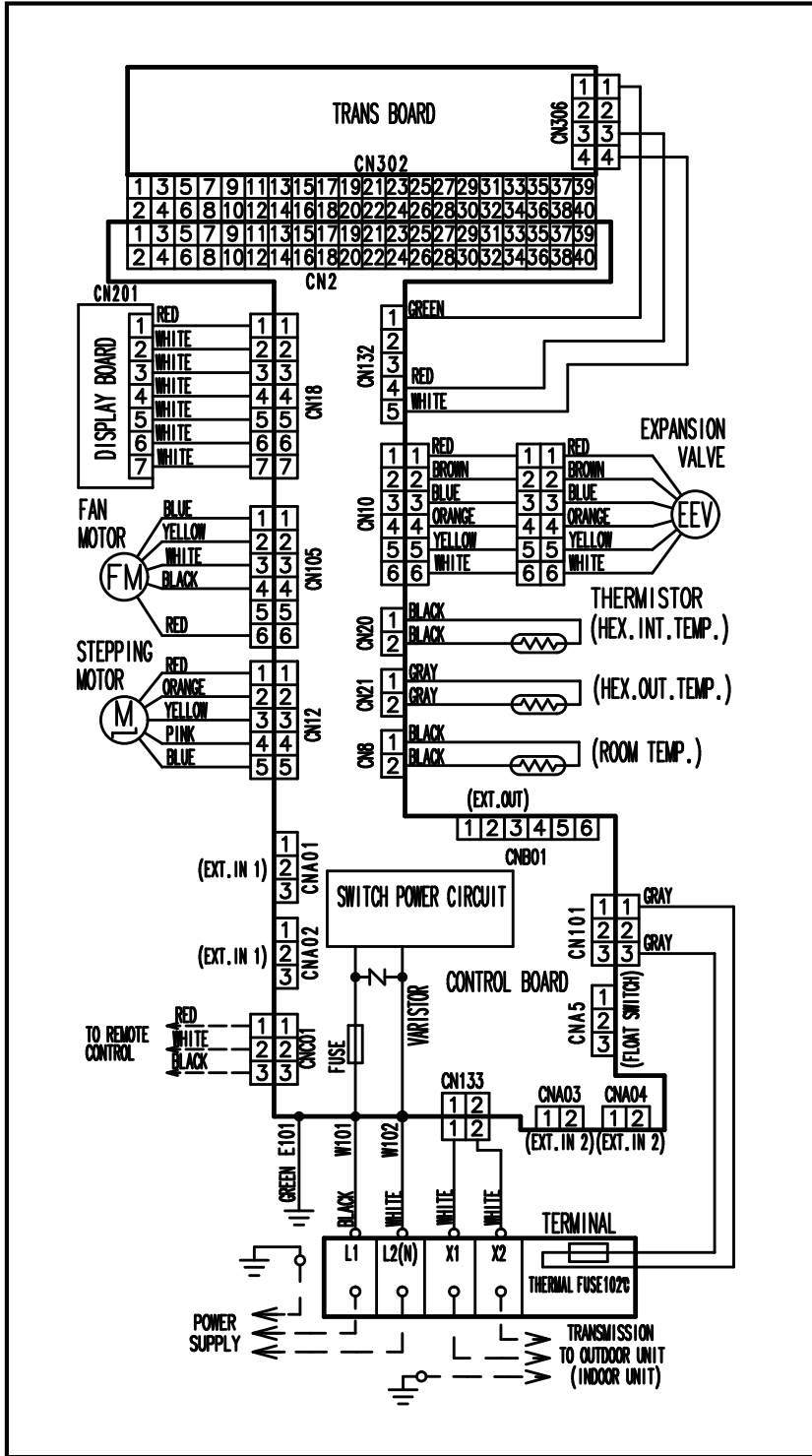
CEILING TYPE

MODELS : ABUA30TLAV, ABUA36TLAV

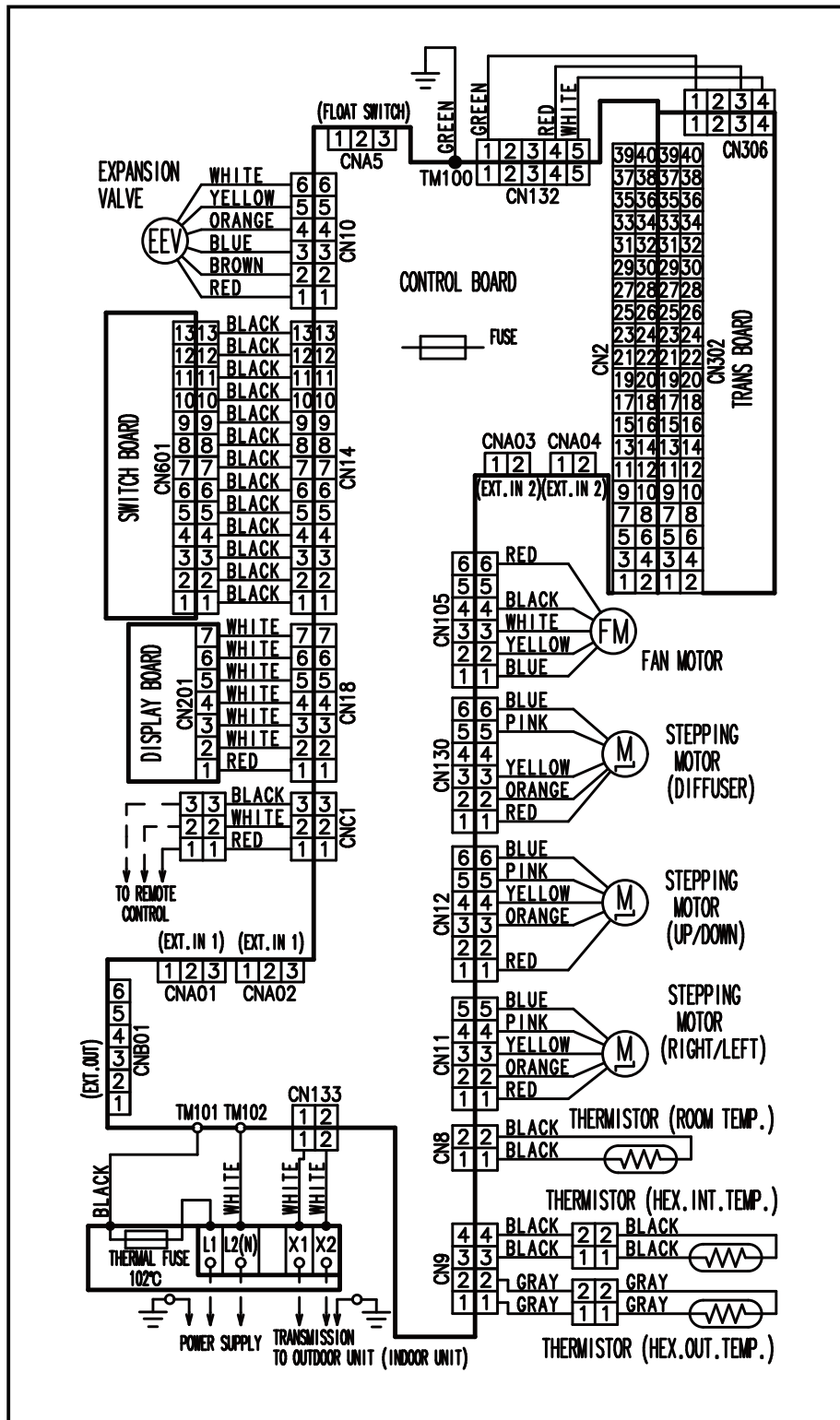


WALL MOUNTED TYPE

MODELS : ASUA7TLAV, ASUA9TLAV, ASUA12TLAV, ASUA14TLAV

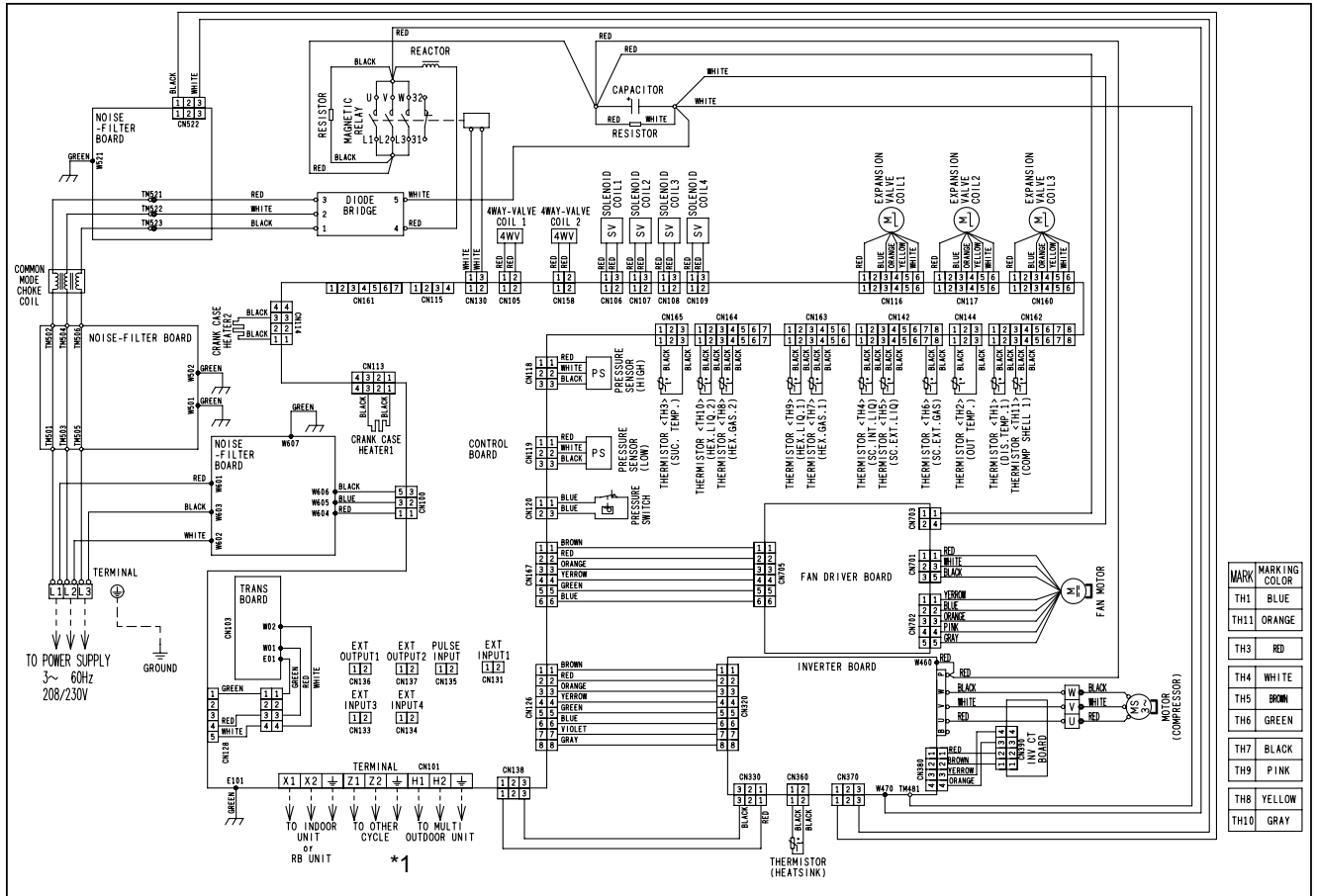


MODELS : ASUB18TLAV, ASUB24TLAV



5-2-2 Outdoor Unit

