3.54 "UC" Address Duplication of Centralized Controller

Remote Control Display

UC

Applicable Models

All models of indoor unit
Centralized controller

Method of Malfunction Detection

The principal indoor unit detects the same address as that of its own on any other indoor unit.

Malfunction Decision Conditions

The malfunction decision is made as soon as the abnormality aforementioned is detected.

Supposed Causes

- Address duplication of centralized controller

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

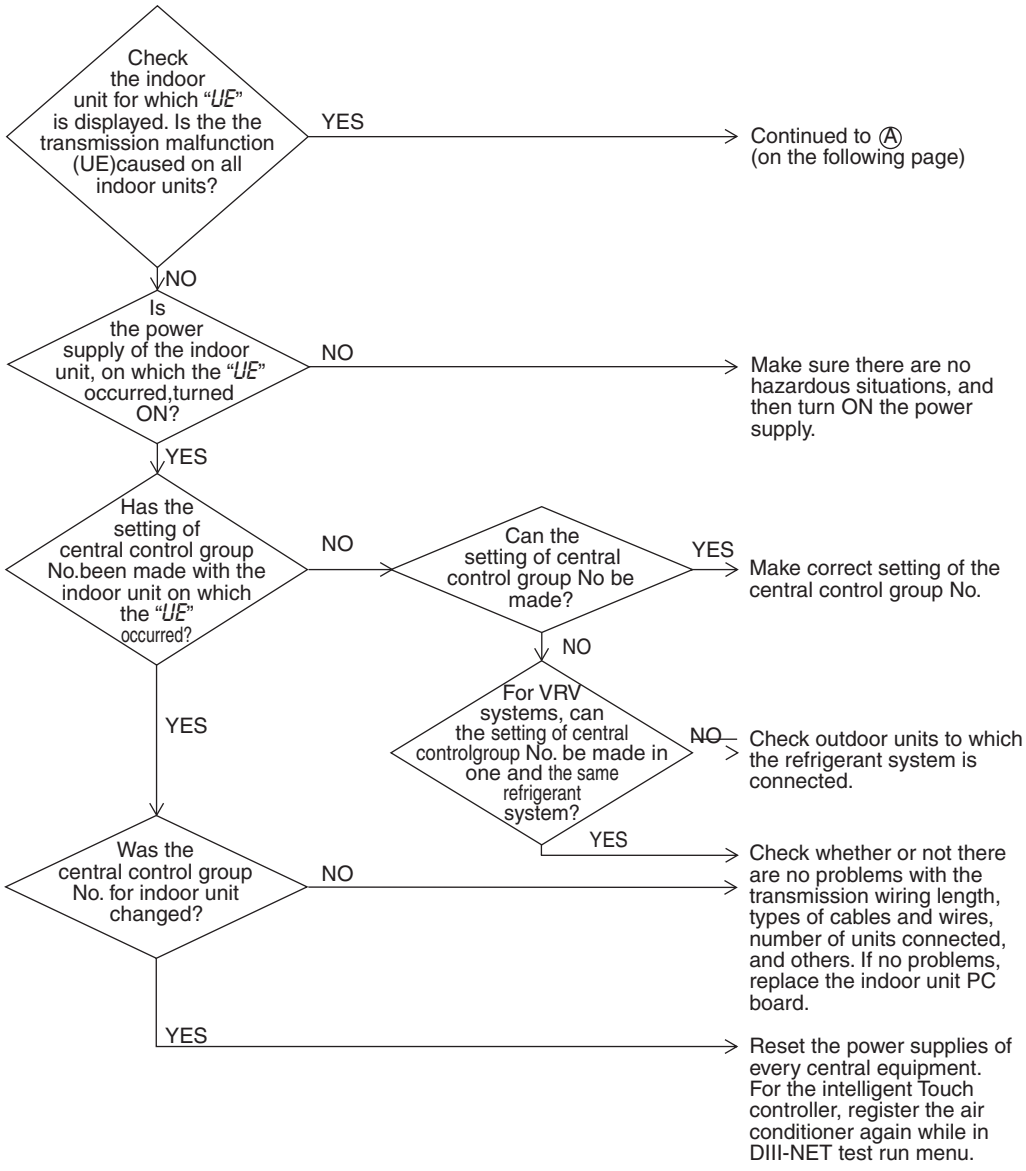
The centralized address is duplicated. → Make setting change so that the centralized address will not be duplicated.

3.55 "UE" Malfunction of Transmission between Centralized Controller and Indoor Unit

Remote Control Display	UE
Applicable Models	All models of indoor units Intelligent Touch Controller Centralized controller Schedule timer
Method of Malfunction Detection	Microcomputer checks if transmission between indoor unit and centralized controller is normal.
Malfunction Decision Conditions	When transmission is not carried out normally for a certain amount of time
Supposed Causes	■ Malfunction of transmission between optional controllers for centralized control and indoor unit ■ Connector for setting master controller is disconnected. (or disconnection of connector for independent / combined use changeover switch.) ■ Failure of PC board for central remote control ■ Defect of indoor unit PC board

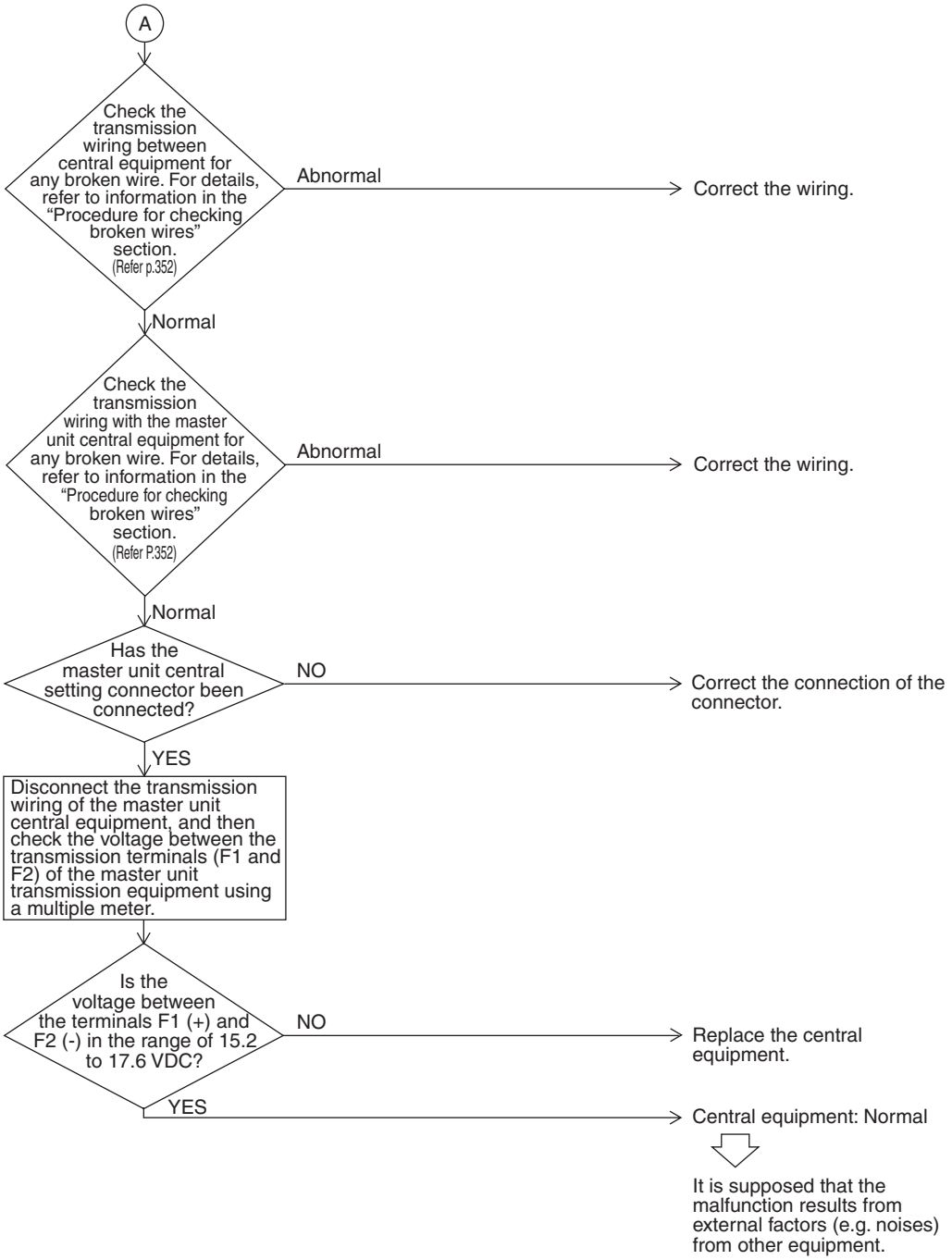
Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2822)

Troubleshooting



3.56 "UF" System is not Set yet

Remote Control Display

UF

Applicable Models

All models of indoor units
REYQ8P~48P

Method of Malfunction Detection

On check operation, the number of indoor units in terms of transmission is not corresponding to that of indoor units that have made changes in temperature.

Malfunction Decision Conditions

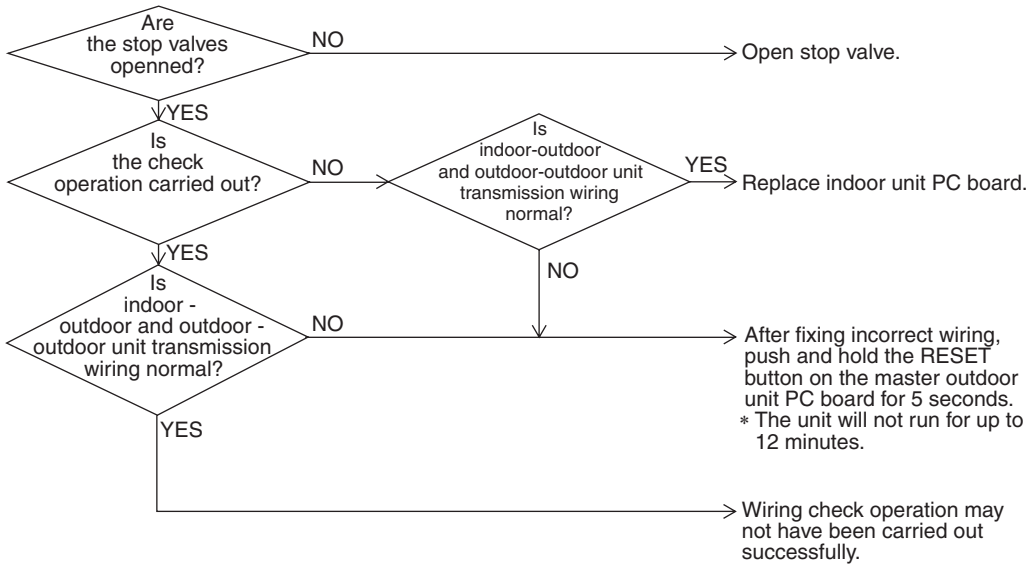
The malfunction is determined as soon as the abnormality aforementioned is detected through checking the system for any erroneous connection of units on the check operation.

Supposed Causes

- Improper connection of transmission wiring between indoor-outdoor units and outdoor-outdoor units
- Failure to execute check operation
- Defect of indoor unit PC board
- Stop valve is left in closed

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



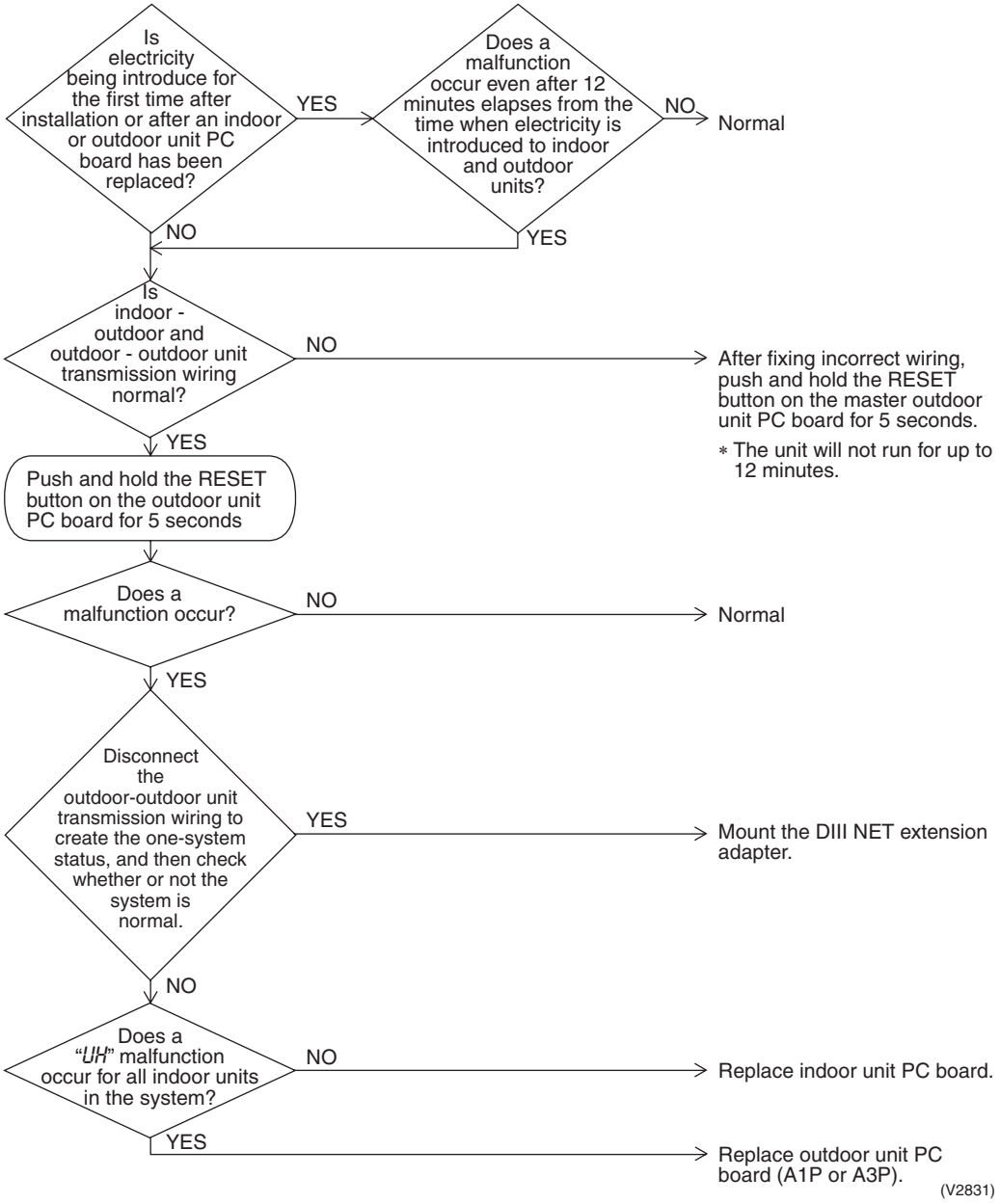
Note: Wiring check operation may not be successful if carried out after the outdoor unit has been off for more than 12 hours, or if it is not carried out after running all connected indoor units in the fan mode for at least an hour.

3.57 "UH" Malfunction of System, Refrigerant System Address Undefined

Remote Control Display	UH
Applicable Models	All models of indoor units REYQ8P~48P
Method of Malfunction Detection	Detect an indoor unit with no address setting.
Malfunction Decision Conditions	The malfunction decision is made as soon as the abnormality aforementioned is detected.
Supposed Causes	■ Improper connection of transmission wiring between indoor-outdoor units and outdoor-outdoor units ■ Defect of indoor unit PC board ■ Defect of outdoor unit main PC board (A1P or A3P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1: Check the correct wiring "indoor-outdoor" and "outdoor-outdoor" by Installation Instruction.
∗2: What is Auto Address?
This is the address automatically assigned to indoor units and outdoor units after initial power supply upon installation, or after executing rewiring (Keep pressing the rewiring button for more than 4 seconds).

4. Troubleshooting (OP: Central Remote Control)

4.1 "M1" PC Board Defect

Remote Control Display

M1

Applicable Models

Central remote control Intelligent Touch Controller
Schedule timer

Method of Malfunction Detection

Detect an abnormality in the DIII-NET polarity circuit.

Malfunction Decision Conditions

When + polarity and - polarity are detected at the same time.

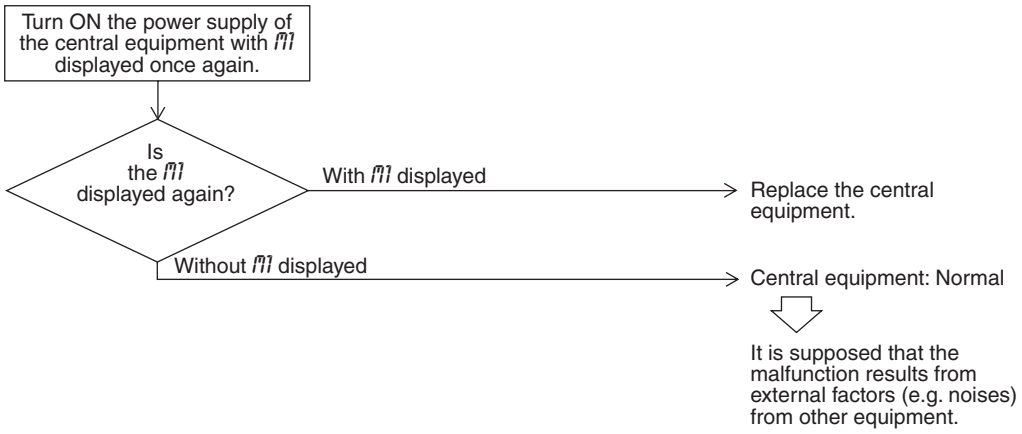
Supposed Causes

- Defect of central remote control PC board
- Defect of Intelligent Touch Controller PC board
- Defect of Schedule timer PC board

Troubleshooting

Replace the central remote control.

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



4.2 "M8" Malfunction of Transmission between Optional Controllers for Centralized Control

Remote Control Display

M8

Applicable Models

Central remote control Intelligent Touch Controller
Schedule timer

Method of Malfunction Detection

Detect the malfunction according to DIII-NET transmission data. (The system will be automatically reset.)

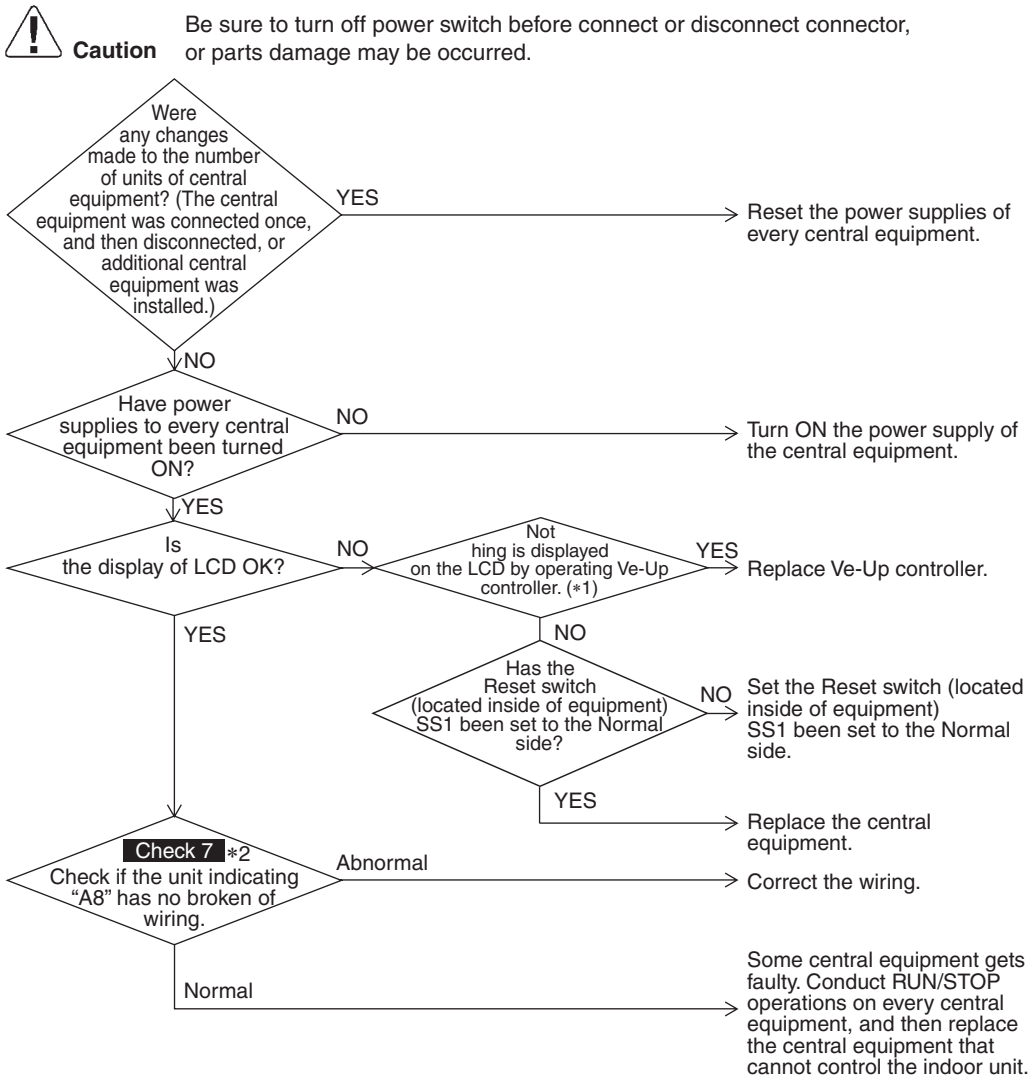
Malfunction Decision Conditions

When no master controller is present at the time of the startup of slave controller.
When the centralized controller, which was connected once, shows no response.

Supposed Causes

- Malfunction of transmission between optional controllers for centralized control
- Defect of PC board of optional controllers for centralized control

Troubleshooting



∗1: Display screen control using Ve-Up controller:
When the screen displays nothing by touching the screen, adjust the contrast volume.

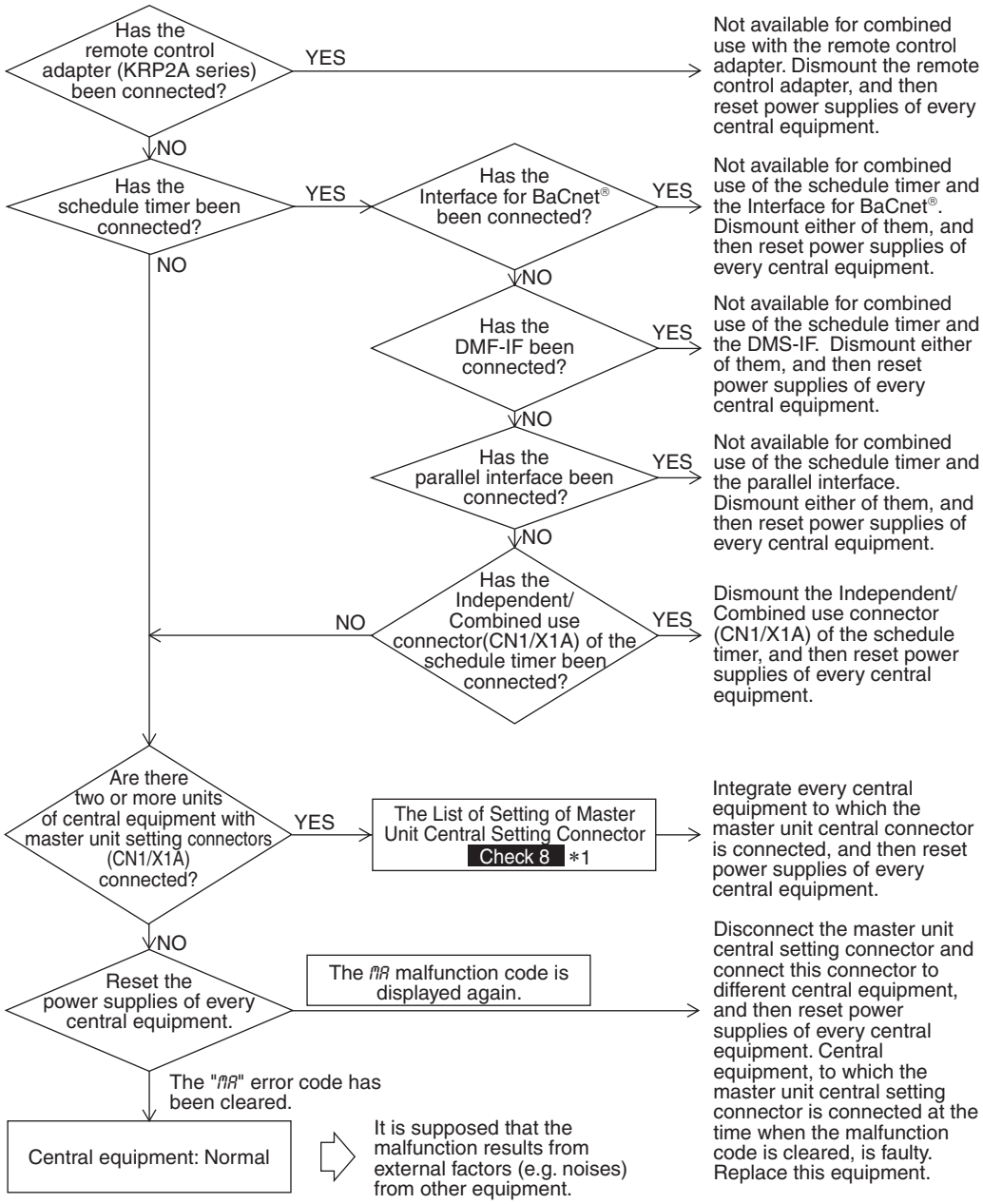
∗2 Check 7 : Referring to the information on P352.

4.3 "MA" Improper Combination of Optional Controllers for Centralized Control

Remote Control Display	MA
Applicable Models	Central remote control Intelligent touch controller Schedule timer
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data.
Malfunction Decision Conditions	When the schedule timer is set to individual use mode, other central component is present. When multiple master controller are present. When the remote control adapter is present.
Supposed Causes	■ Improper combination of optional controllers for centralized control ■ More than one master controller is connected ■ Defect of PC board of optional controller for centralized control

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1 Check 8 : Referring to the information on P353.

4.4 "MC" Address Duplication, Improper Setting

Remote Control Display

MC

Applicable Models

Central remote control Intelligent Touch Controller
Schedule timer

Method of Malfunction Detection

Detect the malfunction according to DIII-NET transmission data.

Malfunction Decision Conditions

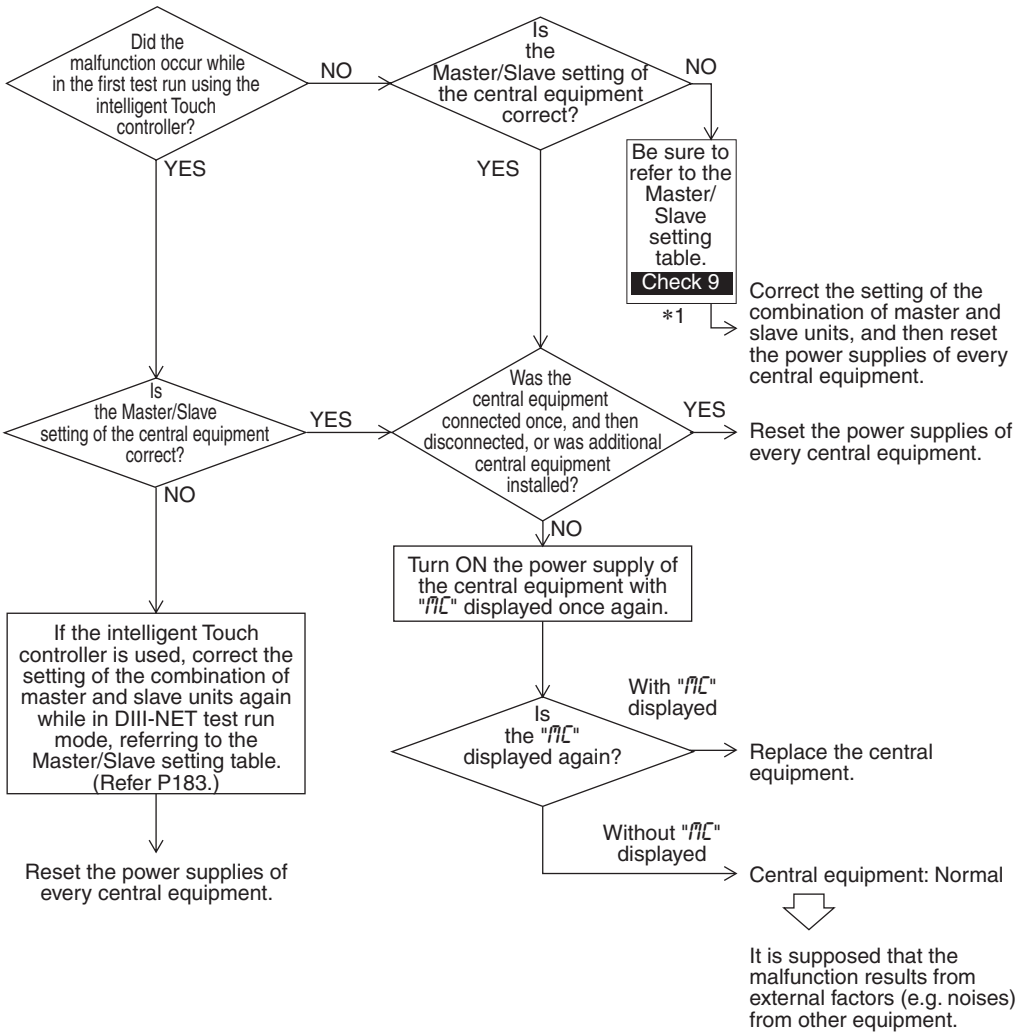
- Two or more units of central remote controls and Intelligent Touch Controllers are connected, and all of them are set to master unit central setting or slave unit central setting.
- Two units of schedule timers are connected.

Supposed Causes

- Address duplication of centralized controller

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1 Check 9 : Referring to the information on P354.

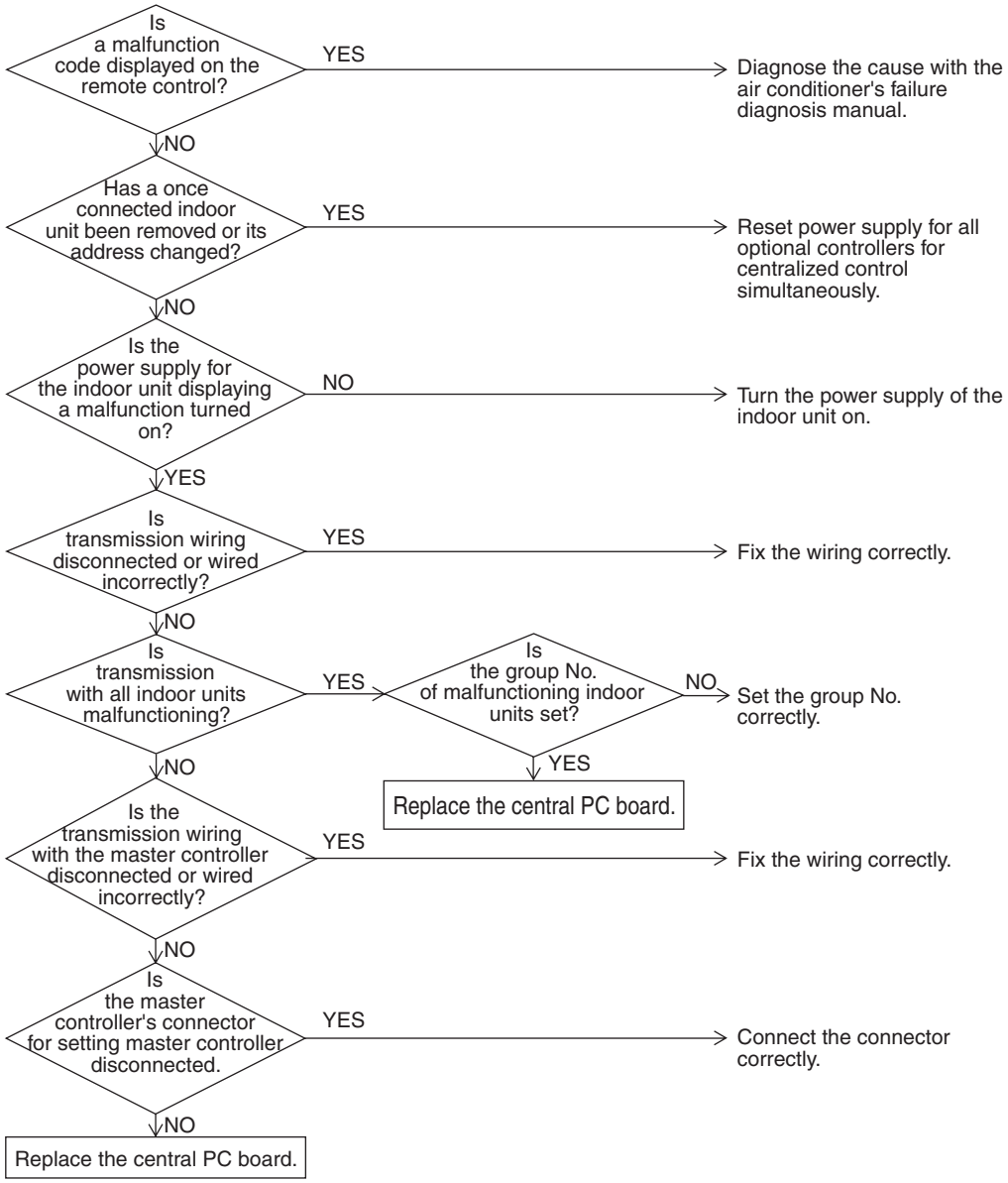
5. Troubleshooting (OP: Unified ON/OFF Controller)

5.1 Operation Lamp Blinks

Remote Control Display	Operation lamp blinks
Applicable Models	All model of indoor units Unified ON/OFF controller
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data.
Malfunction Decision Conditions	
Supposed Causes	■ Malfunction of transmission between optional central controller and indoor unit ■ Connector for setting master controller is disconnected ■ Defect of unified ON/OFF controller PC board ■ Defect of indoor unit PC board ■ Malfunction of air conditioner

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



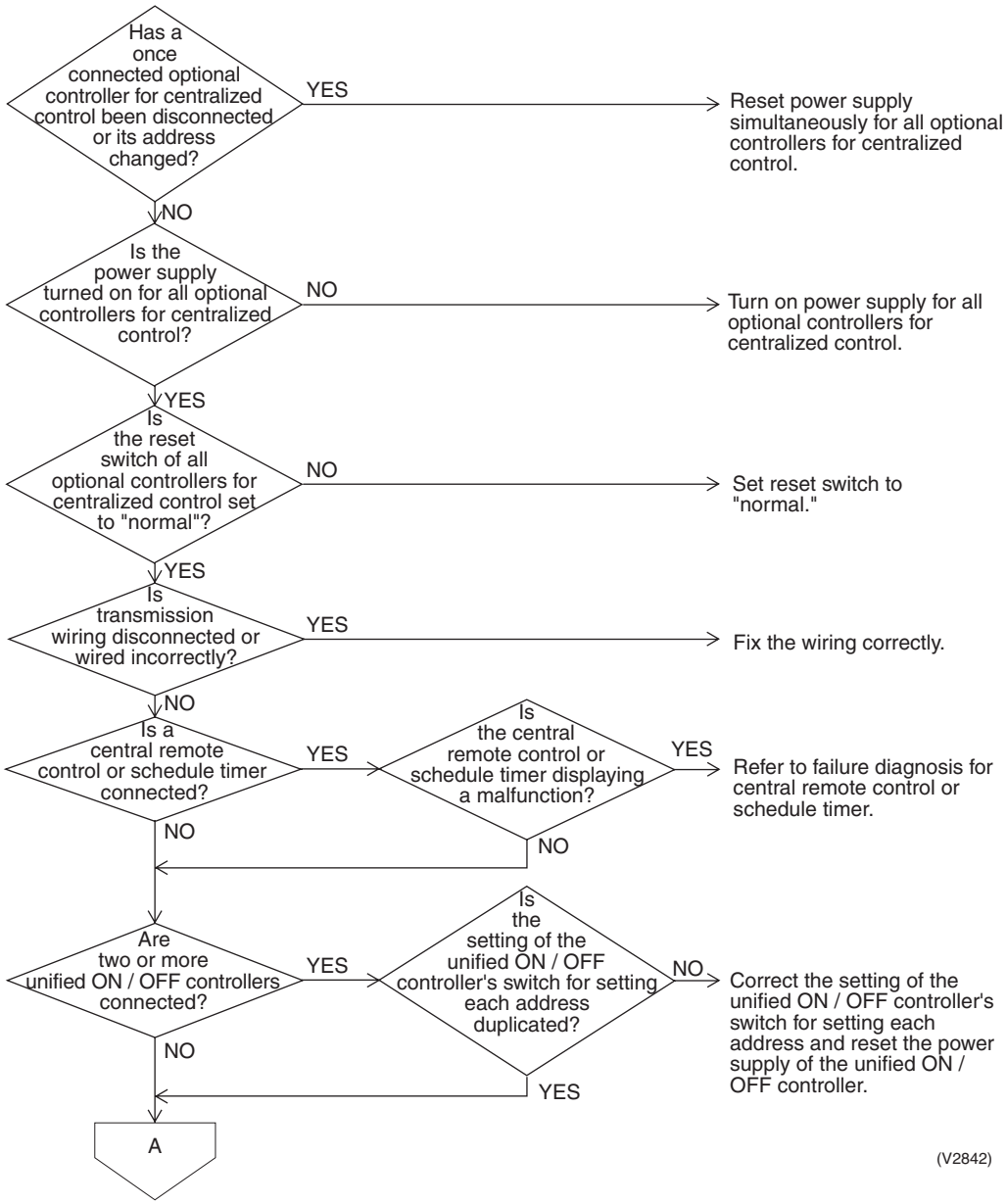
(V2841)

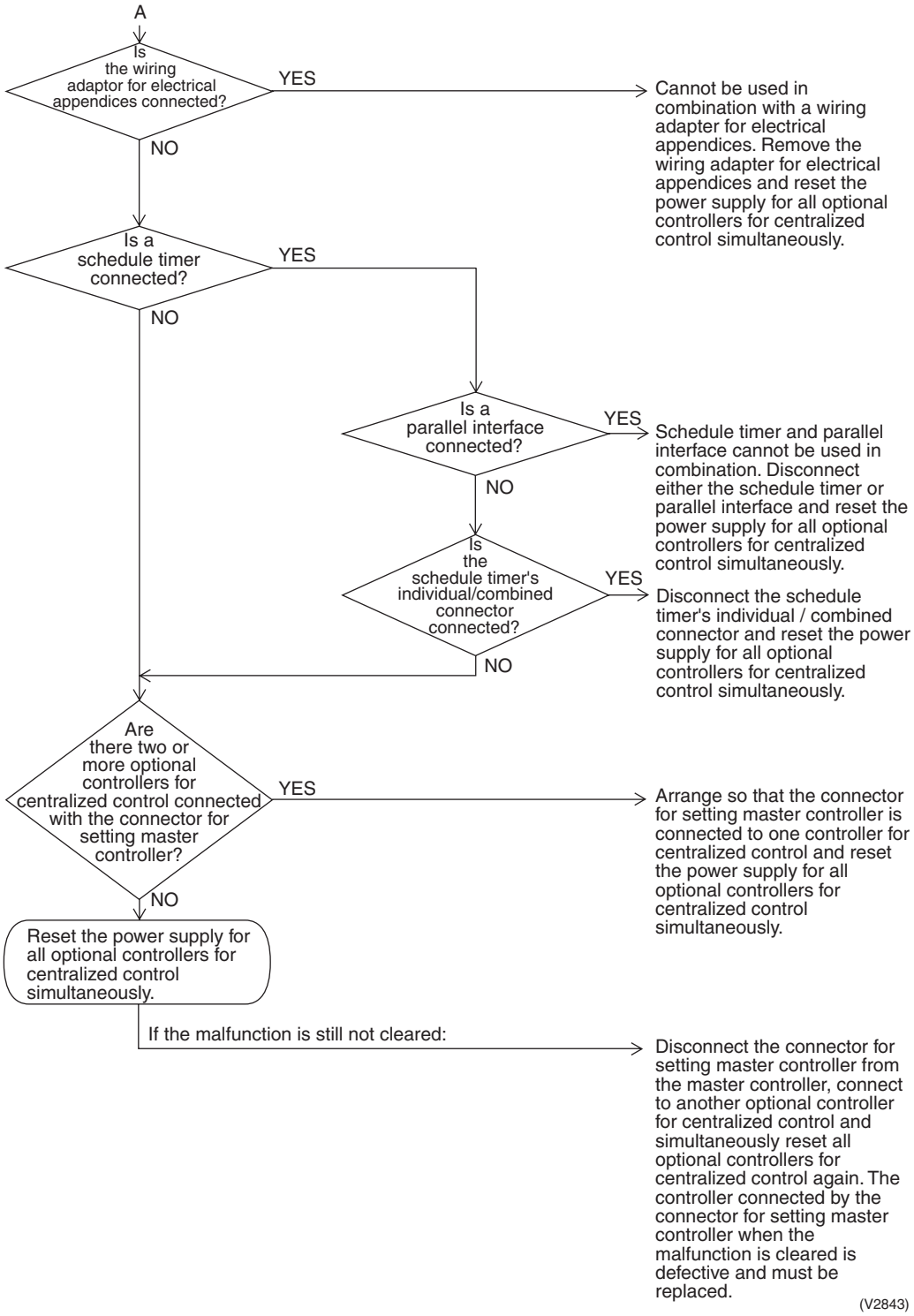
5.2 Display “Under Centralized Control” Blinks (Repeats Single Blink)

Remote Control Display	 “under centralized control” (Repeats single blink)
Applicable Models	Unified ON/OFF controller Central remote control, Schedule timer
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data.
Malfunction Decision Conditions	When the centralized controller, which was connected once, shows no response. The control ranges are overlapped. When multiple master central controller are present. When the schedule timer is set to individual use mode, other central controller is present. When the wiring adapter for electrical appendices is present.
Supposed Causes	■ Address duplication of optional controllers for centralized control ■ Improper combination of optional controllers for centralized control ■ Connection of more than one master controller ■ Malfunction of transmission between optional controllers for centralized control ■ Defect of PC board of optional controllers for centralized control

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.