MODELS : AOUA72TLBV, AOUA96TLBV, AOUA120TLBV



Note : *1

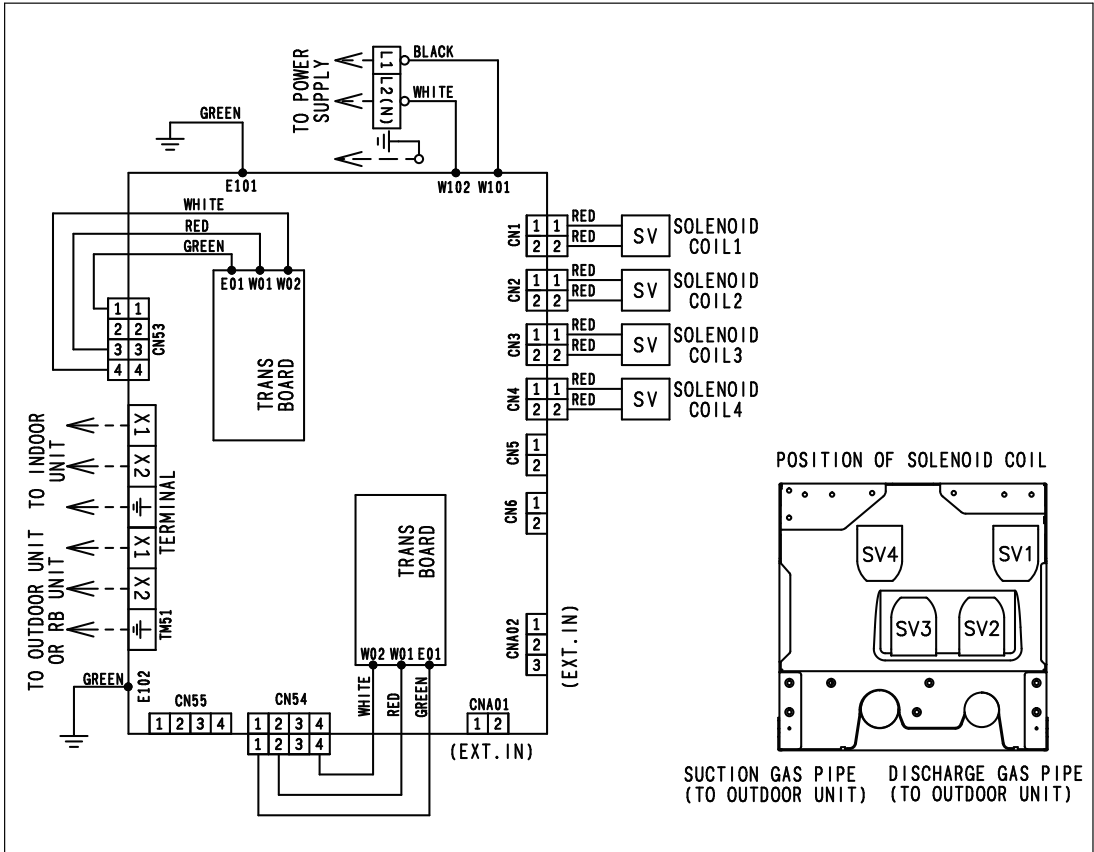
X1, X2 : To be connected to indoor unit or RB unit

Z1, Z2 : To be connected to other master outdoor unit

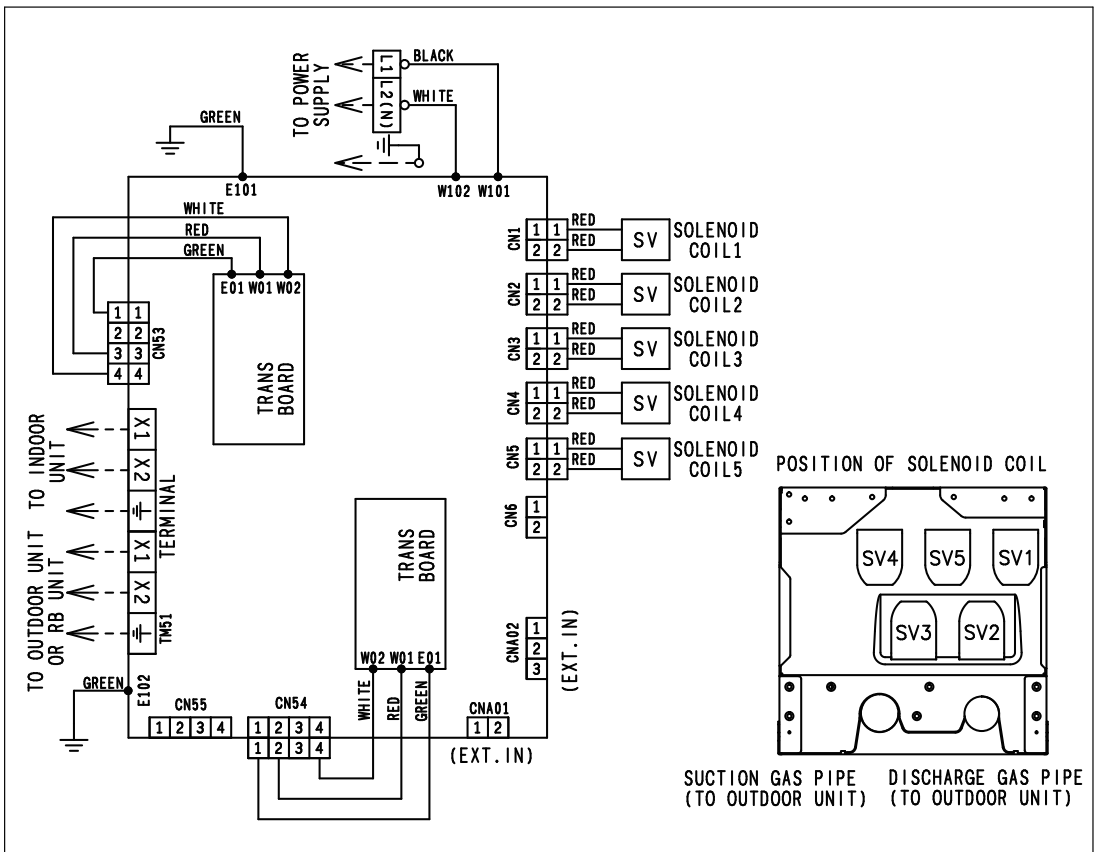
H1, H2 : To be connected to outdoor unit within same refrigerant system