A
Is the wiring adaptor for electrical appendices connected?
YES
Cannot be used in combination with a wiring adapter for electrical appendices. Remove the wiring adapter for electrical appendices and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Is a schedule timer connected?
YES
NO
Is a parallel interface connected?
YES
Schedule timer and parallel interface cannot be used in combination. Disconnect either the schedule timer or parallel interface and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Is the schedule timer's individual/combined connector connected?
YES
Disconnect the schedule timer's individual / combined connector and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Are there two or more optional controllers for centralized control connected with the connector for setting master controller?
YES
Arrange so that the connector for setting master controller is connected to one controller for centralized control and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Reset the power supply for all optional controllers for centralized control simultaneously.
If the malfunction is still not cleared:
Disconnect the connector for setting master controller from the master controller, connect to another optional controller for centralized control and simultaneously reset all optional controllers for centralized control again. The controller connected by the connector for setting master controller when the malfunction is cleared is defective and must be replaced.
(V2843)

5.3 Display “Under Centralized Control” Blinks (Repeats Double Blink)

Remote Control Display

“under centralized control” (Repeats double blink)

Applicable Models

Unified ON/OFF controller

Method of Malfunction Detection

Detect the malfunction according to DIII-NET transmission data.

Malfunction Decision Conditions

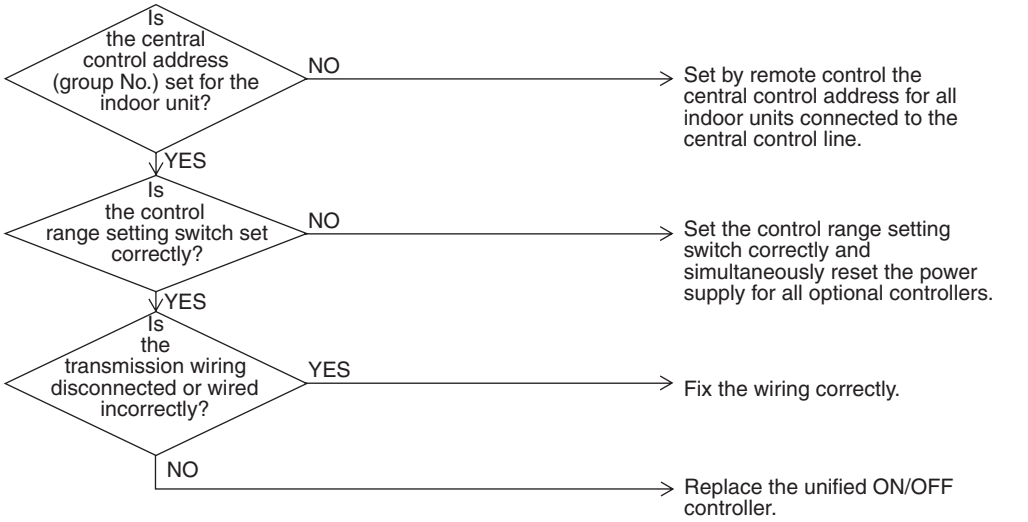
When no central control addresses are set to indoor units.
When no indoor units are connected within the control range.

Supposed Causes

- Central control address (group No.) is not set for indoor unit.
- Improper control range setting switch
- Improper wiring of transmission wiring

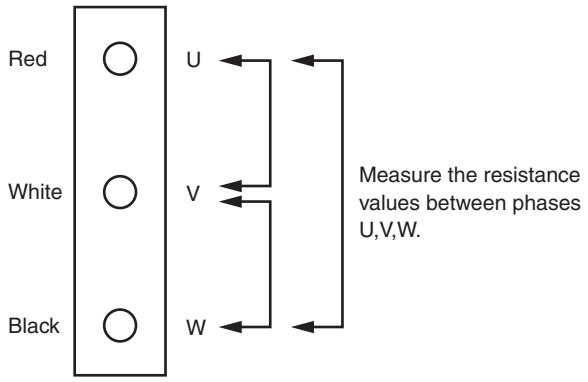
Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



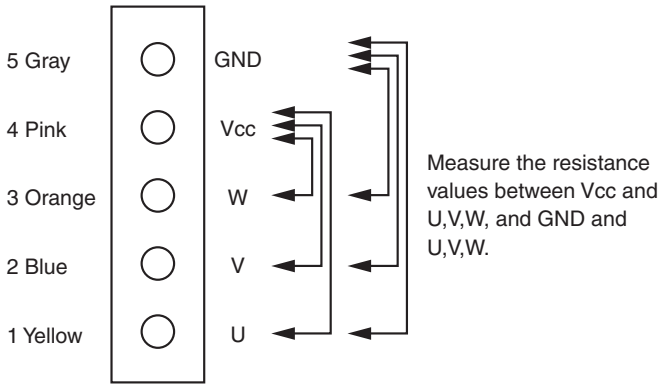
[CHECK 1] **Check on connector of fan motor (Power supply cable)**

(1) Turn off the power supply.
Measure the resistance between phases of U,V,W at the motor side connectors (three-core wire) to check that the values are balanced and there is no short circuiting, while connector or relay connector is disconnected.



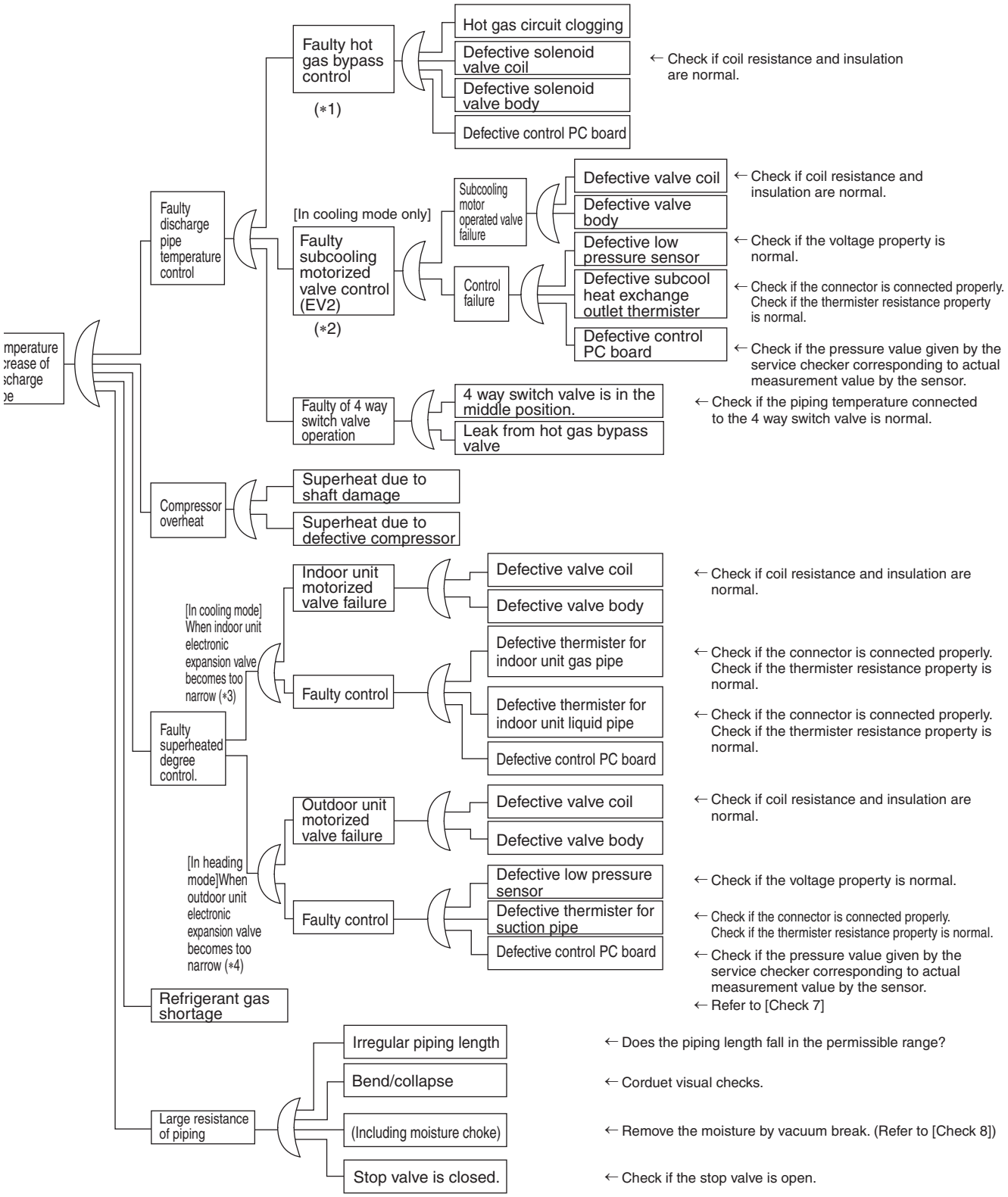
[CHECK 2]

(1) Turn off the power supply.
(2) Measure the resistance between Vcc and each phase of U,V,W, and GND and each phase at the motor side connectors (five-core wire) to check that the values are balanced within the range of ± 20 %, while connector or relay connector is disconnected.
Furthermore, to use a multiple meter for measurement, connect the probe of negative pole to Vcc and that of positive pole to GND.



[CHECK 3] Check the Factors of Overheat Operation

Identify the defective points referring to the failure factor analysis (FTA) as follows.



∗1: Refer to “Low pressure protective control” (P126) for hot gas bypass control.
∗2: Refer to P108 for subcooling electronic expansion valve control.
∗3: “Superheating temperature control” in cooling mode is conducted by indoor unit electronic expansion valve. (Refer to P141)
∗4: Superheating temperature control in heating mode is conducted by outdoor unit electronic expansion valve (EVM). (Refer to P108).
∗5: Judgment criteria of superheat operation:
① Suction gas superheating temperature: 10 degrees and over. ② Discharge gas superheating temperature: 45 degrees and over, except for immediately after starting and drooping control, etc..
(Use the above stated values as a guide. Depending on the other conditions, the unit may be normal despite the values within the above scope.)

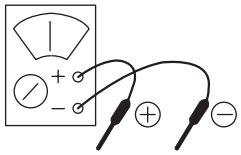
[CHECK 4] Power Transistor Check

Perform the following procedures prior to check.

(1) Power Off.
(2) Remove all the wiring connected to the PC board where power transistors are mounted on.

[Preparation]

· Tester



* Preparing a tester in the analog system is recommended. A tester in the digital system with diode check function will be usable.

[Point of Measurement and Judgment Criteria]

· Measure the resistance value using a tester at each point of measurement below, 10 minutes later after power OFF.

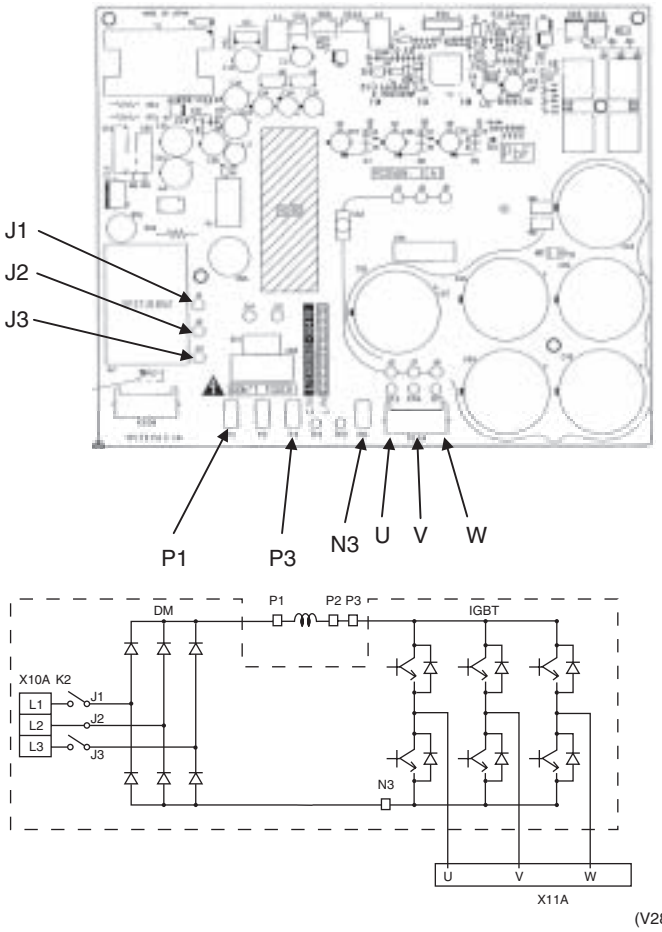
To use analog tester:
Measurement in the resistance value mode in the range of multiplying 1kΩ.

No.	Point of Measurement		Judgment Criteria	Remarks
	+	–		
1	P2	U	2 ~ 15kΩ	
2	P2	V		
3	P2	W		
4	U	P2	15kΩ and above (including ∞)	Due to condenser charge and so on, resistance measurement may require some time.
5	V	P2		
6	W	P2		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	2 ~ 15kΩ	
11	V	N3		
12	W	N3		

To use digital tester:
Measurement is executed in the diode check mode. (—▶|—)

No.	Point of Measurement		Judgment Criteria	Remarks
	+	–		
1	P2	U	1.2V and over	Due to condenser charge and so on, resistance measurement may require some time.
2	P2	V		
3	P2	W		
4	U	P2	0.3 ~ 0.7V	
5	V	P2		
6	W	P2		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	1.2V and over	Due to condenser charge and so on, resistance measurement may require some time.
11	V	N3		
12	W	N3		

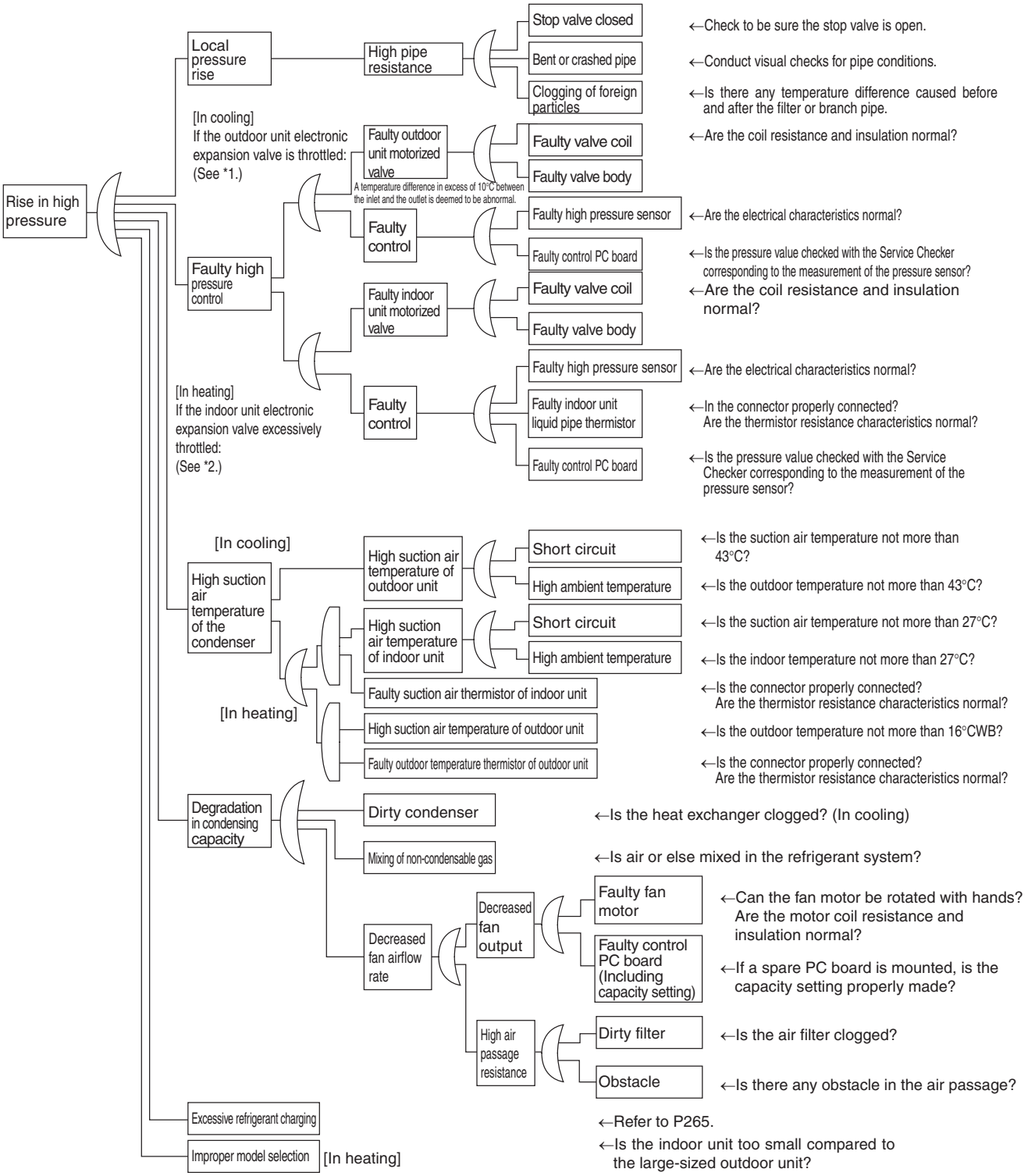
[PC board and Circuit Diagram]



(V2895)

[CHECK 5] Check for causes of rise in high pressure

Referring to the Fault Tree Analysis (FTA) shown below, probe the faulty points.

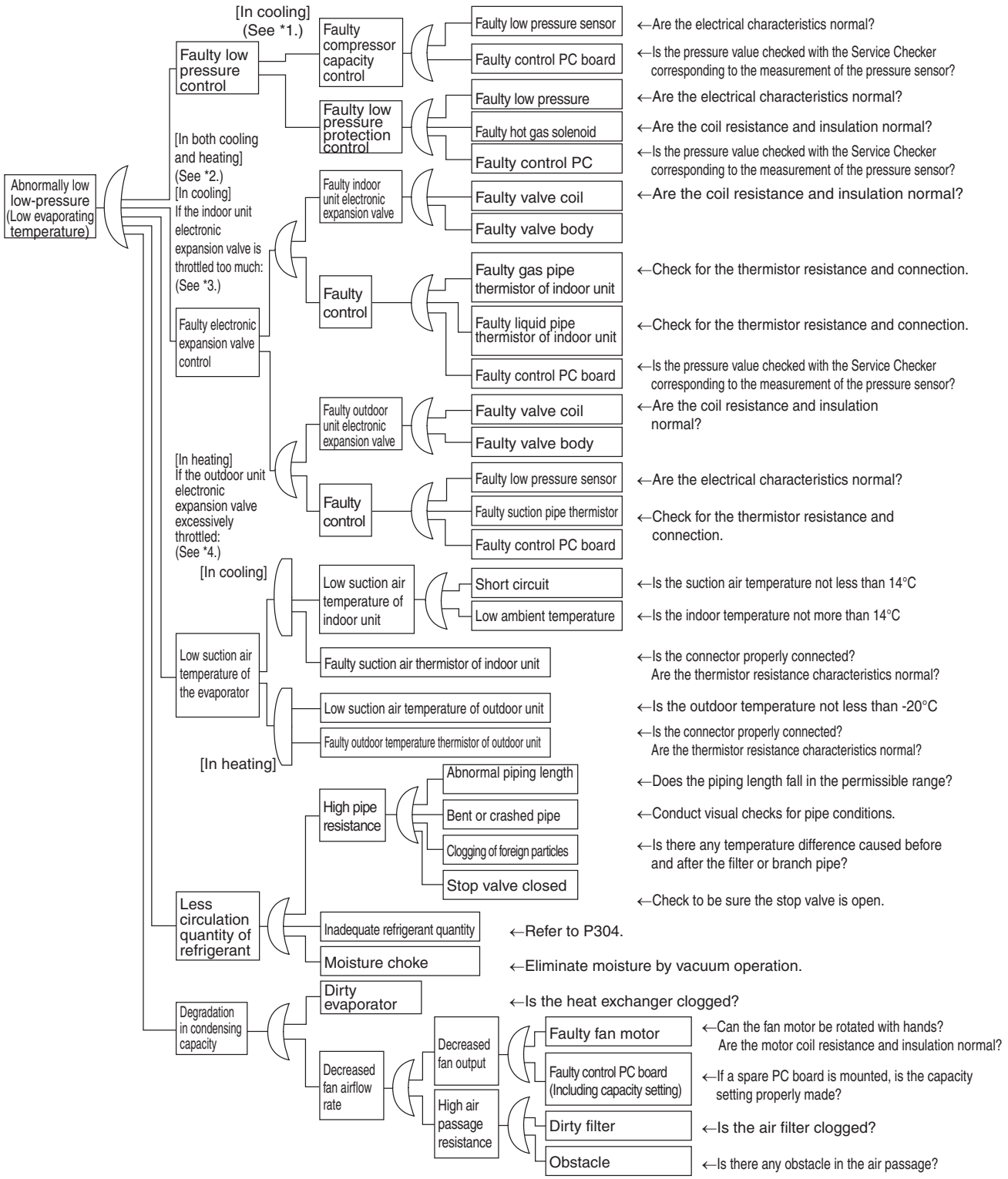


*1: In cooling, it is normal if the outdoor unit electronic expansion valve (EVM) is fully open.
*2: In heating, the indoor unit electronic expansion valve is used for “subcooled degree control”.
(For details, refer to “Electronic Expansion Valve Control” on P141.)

SDK04009

[CHECK 6] Check for causes of drop in low pressure

Referring to the Fault Tree Analysis (FTA) shown below, probe the faulty points.

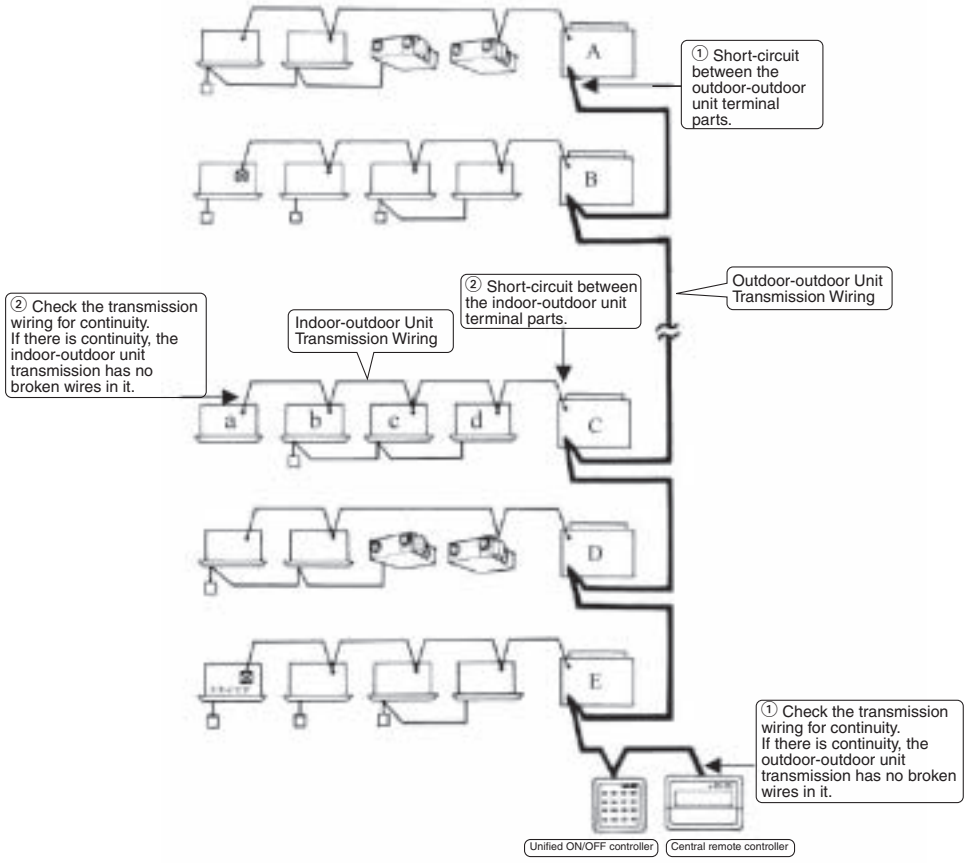


*1: For details of the compressor capacity control while in cooling, refer to "Compressor PI Control" on P100.
*2: The "low pressure protection control" includes low pressure protection control and hot gas bypass control. For details, refer to P126.
*3: In cooling, the indoor unit electronic expansion valve is used for "superheated degree control". (For details, refer to P141.)
*4: In heating, the outdoor unit electronic expansion valve (EVM) is used for "superheated degree control of outdoor unit heat exchanger". (For details, refer to P108.)

SDK04009

[CHECK 7] Broken Wire Check of the Connecting Wires

1. Procedure for checking outdoor-outdoor unit transmission wiring for broken wires
   On the system shown below, turn OFF the power supply to all equipment, short-circuit between the outdoor-outdoor unit terminal parts F1 and F2 in the "Outdoor Unit A" that is farthest from the central remote control, and then conduct continuity checks between the transmission wiring terminal blocks F1 and F2 of the central remote control using a multiple meter. If there is continuity between the said terminal blocks, the outdoor-outdoor unit transmission wiring has no broken wires in it.
   If there is no continuity, the transmission wiring may have broken wires. With the outdoor-outdoor unit terminal parts of the "Outdoor Unit A" short-circuited, conduct continuity checks between the transmission wiring terminal blocks F1 and F2 of the unified ON/OFF controller. If there is no continuity as well, conduct continuity checks between the outdoor-outdoor unit terminal parts of the "Outdoor Unit E", between the outdoor-outdoor unit terminal parts of the "Outdoor Unit D", between the outdoor-outdoor unit terminal parts of the "Outdoor Unit C", … in the order described, thus identifying the place with continuity.
   If the place with continuity can be identified, there may be broken wires in places before the said place with continuity.
2. Procedure for checking indoor-outdoor unit transmission wiring for broken wires (for checking the indoor-outdoor unit transmission wiring of the "Outdoor Unit C" for broken wires)
   Turn OFF the power supply to all equipment, short-circuit between the indoor-outdoor unit terminal parts F1 and F2 in the "Outdoor Unit C, and then conduct continuity checks between the transmission wirings F1 and F2 of the "Indoor Unit a" that is farthest from the "Outdoor Unit C" using a multiple meter. If there is continuity between the said transmission wirings, the indoor-outdoor unit transmission wiring has no broken wires in it.
   If there is no continuity, the transmission wiring may have broken wires. With the indoor-outdoor unit terminal parts of the "Outdoor Unit C" short-circuited, identify the place with continuity in the transmission wiring of the "Indoor Unit b", transmission wiring of the "Indoor Unit c", and transmission wiring of the "Indoor Unit d" in the order described.
   If the place with continuity can be identified, there may be broken wires in places before the said place with continuity.



[CHECK 8] Master Unit Central Connector Setting Table

The master unit central setting connector (CN1/X1A) is mounted at the factory.

- To independently use a single unit of the intelligent Touch controller or a single unit of the central remote control, do not dismount the master unit central setting connector (i.e., use the connector with the factory setting unchanged).
- To independently use the schedule timer, insert an independent-use setting connector. No independent-use setting connector has been mounted at the factory. Insert the connector, which is attached to the casing of the main unit, in the PC board (CN1/X1A). (Independent-use connector=Master unit central setting connector)
- To use two or more central equipment in combination, make settings according to the table shown below.

<table>
<tr><th rowspan="2">Pattern</th><th colspan="4">Central equipment connection pattern</th><th colspan="4">Setting of master unit central setting connector(*2)</th></tr>
<tr><th>Intelligent Touch controller</th><th>Central remote control</th><th>Unified ON/OFF controller</th><th>Schedule timer</th><th>Intelligent Touch controller</th><th>Central remote control</th><th>Unified ON/OFF controller</th><th>Schedule timer</th></tr>
<tr><td>①</td><td>1 to 2 units</td><td></td><td></td><td>× (*1)</td><td>Only a single unit: "Provided", Others: "Not provided"</td><td></td><td></td><td></td></tr>
<tr><td>②</td><td rowspan="2">1 unit</td><td rowspan="2">1 unit</td><td></td><td>× (*1)</td><td rowspan="2">Provided</td><td rowspan="2">Not provided</td><td></td><td></td></tr>
<tr><td>③</td><td rowspan="3">1 to 8 units</td><td>× (*1)</td><td rowspan="3">All "Not provided"</td><td></td></tr>
<tr><td>④</td><td>1 to 2 units</td><td></td><td>× (*1)</td><td>Only a single unit: "Provided", Others: "Not provided"</td><td></td><td></td></tr>
<tr><td>⑤</td><td rowspan="4">1 to 4 units</td><td></td><td></td><td></td><td rowspan="4">Only a single unit: "Provided", Others: "Not provided"</td><td></td><td></td></tr>
<tr><td>⑥</td><td rowspan="2">1 to 16 units</td><td>1 unit</td><td></td><td rowspan="2">All "Not provided"</td><td>Not provided</td></tr>
<tr><td>⑦</td><td></td><td></td><td></td></tr>
<tr><td>⑧</td><td></td><td>1 unit</td><td></td><td></td><td>Not provided</td></tr>
<tr><td>⑨</td><td></td><td></td><td rowspan="2">1 to 16 units</td><td></td><td></td><td></td><td rowspan="2">Only a single unit: "Provided", Others: "Not provided"</td><td></td></tr>
<tr><td>⑩</td><td></td><td></td><td>1 unit</td><td></td><td></td><td>Not provided</td></tr>
<tr><td>⑪</td><td></td><td></td><td></td><td>1 unit</td><td></td><td></td><td></td><td>Provided</td></tr>
</table>

(*1) The intelligent Touch controller and the schedule timer are not available for combined use.

(*2) The intelligent Touch controller, central remote control, and the unified ON/OFF controller have been set to "Provided with the master unit central setting connector" at the factory. The schedule timer has been set to "Not provided with the master unit central setting connector" at the factory, which is attached to the casing of the main unit.

[CHECK 9] Master-Slave Unit Setting Table

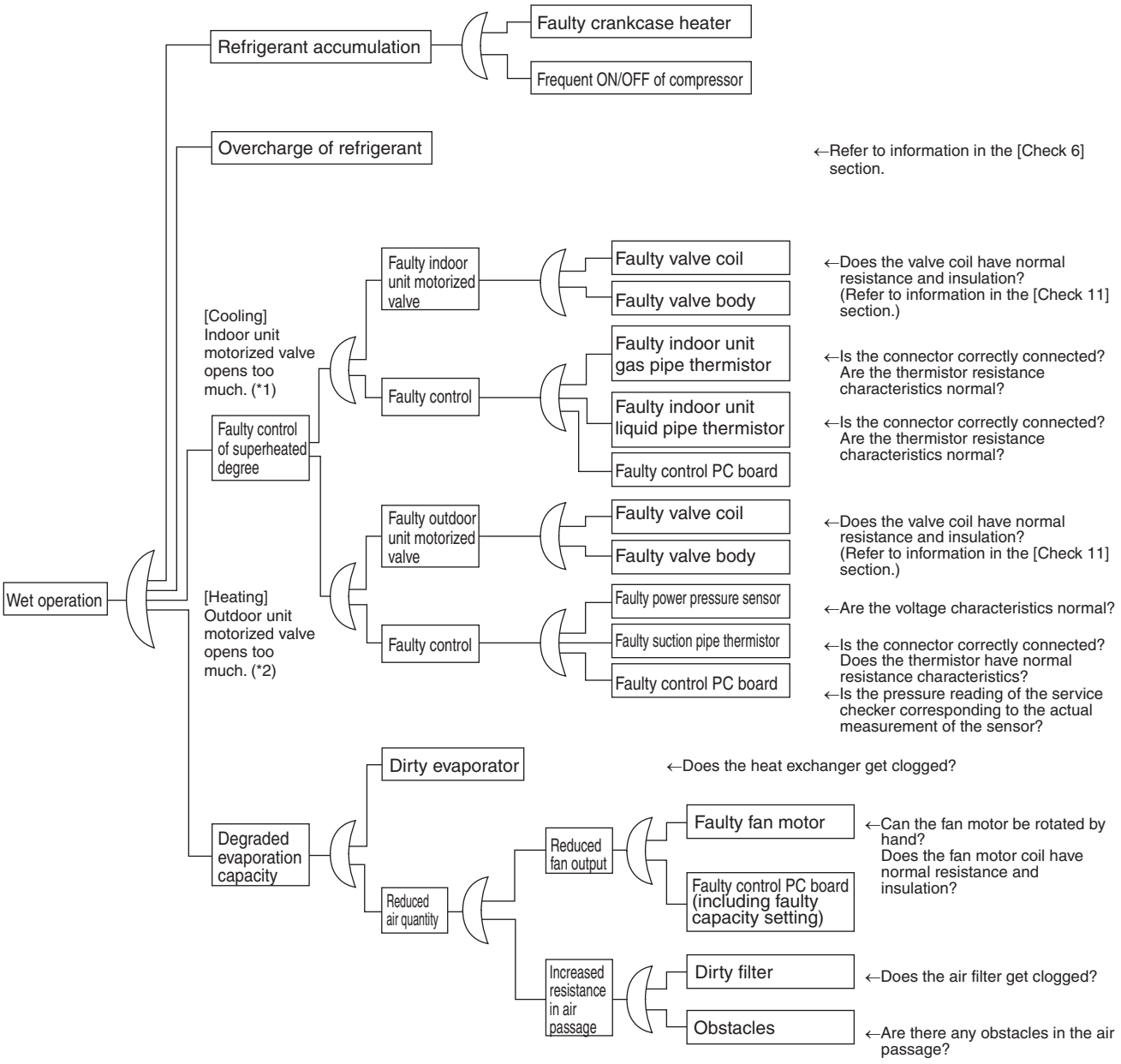
Combination of Intelligent Touch Controller and Central Remote Control

∗ Pattern	#1		#2		#3		#4	
	1-00~4-15	Master/ Slave	5-00~8-15	Master/ Slave	1-00~4-15	Master/ Slave	5-00~8-15	Master/ Slave
①	CRC	Master	CRC	Master	CRC	Slave	CRC	Slave
②	CRC	Master	—	—	CRC	Slave	—	—
③	Intelligent Touch controller	Master	—	—	Intelligent Touch controller	Slave	—	—
④	CRC	Master	—	—	Intelligent Touch controller	Slave	—	—
⑤	Intelligent Touch controller	Master	—	—	CRC	Slave	—	—
⑥	CRC	Master	—	—	—	—	—	—
⑦	Intelligent Touch controller	Master	—	—	—	—	—	—

CRC: Central remote control <DCS302CA61>
Intelligent Touch controller: <DCS601C51>
∗The patterns marked with "∗" have nothing to do with those described in the list of Setting of master unit central setting connector.

[Check 10] Check for causes of wet operation.

Referring to the Fault Tree Analysis (FTA) shown below, identify faulty points.



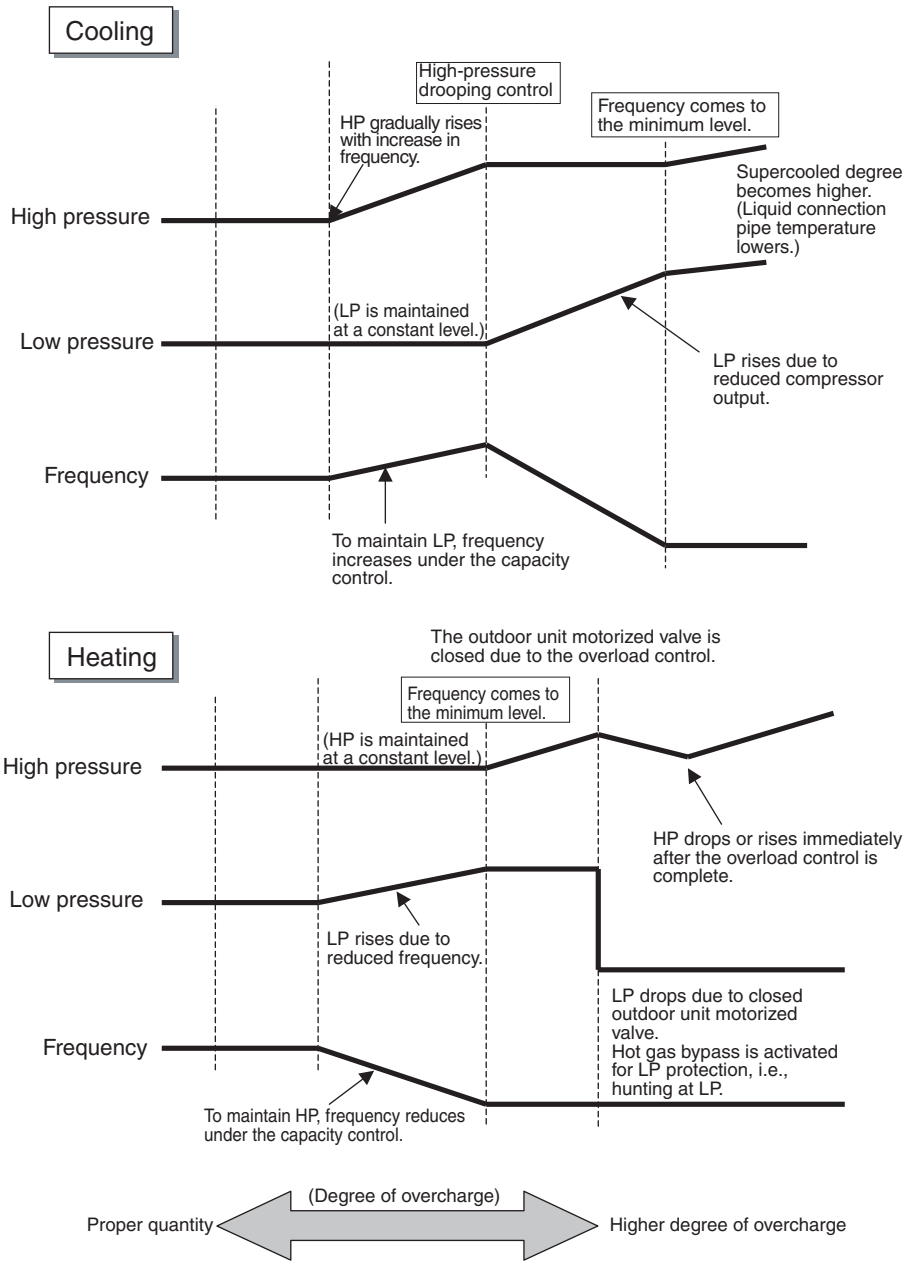
*1: "Superheated degree control" in cooling operation is exercised with the indoor unit motorized valve. (Refer to information on P141.)
*2: "Superheated degree control" in heating operation is exercised with the outdoor unit motorized valve (EV1). (Refer to information on P108.)
*3: Guideline of superheated degree to judge as wet operation
①Suction gas superheated degree: Not more than 3°C; ②Discharge gas superheated degree: Not more than 15°C, except immediately after compressor starts up or is running under drooping control.
(Use the values shown above as a guideline. Even if the superheated degree falls in the range, the compressor may be normal depending on other conditions.)

[Check 11] Check for overcharge of refrigerant.

In case of VRV Systems, the only way to judge as the overcharge of refrigerant is with operating conditions due to the relationship to pressure control and electronic expansion valve control. As information for making a judgment, refer to information provided below.

Diagnosis of overcharge of refrigerant

1. High pressure rises. Consequently, overload control is exercised to cause scant cooling capacity.
2. The superheated degree of suction gas lowers (or the wet operation is performed). Consequently, the compressor becomes lower in discharge pipe temperature despite of pressure loads.
3. The supercooled degree of condensate rises. Consequently, in heating operation, the temperature of outlet air passing through the supercooled section becomes lower.

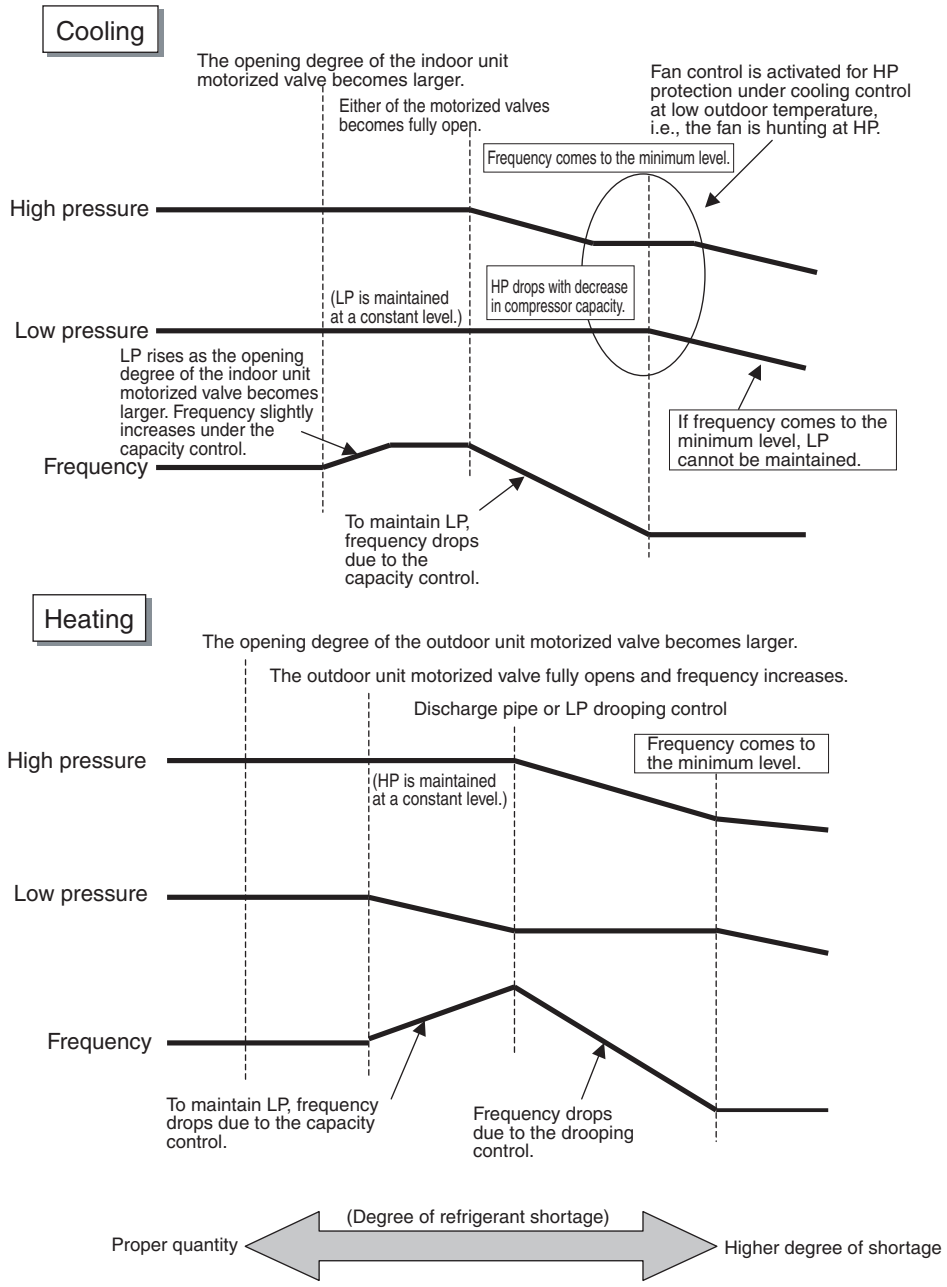


[Check 12] Check for shortage of refrigerant.

In case of VRV Systems, the only way to judge as the shortage of refrigerant is with operating conditions due to the relationship to pressure control and electronic expansion valve control. As information for making a judgment, refer to information provided below.

Diagnosis of shortage of refrigerant

1. The superheated degree of suction gas rises. Consequently, the compressor discharge gas temperature becomes higher.
2. The superheated degree of suction gas rises. Consequently, the electronic expansion valve turns open.
3. Low pressure drops to cause the unit not to demonstrate cooling capacity (heating capacity).



[Check 13] Vacuuming and dehydration procedure

Conduct vacuuming and dehydration in the piping system following the procedure for <Normal vacuuming and dehydration> described below.
Furthermore, if moisture may get mixed in the piping system, follow the procedure for <Special vacuuming and dehydration> described below.

<Normal vacuuming and dehydration>

① Vacuuming and dehydration
- Use a vacuum pump that enables vacuuming up to 100.7kPa (5 torr, -755 mmHg).
- Connect manifold gauges to the service ports of liquid pipe and gas pipe and run the vacuum pump for a period of two or more hours to conduct evacuation to -100.7kPa or less.
- If the degree of vacuum does not reach -100.7kPa or less even though evacuation is conducted for a period of two hours, moisture will have entered the system or refrigerant leakage will have been caused. In this case, conduct evacuation for a period of another one hour.
- If the degree of vacuum does not reach -100.7kPa or less even though evacuation is conducted for a period of three hours, conduct leak tests.

② Leaving in vacuum state
- Leave the compressor at the degree of vacuum of -100.7kPa or less for a period of one hour or more, and then check to be sure that the vacuum gauge reading does not rise. (If the reading rises, moisture may have remained in the system or refrigerant leakage may have been caused.)

③ Refrigerant charge
- Purge air from the manifold gauge connection hoses, and then charge a necessary quantity of refrigerant.

<Special vacuuming and dehydration> - In case moisture may get mixed in the piping*

① Vacuuming and dehydration
- Follow the same procedure as that for 1) Normal vacuuming and dehydration described above.

② Vacuum break
- Pressurize with nitrogen gas up to 0.05MPa.

③ Vacuuming and dehydration
- Conduct vacuuming and dehydration for a period of one hour or more. If the degree of vacuum does not reach -100.7kPa or less even though evacuation is conducted for a period of two hours or more, repeat vacuum break - vacuuming and dehydration.

④ Leaving in vacuum state
- Leave the compressor at the degree of vacuum of -100.7kPa or less for a period of one hour or more, and then check to be sure that the vacuum gauge reading does not rise.

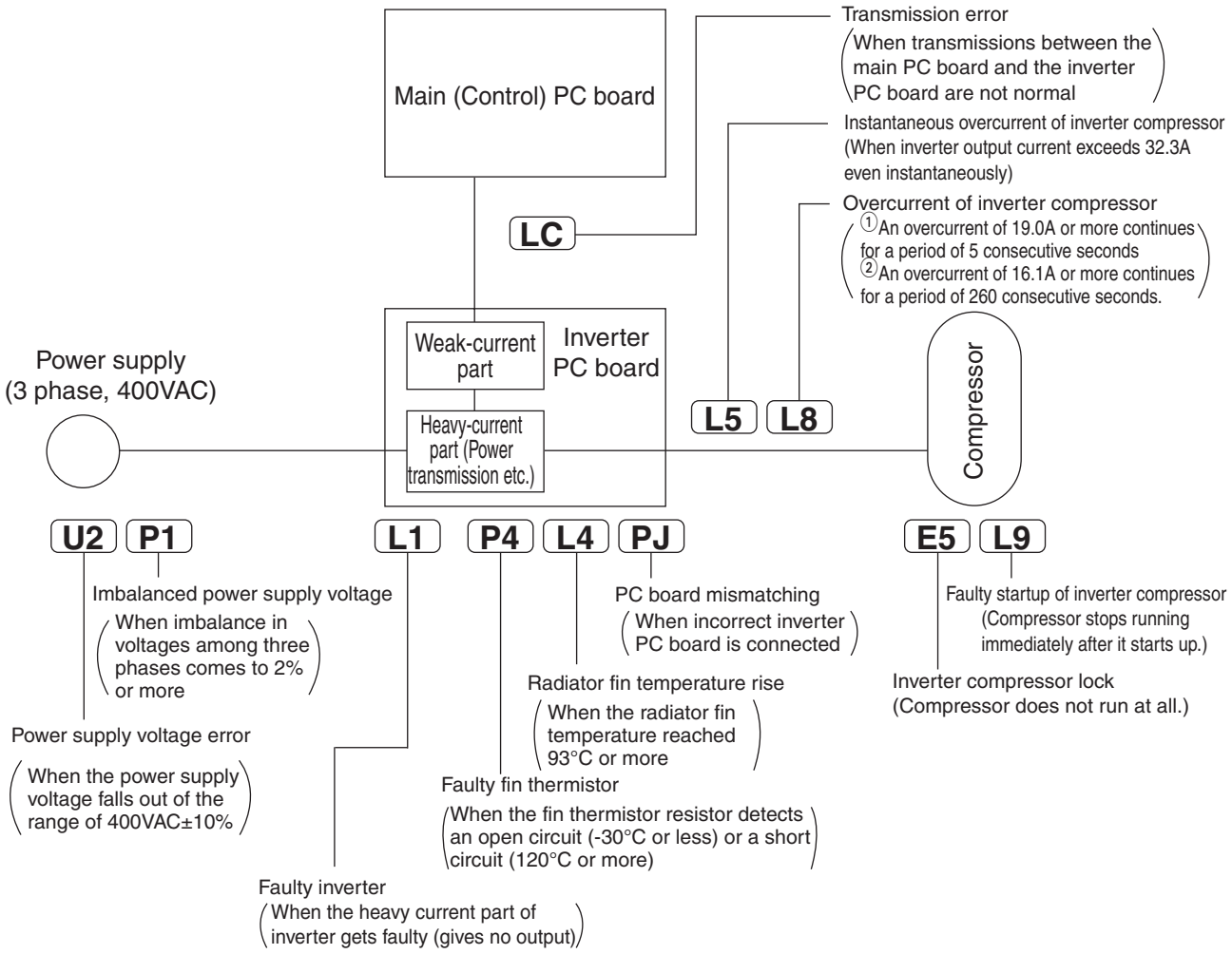
⑤ Refrigerant charge
- Purge air from the manifold gauge connection hoses, and then charge a necessary quantity of refrigerant.

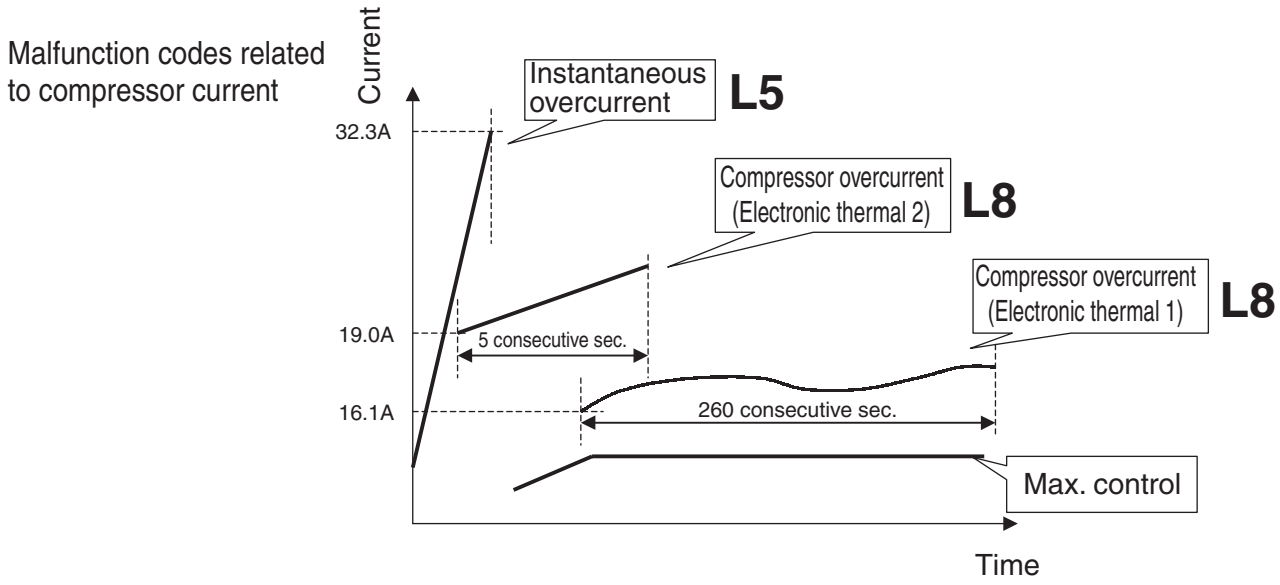
* In case of construction during rainy reason, if dew condensation occurs in the piping due to extended construction period, or rainwater or else may enter the piping during construction work:

[Check 14] List of inverter-related malfunction codes

	Code	Name	Condition for determining malfunction	Major cause
Compressor current	L5	Instantaneous overcurrent of inverter compressor	• Inverter output current exceeds 32.3A even instantaneously.	• Liquid sealing • Faulty compressor • Faulty inverter PC board
	L8	Overcurrent of inverter compressor (Electronic thermal)	• Compressor overload running An overcurrent of 19.0A or more continues for a period of 5 consecutive seconds or that of 16.1A or more continues for a period of 260 consecutive seconds. • The inverter loses synchronization.	• Backflow of compressor liquid • Sudden changes in loads • Disconnected compressor wiring • Faulty inverter PC board
Protection device and others	L1	Faulty inverter PC board	• No output is given.	• Faulty heavy current part of compressor
	L9	Faulty startup of inverter compressor	• The compressor motor fails to start up.	• Liquid sealing or faulty compressor • Excessive oil or refrigerant • Faulty inverter PC board
	E5	Inverter compressor lock	• The compressor is in the locked status (does not rotate).	• Faulty compressor
	L4	Radiator fin temperature rise	• The radiator fin temperature reaches 87°C or more (while in operation).	• Malfunction of fan • Running in overload for an extended period of time • Faulty inverter PC board
	U2	Power supply voltage error	• The inverter power supply voltage is high or low.	• Power supply error • Faulty inverter PC board
	P1	Imbalanced power supply	• Power supply voltages get significantly imbalanced among three phases.	• Power supply error (imbalanced voltages of 2% or more) • Faulty inverter PC board • Dead inverter PC board
	LC	Transmission error (between inverter PC board and control PC board)	• With the outdoor unit PC board, no communications are carried out across control PC board - inverter PC board - fan PC board.	• Broken wire in communication line • Faulty control PC board • Faulty inverter PC board • Faulty fan PC board
	PJ	PC board mismatching	• Any PC board of specification different from that of the product is connected.	• PC board of different specification mounted
	P4	Faulty fin thermistor	• The fin thermistor gets short-circuited or open.	• Faulty fin thermistor

[Check 15] Concept of inverter-related malfunction codes



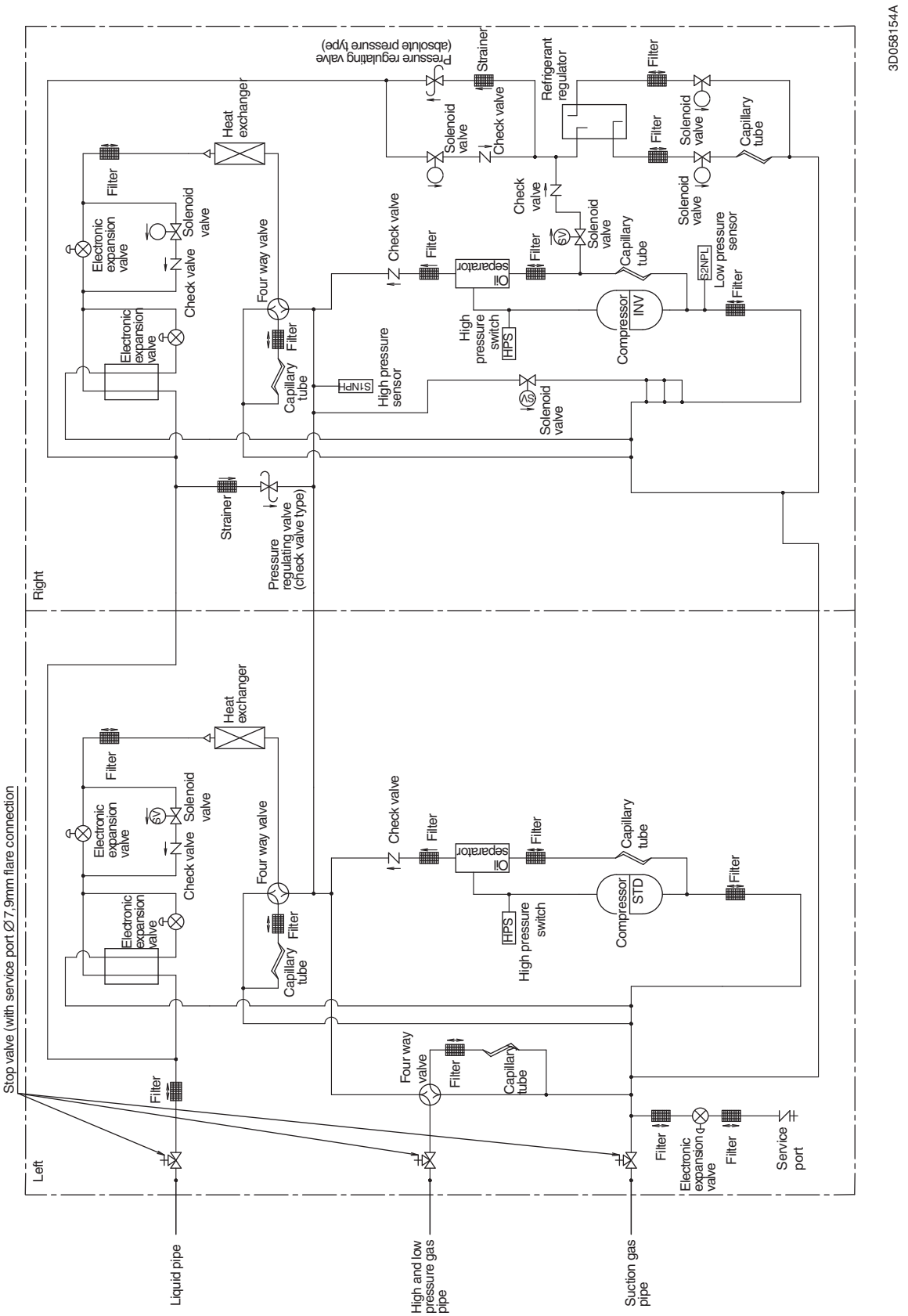


Part 7 Appendix

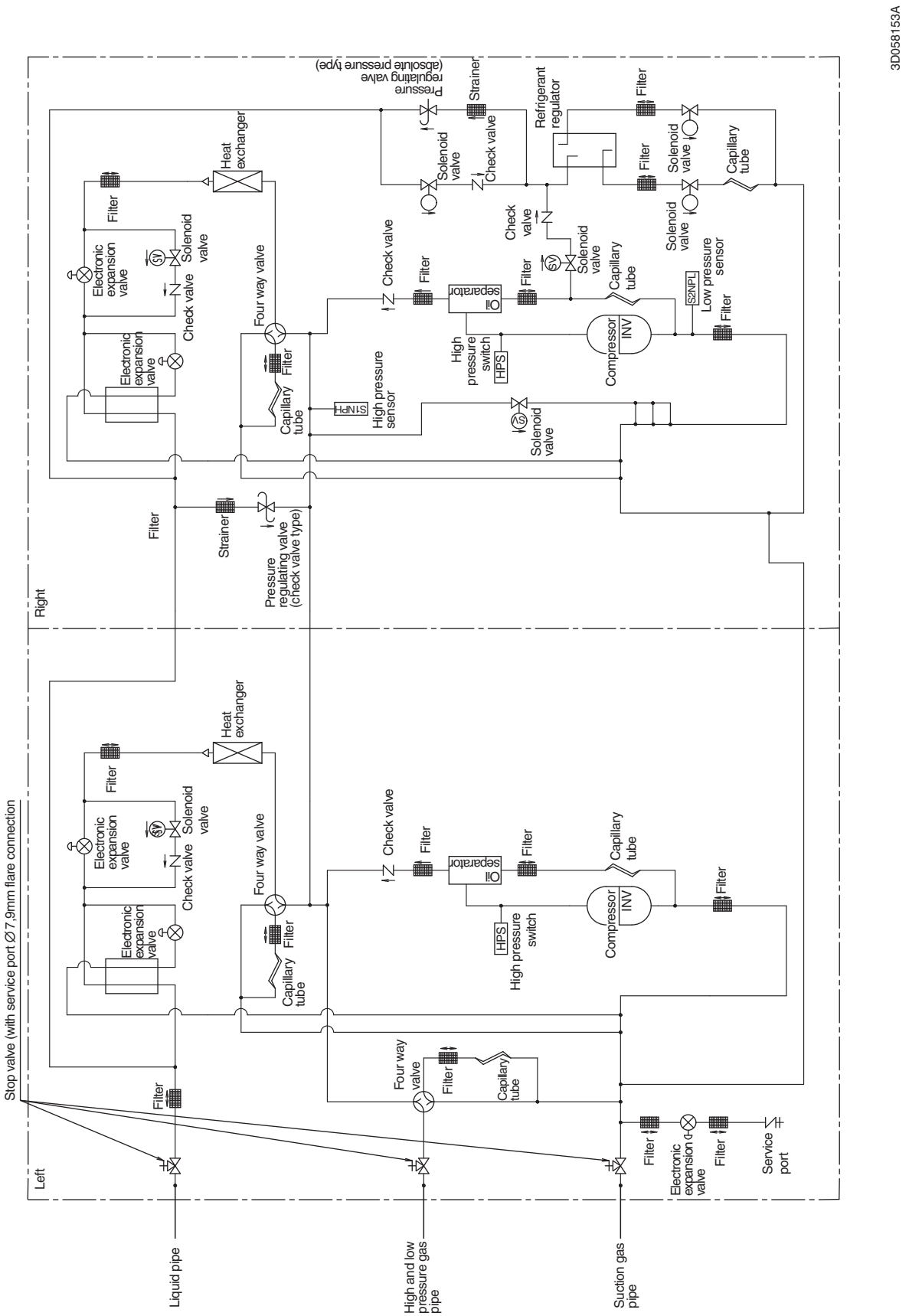
1. Piping Diagrams

1.1 Outdoor Unit

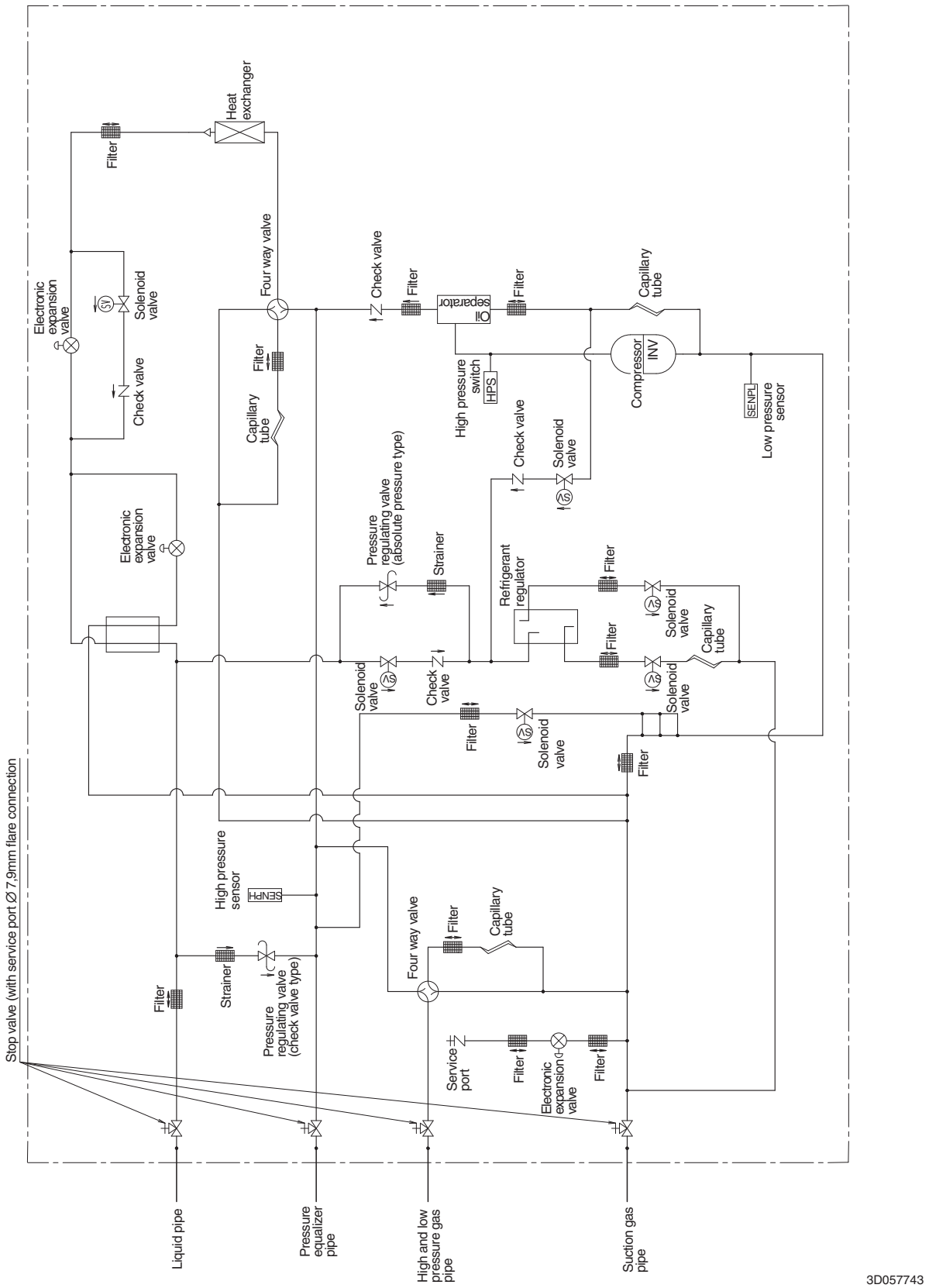
REYQ8P / 10P / 12P



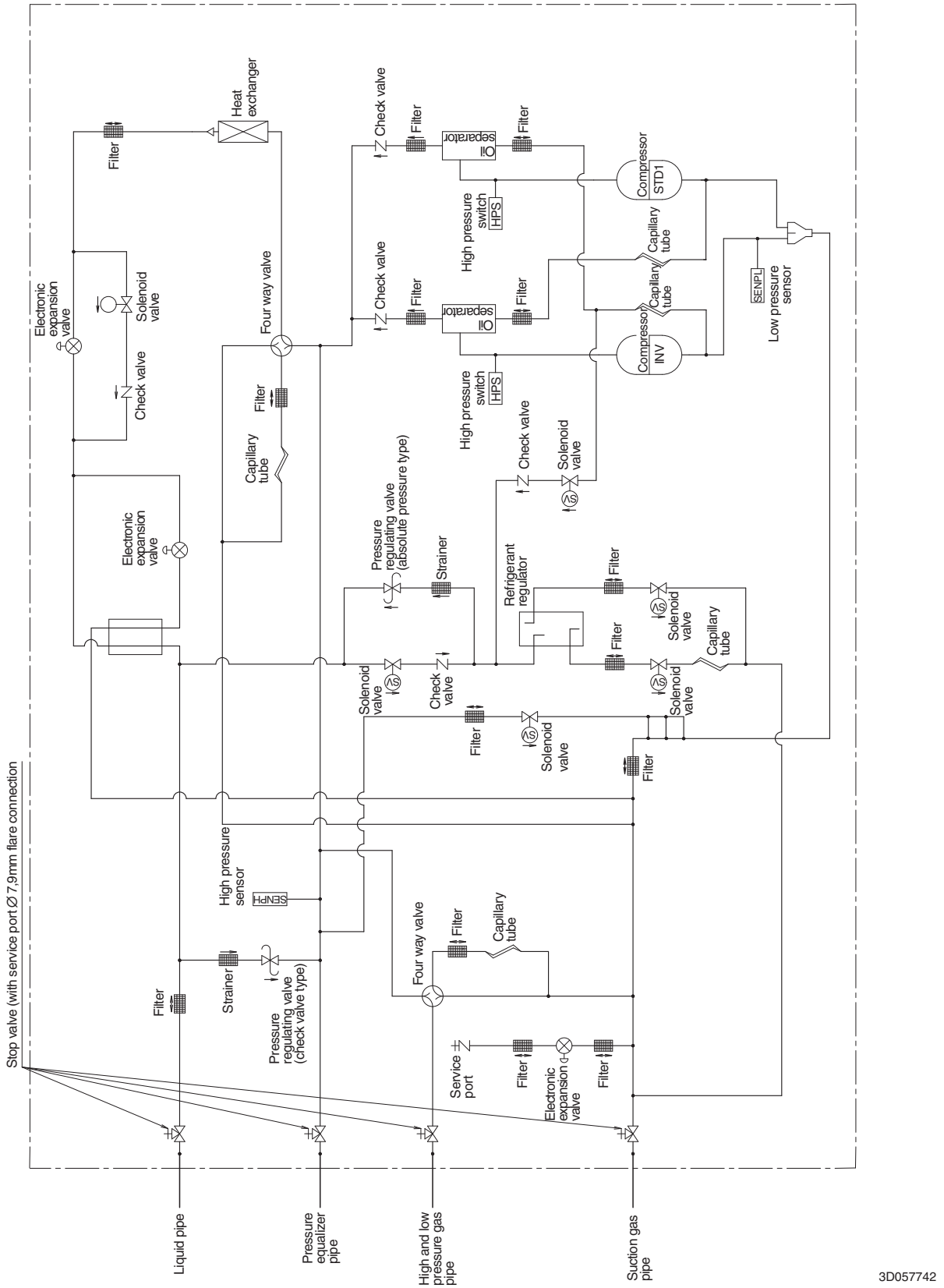
REYQ14P / 16P


3D058153A
Right
Left
Heat exchanger
Filter
Electronic expansion valve
Solenoid valve
Check valve
Four way valve
Capillary tube
Pressure regulating valve (absolute pressure type)
Strainer
Solenoid valve
Check valve
Refrigerant regulator
Filter
Solenoid valve
Capillary tube
Check valve
Solenoid valve
Filter
Separator
Oil
Filter
Capillary tube
Low pressure sensor
S2NPL
Filter
High pressure switch
HPS
Compressor
INV
High pressure sensor
S1NPH
Solenoid valve
Filter
Strainer
Pressure regulating valve (check valve type)
Heat exchanger
Filter
Electronic expansion valve
Solenoid valve
Check valve
Four way valve
Capillary tube
Filter
Check valve
Filter
Separator
Oil
Filter
Capillary tube
HPS
High pressure switch
Compressor
INV
Filter
Four way valve
Filter
Capillary tube
Filter
Electronic expansion valve
Filter
Service port
Stop valve (with service port Ø7,9mm flare connection
Liquid pipe
High and low pressure gas pipe
Suction gas pipe