5-2-3 RB Unit

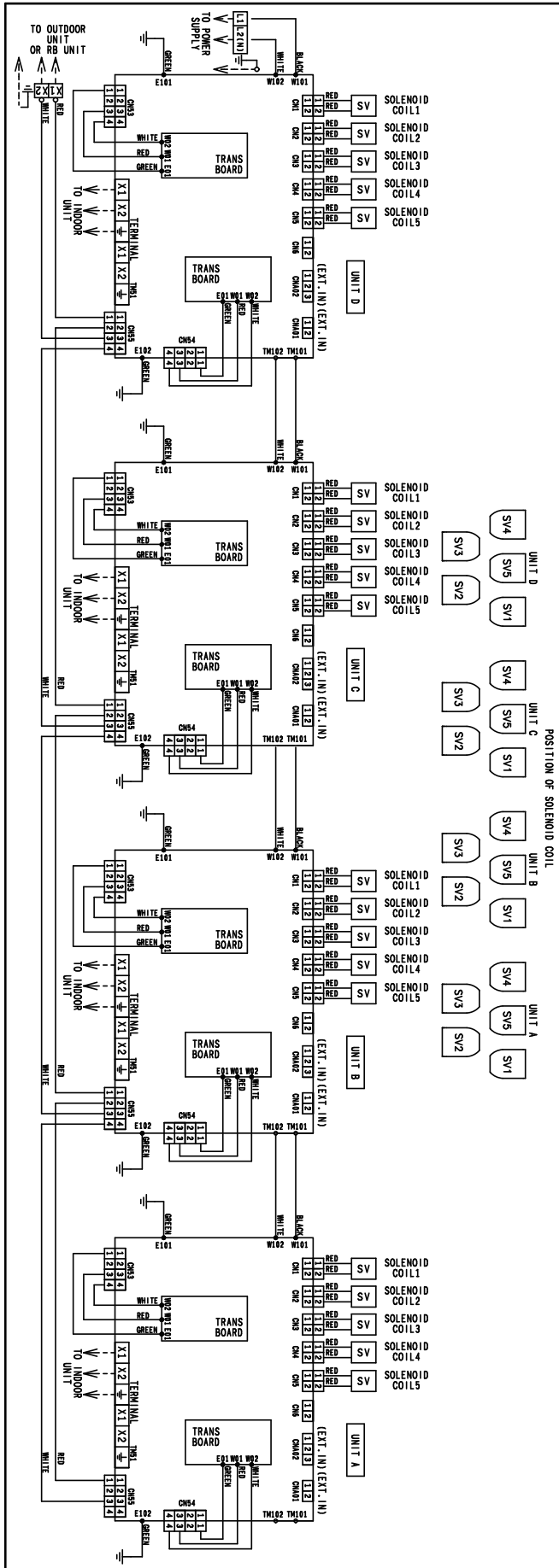
MODEL : UTP-RU01AH



MODEL : UTP-RU01BH

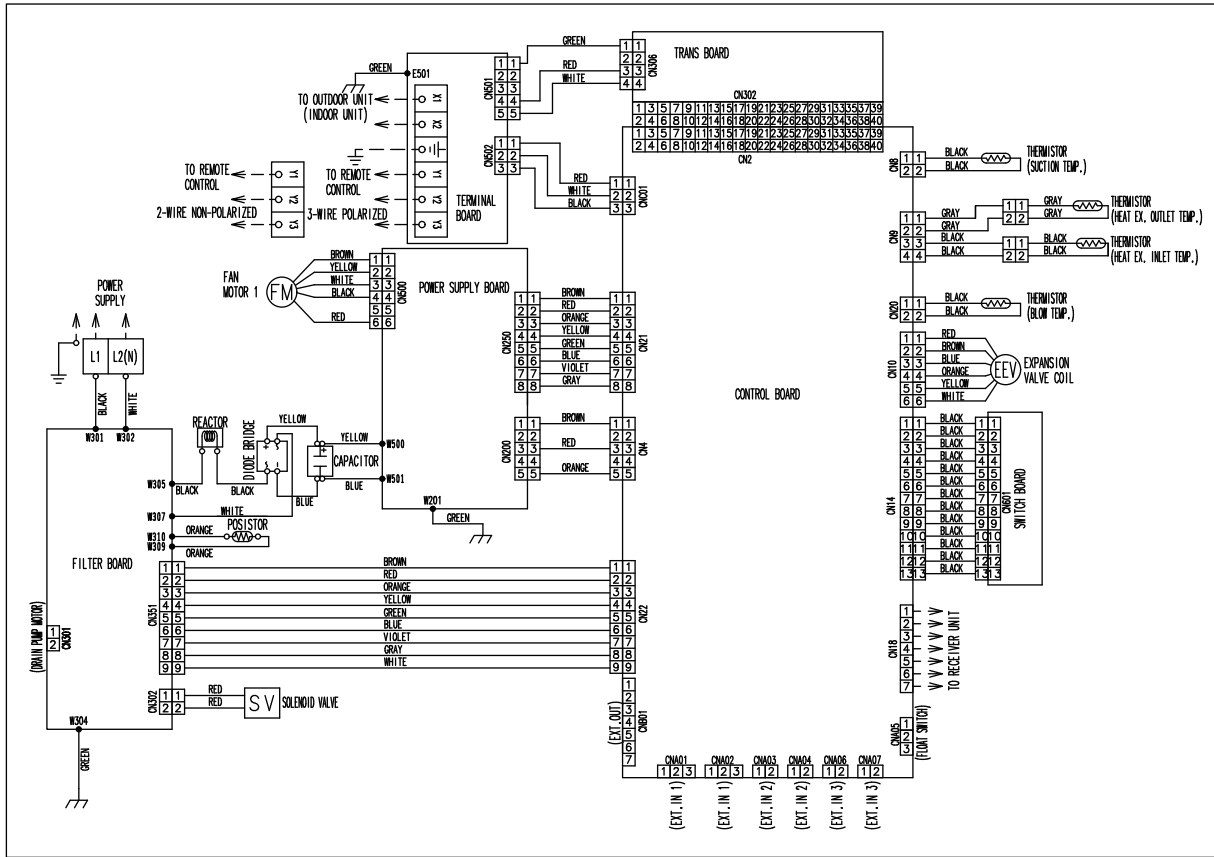


MODEL : UTP-RU04BH

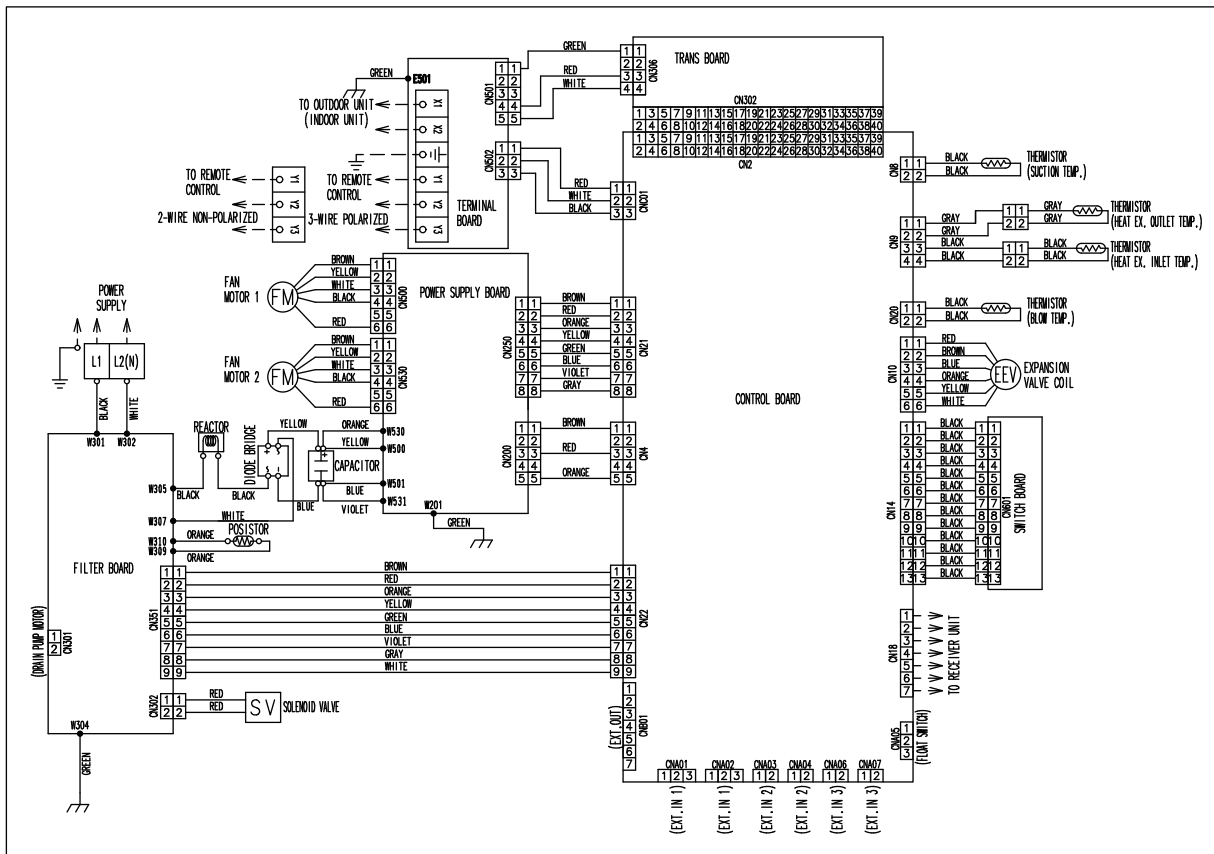


5-2-4 Outdoor Air Unit

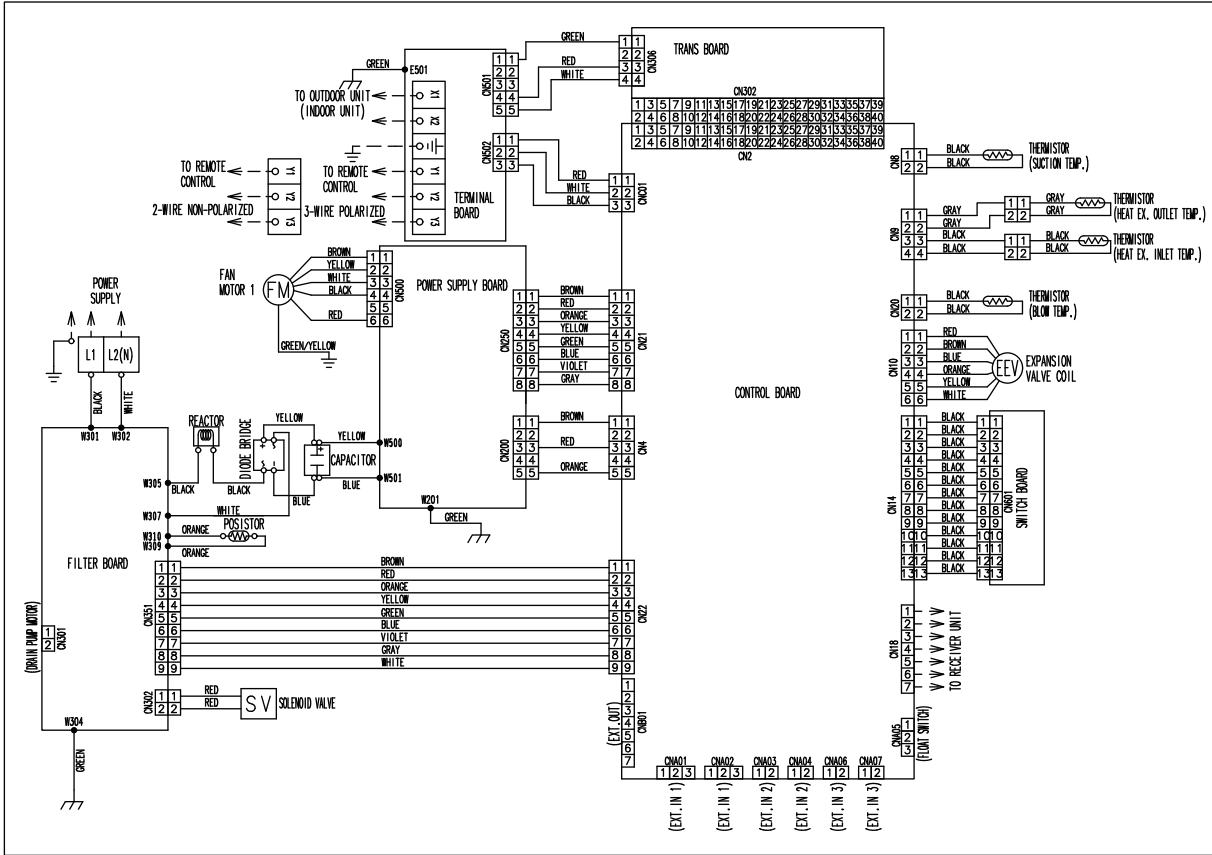
MODELS : AAUA48TLAV



MODELS : AAUA72TLAV

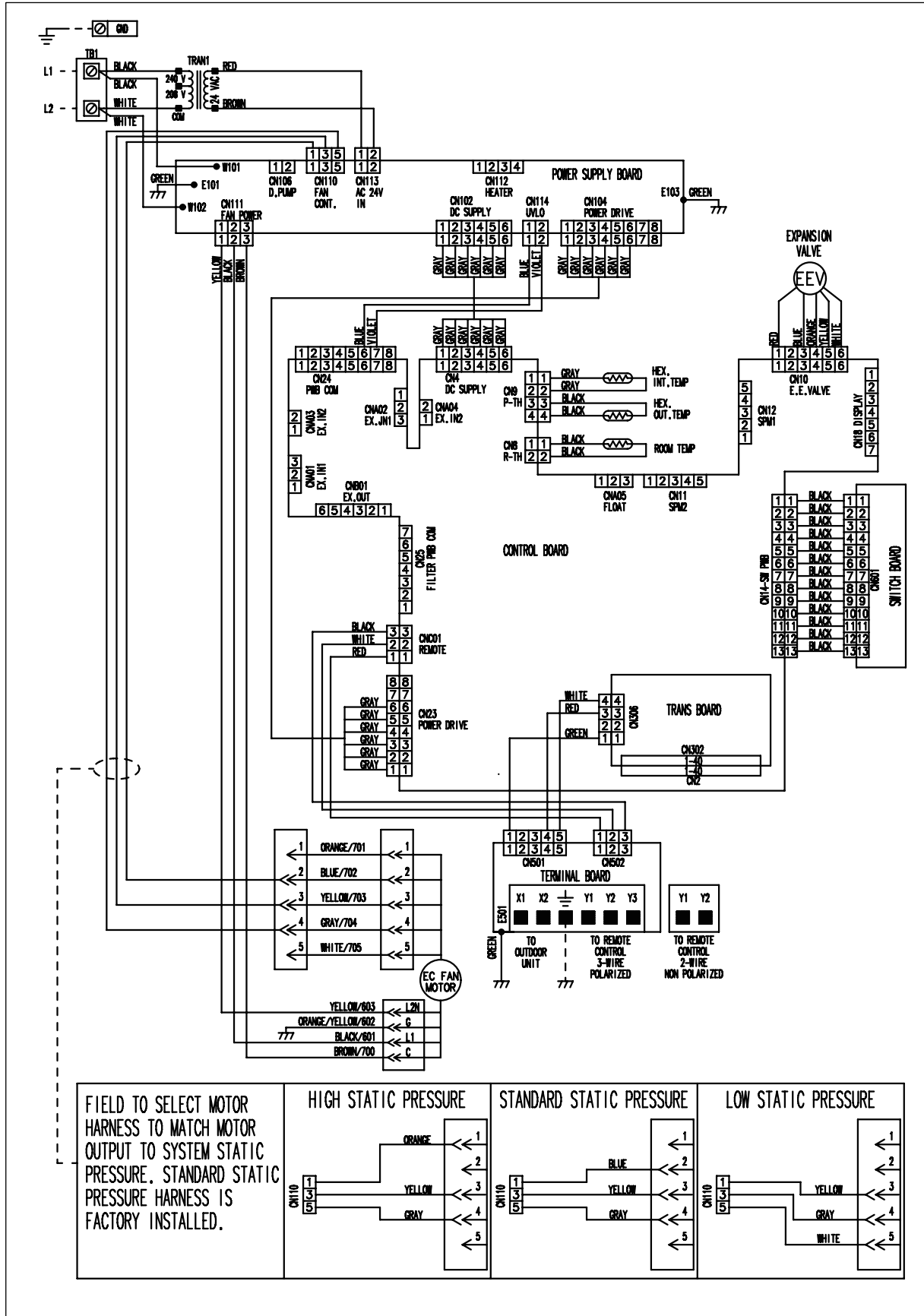


MODELS : AAUA96TLAV



5-2-5 Vertical Air Handler

**MODELS : ARUV12TLAV, ARUV18TLAV, ARUV24TLAV,
ARUV30TLAV, ARUV36TLAV, ARUV48TLAV,
ARUV60TLAV**



AIRSTAGE[™] *VR-II*

Variable Refrigerant Flow System

6. DISASSEMBLY PROCESS

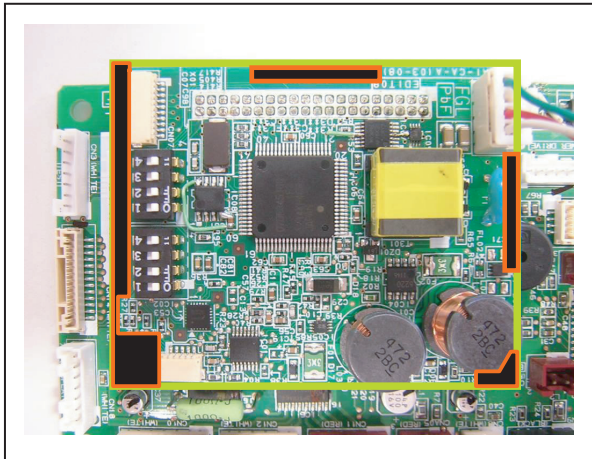
6.DISASSEMBLY/ASSEMBLYPROCESS

6.1 Indoor Unit

⚠ CAUTION

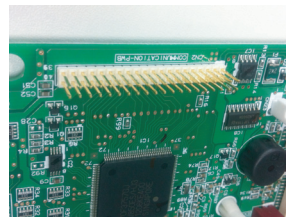
Before servicing the unit, turn the power supply switch OFF,
When you approach PWB, be sure to equip with the electrostatic removal band.
(PWB maybe broken by static electricity.)

1. Indoor unit Transmisson PCB removal

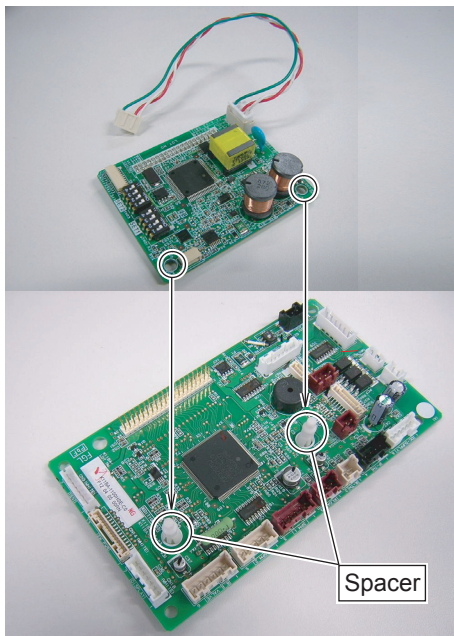


: Touchable area

1. Disconnect the connector of transmisson wire form the **Terminal - board side**.
2. Hold the PCB's both end of touchable area mentioned on the left figure.
3. Pull up the PCB one side and another side step by step.
(Do not deform the pins on the controller PCB)