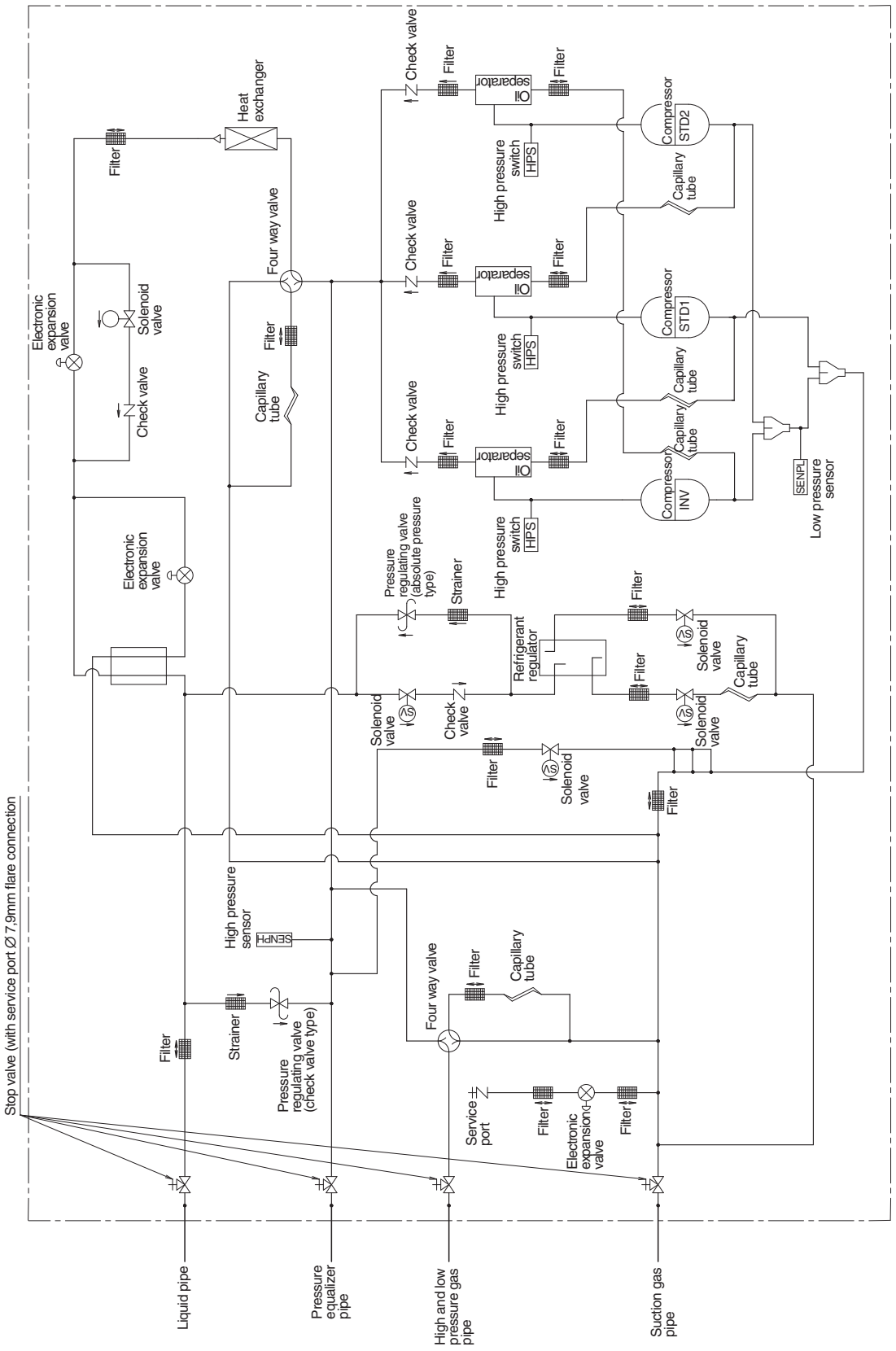
REMQ8P


Heat exchanger
Filter
Four way valve
Check valve
Filter
separator
Oil
Filter
Capillary tube
Electronic expansion valve
Solenoid valve
Check valve
Filter
Capillary tube
High pressure switch
HPS
Compressor
INV
SENPL
Low pressure sensor
Check valve
Solenoid valve
Electronic expansion valve
Pressure regulating valve (absolute pressure type)
Strainer
Refrigerant regulator
Filter
Solenoid valve
Filter
Capillary tube
Solenoid valve
Check valve
Solenoid valve
Filter
Solenoid valve
Filter
Stop valve (with service port Ø 7,9mm flare connection
High pressure sensor
SENPH
Four way valve
Filter
Capillary tube
Filter
Strainer
Pressure regulating valve (check valve type)
Service port
Filter
Electronic expansion valve
Filter
Liquid pipe
Pressure equalizer pipe
High and low pressure gas pipe
Suction gas pipe
3D057743

REMQ10P, 12P

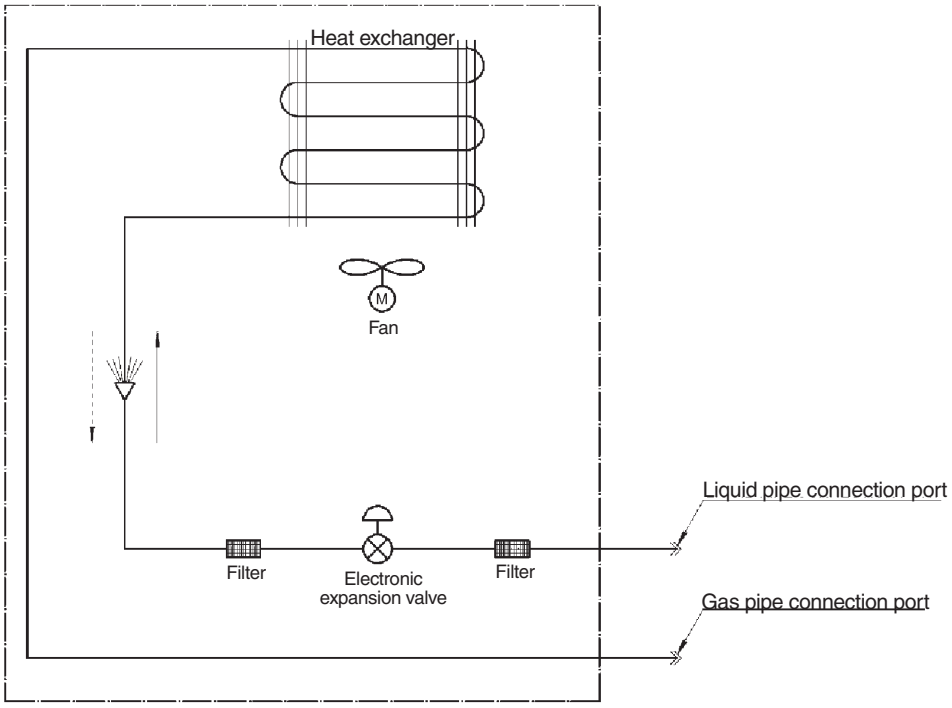

Stop valve (with service port Ø 7,9mm flare connection
Liquid pipe
Pressure equalizer pipe
High and low pressure gas pipe
Suction gas pipe
Filter
Heat exchanger
Check valve
Separator
Oil
High pressure switch
HPS
Compressor
STD1
INV
Capillary tube
Low pressure sensor
SENPL
Four way valve
Electronic expansion valve
Solenoid valve
Pressure regulating valve (absolute pressure type)
Strainer
Refrigerant regulator
Pressure regulating valve (check valve type)
High pressure sensor
SENPH
Service port
3D057742

REMQ14P, 16P


Stop valve (with service port Ø 7,9mm flare connection
Liquid pipe
Pressure equalizer pipe
High and low pressure gas pipe
Suction gas pipe
Filter
Heat exchanger
Four way valve
Electronic expansion valve
Solenoid valve
Check valve
Capillary tube
Separator
Oil
High pressure switch
HPS
Compressor
STD2
STD1
INV
Low pressure sensor
SENPL
Pressure regulating valve (absolute pressure type)
Strainer
Refrigerant regulator
High pressure sensor
SENPH
Pressure regulating valve (check valve type)
Service port
3D057741

1.2 Indoor Unit

FXFQ-P



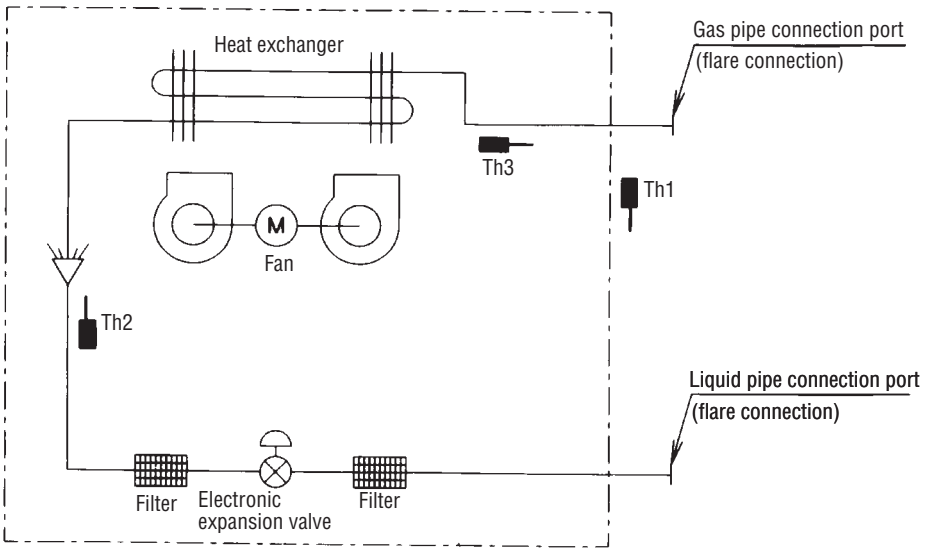
Refrigerant flow
Cooling
Heating

Refrigerant pipe connection port diameters

Model	Gas	Liquid
FXFQ20, 25, 32, 40, 50P	Ø12.70	Ø6.35
FXFQ63, 80, 100, 125P	Ø15.90	Ø9.45

3TW28835-1

FXZQ



Th1: Thermistor for suction air temp.
Th2: Thermistor for liquid air temp.
Th3: Thermistor for gas line temp.

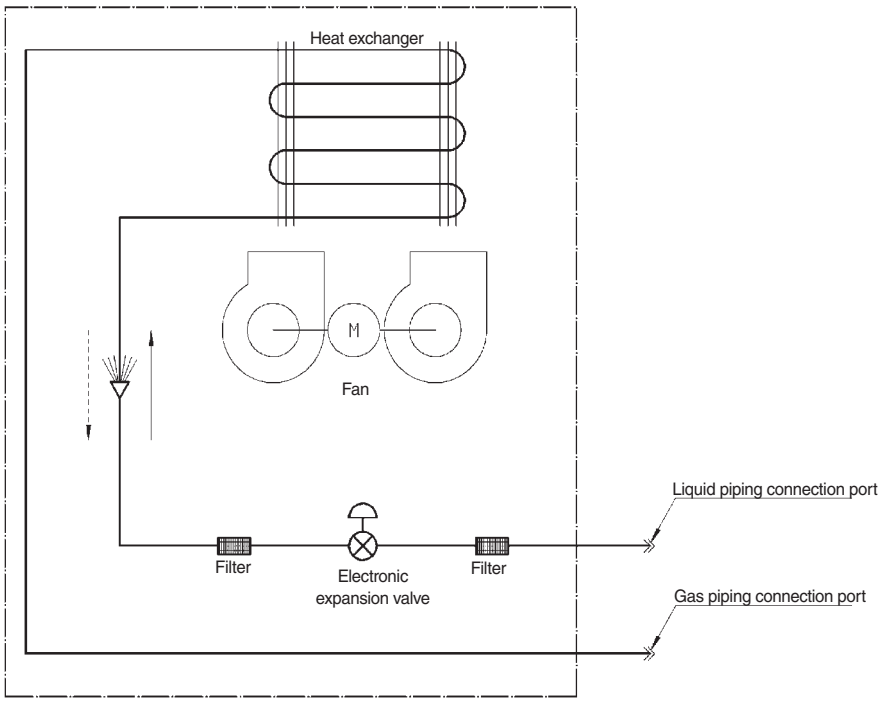
4D040157

■ Refrigerant pipe connection port diameters

(mm)

Model	Gas	Liquid
FXZQ20M / 25M / 32M / 40M / 50M	ϕ12.7	ϕ6.4

FXCQ, FXDQ25/25-M, FXSQ



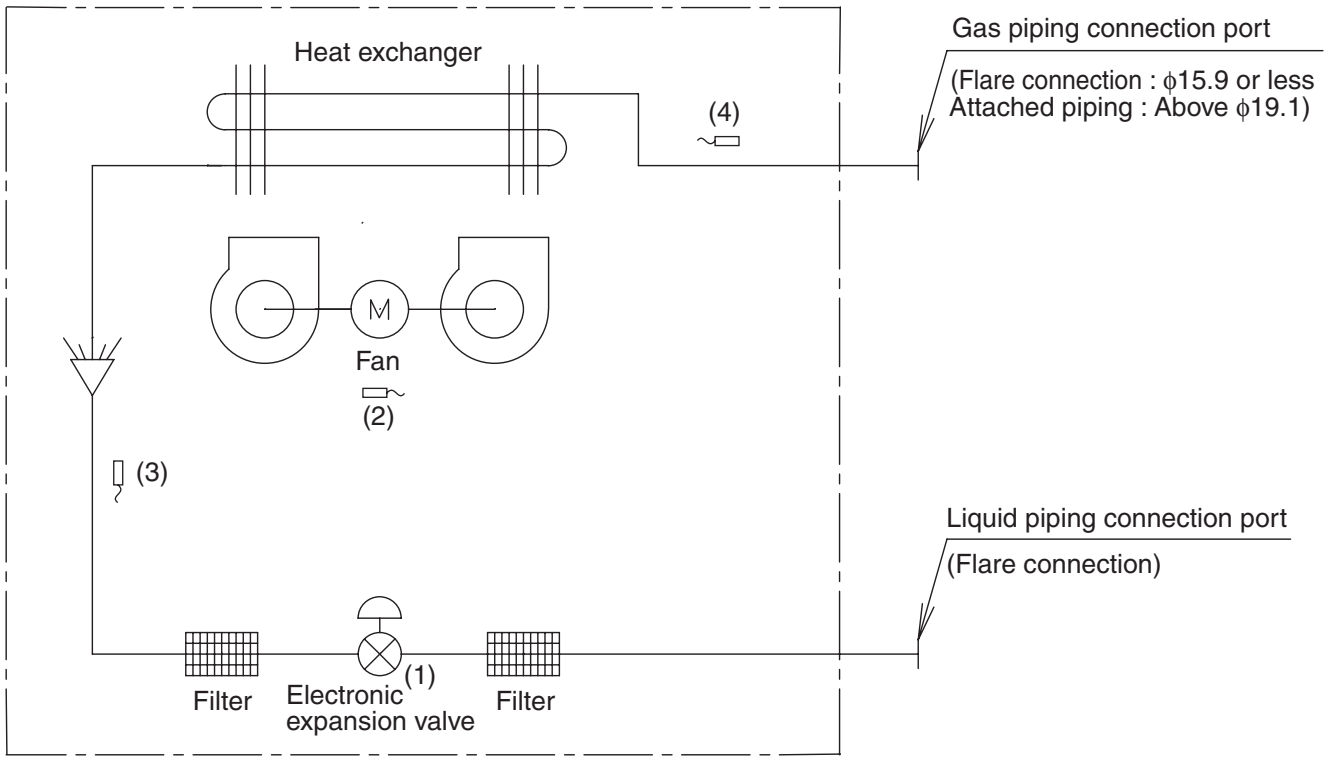
Refrigerant flow
Cooling
Heating

■ Refrigerant pipe connection port diameters

Model	Gas	Liquid
FXSQ20, 25, 32, 40, 50	ϕ12.70	ϕ6.35
FXSQ63, 80, 100, 125	ϕ15.90	ϕ9.52
FXCQ20, 25, 32, 40, 50	ϕ12.70	ϕ6.35
FXCQ63, 80, 125	ϕ15.90	ϕ9.52
FXDQ20, 25	ϕ12.70	ϕ6.35

C:3TW25515-1
C:3TW21175-1C

FXKQ-MA



DU220-602J

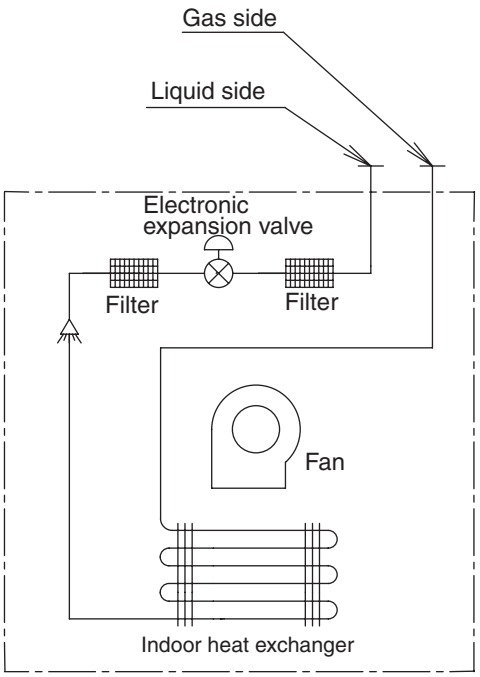
Code	Name	Code	Main function
(1)	Electronic expansion valve	Y1E	Used for gas superheated degree control while in cooling operation or subcooled degree control while in heating operation.
(2)	Suction air temperature thermistor	R1T	Used for thermostat control.
(3)	Liquid pipe	R2T	Used for gas superheated degree control while in cooling operation or subcooled degree control while in heating operation.
(4)	Gas pipe	R3T	Used for gas superheated degree control while in cooling operation.

(mm)

Capacity	GAS	Liquid
25 / 32 / 40 / 50MA	ϕ12.7	ϕ6.4
63MA	ϕ15.9	ϕ9.5

4D034245

FXDQ-NA, P



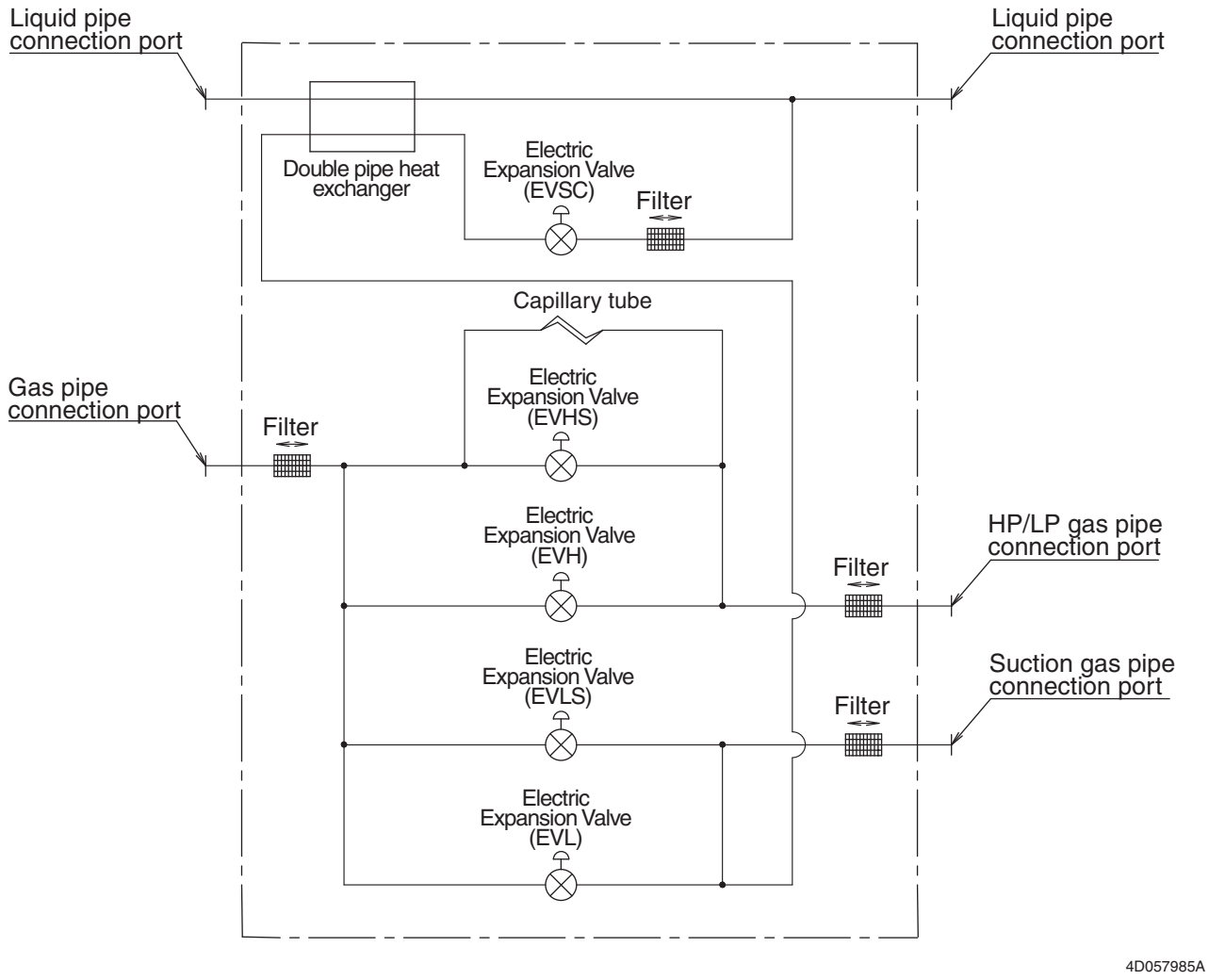
4D043864H

■ **Refrigerant pipe connection port diameters**

(mm)

Model	Gas	Liquid
FXDQ20NA, P / 25NA, P / 32NA, P / 40NA / 50NAVE	ϕ12.7	ϕ6.4
FXDQ63NAVE	ϕ15.9	ϕ9.5

1.3 BS Unit

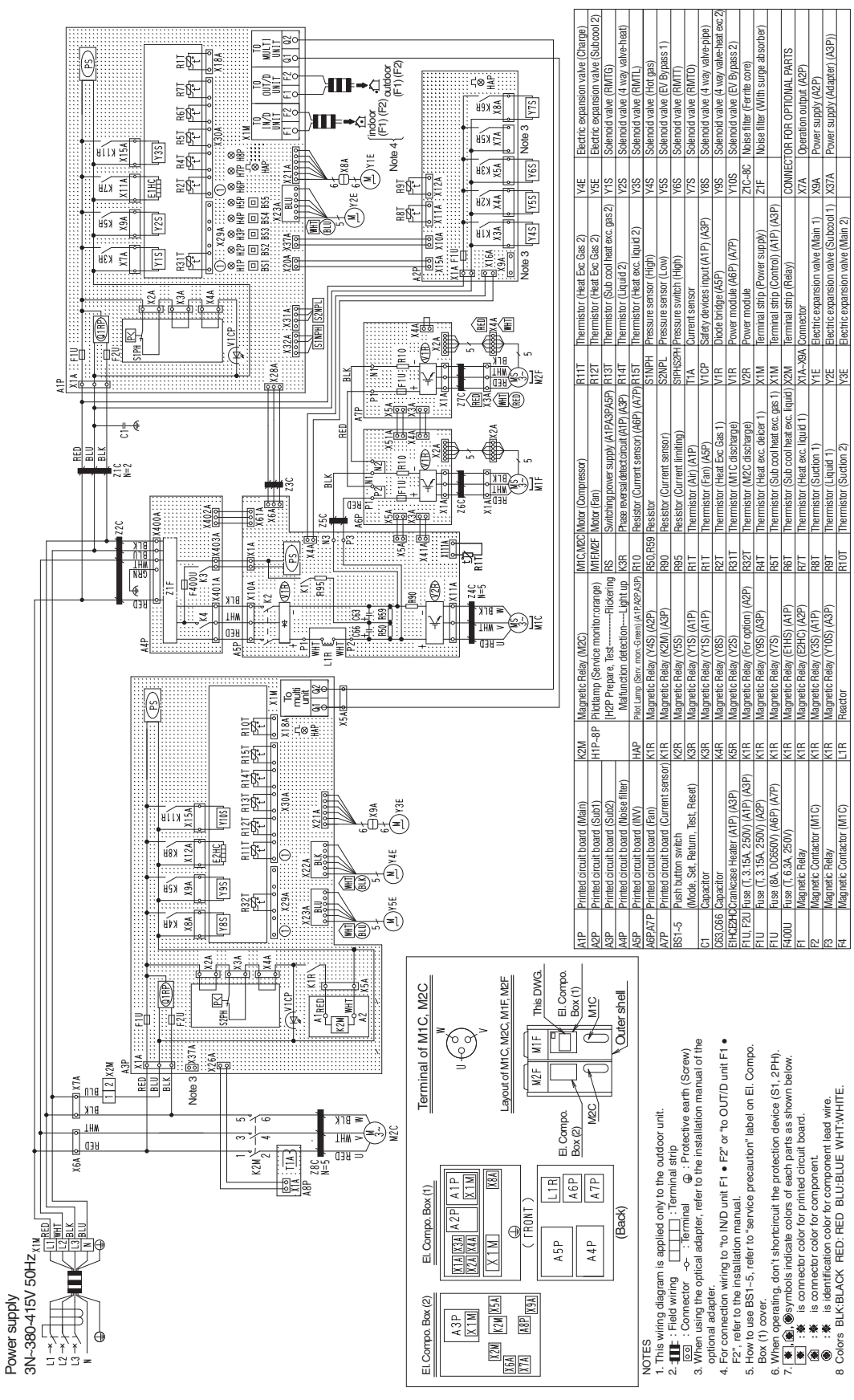

Liquid pipe connection port
Liquid pipe connection port
Double pipe heat exchanger
Electric Expansion Valve (EVSC)
Filter
Capillary tube
Gas pipe connection port
Filter
Electric Expansion Valve (EVHS)
Electric Expansion Valve (EVH)
HP/LP gas pipe connection port
Filter
Electric Expansion Valve (EVLS)
Suction gas pipe connection port
Filter
Electric Expansion Valve (EVL)
4D057985A

2. Wiring Diagrams for Reference

2.1 Outdoor Unit

REYQ8P / 10P / 12PY1B

3D056775D

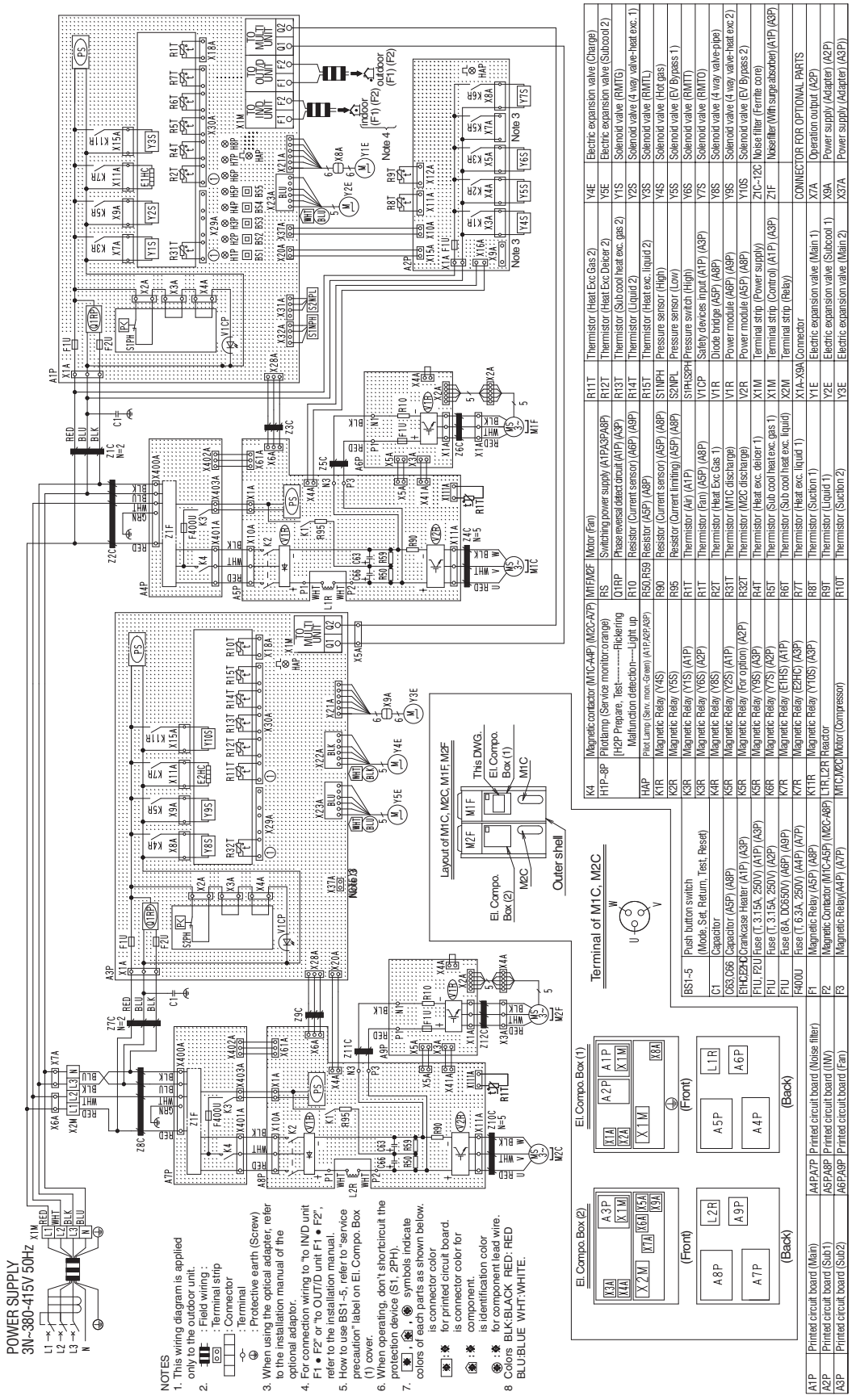


A1P	Printed circuit board (Main)	K2M	Magnetic Relay (M2C)	M1C,M2C	Motor (Compressor)	R11T	Thermistor (Heat Exc Gas 2)	Y4E	Electric expansion valve (Charge)
A2P	Printed circuit board (Sub1)	H1P~8P	Pilotlamp (Service monitor:orange)	M1F,M2F	Motor (Fan)	R12T	Thermistor (Heat Exc Gas 2)	Y5E	Electric expansion valve (Subcool 2)
A3P	Printed circuit board (Sub2)		[H2P Prepare, Test----------Flickering	RS	Switching power supply (A1P,A3P,A5P)	R13T	Thermistor (Sub cool heat exc. gas 2)	Y1S	Solenoid valve (RMTG)
A4P	Printed circuit board (Noise filter)		Malfunction detection----Light up	K3R	Phase reversal detectcircuit (A1P) (A3P)	R14T	Thermistor (Liquid 2)	Y2S	Solenoid valve (4 way valve-heat)
A5P	Printed circuit board (INV)	HAP	Pilot Lamp (Serv. mon.:Green) (A1P,A2P,A3P)	R10	Resistor (Current sensor) (A6P) (A7P)	R15T	Thermistor (Heat exc. liquid 2)	Y3S	Solenoid valve (RMTL)
A6P,A7P	Printed circuit board (Fan)	K1R	Magnetic Relay (Y4S) (A2P)	R50,R59	Resistor	S1NPH	Pressure sensor (High)	Y4S	Solenoid valve (Hot gas)
A7P	Printed circuit board (Current sensor)	K1R	Magnetic Relay (K2M) (A3P)	R90	Resistor (Current sensor)	S2NPL	Pressure sensor (Low)	Y5S	Solenoid valve (EV Bypass 1)
BS1~5	Push button switch	K2R	Magnetic Relay (Y5S)	R95	Resistor (Current limiting)	S1PHS2PH	Pressure switch (High)	Y6S	Solenoid valve (RMTT)
	(Mode, Set, Return, Test, Reset)	K3R	Magnetic Relay (Y1S) (A1P)	R1T	Thermistor (Air) (A1P)	T1A	Current sensor	Y7S	Solenoid valve (RMTO)
C1	Capacitor	K3R	Magnetic Relay (Y1S) (A1P)	R1T	Thermistor (Fan) (A5P)	V1CP	Safety devices input (A1P) (A3P)	Y8S	Solenoid valve (4 way valve-pipe)
C63,C66	Capacitor	K4R	Magnetic Relay (Y8S)	R2T	Thermistor (Heat Exc Gas 1)	V1R	Diode bridge (A5P)	Y9S	Solenoid valve (4 way valve-heat exc 2)
EHC,E2HC	Crankcase Heater (A1P) (A3P)	K5R	Magnetic Relay (Y2S)	R31T	Thermistor (M1C discharge)	V1R	Power module (A6P) (A7P)	Y10S	Solenoid valve (EV Bypass 2)
F1U, F2U	Fuse (T, 3.15A, 250V) (A1P) (A3P)	K1R	Magnetic Relay (For option) (A2P)	R32T	Thermistor (M2C discharge)	V2R	Power module	Z1C~8C	Noise filter (Ferrite core)
F1U	Fuse (T, 3.15A, 250V) (A2P)	K1R	Magnetic Relay (Y9S) (A3P)	R4T	Thermistor (Heat exc. deicer 1)	X1M	Terminal strip (Power supply)	Z1F	Noise filter (With surge absorber)
F1U	Fuse (8A, DC650V) (A6P) (A7P)	K1R	Magnetic Relay (Y7S)	R5T	Thermistor (Sub cool heat exc. gas 1)	X1M	Terminal strip (Control) (A1P) (A3P)		
F400U	Fuse (T, 6.3A, 250V)	K1R	Magnetic Relay (E1HS) (A1P)	R6T	Thermistor (Sub cool heat exc. liquid)	X2M	Terminal strip (Relay)	CONNECTOR FOR OPTIONAL PARTS	
F1	Magnetic Relay	K1R	Magnetic Relay (E2HC) (A2P)	R7T	Thermistor (Heat exc. liquid 1)	X1A~X9A	Connector	X7A	Operation output (A2P)
F2	Magnetic Contactor (M1C)	K1R	Magnetic Relay (Y3S) (A1P)	R8T	Thermistor (Suction 1)	Y1E	Electric expansion valve (Main 1)	X9A	Power supply (A2P)
F3	Magnetic Relay	K1R	Magnetic Relay (Y10S) (A3P)	R9T	Thermistor (Liquid 1)	Y2E	Electric expansion valve (Subcool 1)	X37A	Power supply (Adapter (A3P))
F4	Magnetic Contactor (M1C)	L1R	Reactor	R10T	Thermistor (Suction 2)	Y3E	Electric expansion valve (Main 2)		

NOTES
1. This wiring diagram is applied only to the outdoor unit.
2. ▭▭▭ : Field wiring ▭▭▭ : Terminal strip
   ⊖ : Connector ⏚ : Protective earth (Screw)
3. When using the optical adapter, refer to the installation manual of the optional adapter.
4. For connection wiring to "to IN/D unit F1 ● F2" or "to OUT/D unit F1 ● F2", refer to the installation manual.
5. How to use BS1~5, refer to "service precaution" label on El. Compo. Box (1) cover.
6. When operating, don't shortcircuit the protection device (S1, 2PH).
7. ◆, ◆, ◆ symbols indicate colors of each parts as shown below.
   ◆ : ✱ is connector color for printed circuit board.
   ◆ : ✱ is connector color for component.
   ◆ : ✱ is identification color for component lead wire.
8. Colors BLK:BLACK RED: RED BLU:BLUE WHT:WHITE.

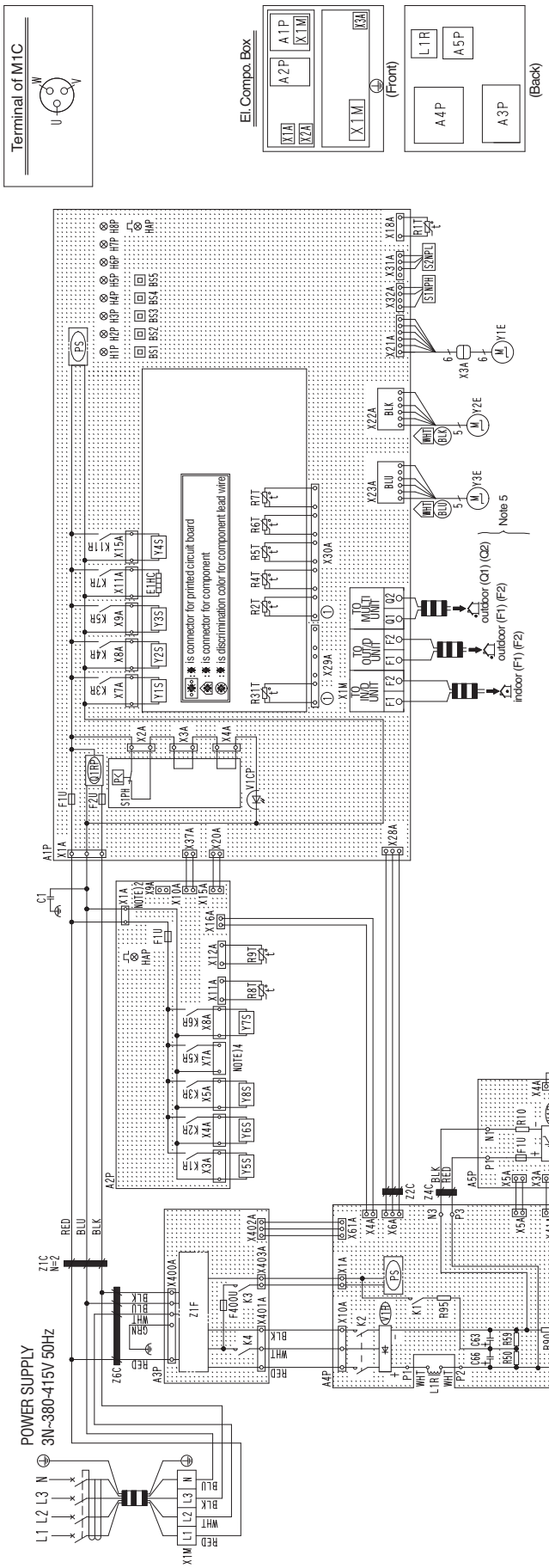
REYQ14P / 16PY1B

3D056774C



A1P	Printed circuit board (Main)	A4P,A7P	Printed circuit board (Noise filter)	K4	Magnetic contactor (M1C-A4P) (M2C-A7P)	M1F,M2F	Motor (Fan)	R11T	Thermistor (Heat Exc.Gas 2)	Y4E	Electric expansion valve (Charge)
A2P	Printed circuit board (Sub1)	A5P,A8P	Printed circuit board (INV)	H1P~8P	Pilot lamp (Service monitor:orange)	RS	Switching power supply (A1P,A3P,A8P)	R12T	Thermistor (Heat Exc.Deicer 2)	Y5E	Electric expansion valve (Subcool 2)
A3P	Printed circuit board (Sub2)	A6P,A9P	Printed circuit board (Fan)		Pilot lamp (Service monitor:green)	Q1RP	Phase reversal detect.circuit (A1P) (A3P)	R13T	Thermistor (Sub.cool heat exc. gas 2)	Y1S	Solenoid valve (RMTG)
					H:P1P Prepare, Test•••••••Flickering	R10	Resistor (Current sensor) (A6P) (A9P)	R14T	Thermistor (Liquid 2)	Y2S	Solenoid valve (4 way valve-heat exc. 1)
					Malfunction detection•••••Light up	R50,R59	Resistor (A5P) (A8P)	R15T	Thermistor (Heat exc. liquid 2)	Y3S	Solenoid valve (RMTL)
				HAP	Pilot Lamp (Serv. mon.:Green) (A1P,A2P,A3P)	K1R	Magnetic Relay (Y4S)	R90	Resistor (Current sensor) (A5P) (A8P)	S1NPH	Pressure sensor (High)	Y4S	Solenoid valve (Hot gas)
				K2R	Magnetic Relay (Y5S)	R95	Resistor (Current limiting) (A5P) (A8P)	S2NPL	Pressure sensor (Low)	Y5S	Solenoid valve (EV Bypass 1)
				K3R	Magnetic Relay (Y1S) (A1P)	R1T	Thermistor (Air) (A1P)	S1PH,S2PH	Pressure switch (High)	Y6S	Solenoid valve (RMTT)
				K3R	Magnetic Relay (Y6S) (A2P)	R1T	Thermistor (Fin) (A5P) (A8P)	V1CP	Safety devices input (A1P) (A3P)	Y7S	Solenoid valve (RMTO)
				K4R	Magnetic Relay (Y8S)	R2T	Thermistor (Heat Exc.Gas 1)	V1R	Diode bridge (A5P) (A8P)	Y8S	Solenoid valve (4 way valve-pipe)
				K5R	Magnetic Relay (Y2S) (A1P)	R31T	Thermistor (M1C discharge)	V1R	Power module (A6P) (A9P)	Y9S	Solenoid valve (4 way valve-heat exc 2)
				K5R	Magnetic Relay (For option) (A2P)	R32T	Thermistor (M2C discharge)	V2R	Power module (A5P) (A8P)	Y10S	Solenoid valve (EV Bypass 2)
				K5R	Magnetic Relay (Y9S) (A3P)	R4T	Thermistor (Heat exc. deicer 1)	X1M	Terminal strip (Power supply)	Z1C~12C	Noise filter (Ferrite core)
				K6R	Magnetic Relay (Y7S) (A2P)	R5T	Thermistor (Sub cool heat exc. gas 1)	X1M	Terminal strip (Control) (A1P) (A3P)	Z1F	Noise filter (With surge absorber) (A1P) (A3P)
				K7R	Magnetic Relay (E1HS) (A1P)	R6T	Thermistor (Sub cool heat exc. liquid)	X2M	Terminal strip (Relay)		
				K7R	Magnetic Relay (E2HC) (A3P)	R7T	Thermistor (Heat exc. liquid 1)	X1A~X9A	Connector	CONNECTOR FOR OPTIONAL PARTS	
				K11R	Magnetic Relay (Y10S) (A3P)	R8T	Thermistor (Suction 1)	Y1E	Electric expansion valve (Main 1)	X7A	Operation output (A2P)
				L1R,L2R	Reactor	R9T	Thermistor (Liquid 1)	Y2E	Electric expansion valve (Subcool 1)	X9A	Power supply (Adapter) (A2P)
				M1C,M2C	Motor (Compressor)	R10T	Thermistor (Suction 2)	Y3E	Electric expansion valve (Main 2)	X37A	Power supply (Adapter) (A3P)
				BS1~5	Push button switch (Mode, Set, Return, Test, Reset)						
				C1	Capacitor						
				C63,C66	Capacitor (A5P) (A8P)						
				E1HC,E2HC	Crankcase Heater (A1P) (A3P)						
				F1U, F2U	Fuse (T, 3.15A, 250V) (A1P) (A3P)						
				F1U	Fuse (T, 3.15A, 250V) (A2P)						
				F1U	Fuse (8A, DC650V) (A6P) (A9P)						
				F400U	Fuse (T, 6.3A, 250V) (A4P) (A7P)						
				F1	Magnetic Relay (A5P) (A8P)						
				P2	Magnetic Contactor (M1C-A5P) (M2C-A8P)						
				F3	Magnetic Relay(A4P) (A7P)						

REMQ8P7Y1B

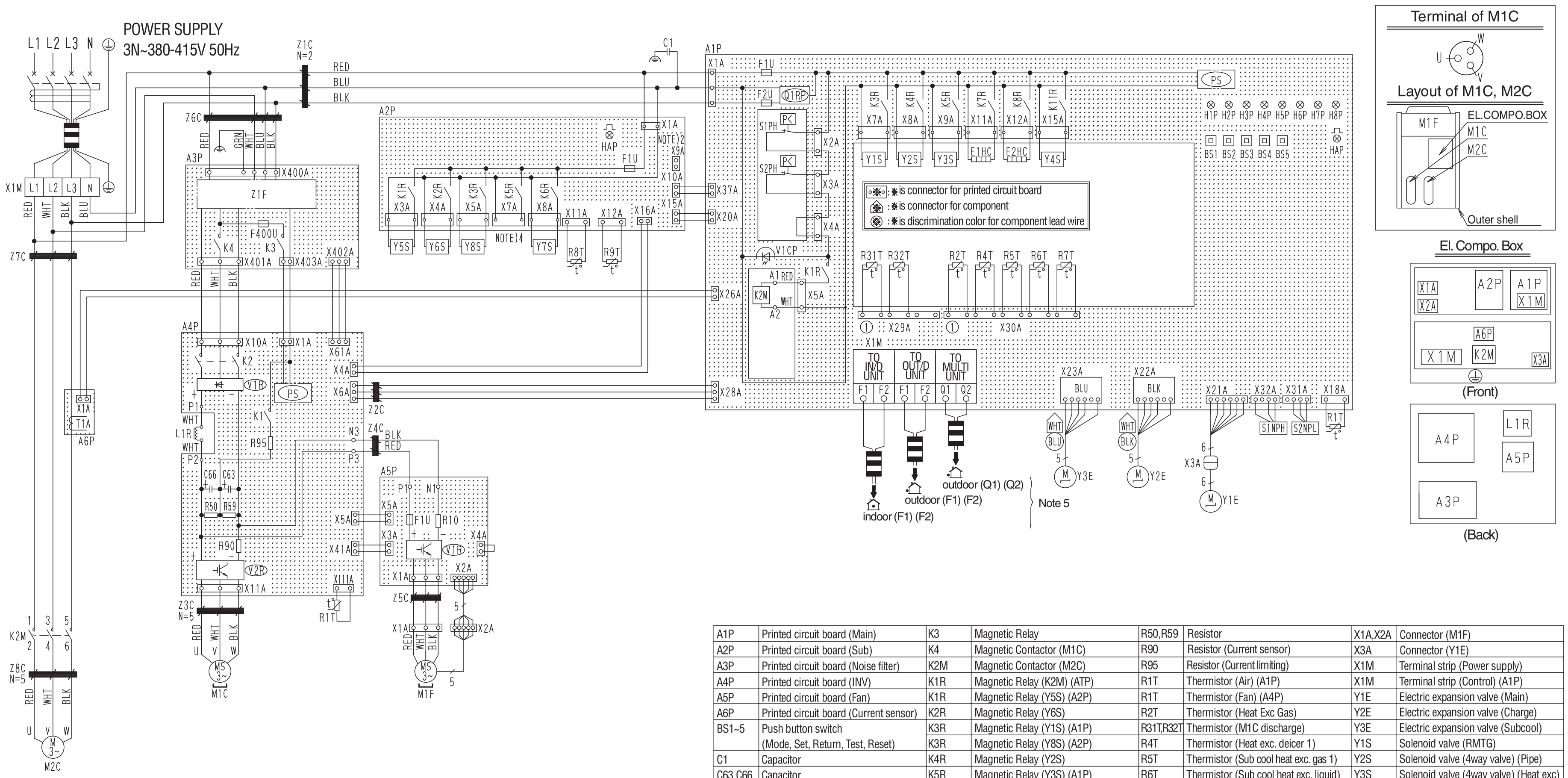


A1P	Printed circuit board (Main)	K3	Magnetic Relay	R95	Resistor (Current limiting)	X1M	Terminal strip (Power supply)
A2P	Printed circuit board (Sub)	K4	Magnetic Relay (M1C)	R1T	Thermistor (Air) (A1P)	X1M	Terminal strip (Control) (A1P)
A3P	Printed circuit board (Noise filter)	K1R	Magnetic Relay (Y5S)	R1T	Thermistor (Fan) (A4P)	Y1E	Electric expansion valve (Main)
A4P	Printed circuit board (INV)	K2R	Magnetic Relay (Y6S)	R2T	Thermistor (Heat Exc Gas)	Y2E	Electric expansion valve (Charge)
A5P	Printed circuit board (Fan)	K3R	Magnetic Relay (Y1S) (A1P)	R31T	Thermistor (M1C discharge)	Y3E	Electric expansion valve (Subcool)
BS1~5	Push button switch (Mode, Set, Return, Test, Reset)	K3R	Magnetic Relay (Y8S) (A2P)	R4T	Thermistor (Heat exc. deicer 1)	Y1S	Solenoid valve (RMTG)
		K4R	Magnetic Relay (Y2S)	R5T	Thermistor (Sub cool heat exc. gas 1)	Y2S	Solenoid valve (4way valve) (Pipe)
C1	Capacitor	K5R	Magnetic Relay (Y3S) (A1P)	R6T	Thermistor (Sub cool heat exc. liquid)	Y3S	Solenoid valve (4way valve) (Heat exc)
C63,C66	Capacitor	K5R	Magnetic Relay (For option) (A2P)	R7T	Thermistor (Heat exc. liquid)	Y4S	Solenoid valve (RMTL)
E1HC,	Crankcase Heater	K6R	Magnetic Relay (Y7S)	R8T	Thermistor (Suction)	Y5S	Solenoid valve (Hot gas)
F1U, F2U	Fuse (T.3.15A, 250V) (A1P)	K6R	Magnetic Relay (E1HC)	R9T	Thermistor (Liquid)	Y6S	Solenoid valve (EV Bypass)
F1U	Fuse (T.3.15A, 250V) (A2P)	K11R	Magnetic Relay (Y4S)	S1NPH	Pressure sensor (High)	Y7S	Solenoid valve (RMTO)
F1U	Fuse (8A, DC650V) (A6P)	L1R	Reactor	S2NPL	Pressure sensor (Low)	Y8S	Solenoid valve (RMTT)
F400U	Fuse (T.6.3A, 250V)	M1C	Motor (compressor)	S1PH	Pressure switch (High)	Z1C~6C	Noise filter (Ferrite core)
H1P~8P	Pilot lamp (service monitor: orange) [H2P] prepare test----------Flickering Malfunction detection--Light up	M1F	Motor (fan)	V1CP	Safety devices input	Z1F	Noise filter (Withsurge absorber)
		RS	Switching power supply (A1P,A4P)	V1R	Diode bridge (A4P)		
		Q1RP	Phase reversal detect circuit (A1P)	V1R	Power module (A5P)		CONNECTOR FOR OPTIONAL PARTS
HAP	Pilot lamp (Service monitor:green) (A1P),(A2P)	R10	Resistor (Current sensor)	V2R	Power module	X7A	Operation output (A2P)
K1	Magnetic relay	R50,R69	Resistor	X1A,X2A	Connector (M1F)	X9A	Power supply (Adapter) (A2P)
K2	Magnetic contactor (M1C)	R90	Resistor (Current sensor)	X3A	Connector (Y1E)		

NOTES
1. This wiring diagram is applied only to the outdoor unit.
2. : Field wiring.
3. : Terminal strip : Connector : Terminal : Protective earth (Screw)
4. When using the optical adapter, refer to the installation manual of the optional adapter.
5. For connection wiring to indoor-outdoor transmission F1 ● F2, outdoor-outdoor transmission F1 ● F2, outdoor-multi transmission Q1 ● Q2, refer to the installation manual.
6. How to use BS1~5, refer to "service precaution" label on El. Compo. Box (1) cover.
7. When operating, don't shortcircuit the protection device (S1PH).
8. Colors BLK:BLACK RED: RED BLU:BLUE WHT:WHITE GRN:GREEN

3D055307E

REMQ10P / 12P7Y1B



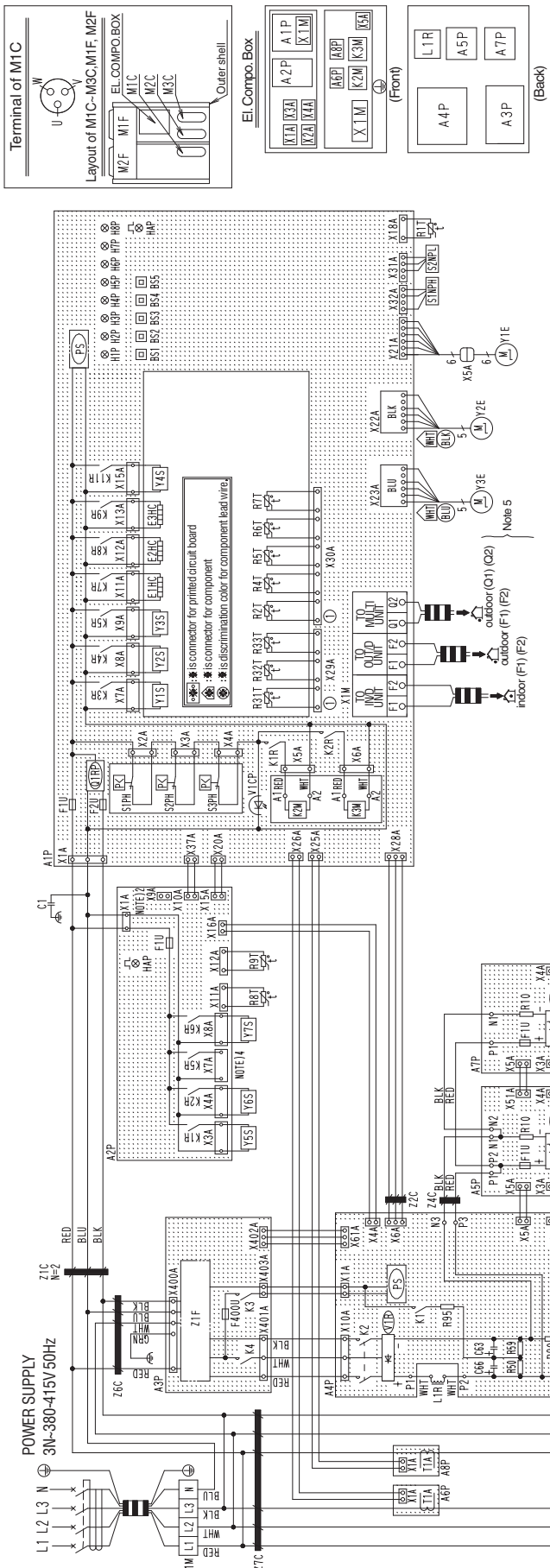
A1P	Printed circuit board (Main)	K3	Magnetic Relay	R50,R59	Resistor	X1A,X2A	Connector (M1F)
A2P	Printed circuit board (Sub)	K4	Magnetic Contactor (M1C)	R90	Resistor (Current sensor)	X3A	Connector (Y1E)
A3P	Printed circuit board (Noise filter)	K2M	Magnetic Contactor (M2C)	R95	Resistor (Current limiting)	X1M	Terminal strip (Power supply)
A4P	Printed circuit board (INV)	K1R	Magnetic Relay (K2M) (ATP)	R1T	Thermistor (Air) (A1P)	X1M	Terminal strip (Control) (A1P)
A5P	Printed circuit board (Fan)	K1R	Magnetic Relay (Y5S) (A2P)	R1T	Thermistor (Fan) (A4P)	Y1E	Electric expansion valve (Main)
A6P	Printed circuit board (Current sensor)	K2R	Magnetic Relay (Y6S)	R2T	Thermistor (Heat Exc Gas)	Y2E	Electric expansion valve (Charge)
BS1~5	Push button switch	K3R	Magnetic Relay (Y1S) (A1P)	R31T,R32T	Thermistor (M1C discharge)	Y3E	Electric expansion valve (Subcool)
	(Mode, Set, Return, Test, Reset)	K3R	Magnetic Relay (Y8S) (A2P)	R4T	Thermistor (Heat exc. deicer 1)	Y1S	Solenoid valve (RMTG)
C1	Capacitor	K4R	Magnetic Relay (Y2S)	R5T	Thermistor (Sub cool heat exc. gas 1)	Y2S	Solenoid valve (4way valve) (Pipe)
C63,C66	Capacitor	K5R	Magnetic Relay (Y3S) (A1P)	R6T	Thermistor (Sub cool heat exc. liquid)	Y3S	Solenoid valve (4way valve) (Heat exc)
E1HC,E2HC	Crankcase Heater	K5R	Magnetic Relay (For option) (A2P)	R7T	Thermistor (Heat exc. liquid)	Y4S	Solenoid valve (RMTL)
F1U, F2U	Fuse (T, 3.15A, 250V) (A1P)	K6R	Magnetic Relay (Y7S)	R8T	Thermistor (Suction)	Y5S	Solenoid valve (Hot gas)
F1U	Fuse (T, 3.15A, 250V) (A2P)	K7R	Magnetic Relay (E1HC)	R9T	Thermistor (Liquid)	Y6S	Solenoid valve (EV Bypass)
F1U	Fuse (8A, DC650V) (A6P)	K8R	Magnetic Relay (E2HC)	S1NPH	Pressure sensor (High)	Y7S	Solenoid valve (RMTO)
F400U	Fuse (T, 6.3A, 250V)	K11R	Magnetic Relay (Y4C)	S2NPL	Pressure sensor (Low)	Y8S	Solenoid valve (RMTT)
H1P~8P	Pilot lamp (service monitor: orange)	L1R	Reactor	S1PH,S2PH	Pressure switch (High)	Z1C~8C	Noise filter (Ferrite core)
	[H2P] prepare test-------------Flickering	M1C,M2C	Motor (compressor)	T1A	Current sensdr	Z1F	Noise filter (With surge absorber)
	Malfunction detection--Light up	M1F	Motor (fan)	V1CP	Safety devices input		
HAP	Pilot lamp (Service monitor-green) (A1P)(A2P)	RS	Switching power supply (A1P, A4P)	V1R	Diode bridge (A4P)	CONNECTOR FOR OPTIONAL PARTS	
K1	Magnetic relay	Q1RP	Phase reversal detect circuit	V1R	Power module (A5P)	X7A	Operation output (A2P)
K2	Magnetic contactor (M1C)	R10	Resistor (Current sensor)	V2R	Power module	X9A	Power supply (Adapter) (A2P)

NOTES

1. This wiring diagram is applied only to the outdoor unit.
2. ▬▮▮▬ : Field wiring
3. ▭▭▭ : Terminal strip ▫▫ : Connector -o- : Terminal ⏚ : Protective earth (Screw)
4. When using the optical adaptor, refer to the installation manual of the optional adaptor.
5. For connection wiring to indoor-outdoor transmission F1 ● F2, outdoor-outdoor transmission F1 ● F2, outdoor-multi transmission Q1 ● Q2, refer to the installation manual.
6. How to use BS1~5, refer to “service precaution” label on El. Compo. Box (1) cover.
7. When operating, don’t shortcircuit the protection device (S1PH).
8. Colors BLK:BLACK RED: RED BLU:BLUE WHT:WHITE GRN:GREEN

3D055308E

REMQ14P / 16P7Y1B



A1P	Printed circuit board (Main)	K3	Magnetic Relay	R50,R59	Resistor	X1A~4A	Connector (M1F,M2F)
A2P	Printed circuit board (Sub)	K4	Magnetic Contactor (M1C)	R90	Resistor (Current sensor)	X3A	Connector (Y1E)
A3P	Printed circuit board (Noise filter)	K2M,K3M	Magnetic Contactor (M2C,M3C)	R95	Resistor (Current limiting)	X1M	Terminal strip (Power supply)
A4P	Printed circuit board (INV)	K1R,K2R	Magnetic Relay (K2M,K3M) (A1P)	R1T	Thermistor (Air) (A1P)	X1M	Terminal strip (Control) (A1P)
A5P,A7P	Printed circuit board (Fan)	K1R	Magnetic Relay (Y5S) (A2P)	R1T	Thermistor (Fan) (A4P)	Y1E	Electric expansion valve (Main)
A6P,A8P	Printed circuit board (Current sensor)	K2R	Magnetic Relay (Y6S)	R2T	Thermistor (Heat Exc.Gas)	Y2E	Electric expansion valve (Charge)
BS1~5	Push button switch (Mode, Set, Return, Test, Reset)	K3R	Magnetic Relay (Y1S)	R31T,33T	Thermistor (M1C discharge)	Y3E	Electric expansion valve (Subcool)
		K4R	Magnetic Relay (Y2S)	R4T	Thermistor (Heat exc. deicer 1)	Y1S	Solenoid valve (RMTG)
C1	Capacitor	K5R	Magnetic Relay (Y3S) (A1P)	R5T	Thermistor (Sub cool heat exc. gas 1)	Y2S	Solenoid valve (4way valve) (Pipe)
C63,C66	Capacitor	K5R	Magnetic Relay (For option) (A2P)	R6T	Thermistor (Sub cool heat exc. liquid)	Y3S	Solenoid valve (4way valve) (Heat exc)
EHC,3HC	Crankcase Heater	K6R	Magnetic Relay (Y7S)	R7T	Thermistor (Heat exc. liquid)	Y4S	Solenoid valve (RMTL)
F1U, F2U	Fuse (T.3.15A, 250V) (A1P)	K7R	Magnetic Relay (E1HC)	R8T	Thermistor (Suction)	Y5S	Solenoid valve (Hot gas)
F1U	Fuse (T.3.15A, 250V) (A2P)	K8R	Magnetic Relay (E2HC)	R9T	Thermistor (Liquid)	Y6S	Solenoid valve (EV Bypass)
F1U	Fuse (8A, DC650V) (A5P,A7P)	K9R	Magnetic Relay (E3HC)	S1NPH	Pressure sensor (High)	Y7S	Solenoid valve (RMTG)
F400U	Fuse (T.6.3A, 250V) (A3P)	K11R	Magnetic Relay (Y4C)	S2NPL	Pressure sensor (Low)	Z1C~10C	Noise filter (Ferrite core)
H1P~8P	Pilot lamp (service monitor: orange) [H2P] prepare test----------Flickering Malfunction detection--Light up	L1R	Reactor	S1PH,S2PH	Pressure switch (High)	Z1F	Noise filter (With surge absorber)
		M1C~3C	Motor (compressor)	T1A	Current sensdr		
		M1F,M2F	Motor (fan)	V1C,P	Safety devices input		CONNECTOR FOR OPTIONAL PARTS
HAP	Pilot lamp (Service monitor-green) (A1P)(A2P)	PS	Switching power supply (A1P, A4P)	V1R	Diode bridge (A4P)	X7A	Operation output (A2P)
K1	Magnetic relay	Q1RP	Phase reversal detect circuit	V1R	Power module (A5P)	X9A	Power supply (Adapter) (A2P)
K2	Magnetic contactor (M1C)	R10	Resistor (Current sensor) (A5P,A7P)	V2R	Power module		

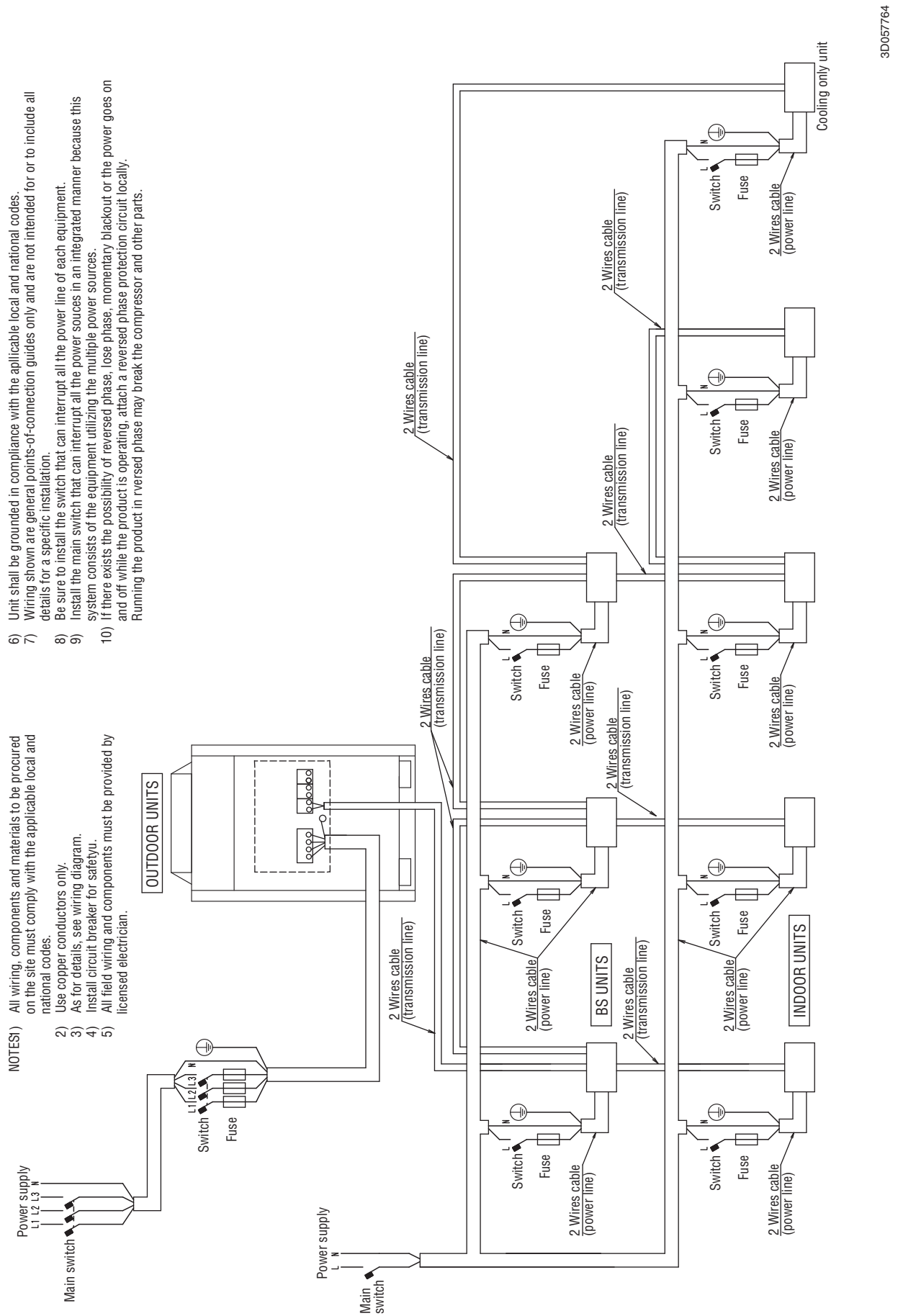
NOTES

1. This wiring diagram is applied only to the outdoor unit.
2. : Field wiring
3. : Terminal strip : Connector : Terminal : Protective earth (Screw)
4. When using the optical adaptor, refer to the installation manual of the optional adaptor.
5. For connection wiring to indoor-outdoor transmission F1 ● F2, outdoor-outdoor transmission F1 ● F2, outdoor-multi transmission Q1 ● Q2, refer to the installation manual.
6. How to use BS1~5, refer to "service precaution" label on El. Compo. Box (1) cover.
7. When operating, don't shortcircuit the protection device (S1PH).
8. Colors BLK:BLACK RED: RED BLU:BLUE WHT:WHITE GRN:GREEN

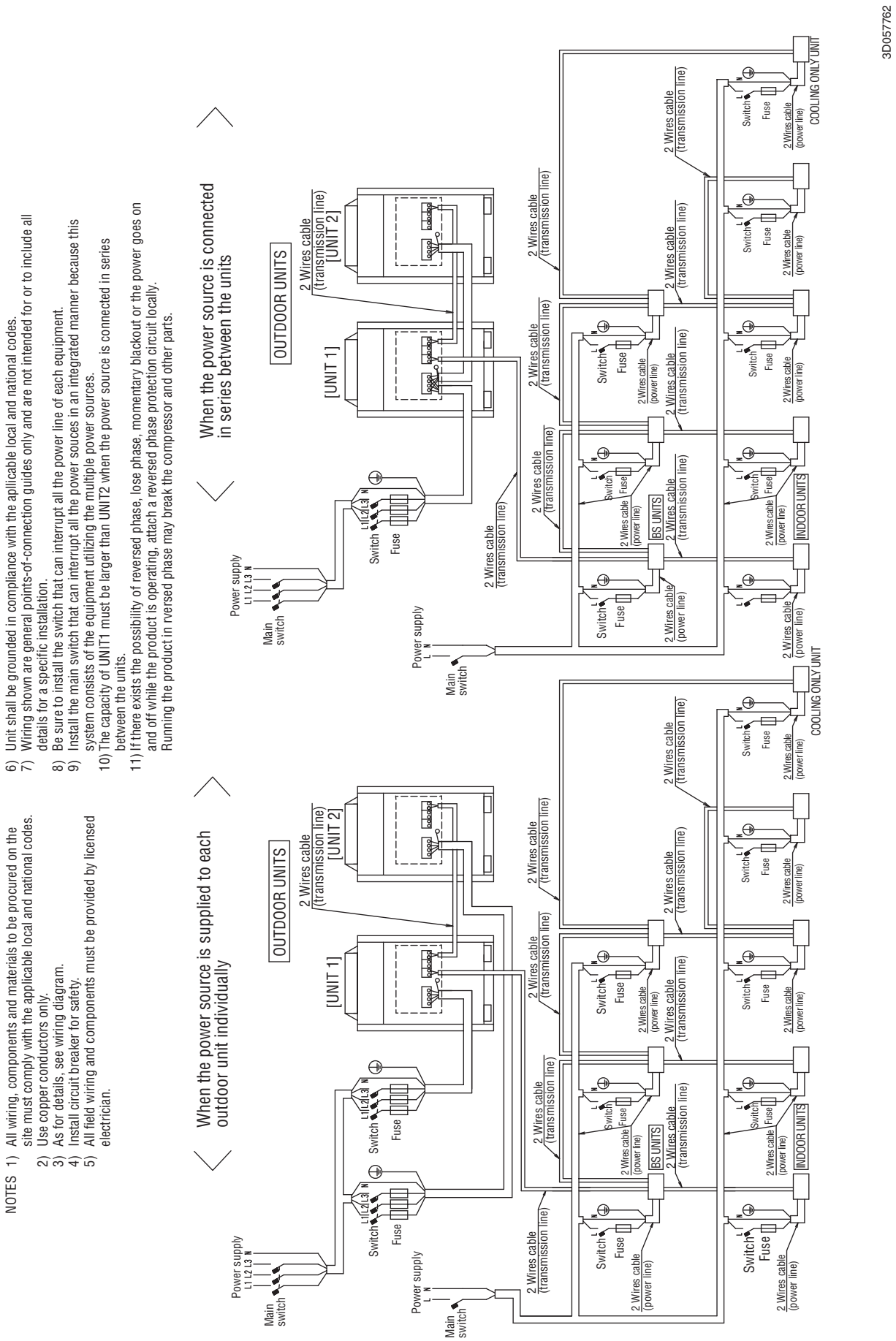
3D055309E

2.2 Field Wiring

REYQ8P / 10P / 12P / 14P / 16PY1B

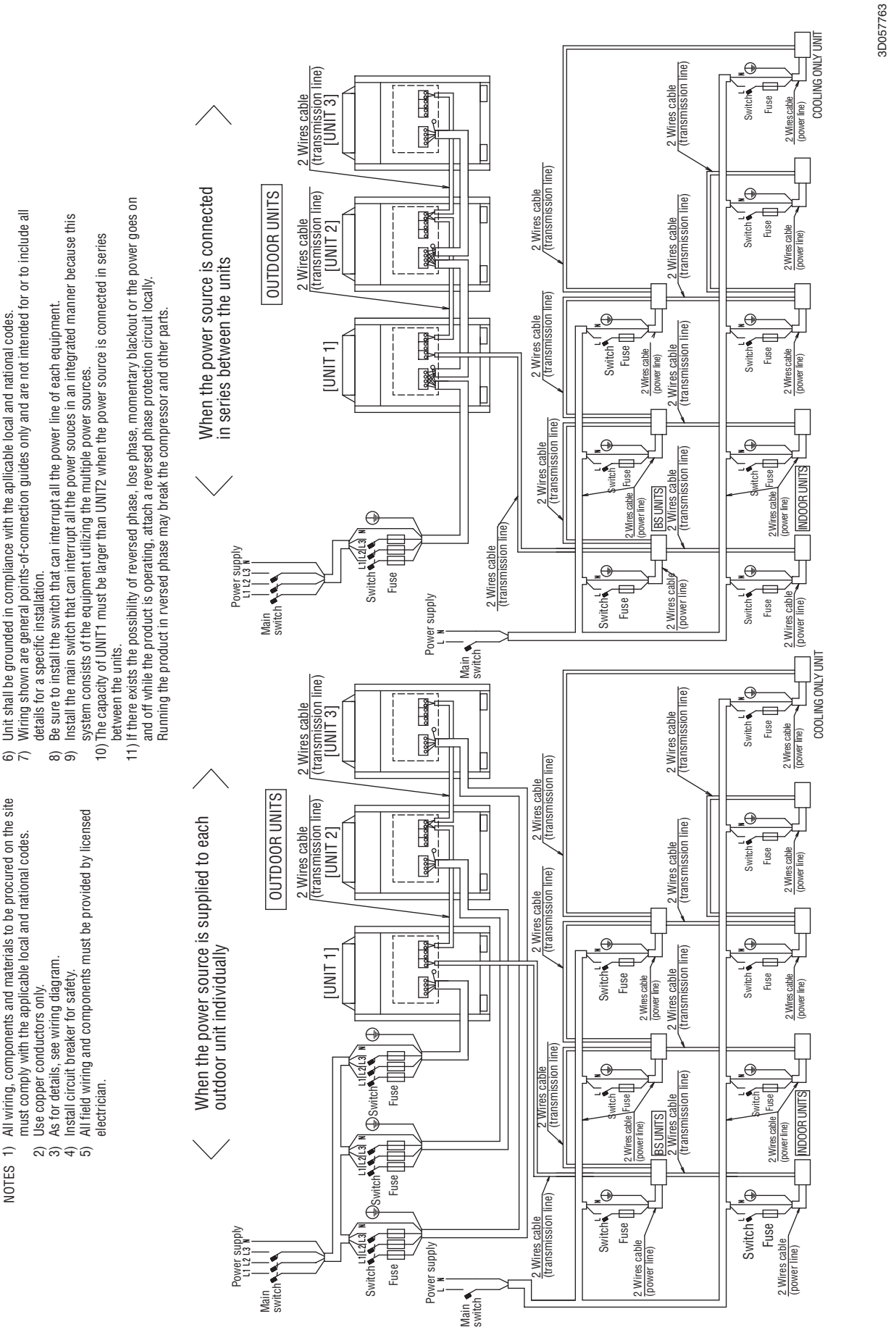


REYQ18P / 20P / 22P / 24P / 26P / 28P / 30P / 32P7Y1B



NOTES
1) All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.
2) Use copper conductors only.
3) As for details, see wiring diagram.
4) Install circuit breaker for safety.
5) All field wiring and components must be provided by licensed electrician.
6) Unit shall be grounded in compliance with the applicable local and national codes.
7) Wiring shown are general points-of-connection guides only and are not intended for or to include all details for a specific installation.
8) Be sure to install the switch that can interrupt all the power line of each equipment.
9) Install the main switch that can interrupt all the power souces in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
10) The capacity of UNIT1 must be larger than UNIT2 when the power source is connected in series between the units.
11) If there exists the possibility of reversed phase, lose phase, momentary blackout or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally. Running the product in rversed phase may break the compressor and other parts.

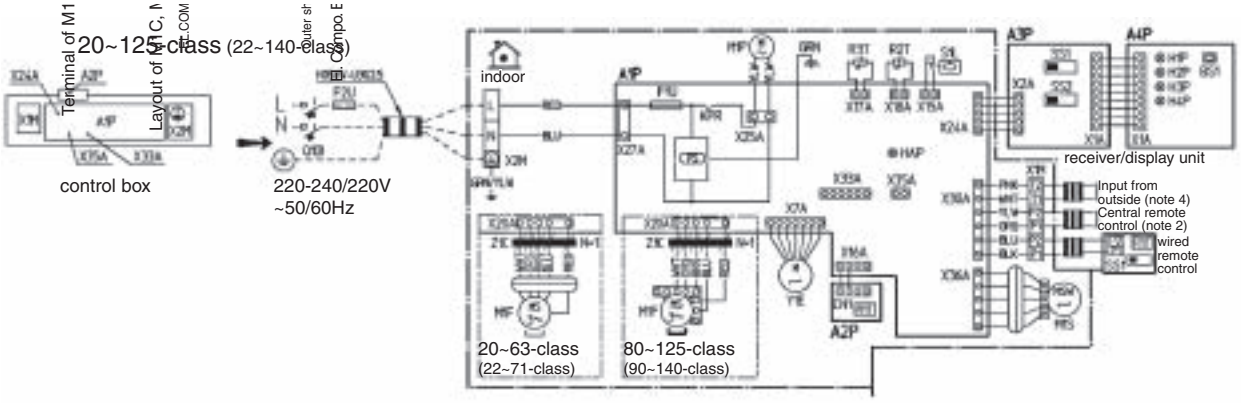
REYQ34P / 36P / 38P / 40P / 42P / 44P / 46P / 48P7Y1B



NOTES
1) All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.
2) Use copper conductors only.
3) As for details, see wiring diagram.
4) Install circuit breaker for safety.
5) All field wiring and components must be provided by licensed electrician.
6) Unit shall be grounded in compliance with the applicable local and national codes.
7) Wiring shown are general points-of-connection guides only and are not intended for or to include all details for a specific installation.
8) Be sure to install the switch that can interrupt all the power line of each equipment.
9) Install the main switch that can interrupt all the power souces in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
10) The capacity of UNIT1 must be larger than UNIT2 when the power source is connected in series between the units.
11) If there exists the possibility of reversed phase, lose phase, momentary blackout or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally. Running the product in rversed phase may break the compressor and other parts.