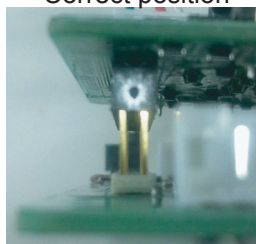


2. Indoor unit Transmisson PCB install

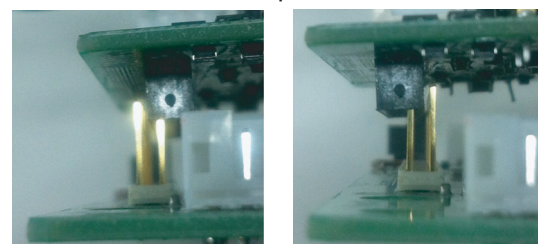


- 1.Before installing transmisson PCB on to the Main PCB, confirm the connector of transmisson wire was connected on the Transmission PCB.
2. Hold the PCB's both end of touchable area and adjust the position of transmisson PCB based on the position of spacers on the Main PCB. (Do not attach the transmisson PCB wrong position.)
*When the connection of transmisson PCB and the Main PCB was wrong, the both of PCB might be broken after power supply on.
3. After adjusting the position of PCB, attach the PCB to the Main PCB.

Correct position



Incorrect position



SET1-1	SET1-2	SET1-3	SET1-4	SET2-1	Indoor unit capacity
OFF	OFF	OFF	OFF	OFF	2.2kW
ON	OFF	OFF	OFF	OFF	2.8kW
OFF	ON	OFF	OFF	OFF	3.6kW
ON	ON	OFF	OFF	OFF	4.0kW
OFF	OFF	ON	OFF	OFF	4.5kW
ON	OFF	ON	OFF	OFF	5.6kW
OFF	ON	ON	OFF	OFF	7.1kW
ON	ON	ON	OFF	OFF	8.0kW
OFF	OFF	OFF	ON	OFF	9.0kW
ON	OFF	OFF	ON	OFF	11.2kW
OFF	ON	OFF	ON	OFF	12.5kW
ON	ON	OFF	ON	OFF	14.0kW
OFF	OFF	ON	ON	OFF	18.0kW
ON	OFF	ON	ON	OFF	22.4kW
OFF	ON	ON	ON	OFF	25.0kW
ON	ON	ON	ON	OFF	28.0kW

When you need to replace the transmisson PCB to new one, set the DIP-SW setting as same as the previous PCB's setting.

6.2 Outdoor Unit

⚠ WARNING

Before servicing the unit, turn the power supply switch OFF,
Then, do not touch electric parts for 10 minutes due to the risk of electric shock.

1. Appearance

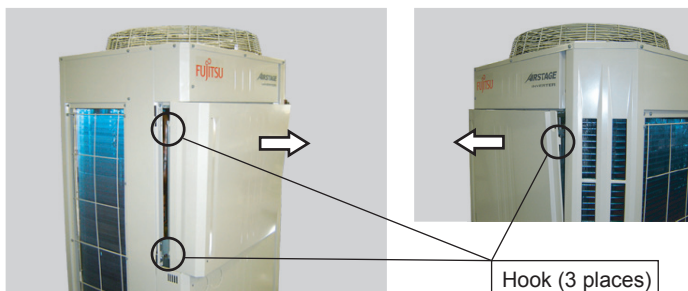


Model : AJUA72_96TLBV (S chassis)
AJUA120TLBV (L chassis)

2. PANEL TOP removal



Remove the 4 mounting screws.

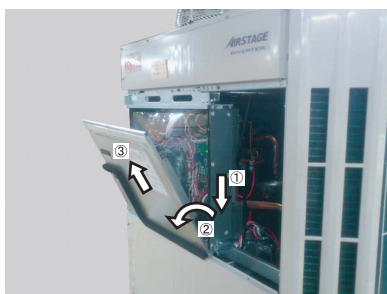


Remove the PANEL TOP
by sliding toward.

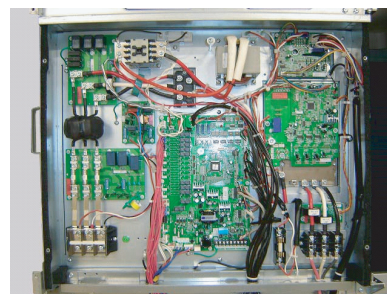
3. CONTROL BOX COVER removal



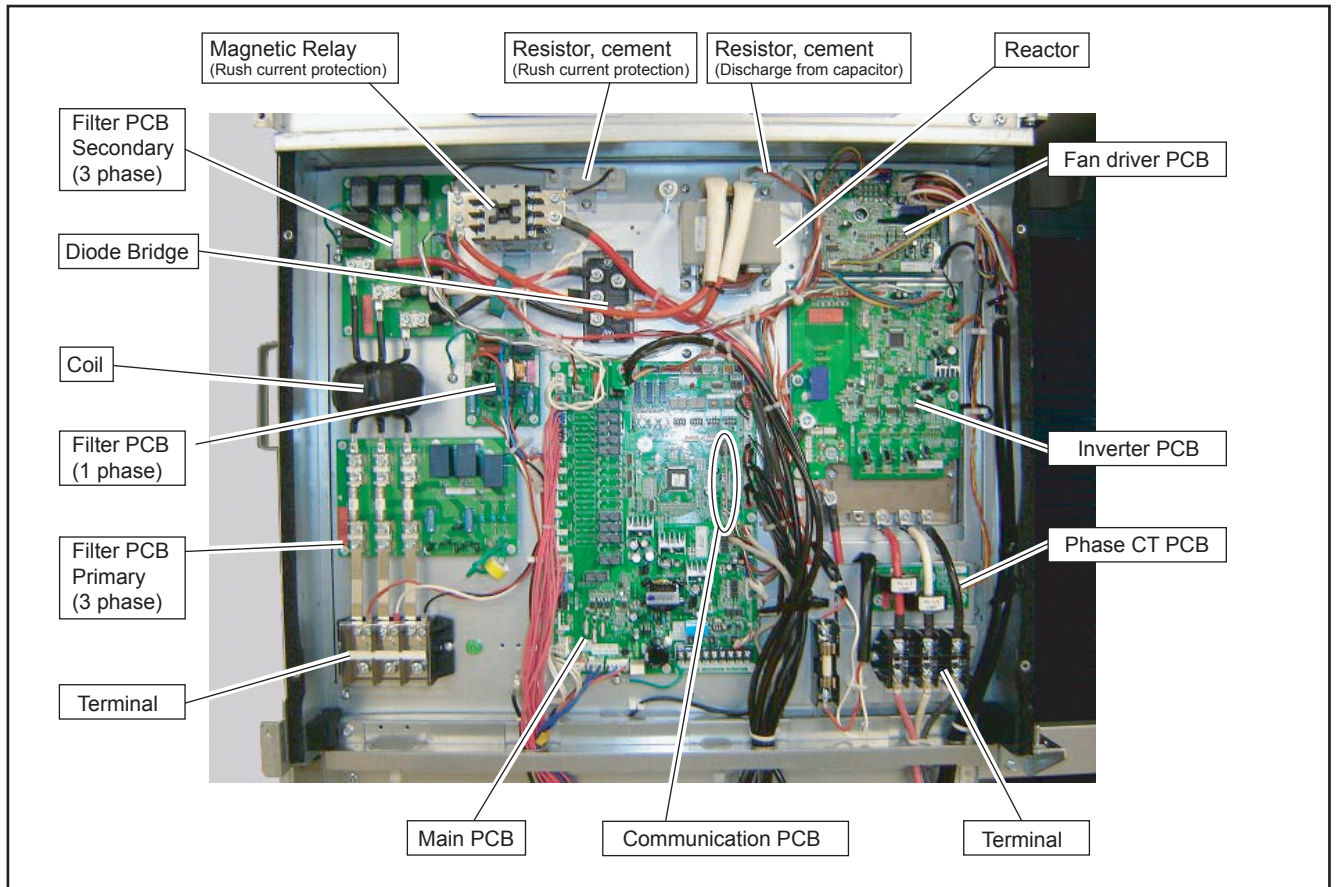
Remove the 4 mounting screws.



Remove the CONTROL BOX COVER
by sliding toward.

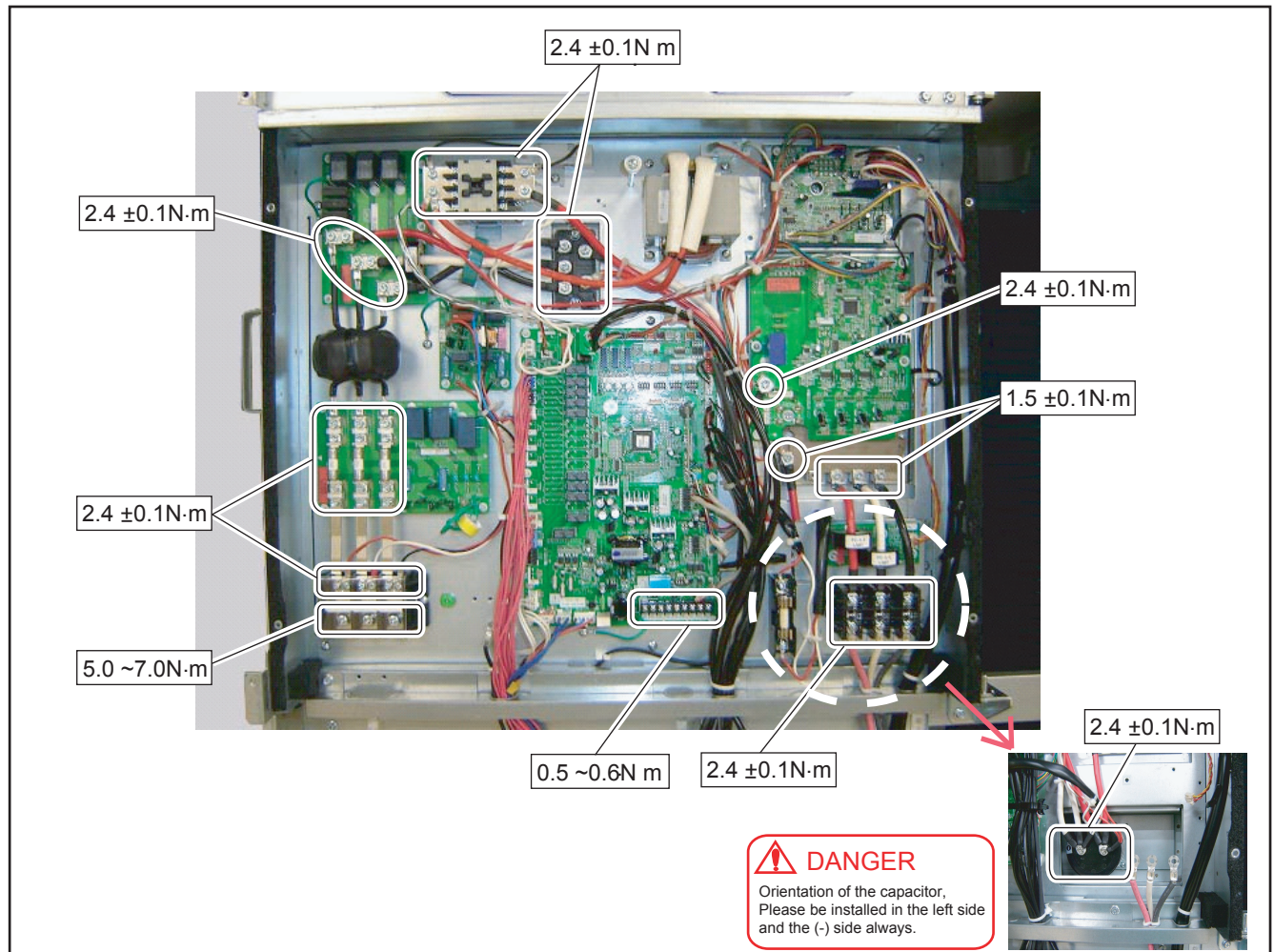


4. Layout plan in CONTROL BOX

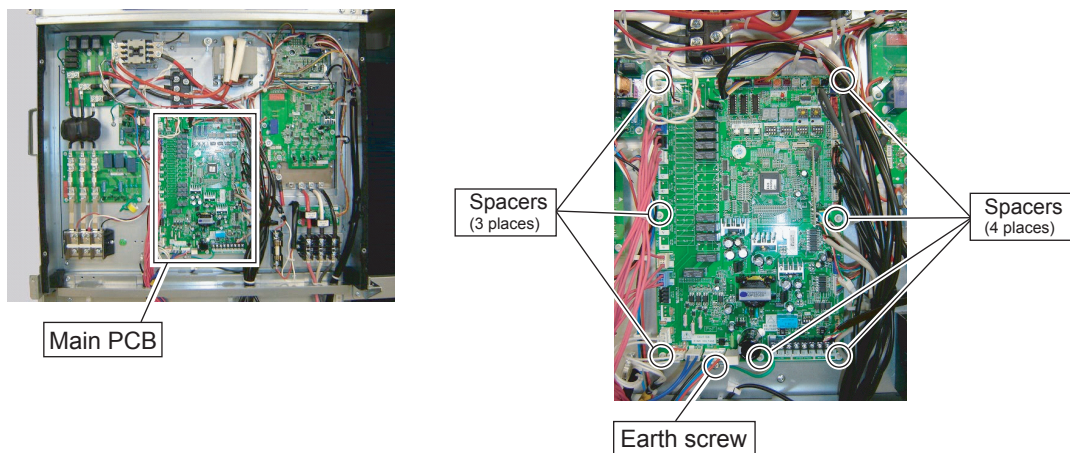


5. Screw tightening torque

⚠ DANGER There is danger to which a fire and the capacitor explosion break out in the market if it does not assemble it with a regulated torque.