2.3 Indoor Unit

FXFQ20P / 25P / 32P / 40P / 50P / 63P / 80P / 100P / 125PVEB



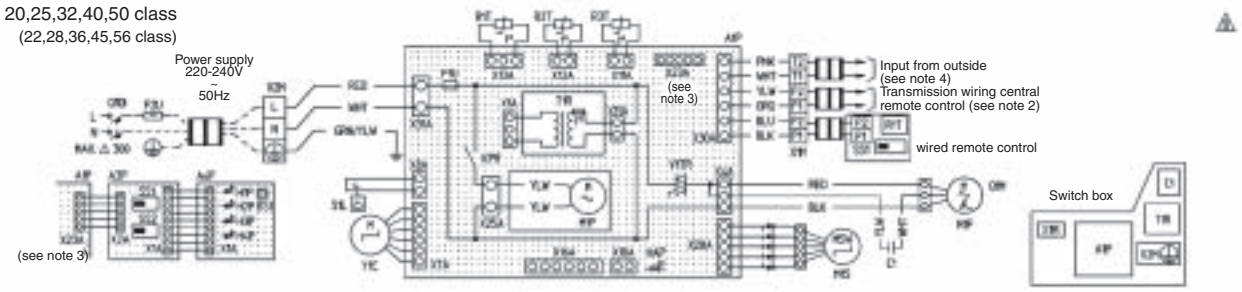
INDOOR UNIT		M1S	Motor (swing flap)	RECIEVER/DISPLAY UNIT (ATTACHED TO WIRELESS REMOTE CONTROL)		SS2	Selector switch (wireless address set)
A1P	Printed circuit board	PS	Power supply circuit			CONNECTOR FOR OPTIONAL PARTS	
A2P	Printed circuit board	Q1DI	Earth leak detector	A3P	Printed circuit board	X24A	Connector (infrared remote control)
C1	Capacitor	R1T	Thermistor (air)	A4P	Printed circuit board	X33A	Connector (adapter for wiring)
F1U	Fuse (T, 5A, 250V)	R2T	Thermistor coil	BS1	Push button (on/off)	X35A	Connector (group control adapter)
F2U	Field Fuse	R3T	Thermistor (Header)	H1P	Light emitting diode (on-red)	WIRED REMOTE CONTROL	
HAP	Light emitting diode (service monitor green)	S1L	Float switch	H2P	Light emitting diode (timer-green)	R1T	Thermistor (Air)
		X1M	Terminal strip	H3P	Light emitting diode (filter sign-red)	SS1	Selector switch (main/sub)
KPR	Magnetic relay (M1P)	X2M	Terminal strip	H4P	Light emitting diode (defrost -orange)		
L1	Coil	Y1E	Electronic expansion valve				
M1F	Motor (indoor fan)	Z1C	Ferrite core	SS1	Selector switch (main-sub)		
M1P	Motor (drain pump)						

NOTES

1. □□□□: Terminal strip ⊡⊡, ⊐: Connector ▮▮▮: Field Wiring
2. In case of using a central remote control, connect it to the unit in accordance with the attached installation manual.
3. X24A, X33A and X35A are connected when the optional accesories are being used.
4. When connecting the input wires from outside, forced off or on/off control operation can be selected by the remote control. See installation manual for more details.
5. Confirm the method of setting the selector switch (SS1, SS2) by installation manual and engineering data, etc.
6. Color legend:
   RED: RED BLK:BLACK WHT:WHITE YLW: YELLOW GRN:GREEN
   ORG: ORANGE BRN: BROWN GRY: GREY BLU:BLUE PNK: PINK

3TW28836-1B

FXZQ20M / 25M / 32M / 40M / 50MV1



A1P	Printed circuit board	T1R	Transformer (220-240/22V)	H3P	Light emitting diode
C1	Capacitor (M1F)	V1TR	Triac		(Filter sign-red)
F1U	Fuse (B , 5A, 250V)	X1M	Terminal strip	H4P	Light emitting diode
F2U	Field fuse	X2M	Terminal strip		(defrost-orange)
HAP	Light emitting diode	Y1E	Electronic expansion valve	SS1	Selector switch (main/sub)
	(service monitor green)	Wired remote control		SS2	Selector switch
KPR	Magnetic relay (M1P)	R1T	Thermistor		(wireless address set)
M1F	Motor (indoor fan)	SS1	Selector switch (main/sub)	connector for optional parts	
M1P	Motor (drain pump)	Infrared remote control		X16A	Connector
M1S	Motor (swing flap)	(receiver/display unit)			(adapter for wire)
Q1DI	Field earth leak detector	A3P	Printed circuit board	X18A	Connector (on/off)
	(max. 300mA)	A4P	Printed circuit board		(wiring adapter for
Q1M	Thermal protector	BS1	Push button (on/off)		electrical appendices)
	(M1F embedded)	H1P	Light emitting diode		
R1T	Thermistor (Air)		(On-red)		
R2T	Thermistor (Coil-Liquid)	H2P	Light emitting diode		
R3T	Thermistor (Coil-Gas)		(Timer-green)		
S1L	Float switch				

RED: RED PNK: PINK
BLK: BLACK ORG: ORANGE
WHT: WHITE GRN: GREEN
YLW: YELLOW BLU: BLUE

□□□ : Terminal

⊡ : Connector

—⊷ : Wire clamp

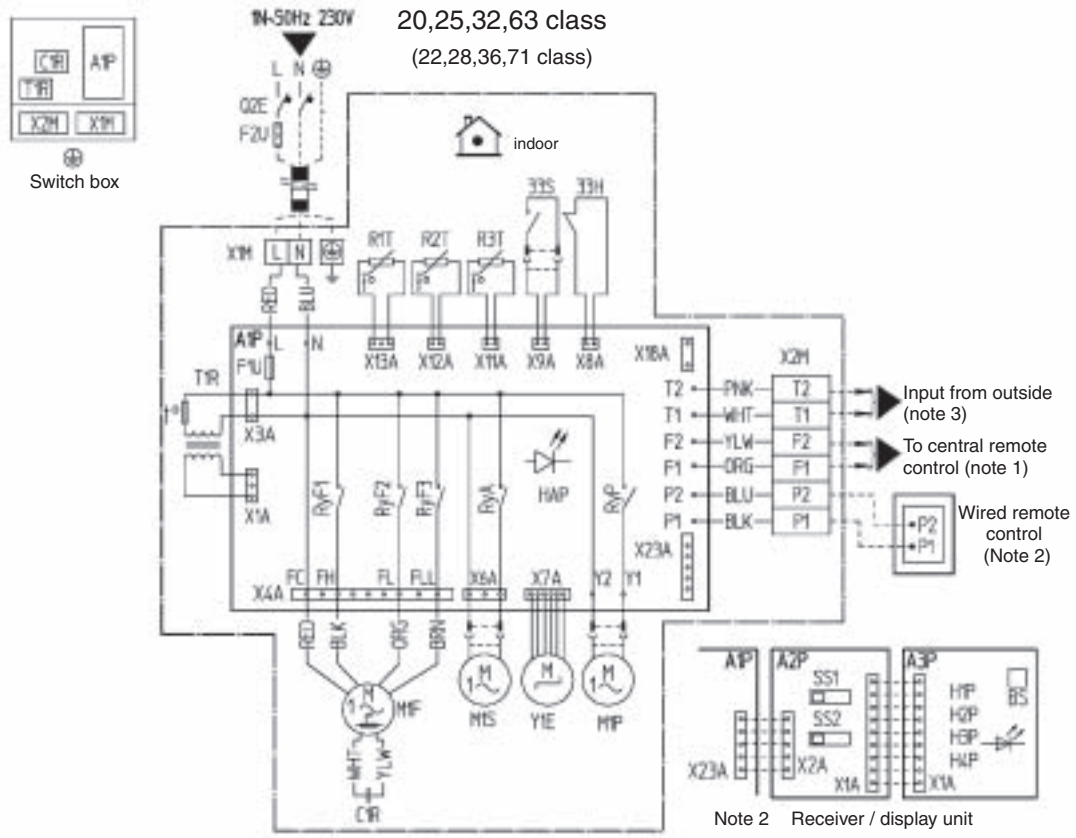
≡▮▮≡ : Field wiring

NOTES

1. In case of using a central remote control, connect it to the unit in accordance to the attached installation manual.
2. X23A is connected when the infrared remote control kit is being used.
3. When connecting the input wires from outside, forced off or on/off control operation can be selected by the remote control.
   In details, refer to the installation manual attached to the unit.
4. Remote control model varies according to the combination system.
   See technical data and catalogs, etc. before connecting.

3TW28836-1B

FXCQ20M / 25M / 32M / 63MV3



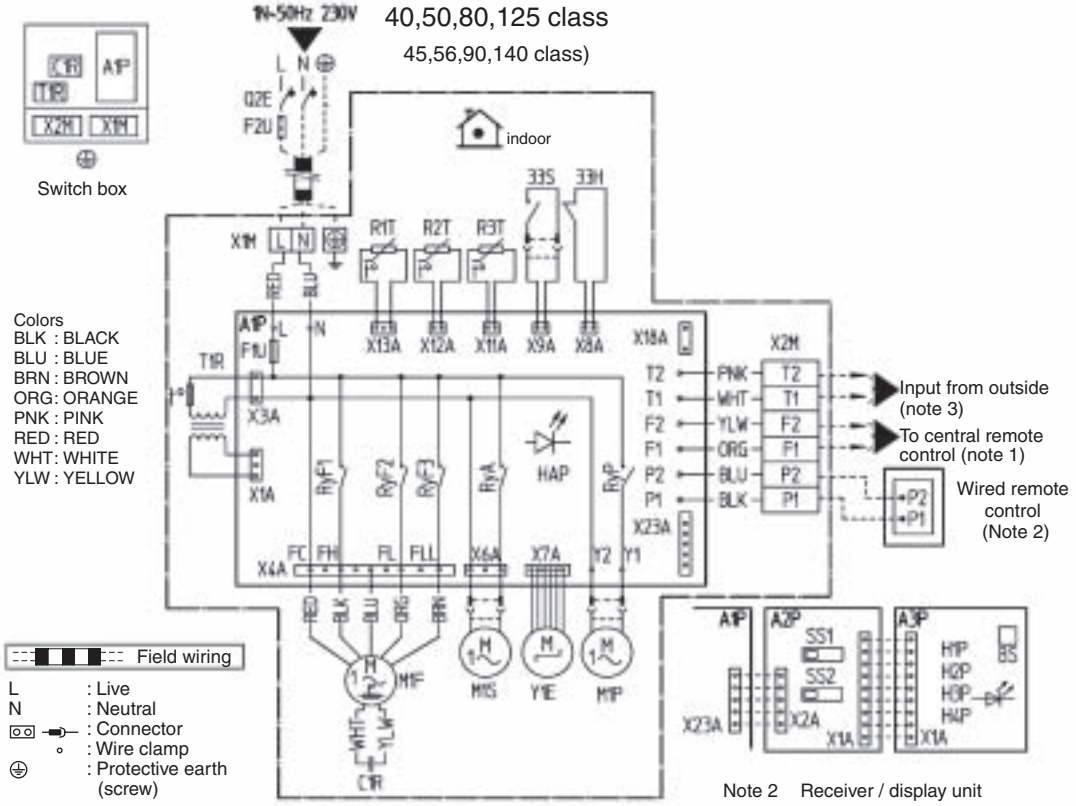
33H	Float switch	R2T, R3T	Thermistor (coil)	H1P	Light emitting diode (on-red)
33S	Limit switch (swing flap)	Q2E	Earth leak detector	H2P	Light emitting diode (timer-green)
A1P	Printed circuit board	RyA	Magnetic relay (M1S)	H3P	Light emitting diode (filter sign-red)
C1R	Capacitor (M1F)	RyF1-3	Magnetic relay (M1F)	H4P	Light emitting diode (defrost-orange)
F1T	Thermal fuse (152°C) (M1F embedded)	RyP	Magnetic relay (M1P)	SS1	Selector switch (main/sub)
F1U	Fuse (250V, 5A)	T1R	Transformer (220-240V/22V)	SS2	Selector switch (wireless address set)
F2U	Field fuse	X1M	Terminal strip (power)	Connector for optional parts	
HAP	Light emitting diode (service monitor-green)	X2M	Terminal strip (control)	X18A	Connector (wiring, adapter for electrical appendices)
		Y1E	Electronic expansion valve		
M1F	Motor (indoor fan)	Receiver / display unit (attached to infrared remote control		X23A	Connector (infrared remote control)
M1S	Motor (swing flap)				
M1P	Motor (drain pump)	A2P, A3P	Printed circuit board		
R1T	Thermistor (air)	BS	On/off button		

NOTES

1. When using a central remote control, see manual for connection to the unit.
2. X23A is connected when the infrared remote control kit is used.
3. When connecting the input wires from outside, “forced off” or “on/off” control operation can be selected by the remote control. For more details see installation manual.
4. Use copper conductors only.

2TW23776-1D

FXCQ40M / 50M / 80M / 125MV3



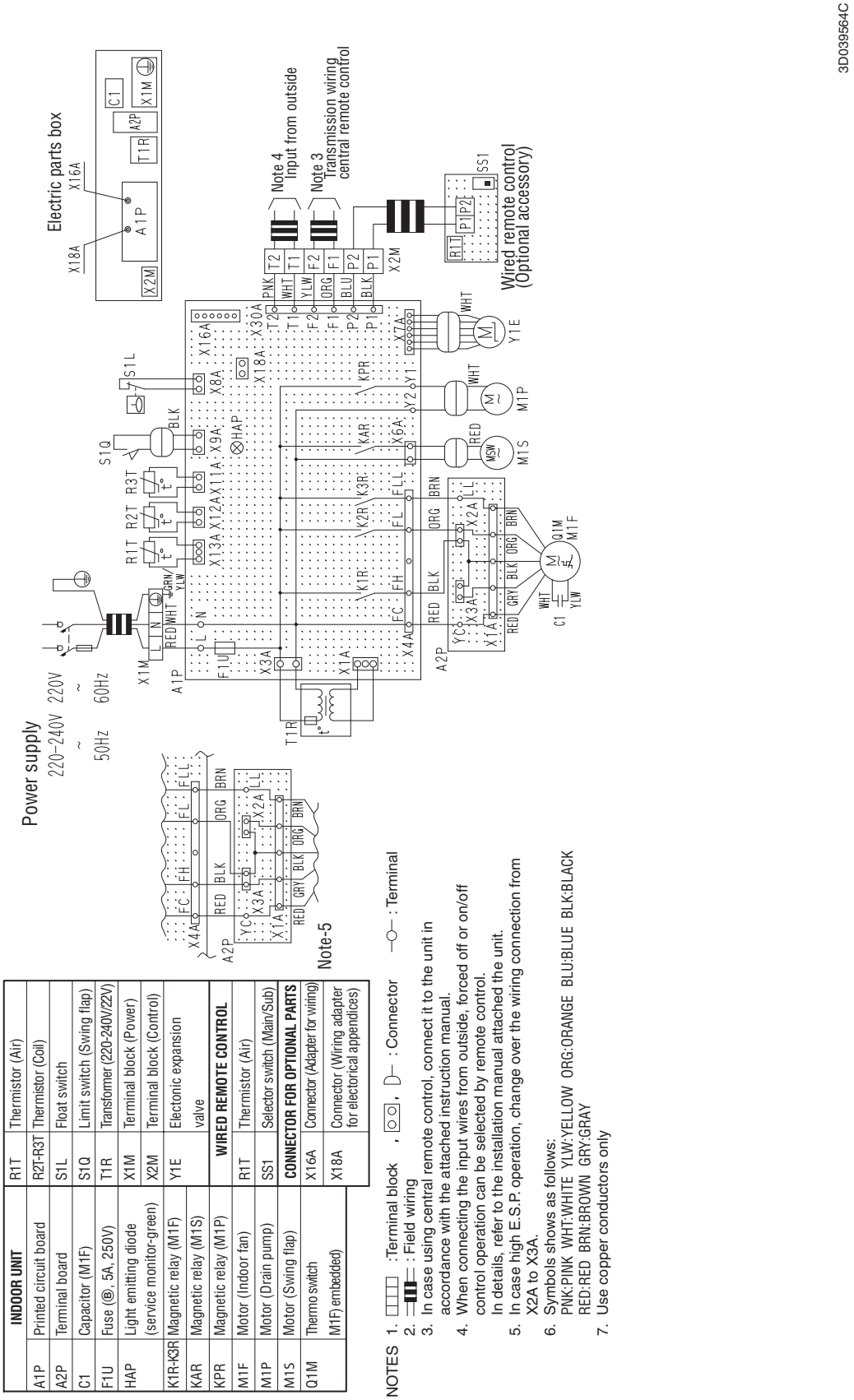
33H	Float switch	R2T, R3T	Thermistor (coil)	H1P	Light emitting diode (on-red)
33S	Limit switch (swing flap)	Q2E	Earth leak detector	H2P	Light emitting diode (timer-green)
A1P	Printed circuit board	RyA	Magnetic relay (M1S)	H3P	Light emitting diode (filter sign-red)
C1R	Capacitor (M1F)	RyF1-3	Magnetic relay (M1F)	H4P	Light emitting diode (defrost-orange)
F1T	Thermal fuse (152°C) (M1F embedded)	RyP	Magnetic relay (M1P)	SS1	Selector switch (main/sub)
F1U	Fuse (250V, 5A)	T1R	Transformer (220-240V/22V)	SS2	Selector switch (wireless address set)
F2U	Field fuse	X1M	Terminal strip (power)	Connector for optional parts	
HAP	Light emitting diode (service monitor-green)	X2M	Terminal strip (control)	X18A	Connector (wiring, adapter for electrical appendices)
		Y1E	Electronic expansion valve		
M1F	Motor (indoor fan)	Receiver / display unit (attached to infrared remote control		X23A	Connector (infrared remote control)
M1S	Motor (swing flap)				
M1P	Motor (drain pump)	A2P, A3P	Printed circuit board		
R1T	Thermistor (air)	BS	On/off button		

NOTES

1. When using a central remote control, see manual for connection to the unit.
2. X23A is connected when the infrared remote control kit is used.
3. When connecting the input wires from outside, “forced off” or “on/off” control operation can be selected by the remote control. For more details see installation manual.
4. Use copper conductors only.

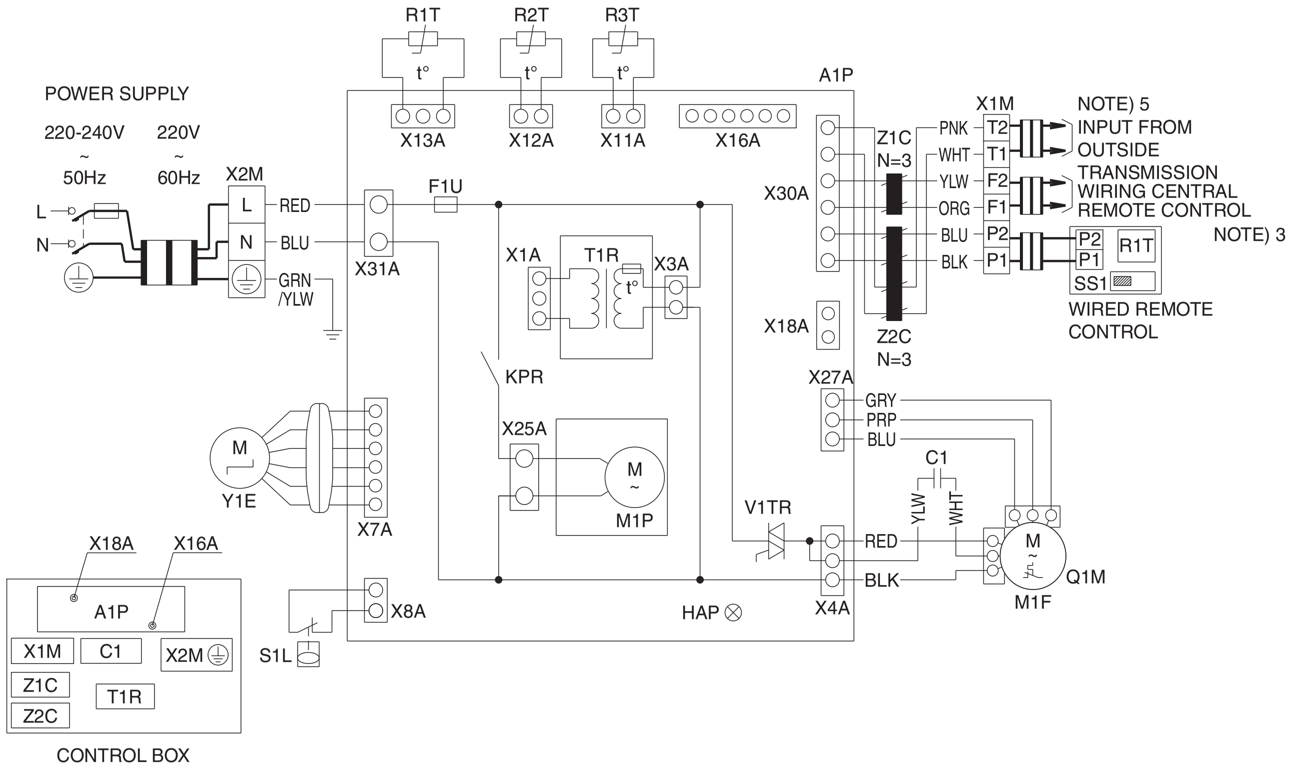
2TW23806-1D

FXKQ25MA / 32MA / 40MA / 63MAVE



FXDQ20P / 25P / 32P
FXDQ20NA / 25NA / 32NA / 40NA / 50NA / 63NAVE (with Drain Pump)

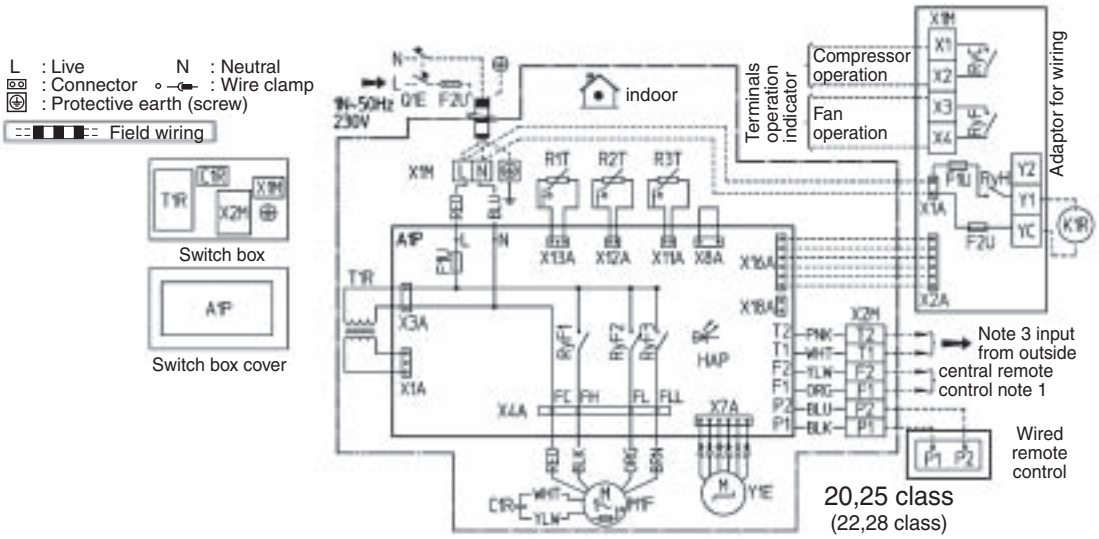
A1P	PRINTED CIRCUIT BOARD
C1	CAPACITOR (M1F)
F1U	FUSE (F5A/250V)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)
KPR	MAGNETIC RELAY (M1P)
M1F	MOTOR (INDOOR FAN)
M1P	MOTOR (DRAIN PUMP)
Q1M	THERMAL PROTECTOR (M1F EMBEDDED)
R1T	THERMISTOR (AIR)
R2T	THERMISTOR (COIL-1)
R3T	THERMISTOR (COIL-2)
S1L	FLOAT SWITCH
T1R	TRANSFORMER (220V/22V)
V1TR	PHASE CONTROL CIRCUIT
X1M	TERMINAL BLOCK
X2M	TERMINAL BLOCK
Y1E	ELECTRONIC EXPANSION VALVE
Z1C·Z2C	NOISE FILTER (FERRITE CORE)
WIRED REMOTE CONTROLLER	
R1T	THERMISTOR (AIR)
SS1	SELECTOR SWITCH (MAIN/SUB)
CONNECTOR FOR OPTIONAL PARTS	
X16A	CONNECTOR (ADAPTOR FOR WIRING)
X18A	CONNECTOR (WIRING ADAPTOR FOR ELECTRICAL APPENDICES)



NOTES)
1. ▭▭▭ : TERMINAL
⦾⦾ , ⫼ : CONNECTOR
2. ⫼ : FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
4. REMOTE CONTROLLER MODEL VARIES ACCORDING TO THE COMBINATION SYSTEM, CONFIRM ENGINEERING MATERIALS AND CATALOGS, ETC. BEFORE CONNECTING.
5. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.
6. SYMBOLS SHOW AS FOLLOWS: RED : RED BLK : BLACK WHT : WHITE YLW : YELLOW PRP : PURPLE GRY : GRAY BLU : BLUE PNK : PINK ORG : ORANGE GRN : GREEN

3D045500C

FXDQ20M / 25MV3



A1P	Printed circuit board	RyF1-3	Magnetic relay (fan)	Adapter for wiring		X1M	Terminal strip
C1R	Capacitor (Fan)	T1R	Transformer	RyC, RyF	Magnetic relay	Connector for optional parts	
F1U	Fuse (250V, 10A)		(220-240V/22V)	RyH	Magnetic relay (J1EH)	X16A	Connector (wiring adapter)
F2U	Field fuse	X1M	Terminal strip (power)	F1U, F2U	Fuse (250V, 5A)	X18A	Connector (wiring adapter for
HAP	Light emitting diode	X2M	Terminal strip (control)	X1A, X2A	Connector (wiring adaptor)		electrical appendices
	(service monitor-green)	Y1E	Electronic expansion valve				
M1F	Motor (fan)						
Q1E	Earth leak detector	Optional parts					
R1T	Thermistor (air)	J1EH	Electric heater				
R2T, R3T	Thermistor (refrigerant)	K1R	Magnetic relay (J1EH)				

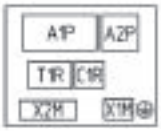
Colors:

BLK : BLACK	BLU : BLUE	BRN : BROWN	ORG : ORANGE
PNK : PINK	WHT : WHITE	YLW : YELLOW	RED : RED

NOTES
1. Use copper conductors only.
2. When using the central remote control, see manual for connection to the unit.
3. When installing the electric heater, change the wiring for the heater circuit. The main power supply has to be supplied independently.
4. When connecting the input wires from outside, “forced off” or “on/off” operation can be selected by the remote control. See installation manual for details.

2TW23666-1E

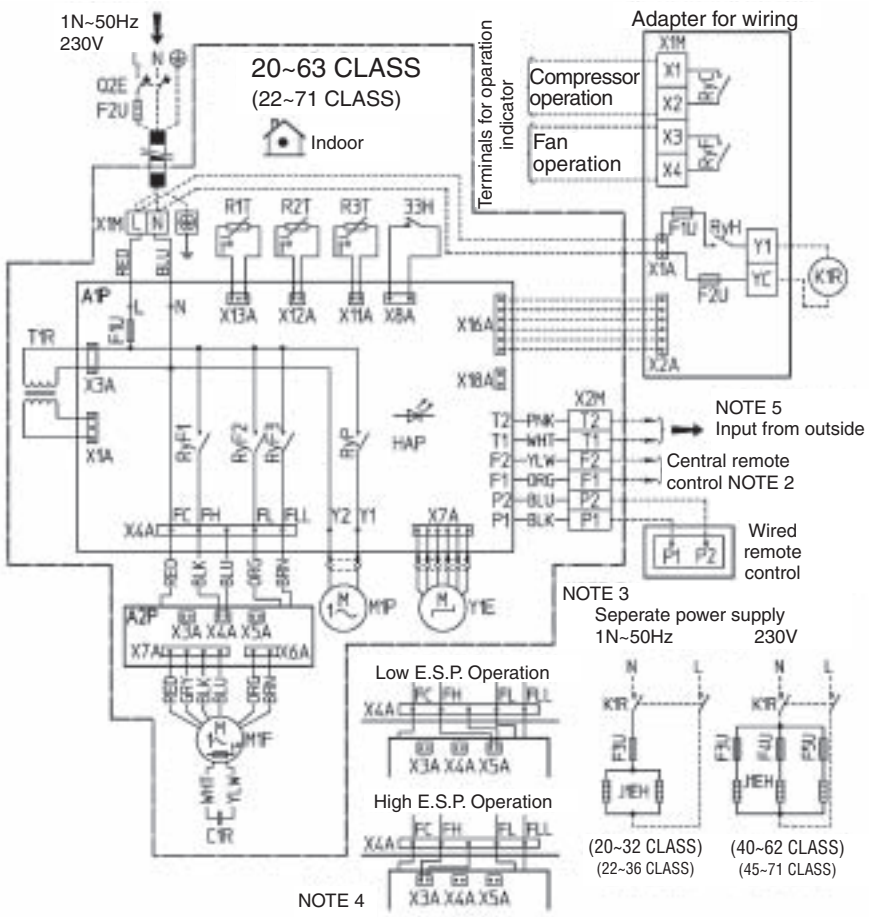
FXSQ20M / 25M / 32M / 40M / 50M / 63MV3



SWITCH BOX

COLORS:

BLK : BLACK
BLU : BLUE
BRN : BROWN
ORG: ORANGE
PNK : PINK
RED : RED
WHT: WHITE
YLW : YELLOW



33H	Float switch	R1T	Thermistor (air)	K1R	Magnetic relay (J1EH)
A1P	Printed circuit board	R2T,R3T	Thermistor (refrigerant)		**Adapter for wiring**
A2P	Therminal board	RyF1-3	Magnetic relay (Fan)	RyC,RyF	Magnetic relay
C1R	Capacitor (M1F)	RyP	Magnetic relay (Drain pump)	RyH	Magnetic relay (J1EH)
F1U	Fuse (250V, 5A)	T1R	Transformer (220V-27V)	F1U,F2U	Fuse (250V,5A)
F2U	Field fuse	X1M	Terminal strip (power)	X1A,X2A	Connecter (wiring adaptor)
HAP	Light emitting diode (service monitor-green)	X2M	Terminal strip (control)	X1M	Terminal strip
		Y1E	Electronic expansion valve		**Connector for optional parts**
M1F	Motor (fan)		**Optional parts**	X16A	Connector (wiring adapter)
M1P	Motor (drain pump)	F3-5U	Fuse (250V, 16A)	X18A	Connector (wiring adapter for electronical appendices)
		J1EH	Electric heater		
Q2E	Earth leak detector				

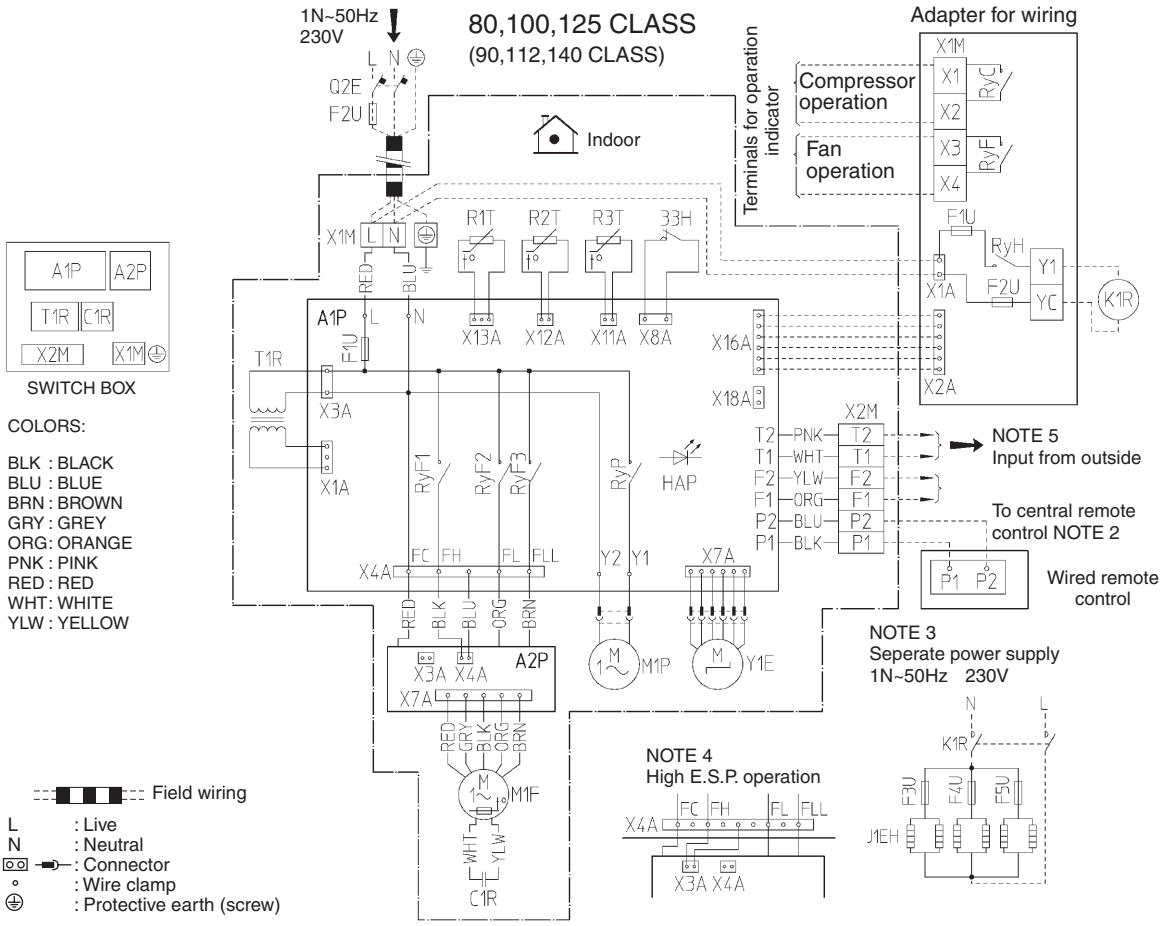
Field wiring
L : Live
N : Neutral
: Connector
: Wire clamp
: Protective earth (screw)

NOTES

1. Use copper conductors only.
2. When using a central remote control, see manual for connection to the unit.
3. When installing the electric heater, change the wiring for the heater circuit. The main power supply has to be supplied independently.
4. For high E.S.P. operation, change the wiring connection of x4A as shown on the wiring diagram.
5. When connecting the input wires from outside, “forced off” or “on/off” control operation can be selected by the remote control. See installation manual.

2TW23686-1C

FXSQ80M / 100M / 125MV3



33H	Float switch	R2T, R3T	Thermistor (refrigerant)		**Adapter for wiring**
A1P	Printed circuit board	RyF1-3	Magnetic relay (Fan)	RyC,RyF	Magnetic relay
A2P	Therminal board	RyP	Magnetic relay (Drain pump)	RyH	Magnetic relay (J1EH)
C1R	Capacitor (M1F)	T1R	Transformer (220V-27V)	F1U,F2U	Fuse (250V,5A)
F1U	Fuse (250V, 5A)	X1M	Terminal strip (power)	X1A,X2A	Connecter (wiring adapter)
F2U	Field fuse	X2M	Terminal strip (control)	X1M	Terminal strip
HAP	Light emitting diode (service monitor-green)	Y1E	Electronic expansion valve		**Connector for optional parts**
		Optional parts		X16A	Connector (wiring adapter)
M1F	Motor (fan)	F3-5U	Fuse (250V, 16A)	X18A	Connector (wiring adapter for
M1P	Motor (drain pump)	J1EH	Electric heater		electronical appendices)
Q2E	Earth leak detector	K1R	Magnetic relay (J1EH)		
R1T	Thermistor (air)				

NOTES

1. Use copper conductors only.
2. When using a central remote control, see manual for connection to the unit.
3. When installing the electric heater, change the wiring for the heater circuit. The main power supply has to be supplied independently.
4. For high E.S.P. operation, change the wiring connection of x4A as shown on the wiring diagram.
5. When connecting the input wires from outside, “forced off” or “on/off” control operation can be selected by the remote control. See installation manual for more details.

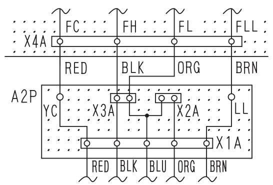
2TW23736-1C

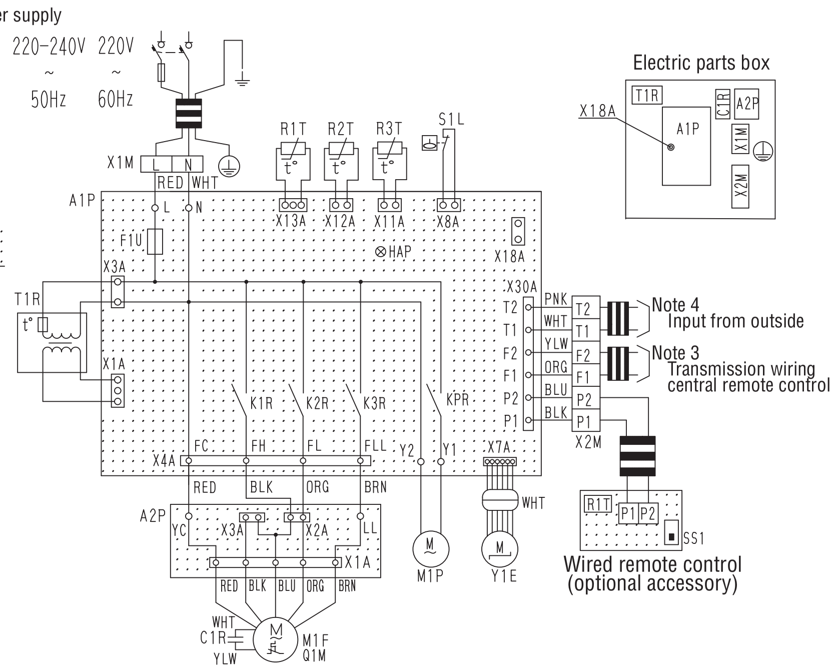
FXMQ40MA / 50MA / 63MA / 80MA / 100MA / 125MAVE

INDOOR UNIT			
A1P	Printed circuit board	R1T	Thermistor (Air)
A2P	Terminal board	R2T-R3T	Thermistor (Coil)
C1R	Capacitor (M1F)	S1L	Float switch
F1U	Fuse (Ⓑ 5A, 250V) 40•50•63•80 type	T1R	Transformer (220-240V/22V)
F1U	Fuse (Ⓑ 10A, 250V) 100•125 type	X1M	Terminal block (Power)
HAP	Light emitting diode (service monitor green)	X2M	Terminal block (Control)
K1R-K3P	Magnetic relay (M1F)	Y1E	Electronic expansion valve
KPR	Magnetic relay (M1P)	OPTIONAL PARTS	
M1F	Motor (Indoor fan)	M1P	Motor (Drain pump)
Q1M	Thermo switch (M1F embeded)	WIRED REMOTE CONTROL	
		SS1	Selector switch (Main/Sub)
		R1T	Thermistor (Air)
		CONNECTOR FOR OPTIONAL PARTS	
		X18A	Connector (Wiring adaptor for electorical appendices)

NOTES
1. ▭▭▭: Terminal block ⊡, ▷— : Connector —○— : Terminal
2. ≡▮▮▮: Field wiring
3. In case using central remote control, connect it to the unit in accordance with the attached instruction manual.
4. When connecting the input wires from outside, forced off or on/off control operation can be selected by remote control.
   In details, refer to the installation manual attached the unit.
5. In case high E.S.P. operation, change the wiring connection of X2A as shown upper figure.
6. Symbols shows as follows:
   PNK:PINK WHT:WHITE YLW:YELLOW ORG:ORANGE BLU:BLUE BLK:BLACK RED:RED BRN:BROWN
7. Use copper conductors only.