6. Main PCB removal



Remove the connectors and earth screw.
Remove the spacers.

⚠ CAUTION

The model name is written in Main PCB of the outdoor unit and indoor unit, and when the factory of the product is shipped, it is written. However, the model name is not written in the Main PCB supplied for the repair. When the following function is made to work, the written model name is needed.

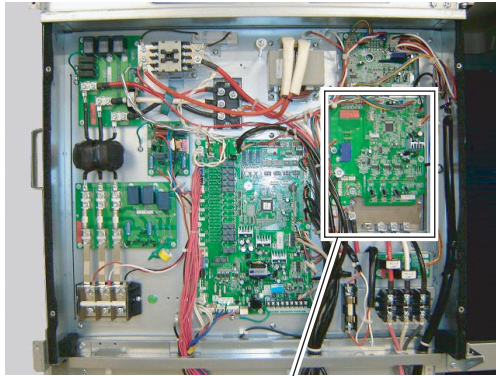
1. Display of system list display in service tool or system controller
2. Display of refrigerant circuit diagram in service tool.
3. When you use the electricity charge calculation function as system controller or touch panel controller.

If the model name is not written, the trouble such as the refrigerant circuit diagram is not displayed or the electricity charge calculation is not done accurately might occur.

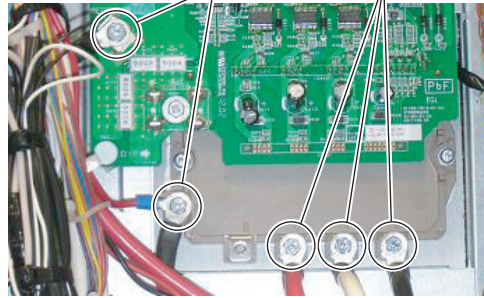
Therefore, please register the model name to each controller who uses it when you exchange Main PCB by the repair.

1. Model name registration to service tool
Please register the model name with the system list template files.
(Please see the operation manual of the service tool for details)
2. Model name registration to system controller
Please register the model name by the electricity charge calculation setting.
(Please see the operation manual of the system controller for details)

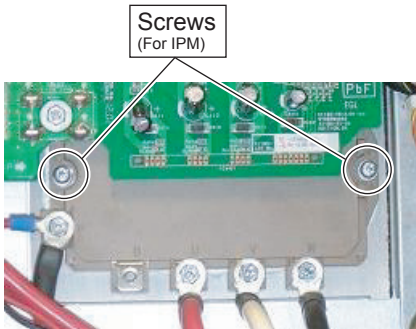
7. Inverter PCB removal



Inverter PCB



Remove the 5 mounting screws and codes.

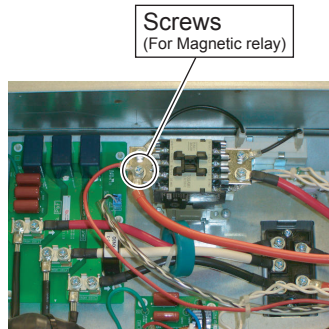


Remove the 2 mounting screws.

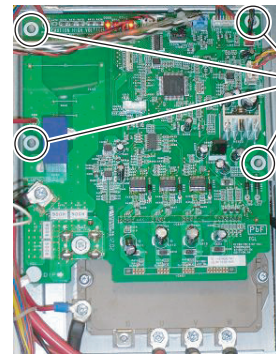
Note the tightening torque at the installation.

Tightening torque is as follows.

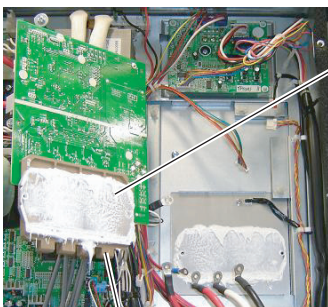
- Temporary tightening : $0.3 \pm 0.1 \text{ N}\cdot\text{m}$
- Final tightening : $1.5 \pm 0.1 \text{ N}\cdot\text{m}$



Remove the mounting screw and code.



Remove the connectors and spacers.



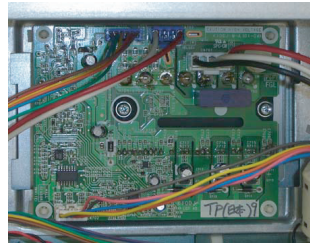
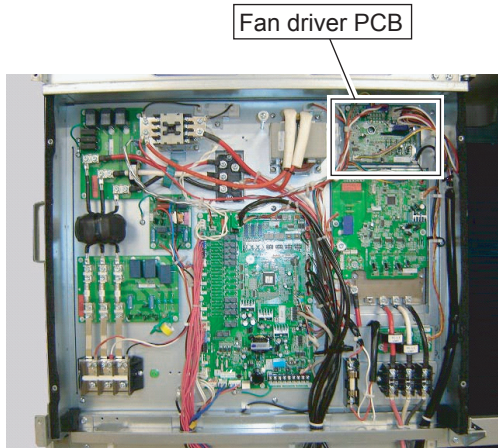
IPM

Compound

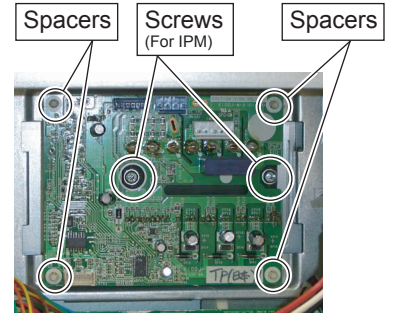
Parts Name	Service Parts No.
HEAT SINKER(20g)	0000036795

Spread the heat dissipation compound on the other side of IPM when you exchange Inverter PCB by the repair.

8. Fan driver PCB removal



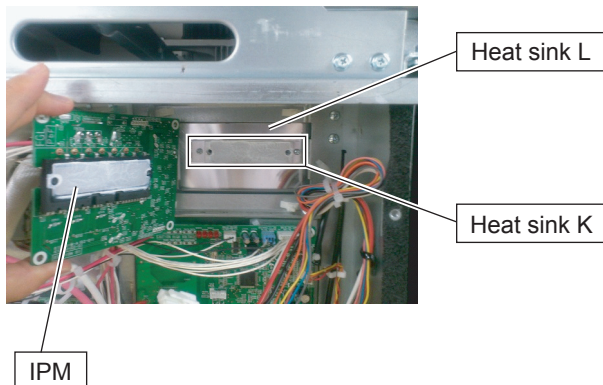
Remove the connectors.



Remove the 2 mounting screws and the spacers.

Note the tightening torque at the installation. Tightening torque is as follows.

- Temporary tightening : $0.3 \pm 0.1\text{N}\cdot\text{m}$
- Final tightening : $1.3 \pm 0.1\text{N}\cdot\text{m}$



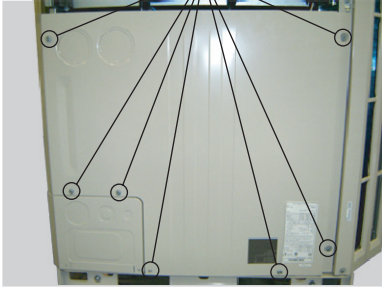
- Spread the heat dissipation compound on the other side of IPM when you exchange Fan driver PCB by the repair.

- Spread the heat dissipation compound without a gap between the Heat sink L and Heat sink K.

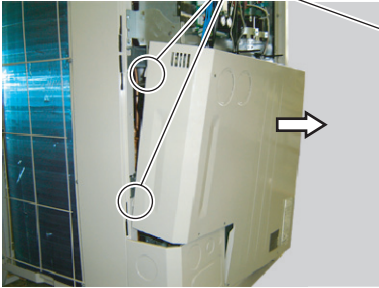
Compound

Parts Name	Service Parts No.
HEAT SINKER(20g)	0000036795

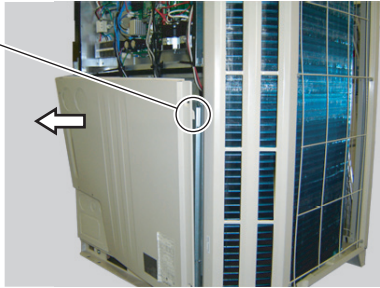
9. PANEL BTM removal



Screws (7 places)

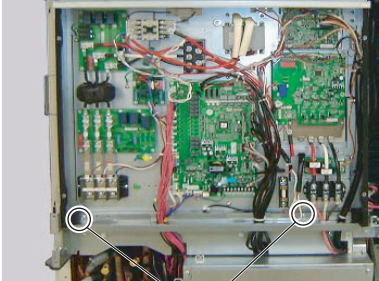


Hook (3 places)

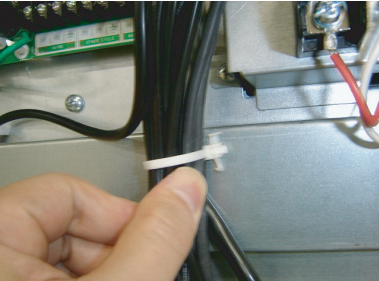
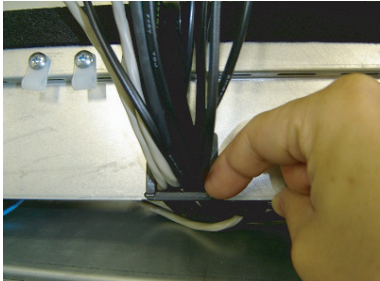


Remove the 7 mounting screws. Remove the PANEL BTM by sliding toward.

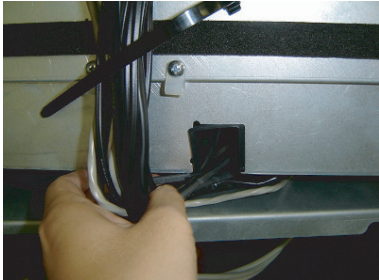
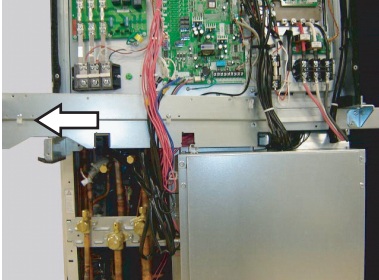
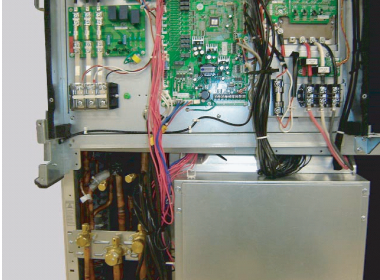
10. Control Box open



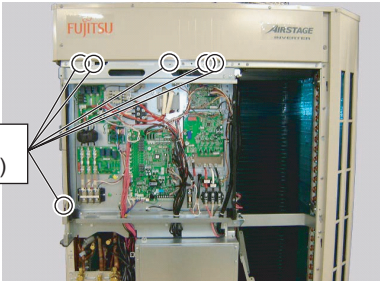
Screws (2 places)

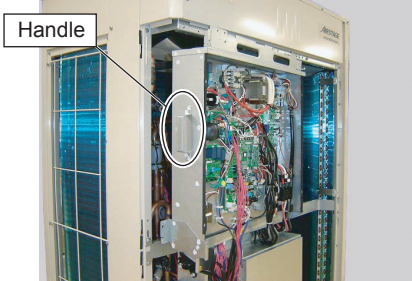
Remove the 2 mounting screws. Loose or remove the cable ties. (3 places) Remove the locking stopper of edging saddle. (3 places)

Remove the wires from edging saddle. (3 places) Remove the Wire plate by sliding rightward.



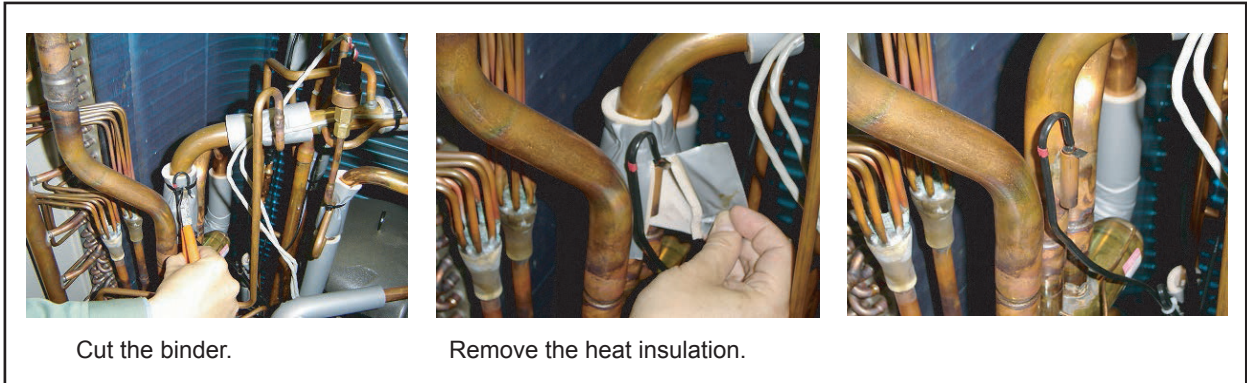
Screws (6 places)



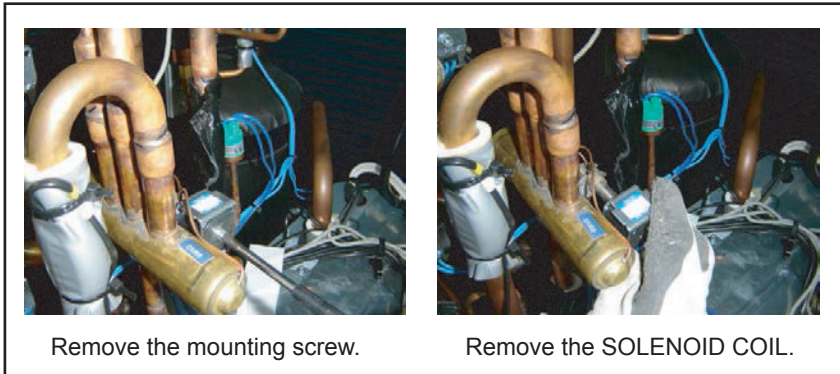
Handle

Remove the 6 mounting screws. Open the Control Box with handle.

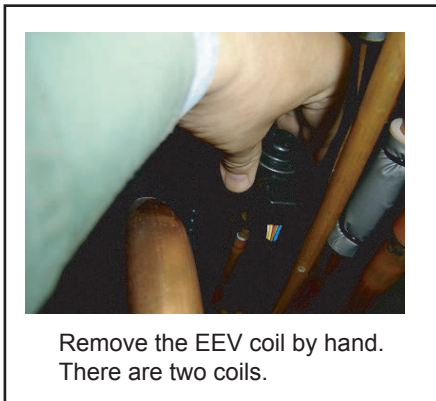
11. THERMISTORS removal



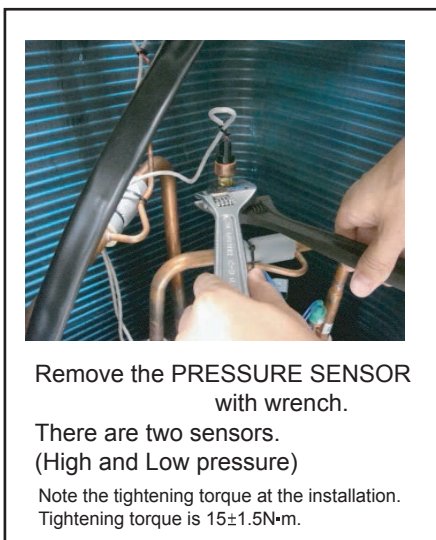
12. SOLENOID COILS (4way valve and Solenoid valves) removal



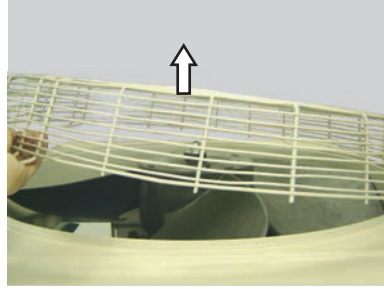
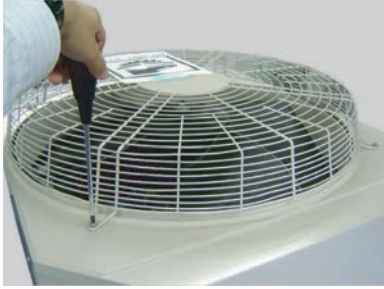
13. EEV COILS removal



14. PRESSURE SENSORS removal



15. Fan motor removal



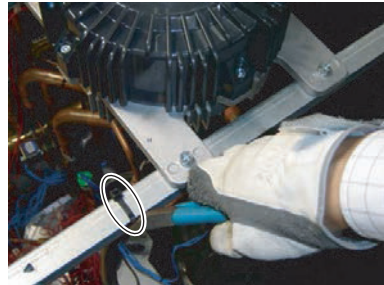
Remove the Fan Guard.



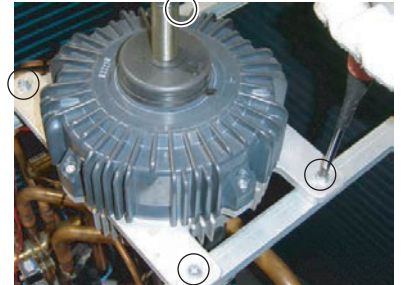
Remove the nut.
Note the tightening torque at the installation.
Tightening torque is from 15 to 20N·m.



Remove the Propeller fan.
Note at the installation.
Insert propeller fan and motor shaft reference
D cutting position.

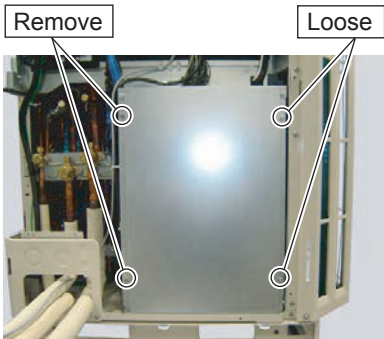


Cut the cable tie.

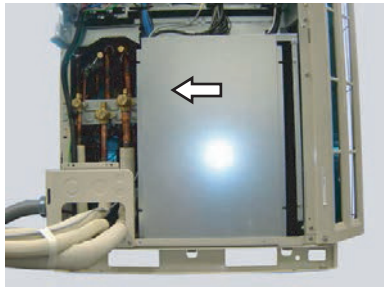


Remove the 4 mounting screws.
Remove the Fan motor.

16. Comp box cover removal



Loose the 2 mounting screws.
Remove the 2 mounting screws.



Remove the Comp box cover
by sliding leftward and toward.



17. Compressor removal

Precautions for exchange of Compressor.