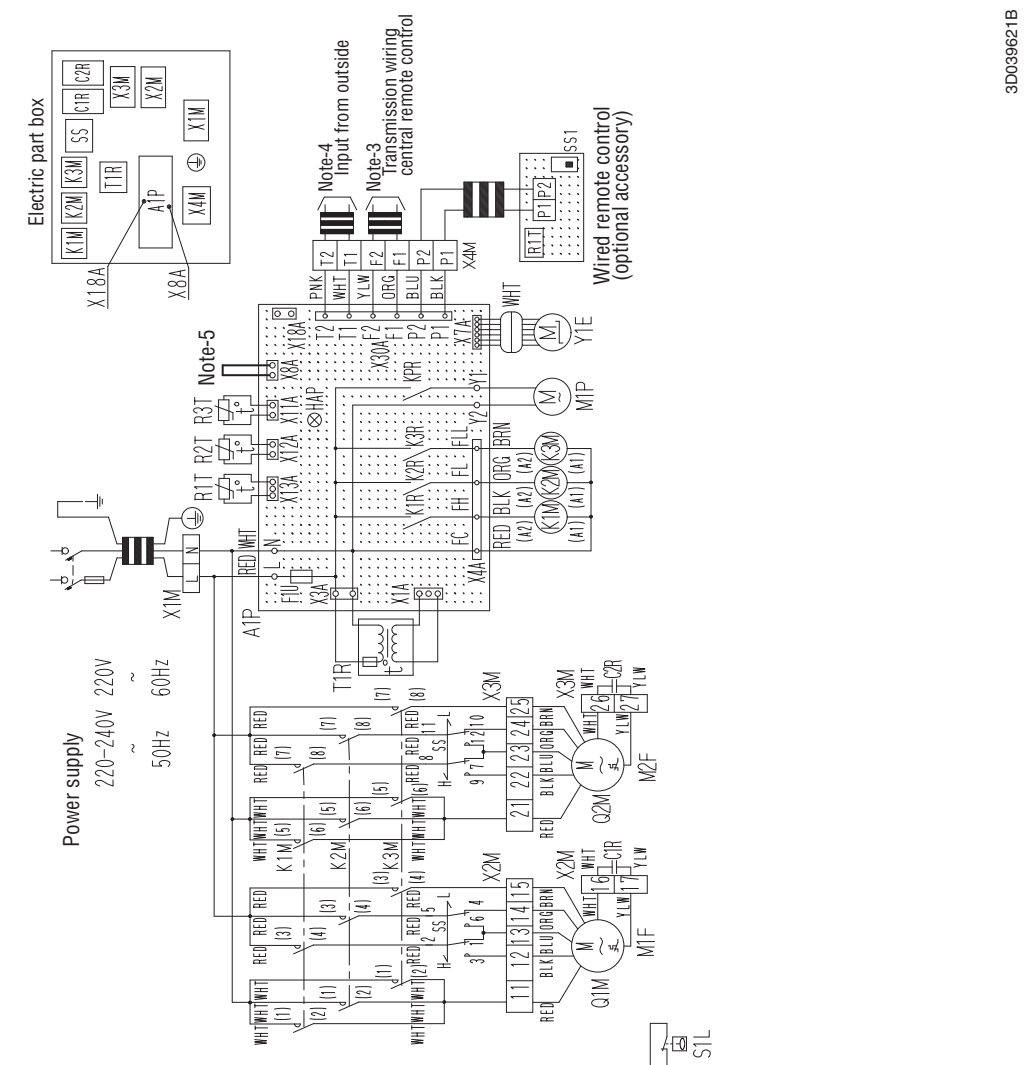
Note-5





3D039620B

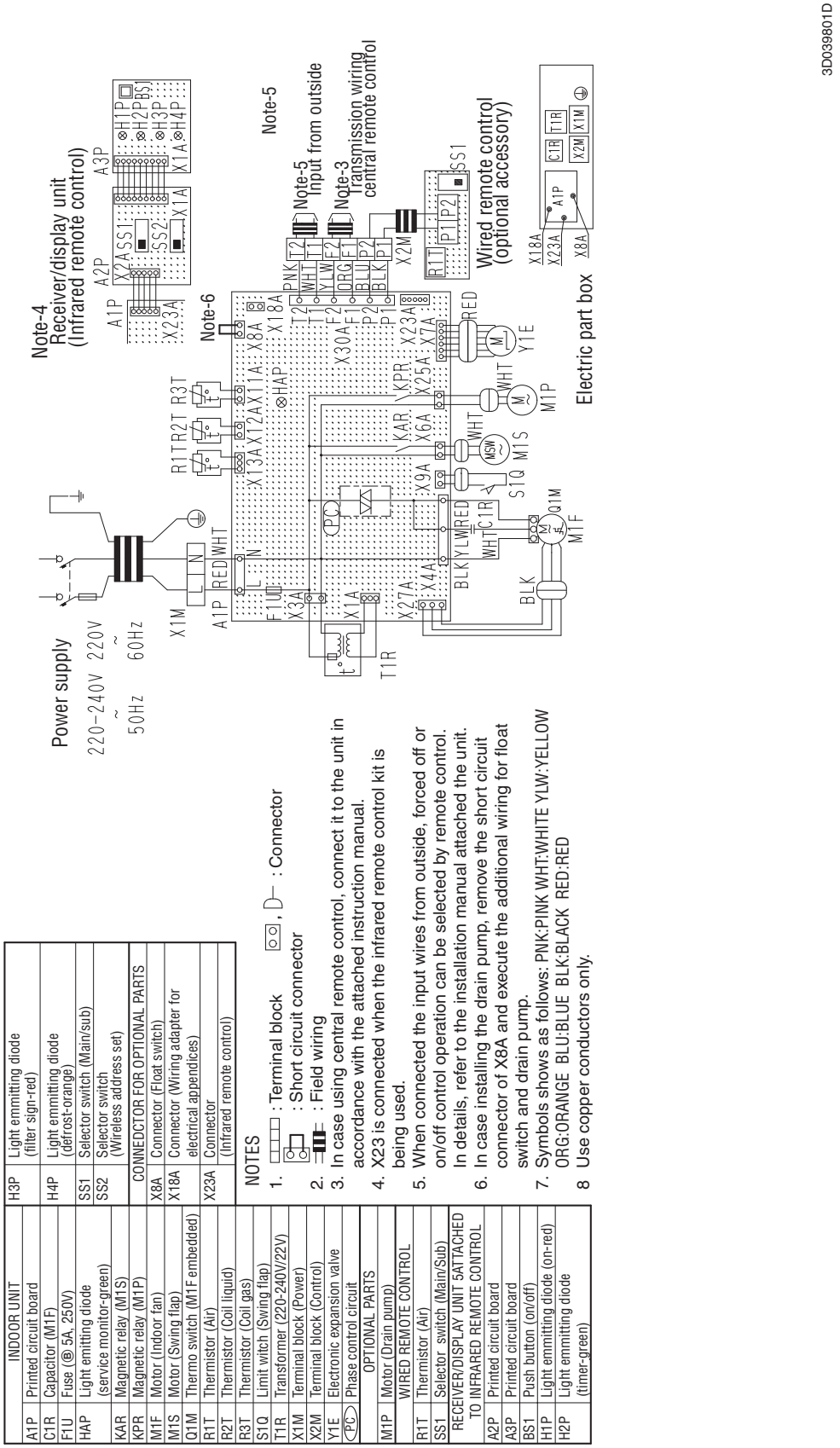
FXMQ200MA / 250MAVE



INDOOR UNIT			
A1P	Printed circuit board	R1T	Thermistor (Air)
C1R•C2R	Capacitor (M1F•2F)	R2T-R3T	Thermistor (Coil)
F1U	Fuse (Ⓑ 5A, 250V)	SS	Selector switch (Static pressure)
HAP	Light emitting diode (service monitor-green)	T1R	Transformer (220-240V/22V)
K1M	Magnetic contactor (M1F•2F)	X1M	Terminal block (Power)
K2M	Magnetic contactor (M1F•2F)	X2M-X3M	Terminal block
K3M	Magnetic contactor (M1F•2F)	X4M	Terminal block (Control)
K1R-K3P	Magnetic relay (M1F•2F)	Y1E	Electronic expansion valve
KPR	Magnetic relay (M1P)	OPTIONAL PARTS	
M1F•M2F	Motor (Indoor fan)	M1P	Motor (Drain pump)
Q1M•Q2M	Thermo switch (M1F•2F embedded)	WIRED REMOTE CONTROL	
		R1T	Thermistor (Air)
		SS1	Selector switch (Main/Sub)
		CONNECTOR FOR OPTIONAL PARTS	
		X8A	Connector (float switch)
		X18A	Connector (Wiring adapter for electorical appendices)

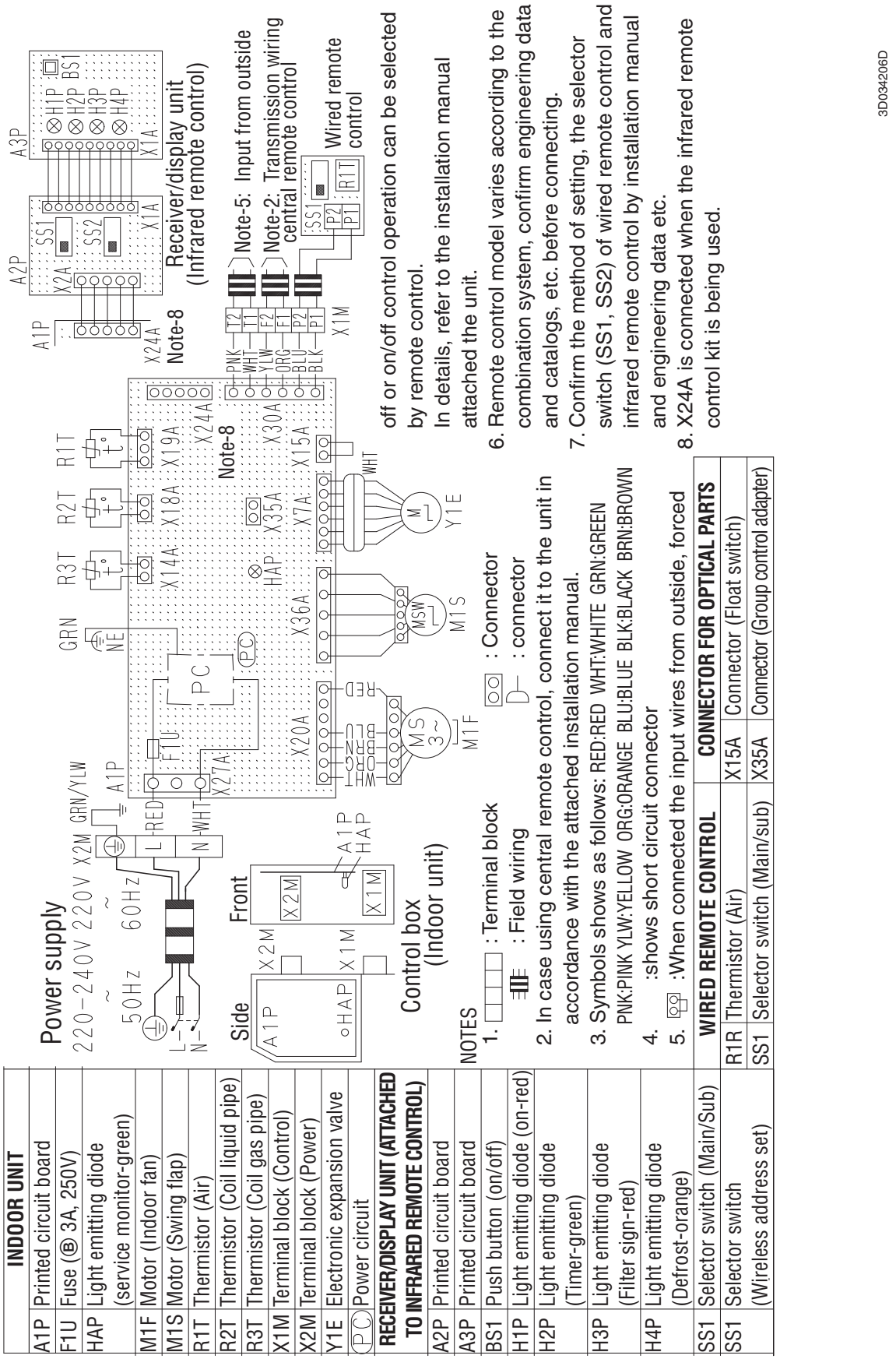
NOTES
1. : Terminal block
   : Connector
   : Short circuit connector
   : Terminal
2. : Field wiring
3. In case using central remote control, connect it to the unit in accordance with the attached instruction manual.
4. When connecting the input wires from outside, forced off or on/off control operation can be selected by remote control.
   In details, refer to the installation manual attached the unit.
5. In case installing the drain pump, remove the short circuit connector of X8A and execute the additional wiring for float switch and drain pump.
6. Symbols shows as follows: PNK:PINK WHT:WHITE YLW:YELLOW
   ORG:ORANGE BLU:BLUE BLK:BLACK RED:RED BRN:BROWN
7. Use copper conductors only.
8. In case high E.S.P. operation, change the switch(ss) for "H".

FXHQ32MA / 63MA / 100MAVE



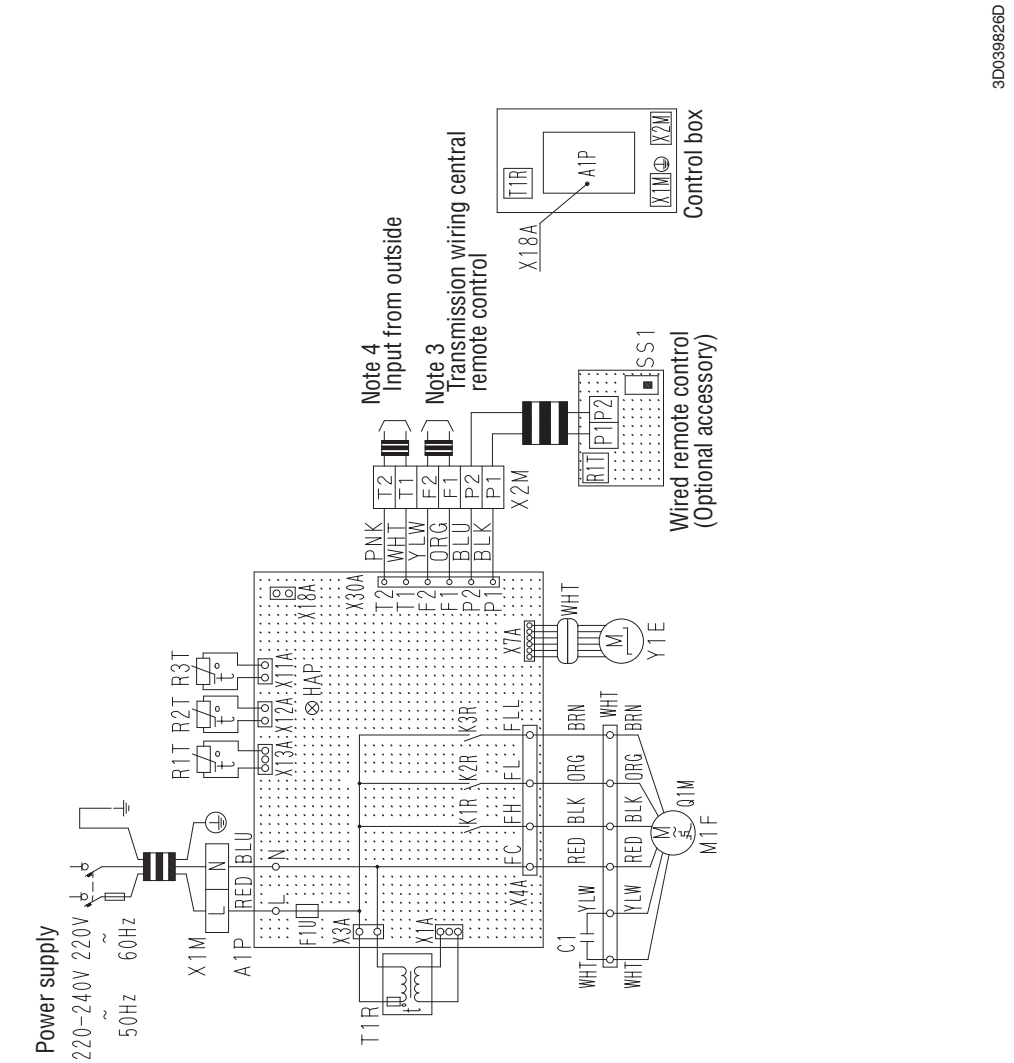
	INDOOR UNIT	H3P	Light emmitting diode (filter sign-red)
A1P	Printed circuit board		
C1R	Capacitor (M1F)	H4P	Light emmitting diode (defrost-orange)
F1U	Fuse (⑧ 5A, 250V)	SS1	Selector switch (Main/sub)
HAP	Light emitting diode (service monitor-green)	SS2	Selector switch (Wireless address set)
KAR	Magnetic relay (M1S)		CONNECTOR FOR OPTIONAL PARTS
KPR	Magnetic relay (M1P)	X8A	Connector (Float switch)
M1F	Motor (Indoor fan)	X18A	Connector (Wiring adapter for electrical appendices)
M1S	Motor (Swing flap)	X23A	Connector (Infrared remote control)
Q1M	Thermo switch (M1F embedded)		
R1T	Thermistor (Air)		
R2T	Thermistor (Coil liquid)		
R3T	Thermistor (Coil gas)		
S1Q	Limit witch (Swing flap)		
T1R	Transformer (220-240V/22V)		
X1M	Terminal block (Power)		
X2M	Terminal block (Control)		
Y1E	Electronic expansion valve		
(PC)	Phase control circuit		
	OPTIONAL PARTS		
M1P	Motor (Drain pump)		
	WIRED REMOTE CONTROL		
R1T	Thermistor (Air)		
SS1	Selector switch (Main/Sub)		
	RECEIVER/DISPLAY UNIT SATTACHED TO INFRARED REMOTE CONTROL		
A2P	Printed circuit board		
A3P	Printed circuit board		
BS1	Push button (on/off)		
H1P	Light emmitting diode (on-red)		
H2P	Light emmitting diode (timer-green)		

FXAQ20MA / 25MA / 32MAVE / 40MA / 50MA / 63MAVE



INDOOR UNIT			
A1P	Printed circuit board		
F1U	Fuse (Ⓑ 3A, 250V)		
HAP	Light emitting diode (service monitor-green)		
M1F	Motor (Indoor fan)		
M1S	Motor (Swing flap)		
R1T	Thermistor (Air)		
R2T	Thermistor (Coil liquid pipe)		
R3T	Thermistor (Coil gas pipe)		
X1M	Terminal block (Control)		
X2M	Terminal block (Power)		
Y1E	Electronic expansion valve		
PC	Power circuit		
RECEIVER/DISPLAY UNIT (ATTACHED TO INFRARED REMOTE CONTROL)			
A2P	Printed circuit board		
A3P	Printed circuit board		
BS1	Push button (on/off)		
H1P	Light emitting diode (on-red)		
H2P	Light emitting diode (Timer-green)		
H3P	Light emitting diode (Filter sign-red)		
H4P	Light emitting diode (Defrost-orange)		
SS1	Selector switch (Main/Sub)	**WIRED REMOTE CONTROL**	**CONNECTOR FOR OPTICAL PARTS**
SS1	Selector switch (Wireless address set)	R1R Thermistor (Air)	X15A Connector (Float switch)
		SS1 Selector switch (Main/sub)	X35A Connector (Group control adapter)

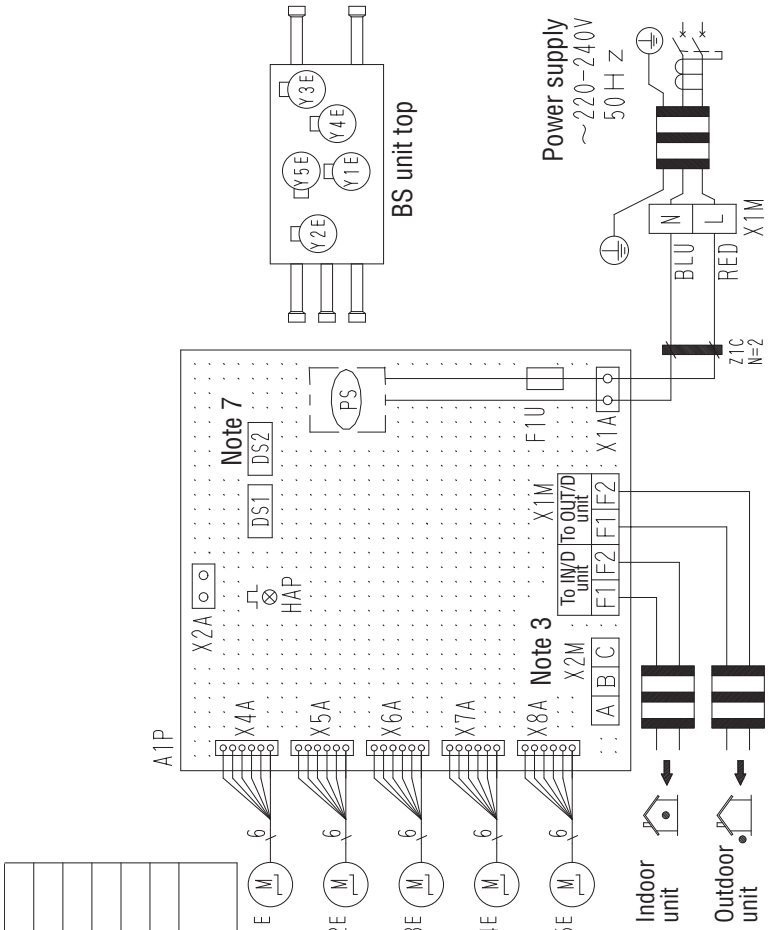
FXLQ20MA / 25MA / 32MA / 40MA / 50MA / 63MAVE
FXNQ20MA / 25MA / 32MA / 40MA / 50MA / 63MAVE



INDOOR UNIT		X2M	Terminal block (Control)
A1P	Printed circuit board	Y1E	Electonic expansion valve
C1	Capacitor (M1F)	**WIRED REMOTE CONTROL**	
F1U	Fuse (Ⓑ, 5A, 250V)	R1T	Thermistor (Air)
HAP	Light emitting diode (service monitor-green)	SS1	Selector switch (Main/Sub)
		CONNECTOR FOR OPTIONAL PARTS	
K1R-K3R	Magnetic relay (M1F)	X18A	Connector (Wiring adaptor for electorical appendices)
M1F	Motor (Indoor fan)		
Q1M	Thermo switch (M1F) embedded)		
R1T	Thermistor (Air)		
R2T-R3T	Thermistor (Coil)		
T1R	Transformer (220-240V/22V)		
X1M	Terminal block (Power)		

NOTES
1. □□□ : Terminal block ⊙⊙, ▷ : Connector ⊸ : Terminal
2. ▬▬ : Field wiring
3. In case using central remote control, connect it to the unit inaccordance with the attached instruction manual.
4. When connected the input wires from outside, forced off or on/off control operation can be selected by remote control.
   In details, refer to the installation manual attached the unit.
5. Symbols shows as follows:
   PNK:PINK WHT:WHITE YLW:YELLOW ORG:ORANGE BLU:BLUE
   BLK:BLACK RED:RED BRN:BROWN
6. Use copper conductors only

2.4 BS Unit



3D055928C

A1P	Printed circuit board	Y2E	Electric expansion valve (Sub discharge)
DS1, D2S	Dip switch	Y3E	Electric expansion valve (Sub suction)
F1U	Fuse (T, 3, 15A, 250V)	Y4E	Electric expansion valve (Main discharge)
HAP	Flashing lamp (service monitor-green)	Y5E	Electric expansion valve (Main suction)
		Z1C	Noise filter (Ferrite core)
PS	Switching power sypply (A1P)	**CONNECTOR FOR OPTIONAL PARTS**	
X1M	Terminal strip (Power)	X2A	Connector (Wiring external control adapter for outdoor unit)
X1M (A1P)	Terminal strip (Control)		
X2M	Terminal strip (C/H Selector)		
Y1E	Electric expansion valve (Sub cool)		

NOTES 1. This wiring diagram applies ti the BS unit only.
2. □□□ :Terminal strip, ○○ : Connector, —○— : Terminal
2. =▮▮= : Field wiring ⏚ : Protective earth
3. When using the cool/heat selector (optional accessory),connect it to terminals A, B, and C, on X2M
4. As for wiring to the IN/D unit (F1) - (F2) and OUT/D unit (F1- - (F2) on X1M (A1P), refer to installation manual.
5. Symbols shows as follows: BLU:BLUE RED:RED
6. Use copper conductors only
7. Dip switch (DS1-2) initial settings are as follows,

For using DIP switch (DS1-2), refer to installation manual or “service precaution” label on El, compo, box cover.

3. List of Electrical and Functional Parts

3.1 Outdoor Unit

3.1.1 REYQ8PY1~12PY1

Item	Name		Symbol	Model		
				REYQ8PY1	REYQ10PY1	REYQ12PY1
Compressor	Inverter	Type	M1C	JT1GCVDKYR@SA		
		OC protection device		14.7A		
	STD 1	Type	M2C	JT170G-KYE@T		
		OC protection device		15.0A		
	STD 2	Type	M3C	—		
		OC protection device				
Fan motor		OC protection device	M1F	3.0A		3.0A (for General overseas : 1.14A)
Electronic expansion valve (Main)			Y1E	Fully closed: 0pls Fully open: 1375pls		
Electronic expansion valve (Subcool)			Y2E	Fully closed: 0pls Fully open: 480pls		
Electronic expansion valve (Refrigerant charge)			EV	0~480pls		
Pressure protection	High pressure switch	For M1C	S1PH	OFF: $4.0^{+0}_{-0.12}$ MPa ON: 3.0±0.15MPa		
		For M2C	S2PH	OFF: $4.0^{+0}_{-0.12}$ MPa ON: 3.0±0.15MPa		
		For M3C	S3PH	—		
	Low pressure sensor		SENPL	OFF: 0.07MPa		
Temperature protection	Discharge gas temperature protection (Discharge pipe thermistor)		R3T	OFF: 135°C		
	Inverter fin temperature protection (Radiator fin thermistor)		R1T	OFF: 93°C		
Others	Fuse	For main PC board	F1U	250V AC 10A Class B Time-lag 3.15A AC 250V		
			F2U	250V AC 10A Class B Time-lag 3.15A AC 250V		
		For Noise filter PC board	F1U	250V AC 5A Class B		

3.1.2 REYQ14PY1~16PY1

Item	Name		Symbol	Model	
				REYQ14PY1	REYQ16PY1
Compressor	Inverter	Type	M1C	JT1GCVDKYR@SA	
		OC protection device		14.7A	
	STD 1	Type	M2C	JT170G-KYE@T	
		OC protection device		15.0A	
	STD 2	Type	M3C	JT170G-KYE@T	
		OC protection device		15.0A	
Fan motor		OC protection device	M1F, M2F	1.2A	
Electronic expansion valve (Main)			Y1E	Fully closed: 0pls Fully open: 1375pls	
Electronic expansion valve (Subcool)			Y2E	Fully closed: 0pls Fully open: 480pls	
Electronic expansion valve (Refrigerant charge)			EV	0~480pls	
Pressure protection	High pressure switch	For M1C	S1PH	OFF: $4.0^{+0}_{-0.12}$ MPa ON: 3.0±0.15MPa	
		For M2C	S2PH	OFF: $4.0^{+0}_{-0.12}$ MPa ON: 3.0±0.15MPa	
		For M3C	S3PH	OFF: $4.0^{+0}_{-0.12}$ MPa ON: 3.0±0.15MPa	
	Low pressure sensor		SENPL	OFF: 0.07MPa	
Temperature protection	Discharge gas temperature protection (Discharge pipe thermistor)		R3T	OFF: 135°C	
	Inverter fin temperature protection (Radiator fin thermistor)		R1T	OFF: 93°C	
Others	Fuse	For main PC board	F1U	250V AC 10A Class B Time-lag 3.15A AC 250V	
			F2U	250V AC 10A Class B Time-lag 3.15A AC 250V	
		For Noise filter PC board	F1U	250V AC 5A Class B	

3.1.3 REMQ8PY1~12PY1

Item	Name		Symbol	Model		
				REMQ8PY1	REMQ10PY1	REMQ12PY1
Compressor	Inverter	Type	M1C	JT1GCVDKYR@SA		
		OC protection device		14.7A		
	STD 1	Type	M2C	—	JT170G-KYE@T	
		OC protection device		—	15.0A	
	STD 2	Type	M3C	—	—	
		OC protection device		—	—	
Fan motor		OC protection device	M1F	3.0A		
Electronic expansion valve (Main)			Y1E	Fully closed : 0pls	Fully open : 480pls	
Electronic expansion valve (Refrigerant charge)			Y2E	Fully closed : 0pls	Fully open : 480pls	
Electronic expansion valve (Subcool)			Y3E	Fully closed : 0pls	Fully open : 480pls	
Pressure protection	High pressure switch	For M1C	S1PH	OFF : $4.0^{+0}_{-0.12}$ MPa	ON : 3.0±0.15MPa	
		For M2C	S2PH	OFF : $4.0^{+0}_{-0.12}$ MPa	ON : 3.0±0.15MPa	
		For M3C	S3PH	—		
	Low pressure sensor		SENPL	OFF : 0.07MPa		
Temperature protection	Discharge gas temperature protection (Discharge pipe thermistor)		R3T	OFF : 135°C		
	Inverter fin temperature protection (Radiator fin thermistor)		R1T	OFF : 93°C		
Others	Fuse	For main PC board	F1U	Time-lag 3.15A AC 250V / 250V AC 10A Class B		
			F2U	Time-lag 3.15A AC 250V / 250V AC 10A Class B		
		For Noise filter PC board	F1U	250V AC 5A Class B		

3.1.4 REMQ14PY1~16PY1

Item	Name		Symbol	Model	
				REMQ14PY1	REMQ16PY1
Compressor	Inverter	Type	M1C	JT1GCVDKYR@SA	
		OC protection device		14.7A	
	STD 1	Type	M2C	JT170G-KYE@T	
		OC protection device		15.0A	
	STD 2	Type	M3C	JT170G-KYE@T	
		OC protection device		15.0A	
Fan motor		OC protection device	M1F, M2F	1.2A	
Electronic expansion valve (Main)			Y1E	Fully closed : 0pls	Fully open : 480pls
Electronic expansion valve (Refrigerant charge)			Y2E	Fully closed : 0pls	Fully open : 480pls
Electronic expansion valve (Subcool)			Y3E	Fully closed : 0pls	Fully open : 480pls
Pressure protection	High pressure switch	For M1C	S1PH	OFF : $4.0^{+0}_{-0.12}$ MPa	ON : 3.0±0.15MPa
		For M2C	S2PH	OFF : $4.0^{+0}_{-0.12}$ MPa	ON : 3.0±0.15MPa
		For M3C	S3PH	OFF : $4.0^{+0}_{-0.12}$ MPa	ON : 3.0±0.15MPa
	Low pressure sensor		SENPL	OFF : 0.07MPa	
Temperature protection	Discharge gas temperature protection (Discharge pipe thermistor)		R3T	OFF : 135°C	
	Inverter fin temperature protection (Radiator fin thermistor)		R1T	OFF : 93°C	
Others	Fuse	For main PC board	F1U	Time-lag 3.15A AC 250V / 250V AC 10A Class B	
			F2U	Time-lag 3.15A AC 250V / 250V AC 10A Class B	
		For Noise filter PC board	F1U	250V AC 5A Class B	

3.2 Indoor Side

3.2.1 Indoor Unit

Parts Name		Symbol	Model								Remark
			FXFQ20 PVE	FXFQ25 PVE	FXFQ32 PVE	FXFQ40 PVE	FXFQ50 PVE	FXFQ63 PVE	FXFQ80 PVE	FXFQ 100 PVE	FXFQ 125 PVE	
Remote Control	Wired Remote Control		BRC1D52									Option
	Infrared Remote Control		BRC7F532									
Motors	Fan Motor	M1F	Thermal Proctector : OFF : $108^{\pm5}$ (ON : $96^{\pm15}$)									
	Drain Pump	M1P	AC220-240V (50Hz) AC220V (60Hz) PLD-12230DM Thermal Fuse 145°C									
	Swing Motor	M1S	MP35HCA[3P007482-1] Stepping Motor DC16V									
Thermistors	Thermistor (Suction Air)	R1T	In PC board A4P or wired remote control									
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-5 ϕ8 L1000 20kΩ (25°C)									
	Thermistor (Heat Exchanger)	R2T	ST8602A-5 ϕ6 L1000 20kΩ (25°C)									
Others	Float Switch	S1L	FS-0211B									
	Fuse	F1U	250V 5A ϕ5.2									
	Thermal Fuse	TFu	—									
	Transformer	T1R	—									

Parts Name		Symbol	Model								Remark
			FXCQ 20MV3	FXCQ 25MV3	FXCQ 32MV3	FXCQ 40MV3	FXCQ 50MV3	FXCQ 63MV3	FXCQ 80MV3	FXCQ 125 MV3	
Remote Control	Wired Remote Control		BRC1D52								Option
	Infrared Remote Control		BRC7C62								
Motors	Fan Motor	M1F	AC 220~240V 50Hz								
			1ϕ10W	1ϕ15W		1ϕ20W		1ϕ30W	1ϕ50W	1ϕ85W	
			Thermal Fuse 152°C				—	Thermal protector 135°C : OFF 87°C : ON			
	Drain Pump	M1P	AC220-240V (50Hz) AC220V (60Hz) PLD-12230DM Thermal Fuse 145°C								
	Swing Motor	M1S	MT8-L[3PA07509-1] AC200~240V								
Thermistors	Thermistor (Suction Air)	R1T	ST8601-6 ϕ4 L1250 20kΩ (25°C)								
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-6 ϕ8 L1250 20kΩ (25°C)								
	Thermistor (Heat Exchanger)	R2T	ST8602A-5 ϕ6 L1000 20kΩ (25°C)								
Others	Float Switch	S1L	FS-0211B								
	Fuse	F1U	250V 5A ϕ5.2								
	Transformer	T1R	TR22H21R8								

Parts Name		Symbol	Model					Remark
			FXZQ 20MV1	FXZQ 25MV1	FXZQ 32MV1	FXZQ 40MV1	FXZQ 50MV1	
Remote control	Wired Remote Control		BRC1D52					Option
	Infrared Remote Control		BRC7E530					
Motors	Fan Motor	M1F	AC 220~240V 50Hz					
			1φ55W 4P					
			Thermal Fuse OFF : $130^{\pm5}$ / ON : $80^{\pm20}$					
	Capacitor, fan motor	C1	4.0μ F 400VAC					
	Drain Pump	M1P	AC220-240V (50Hz) PLD-12230DM Thermal Fuse 145°C					
	Swing Motor	M1S	MP35HCA [3P080801-1] AC200~240V					
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-1 φ4 L250 20kΩ (25°C)					
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-3 φ8 L630 20kΩ (25°C)					
	Thermistor (Heat Exchanger)	R2T	ST8602A-3 φ6 L630 20kΩ (25°C)					
Others	Float Switch	S1L	FS-0211					
	Fuse	F1U	250V 5A φ5.2					
	Transformer	T1R	TR22H21R8					

Parts Name		Symbol	Model				Remark
			FXKQ 25MAVE	FXKQ 32MAVE	FXKQ 40MAVE	FXKQ 63MAVE	
Remote control	Wired Remote Control		BRC1D52				Option
	Infrared Remote Control		BRC4C61				
Motors	Fan Motor	M1F	AC 220~240V 50Hz				
			1φ15W 4P		1φ20W 4P	1φ45W 4P	
			Thermal Fuse 146°C		Thermal protector 120°C : OFF 105°C : ON		
	Drain Pump	M1P	AC 220-240V (50Hz) PLD-12200DM Thermal Fuse 145°C				
	Swing Motor	M1S	MP35HCA [3P080801-1] AC200~240V				
Thermistors	Thermistor (Suction Air)	R1T	ST8601-13 φ4 L630 20kΩ (25°C)				
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-7 φ8 L1600 20kΩ (25°C)				
	Thermistor (Heat Exchanger)	R2T	ST8602A-7 φ6 L1600 20kΩ (25°C)				
Others	Float Switch	S1L	FS-0211B				
	Fuse	F1U	250V 5A φ5.2				
	Transformer	T1R	TR22H21R8				

Parts Name		Symbol	Model						Remark
			FXDQ 20NAVE, PVE	FXDQ 25NAVE, PVE	FXDQ 32NAVE, PVE	FXDQ 40NAVE	FXDQ 50NAVE	FXDQ 63NAVE	
Remote control	Wired Remote Control		BRC1D52						Option
	Infrared Remote Control		BRC4C62						
Motors	Fan Motor	M1F	AC 220~240V 50Hz						
			1φ62W				1φ130W		
			Thermal protector 130°C: OFF, 83°C: ON						
	Drain Pump	M1P	AC220-240V (50Hz) PLD-12230DM Thermal Fuse 145°C						*
Thermistors	Thermistor (Suction Air)	R1T	ST8601-1 φ4 L=250 20kΩ (25°C)						
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-4 φ8 L=800 20kΩ (25°C)						
	Thermistor (Heat Exchanger)	R2T	ST8602A-4 φ6 L=800 20kΩ (25°C)						
Others	Float Switch	S1L	FS-0211E						*
	Fuse	F1U	250V 5A φ5.2						
	Transformer	T1R	TR22H21R8						

*only for FXDQ20~63N(A)VE, FXDQ20~32PVE (with Drain Pump Type)