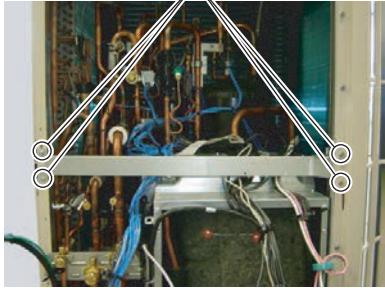
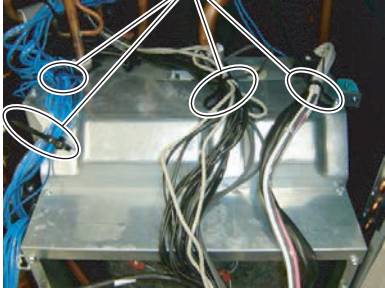
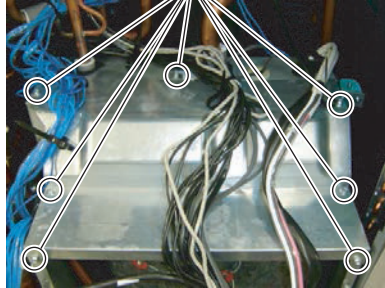
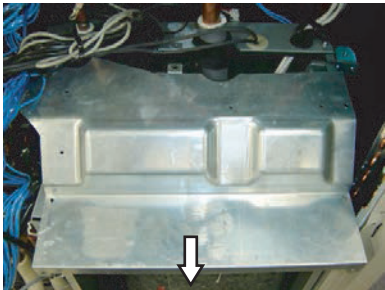
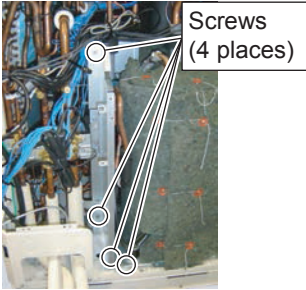
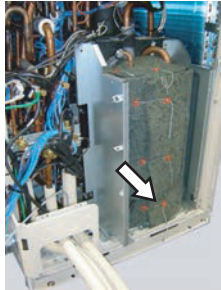
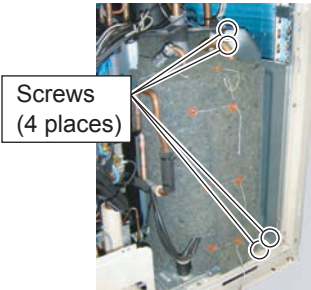


Do not allow moisture or debris to get inside refrigerant pipes during work.

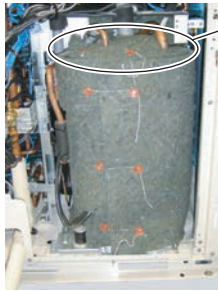
Procedure for compressor removal.

- (1) Turn off power.
- (2) Remove the Panel top and Panel btm.
- (3) Remove the Control Box.
- (4) Fully close the 3-way valve (Discharge gas), (Suction gas), and (Liquid).
- (5) Collect the refrigerant from the service port.

Start the following work after completely collecting the refrigerant.

Do not reuse the refrigerant that has been collected.

 <p>Screws (4 places)</p>	 <p>Cable ties (4 places)</p>	 <p>Screws (7 places)</p>
<p>Remove the 4 mounting screws. Remove the Center beam.</p>	<p>Loose or remove the cable ties. (4 places)</p>	<p>Remove the 7 mounting screws.</p>
 <p>Remove the Comp Box(Top) by sliding toward.</p>	 <p>Screws (4 places)</p> <p>Remove the 4 mounting screws.</p>	 <p>Remove the Comp Box(L) by sliding toward.</p>
 <p>Screws (4 places)</p> <p>Remove the 4 mounting screws.</p>	 <p>Remove the Comp Box(R) by sliding toward.</p>	



Comp.cover (Top)
Color: White& Green



Comp. cover (Body)
Color: White

Comp. cover (Accumulator)
Color: white

Comp. cover (Outside)
Color: Green

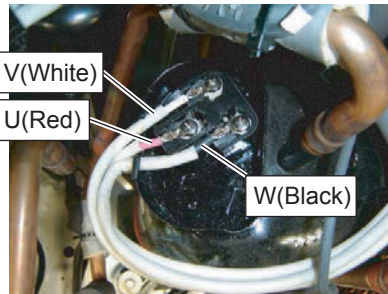
Remove the Compressor cover (Top).

Note :
Compressor cover (Top) consists of 2 parts.
The inside of the Comp.cover is white, and the outside of Comp.cover is green.

Remove the Compressor cover (Outside), Compressor cover (Accumulator), and Compressor cover (Body).



Remove the Terminal Cover.



Remove the 3 mounting screws of Terminal.

[U: Red, V: White, W: Black]

Note the tightening torque at the installation.
Tightening torque is 2.0 ~2.5N·m.



Discharge temp. thermistor (TH1)

Compressor shell temp. thermistor (TH11)

Remove the Discharge temp. thermistor and Compressor shell temp. thermistor.



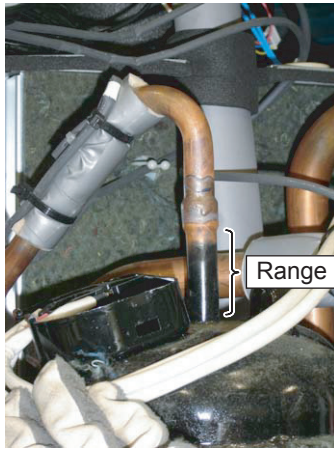
Remove the Comp Bolts.
(4 places)



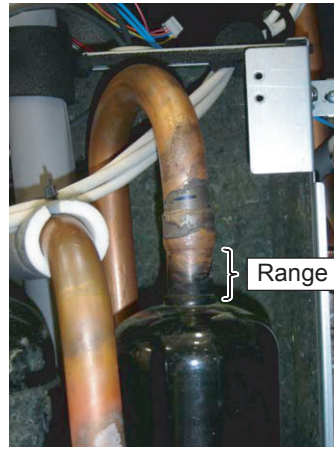
Hook (2 places)

Crank Case Heater (2 places)

Remove the Crank Case Heaters.
Note the tightening torque at the installation.
Crank Case Heater should not overlap each other.



Cut the Discharge pipe in this range.



Cut the Suction pipe in this range.
Remove the Compressor.

Caution

- Keep their shape better.
- There is a possibility of catching fire to oil when removing by the welding without cutting it.

Procedure for compressor installation.

Reverse procedure to removing the compressor.

Precautions for installation of Compressor.

- (1) When brazing, do not apply the flame to the terminal.
- (2) When brazing, be sure to replace the air in the pipe with nitrogen gas to prevent forming oxidization scale.

18. Precautions for exchange of 4 way valve A Assy

4 way valve A assy includes a " Fusible plug ". Be aware of the followings when repairing.

1. Fusible plug

Plug made of fusible alloy.

When a temperature inside equipment extremely rises by fire disaster, fusible alloy of plug will melt and make a hole.

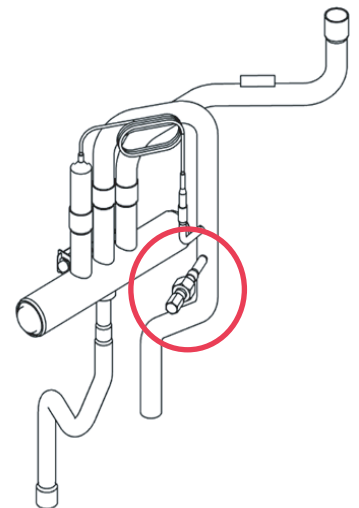
And refrigerant inside equipment will be discharged for preventing a burst of pressure vessel coming from pressure increase.

2. Location of Fusible plug

<Precautions>

- (1) When a temperature reaches to 167 degrees F (75 degrees C), fusible alloy in the center of plug will melt and make a hole.
- (2) When you replace a fusible plug, make sure to replace "4 way valve A assy" extensively.
- (3) When you replace a "4 way valve A assy", make sure to drape a wet rag on it for keeping it cool.
If fusible alloy melts and makes a hole from heat, vacuum drawing and refrigerant charging will be not available.
Also refrigerant inside will be discharged swiftly.
- (4) When you weld pipes or parts near fusible plug, make sure to insulate plug and pipes from fire and guard a plug using a wet rag.
- (5) Do not unclench a fusible plug. Airtightness will be compromised.
If a plug is unclenched
(In order to keep high airtightness, it is controlled strictly by tightening torque, seal tape and Loctite.)

"4 way valve A assy"
(P/N 9379052092)



19. Precautions for when replacing refrigerant-cycle-parts

- (1) During replacement of the following parts shall be protected by wet rag and not make the allowable temperature or more.
- (2) Remove the heat insulation when there is the heat insulation near the welding place.
Move and cool it when its detaching is difficult.
- (3) Cool the parts when there are parts where heat might be transmitted besides the replacement part.
- (4) Interrupt the flame with the fire-retardant board when the flame seems to hit the following parts directly.
- (5) Do not allow moisture or debris to get inside refrigerant pipes during work.
- (6) When brazing, be sure to replace the air in the pipe with nitrogen gas to prevent forming oxidization scale.

Part name	Allowable temperature	Precautions in work
Solenoid Valve 1 /2 /3 /4	392°F (200°C)	Remove the coil before brazing. And install the coil after brazing.
Expansion Valve 1 /2 /3	248°F (120°C)	Remove the coil before brazing. And install the coil after brazing.
4-way Valve A /B		Remove the suction temp. sensor before brazing. And install the suction temp. sensor after brazing.
Check Valve		
3-way Valve (Discharge gas)	212°F (100°C)	
3-way Valve (Suction gas)		
3-way Valve (Liquid)		
Union Joint		Remove the pressure sensor before brazing. And install the pressure sensor after brazing.
High pressure sensor		Tighten the flare part gripping it. (Tightening torque :15±1.5N·m)
Low pressure sensor		Do the static electricity measures.
Pressure switch		
Fusible plug	167°F (75°C)	Make sure to drape a wet rag on it. for keeping fusible plug cool.



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Product specifications are subject to change without notice.

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