Parts Name		Symbol	Model		Remark
			FXDQ20MV3	FXDQ25MV3	
Remote control	Wired Remote Control		BRC1D52		Option
	Infrared Remote Control		BRC4C62		
Motors	Fan Motor	M1F			
			Thermal protector 135°C : OFF, 87°C : ON		
	Drain Pump	M1P			
Thermistors	Thermistor (Suction Air)	R1T			
	Thermistor (for Heat Exchanger High Temp.)	R3T			
	Thermistor (Heat Exchanger)	R2T			
Others	Float Switch	S1L			
	Fuse	F1U	250V 10A		
	Transformer	T1R			

Parts Name		Symbol	Model									Remark
			FXSQ 20 MV3	FXSQ 25 MV3	FXSQ 32 MV3	FXSQ 40 MV3	FXSQ 50 MV3	FXSQ 63 MV3	FXSQ 80 MV3	FXSQ 100 MV3	FXSQ 125 MV3	
Remote control	Wired Remote Control		BRC1D52									Option
	Infrared Remote Control		BRC4C62									
Motors	Fan Motor	M1F	AC 220~240V 50Hz									
			1φ50W			1φ65W	1φ85W	1φ125 W	1φ225W			
			Thermal Fuse 152°C						Thermal protector 135°C : OFF 87°C : ON			
	Drain Pump	M1P	AC220-240V (50Hz) PLD-12230DM Thermal Fuse 145°C									
Thermistors	Thermistor (Suction Air)	R1T	ST8601-4 φ4 L800 20kΩ (25°C)									
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-7 φ8 L1600 20kΩ (25°C)									
	Thermistor (Heat Exchanger)	R2T	ST8602A-6 φ6 L1250 20kΩ (25°C)									
Others	Float Switch	S1L	FS-0211B									
	Fuse	F1U	250V 5A φ5.2									
	Transformer	T1R	TR22H21R8									

Parts Name		Symbol	Model								Remark
			FXMQ 40MAVE	FXMQ 50MAVE	FXMQ 63MAVE	FXMQ 80MAVE	FXMQ 100MAVE	FXMQ 125MAVE	FXMQ 200MAVE	FXMQ 250MAVE	
Remote control	Wired Remote Control		BRC1D52								Option
	Infrared Remote Control		BRC4C62								
Motors	Fan Motor	M1F	AC 220~240V 50Hz								
			1φ100W			1φ160W	1φ270W	1φ430W	1φ380W×2		
			Thermal protector 135°C : OFF 87°C : ON								
	Capacitor for Fan Motor	C1R	5μ F-400V			7μ F 400V	10μ F 400V	8μ F 400V	10μ F 400V	12μ F 400V	
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-5 φ4 L1000 20kΩ (25°C)						ST8601A-13 φ4 L630		
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605A-4 φ8 L800 20kΩ (25°C)						ST8605A-5 φ8 L1000		
	Thermistor (Heat Exchanger)	R2T	ST8602A-4 φ6 L800 20kΩ (25°C)						ST8602A-6 φ6 L1250		
Others	Float switch	S1L	FS-0211								
	Fuse	F1U	250V 5A φ5.2				250V 10A φ5.2		250V 5A φ5.2		
	Transformer	T1R	TR22H21R8								

Parts Name		Symbol	Model			Remark
			FXHQ 32MAVE	FXHQ 63MAVE	FXHQ 100MAVE	
Remote control	Wired Remote Control		BRC1D52			Option
	Infrared control		BRC7E63W			
Motors	Fan Motor	M1F	AC 220~240V/220V 50Hz/60Hz			
			1φ63W		1φ130W	
			Thermal protector 130°C : OFF 80°C : ON			
	Capacitor for Fan Motor	C1R	3.0μF-400V		9.0μF-400V	
	Swing Motor	M1S	MT8-L[3P058751-1] AC200~240V			
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-1 φ4 L250 20kΩ (25°C)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-6 φ8 L = 1250 20kΩ (25°C)		ST8605-6 φ8 L = 1250 20kΩ (25°C)	
	Thermistor (Heat Exchanger)	R2T	ST8602A-6 φ6 L = 1250 20kΩ (25°C)		ST8602A-6 φ6 L = 1250 20kΩ (25°C)	
Others	Fuse	F1U	250V 5A φ5.2			
	Transformer	T1R	TR22H21R8			

Parts Name		Symbol	Model						Remark
			FXAQ 20MAVE	FXAQ 25MAVE	FXAQ 32MAVE	FXAQ 40MAVE	FXAQ 50MAVE	FXAQ 63MAVE	
Remote control	Wired Remote Control		BRC1D52						Option
	Infrared Remote Control		BRC7E618						
Motors	Fan Motor	M1F	AC 220~240V 50Hz						
			1φ40W			1φ43W			
			Thermal protector 130°C : OFF 80°C : ON						
	Swing Motor	M1S	MP24 [3SB40333-1] AC200~240V			MSFBC20C21 [3SB40550-1] AC200~240V			
Thermistors	Thermistor (Suction Air)	R1T	ST8601-2 φ4 L400 20kΩ (25°C)						
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-2 φ8 L400 20kΩ (25°C)						
	Thermistor (for Heat Exchanger)	R2T	ST8602-2 φ6 L400 20kΩ (25°C)						
Others	Float Switch	S1L	OPTION						
	Fuse	F1U	250V 5A φ5.2						

Parts Name		Symbol	Model						Remark
			FXLQ 20MAVE	FXLQ 25MAVE	FXLQ 32MAVE	FXLQ 40MAVE	FXLQ 50MAVE	FXLQ 63MAVE	
Remote control	Wired Remote Control		BRC1D52						Option
	Infrared Remote Control		BRC4C62						
Motors	Fan Motor	M1F	AC 220~240V 50Hz						
			1φ15W		1φ25W		1φ35W		
			Thermal protector 135°C : OFF 120°C : ON						
	Capacitor for Fan Motor	C1R	1.0μF-400V		0.5μF-400V	1.0μF-400V	1.5μF-400V	2.0μF-400V	
Thermistors	Thermistor (Suction Air)	R1T	ST8601-6 φ4 L1250 20kΩ (25°C)						
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-9 φ8 L2500 20kΩ (25°C)						
	Thermistor (for Heat Exchanger)	R2T	ST8602A-9 φ6 L2500 20kΩ (25°C)						
Others	Fuse	F1U	AC250V 5A						
	Transformer	T1R	TR22H21R8						

Parts Name		Symbol	Model						Remark
			FXNQ 20MAVE	FXNQ 25MAVE	FXNQ 32MAVE	FXNQ 40MAVE	FXNQ 50MAVE	FXNQ 63MAVE	
Remote control	Wired Remote Control		BRC1D52						Option
	Infrared Remote Control		BRC4C62						
Motors	Fan Motor	M1F	AC 220~240V 50Hz						
			1φ15W		1φ25W		1φ35W		
			Thermal protector 135°C : OFF 120°C : ON						
	Capacitor for Fan Motor	C1R	1.0μF-400V		0.5μF-400V	1.0μF-400V	1.5μF-400V	2.0μF-400V	
Thermistors	Thermistor (Suction Air)	R1T	ST8601-6 φ4 L1250 20kΩ (25°C)						
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-9 φ8 L2500 20kΩ (25°C)						
	Thermistor (for Heat Exchanger)	R2T	ST8602A-9 φ6 L2500 20kΩ (25°C)						
Others	Fuse	F1U	AC250V 5A						
	Transformer	T1R	TR22H21R8						

4. Option List

4.1 Option List of Controllers

Operation Control System Optional Accessories

No.	Item \ Type			FXCQ-M	FXFQ-P	FXZQ-M	FXKQ-MA	FXDQ-P FXDQ-NA	FXSQ-M	FXDQ-M	FXMQ-MA	FXHQ-MA	FXAQ-MA	FXLQ-MA FXNQ-MA
1	Remote control	Infrared	H/R	BRC7C62	BRC7F532F	BRC7E530	BRC4C61	BRC4C62	BRC4C62	BRC4C62	BRC4C62	BRC7E63	BRC7E618	BRC4C62
		Wired		BRC1D52										
2	Wired remote control with weekly schedule timer				BRC1D528	BRC1D61								
3	Simplified remote control (Exposed type)			—				BRC2C51				—		BRC2C51
4	Remote control for hotel use (Concealed type)			—				BRC3A61				—		BRC3A61
5	Adapter for wiring			★KRP1B61	—	★KRP1B57	KRP1B61	★KRP1B56	—	KRP1B61		KRP1B3	—	KRP1B61
6-1	Wiring adapter for electrical appendices (1)			★KRP2A61	★KRP2A526	★KRP2A526	KRP2A61	★KRP2A53	KRP2A516	KRP2A51		★KRP2A62	★KRP2A51	KRP2A51
6-2	Wiring adapter for electrical appendices (2)			★KRP4A51	★KRP4AA53	★KRP4A536	KRP4A51	★KRP4A54	KRP4A516	KRP4A51		★KRP4A52	★KRP4A51	KRP4A51
7	Remote sensor			KRCS01-1	KRCS01-4	KRCS01-1	KRCS01-1							
8	Installation box for adapter PC board ☆			Note 2,3 KRP1B96	Note 2,3 KRP1H98	Note 4,6 KRP1BA101	—	Note 4,6 KRP1BA101	Note 5 KRP4A91	—		Note 3 KRP1C93	Note 2,3 KRP4A93	—
9	External control adapter for outdoor unit (Must be installed on indoor units)			★DTA104A61	★DTA104A52		DTA104A61	★DTA104A53	DTA104A51	DTA104A61		★DTA104A62	★DTA104A51	DTA104A61

Note:

1. Installation box ☆ is necessary for each adapter marked ⋆.
2. Up to 2 adapters can be fixed for each installation box.
3. Only one installation box can be installed for each indoor unit.
4. Up to 2 installation boxes can be installed for each indoor unit.
5. Installation box ☆ is necessary for second adapter.
6. Installation box ☆ is necessary for each adapter.

Various PC Boards

No.	Part name	Model No.	Function
1	Adapter for wiring	KRP1B56 KRP1B57 KRP1B61 KRP1B3	■ PC board when equipped with auxiliary electric heater in the indoor unit.
2	DIII-NET Expander Adapter	DTA109A51	■ Up to 1,024 units can be centrally controlled in 64 different groups. ■ Wiring restrictions (max. length: 1,000 m, total wiring length: 2,000 m, max. number of branches: 16) apply to each adapter.

System Configuration

No.	Part name		Model No.	Function
1	Central remote control		DCS302C51 DCS302CA51 (FXFQ-P)	• Up to 64 groups of indoor units(128 units) can be connected, and ON/OFF, temperature setting and monitoring can be accomplished individually or simultaneously. Connectable up to 2 controllers in one system.
1-1	Electrical box with earth terminal (3 blocks)		KJB311A	
2	Unified ON/OFF controller		DCS301B51 DCS301BA51 (FXFQ-P)	• Up to 16 groups of indoor units(128 units) can be turned, ON/OFF individually or simultaneously, and operation and malfunction can be displayed. Can be used in combination with up to 8 controllers.
2-1	Electrical box with earth terminal (2 blocks)		KJB212A	
2-2	Noise filter (for electromagnetic interface use only)		KEK26-1	
3	Schedule timer		DST301B51 DST301BA51 (FXFQ-P)	• Programmed time weekly schedule can be controlled by unified control for up to 64 groups of indoor units (128 units). Can turn units ON/OFF twice per day.
4	Interface adapter for SkyAir-series	R-407C/R-22	★DTA102A52	• Adapters required to connect products other than those of the VRV System to the high-speed DIII-NET communication system adopted for the VRV System. * To use any of the above optional controllers, an appropriate adapter must be installed on the product unit to be controlled.
		R-410A	★DTA112B51	
5	Central control adapter kit	For UAT(Y)-K(A),FD-K	★DTA107A55	
6	Wiring adapter for other air-conditioner		★DTA103A51	
7	DIII -NET Expander Adapter		DTA109A51	• Up to 1024 units can be centrally controlled in 64 different groups. • Wiring restrictions (max. lengh : 1,000m, total wiring lengh : 2,000m, max. number of branches : 16) apply to each adapter.
7-1	Mounting plate		KRP4A92	• Fixing plate for DTA109A51

Note:

1. Installation box for ⋆ adapter must be procured on site.

Building Management System

No.	Part name					Model No.	Function
1	intelligent Touch Controller	Basic	Hardware	intelligent Touch Controller		DCS601C51	• Air-Conditioning management system that can be controlled by a compact all-in-one unit.
1-1		Option	Hardware	DIII-NET plus adapter		DCS601A52	• Additional 64 groups (10 outdoor units) is possible.
1-2			Software	P. P. D.		DCS002C51	• P. P. D.: Power Proportional Distribution function
1-3				Web		DCS004A51	• Monitors and controls the air conditioning system using the Internet and a Web browser application on a PC.
1-4	Electrical box with earth terminal (4 blocks)					KJB411A	• Wall embedded switch box.
2	intelligent Manager III	Basic	Hardware	Number of units to be connected	128 units	DAM602B52	• Air conditioner management system that can be controlled by personal computers.
					256 units	DAM602B51	
					512 units	DAM602B51x2	
					768 units	DAM602B51x3	
					1024 units	DAM602B51x4	
2-1		Option	Software		P.P.D.	DAM002A51	• Power Proportional Distribution function
2-2					Web	DAM004A51	• Monitors and controls the air conditioning system using the Internet and a Web browser application on a PC.
2-3					Eco	DAM003A51	• ECO (Energy saving functions.)
2-4	Optional DIII Ai unit					DAM101A51	• External temperature sensor for intelligent Manager III.
2-5	Di unit					DEC101B51	• Input contacts: 16 points
2-6	Dio unit					DEC102B51	• Input contacts: 8 points; output contacts: 4 points
3	Communication line	*1 Interface for use in BACnet®				DMS502B51	• Interface unit to allow communications between VRV and BMS. Operation and monitoring of air-conditioning systems through BACnet® communication.
3-1		Optional DIII board				DAM411B51	• Expansion kit, installed on DMS502B51, to provide 2 more DIII-NET communication ports. Not usable independently.
3-2		Optional Di board				DAM412B51	• Expansion kit, installed on DMS502B51, to provide 16 more wattmeter pulse input points. Not usable independently.
4		*2 Interface for use in LONWORKS®				DMS504B51	• Interface unit to allow communications between VRV and BMS. Operation and monitoring of air-conditioning systems through LONWORKS® communication.
5	Contact/analog signal	Parallel interface Basic unit				DPF201A51	• Enables ON/OFF command, operation and display of malfunction; can be used in combination with up to 4 units.
6		Temperature measurement units				DPF201A52	• Enables temperature measurement output for 4 groups; 0-5VDC.
7		Temperature setting units				DPF201A53	• Enables temperature setting input for 16 groups; 0-5VDC.
8		Unification adapter for computerized control				★DCS302A52	• Interface between the central monitoring board and central control units.

Notes:

⋆1. BACnet® is a registered trademark of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

⋆2. LONWORKS®, is a registered trade mark of Echelon Corporation.

⋆3. Installation box for ⋆ adapter must be procured on site.

4.2 Option Lists (Outdoor Unit)

REYQ8 ~ 16PY1

Optional accessories \ Series / Models			VRV III H/R	
			REYQ8PY1	**REYQ10PY1 REYQ12PY1 REYQ14PY1 REYQ16PY1**
Distributive Piping	Refnet header	Model	KHRP25M33H (Max. 8 branch)	KHRP25M33H, KHRP25M72H (Max. 8 branch) (Max. 8 branch)
Distributive Piping	Refnet joint	Model	KHRP25A22T, KHRP25A33T	KHRP25A22T, KHRP25A33T (KHRP25A72T+KHRP25M72TP)
Central drain pan kit		Model	KWC25C450	KWC25C450
Digital pressure gauge kit		Model	BHGP26A1	BHGP26A1

C : 3D057610A

REYQ18 ~ 32PY1

Optional accessories \ Series / Models			VRV III H/R	
			REYQ18PY1	**REYQ20PY1 REYQ22PY1 REYQ24PY1**
Distributive Piping	Refnet header	Model	KHRP25M33H, KHRP25M72H (Max. 8 branch) (Max. 8 branch)	KHRP25M33H, KHRP25M72H, KHRP25M73H (Max. 8 branch) (Max. 8 branch) (Max. 8 branch)
Distributive Piping	Refnet joint	Model	KHRP25A22T, KHRP25A33T (KHRP25A72T+KHRP25M72TP)	KHRP25A22T, KHRP25A33T, (KHRP25A72T+ KHRP25M72TP), (KHRP25A73T+KHRP25M73TP)
Outdoor unit multi connection piping kit		Model	BHFP26P90	
Central drain pan kit		Model	KWC26C280×2	KWC26C280×2
Digital pressure gauge kit		Model	BHGP26A1	BHGP26A1

Optional accessories \ Series / Models			VRV III H/R	
			REYQ26PY1 REYQ28PY1	**REYQ30PY1 REYQ32PY1**
Distributive Piping	Refnet header	Model	KHRP25M33H, KHRP25M72H, KHRP25M73H (Max. 8 branch) (Max. 8 branch) (Max. 8 branch)	
Distributive Piping	Refnet joint	Model	KHRP25A22T, KHRP25A33T, (KHRP25A72T+KHRP25M72TP), (KHRP25A73T+KHRP25M73TP)	
Outdoor unit multi connection piping kit		Model	BHFP26P90	
Central drain pan kit		Model	KWC26C280 KWC26C450	KWC26C450×2
Digital pressure gauge kit		Model	BHGP26A1	BHGP26A1

C : 3D057611C

REYQ34 ~ 48PY1

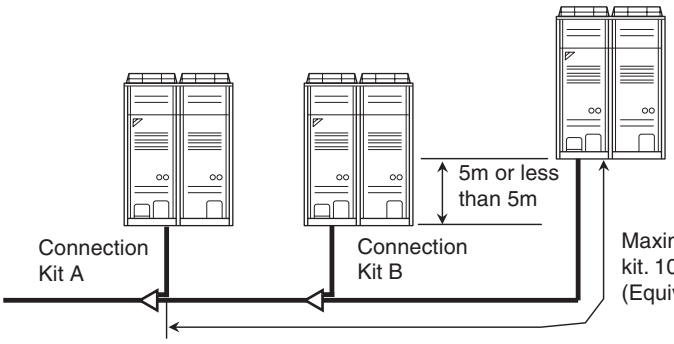
Optional accessories \ Series / Models			VRV III H/R	
			REYQ34PY1 REYQ36PY1 REYQ38PY1 REYQ40PY1	**REYQ42PY1 REYQ44PY1**
Distributive Piping	Refnet header	Model	KHRP25M33H, KHRP25M72H, KHRP25M73H (Max. 8 branch) (Max. 8 branch) (Max. 8 branch)	
Distributive Piping	Refnet joint	Model	KHRP25A22T, KHRP25A33T, (KHRP25A72T+ KHRP25M72TP), (KHRP25A73T+KHRP25M73TP)	
Outdoor unit multi connection piping kit		Model	BHFP26P136	
Central drain pan kit		Model	KWC26C280×2 KWC26C450	KWC26C280 KWC26C450×2
Digital pressure gauge kit		Model	BHGP26A1	BHGP26A1

Optional accessories \ Series / Models			VRV III H/R
			REYQ46PY1 REYQ48PY1
Distributive Piping	Refnet header	Model	KHRP25M33H, KHRP25M72H, KHRP25M73H (Max. 8 branch) (Max. 8 branch) (Max. 8 branch)
Distributive Piping	Refnet joint	Model	KHRP25A22T, KHRP25A33T, (KHRP25A72T+ KHRP25M72TP), (KHRP25A73T+KHRP25M73TP)
Outdoor unit multi connection piping kit		Model	BHFP26P136
Central drain pan kit		Model	KWC26C450×3
Digital pressure gauge kit		Model	BHGP26A1

C : 3D057612C

5. Piping Installation Point

5.1 Piping Installation Point



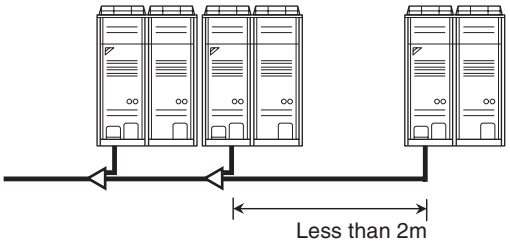
Since there is a possibility that oil may be collected on a stop machine side, install piping between outdoor units to go to level or go up to an outdoor unit, and to make a slope.

(V3036)

The projection part between multi connection piping kits

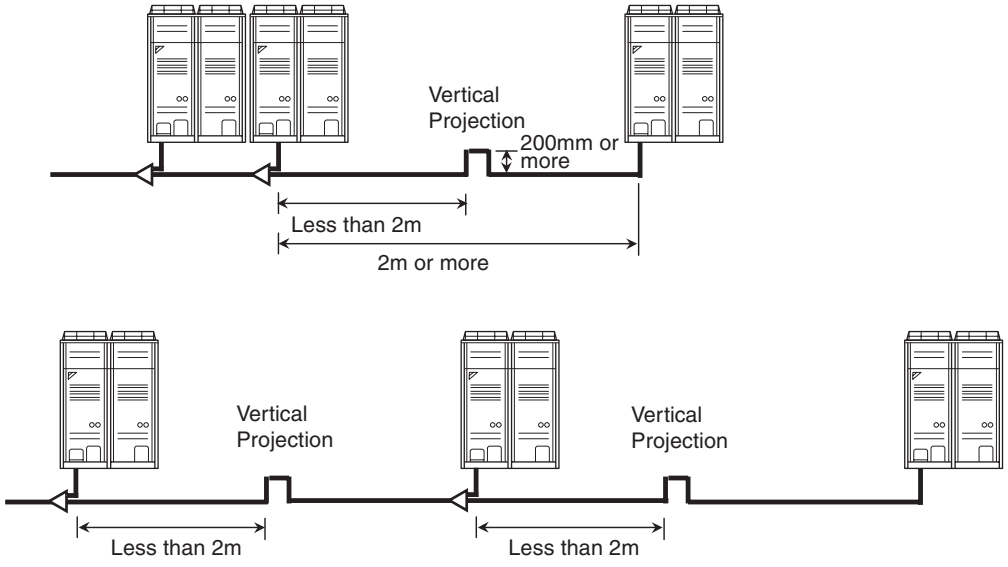
When the piping length between the multi connection kits or between multi connection kit and outdoor unit is 2m or more, prepare a vertical projection part (200mm or more as shown below) only on the gas pipe line location less than 2m from multi connection kit.

In the case of 2m or less



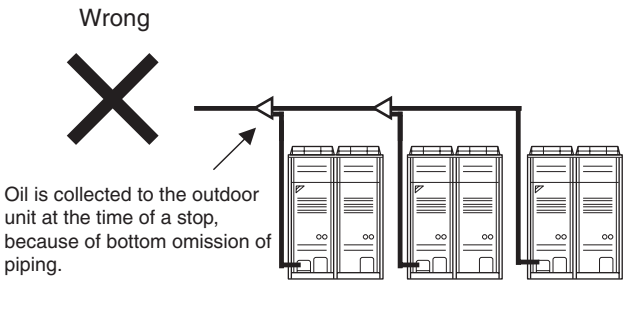
(V3037)

In the case of 2m or more

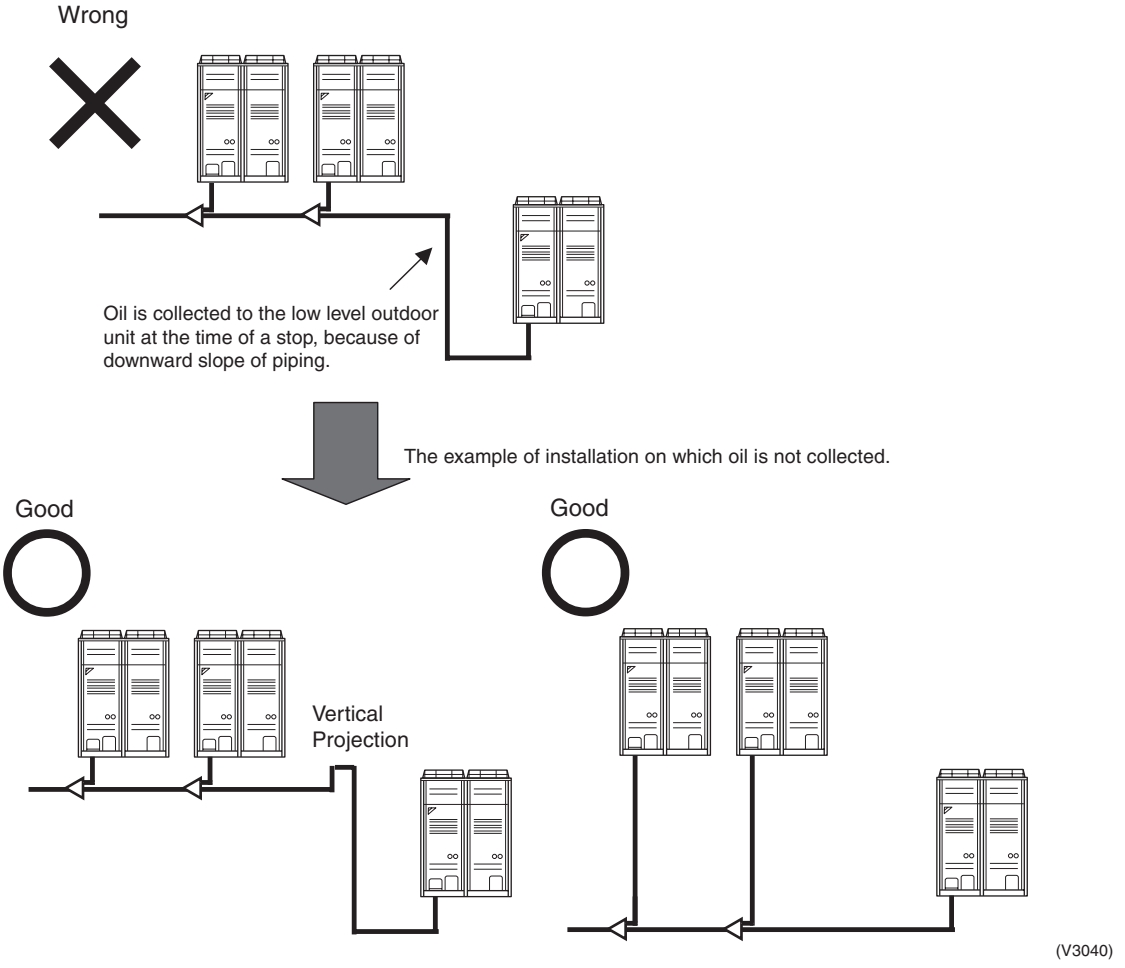


(V3038)

5.2 The Example of a Wrong Pattern



(V3039)



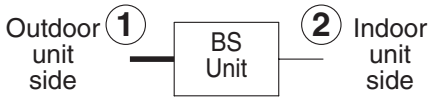
(V3040)

Max.allowable Piping Length	Outdoor Unit - Multi Connection Piping Kit	Actual piping length 10m or less, equivalent length 13m or less	
	Multi Connection Piping Kit - Indoor Unit	Actual piping length 165m or less, equivalent length 190m or less, the total extension 1000m or less	
	REFNET Joint - Indoor Unit	Actual piping length 40m or less (Refer to Page 453 Note 2 in case of up to 90m)	
Allowable Level Difference	Outdoor Unit - Outdoor Unit	5m or less	
	Outdoor Unit - Indoor Unit	Outdoor Unit is above	50m or less ★90m or less
		Outdoor Unit is below	90m
	Indoor Unit - Indoor Unit	15m or less	

Note: ★ Available on request if the outdoor unit is above.

6. Example of connection

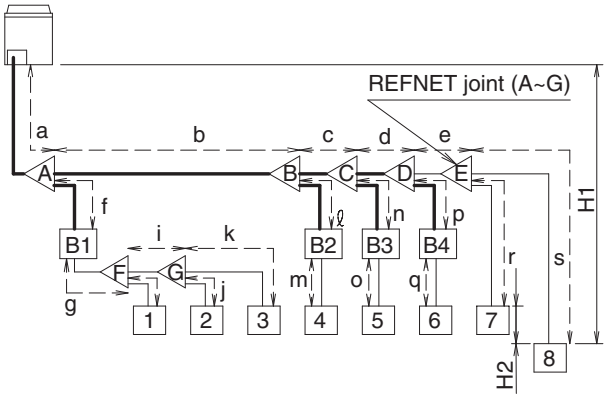
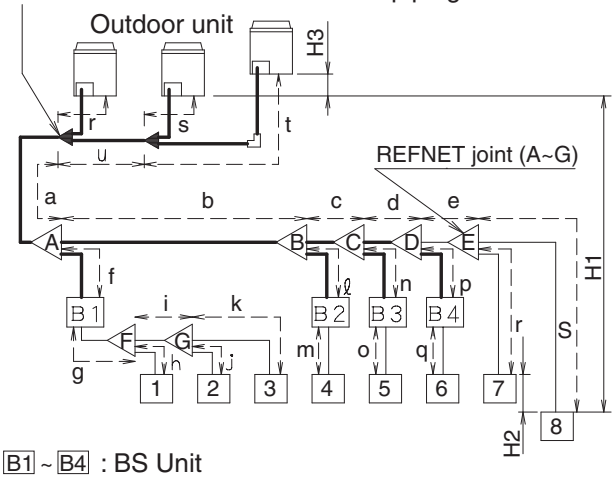
Example of connection
(Connection of 8 indoor units)



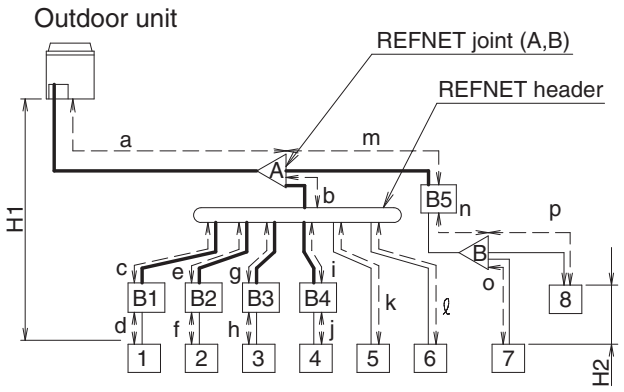
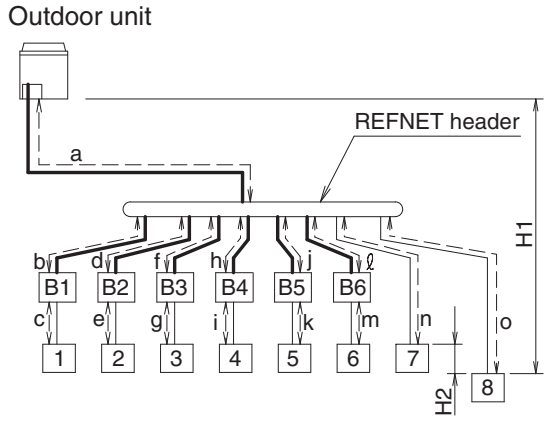
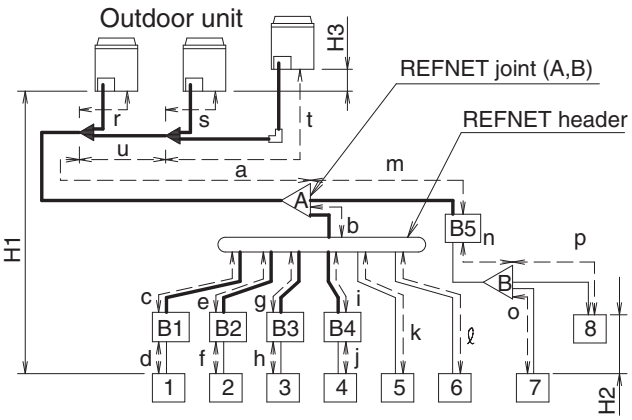
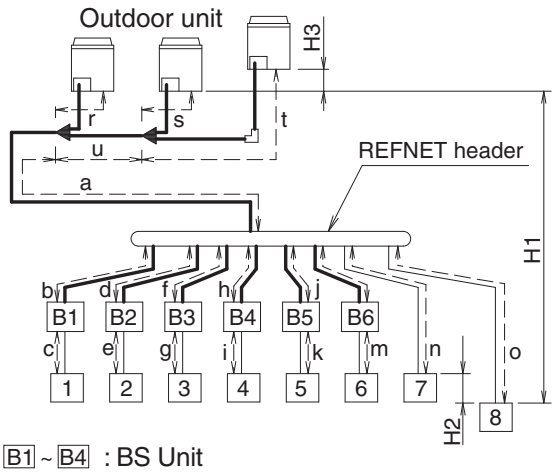
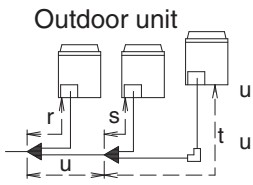
① Piping from outdoor unit to BS unit
—— (Bold):3 pipes { Suction gas pipe / HP/LP gas pipe / Liquid pipe

② Piping from BS unit to indoor unit or Piping from Refrigerant branch kit to indoor unit used as cooling only
—— (Thin):2 pipes { (Suction) gas pipe / Liquid pipe

(*1) " ◀ " Indicate the Outdoor unit multi connection piping kit.
(*2) In case of multi outdoor system, re-read "outdoor unit" to "the first Outdoor unit multi connection piping kit" as seen from the indoor unit.

	Branch with REFNET joint
Single outdoor system (REYQ 8~16)	Outdoor unit  B1 ~ B4 : BS Unit 1~6 : Indoor unit (Cool/Heat selection possible) 7, 8 : Indoor unit (Cooling only)
Multi outdoor system (REYQ 16~48)	First outdoor unit multi connection piping kit Outdoor unit  B1 ~ B4 : BS Unit 1~6 : Indoor unit (Cool/Heat selection possible) 7, 8 : Indoor unit (Cooling only)

Maximum allowable length	Between outdoor unit (*2) and indoor unit	Actual pipe length	Pipe length between outdoor unit (*2) and indoor unit ≤ 16 Example 8 : a + b + c + d + e + s ≤ 165m
		Equivalent length	Equvalent pipe length between outdoor unit (*2) and indoo (Assume eqivalent pipe length of REFNET joint to be 0.5m, that
		Total extention length	Total piping length from outdoor unit (*2) to all indoor unit
	Between first outdoor unit multi connection piping kit and outdoor unit (in case of multi system)	Actual and Equivalent pipe length	Actual pipe length from first outdoor unit multi connection Equivalent pipe length from first outdoor unit multi connec
Allowable height difference	Between outdoor and indoor units	Difference in height	Difference in height between outdoor unit and indoor unit
	Between indoor and indoor units	Difference in height	Difference in height between adjacent indoor units (H2) ≤
	Between outdoor and outdoor units	Difference in height	Difference in height between adjacent outdoor units (H3) ≤
Allowable length after the branch		Actual pipe length	Actual pipe length from first refrigerant branch kit (either F Example 8 : b + c + d + e + s ≤ 40m

	Branch with REFNET joint and header	Branch with REFNET header
	 B1 ~ B5 : BS Unit 1~4, 7, 8 : Indoor unit (Cool/Heat selection possible) 5, 6 : Indoor unit (Cooling only)	 B1 ~ B4 : BS Unit 1~6 : Indoor unit (Cool/Heat selection possible) 7, 8 : Indoor unit (Cooling only)
	 B1 ~ B5 : BS Unit 1~4, 7, 8 : Indoor unit (Cool/Heat selection possible) 5, 6 : Indoor unit (Cooling only)	 B1 ~ B4 : BS Unit 1~6 : Indoor unit (Cool/Heat selection possible) 7, 8 : Indoor unit (Cooling only)
≤ 165m		
	Example 6 : a + b + ℓ ≤ 165m, 8 : a + m + n + p ≤ 165m	Example 8 : a + o ≤ 165m
ndoor unit ≤ 190m (Note 1) that of REFNET header to be 1m, that of BSVQ100, 160 to be 4m, that of BSVQ250 to be 6m for calculation purposes)		
unit ≤ 1000m		
tion piping kit to outdoor unit ≤ 10m nection piping kit to outdoor unit ≤ 13m		 r ≤ 10m (Equivalent length ≤ 13m) u + s ≤ 10m (Equivalent length ≤ 13m) u + t ≤ 10m (Equivalent length ≤ 13m)
unit (H1) ≤ 50m (Max 40m if the outdoor unit is below)		
2) ≤ 15m		
H3) ≤ 5m		
er REFNET joint or REFNET header) to indoor unit ≤ 40m (Note 2)		
	Example 6 : b + ℓ ≤ 40m, 8: m + n + p ≤ 40m	Example 8 : o ≤ 40m

Outdoor unit multi connection piping kit and Refrigerant branch kit selection

- Refrigerant branch kits can only be used with R410A.
- When multi outdoor system are installed, be sure to use the special separately sold Outdoor unit multi connection piping kit. (BHFP26P90 · 136).
  (For how to select the proper kit, follow the table at right.)
- Never use BHFP26M90 · 135, BHFP22M90 · 135P for M type of this series or T joint (field supplyed).

How to select the REFNET joint

- When using REFNET joint at the first branch counted fro
  choose from the following table in accordance with the ou
  (Example : REFNET joint A)

Outdoor unit capacity type	Refrigerant bra
8,10HP type	KHRP25A33T
12~22HP type	KHRP25A72T-
24HP type ~	KHRP25A73T-

- Choose the REFNET joints other than the first branch from the
  with the total capacity index of all the indoor units connected be

Indoor unit total capacity index	Refrigerant bra
	3 pipes
x < 200	KHRP25A22T
200 ≤ x < 290	KHRP25A33T
290 ≤ x < 640	KHRP25A72T+KHRP25M72TP
640 ≤ x	KHRP25A73T+KHRP25M73TP

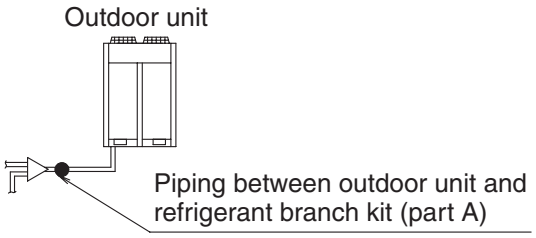
Example for indoor units connected downstream

Example REFNET joint C : Indoor units 5 + 6 + 7 + 8

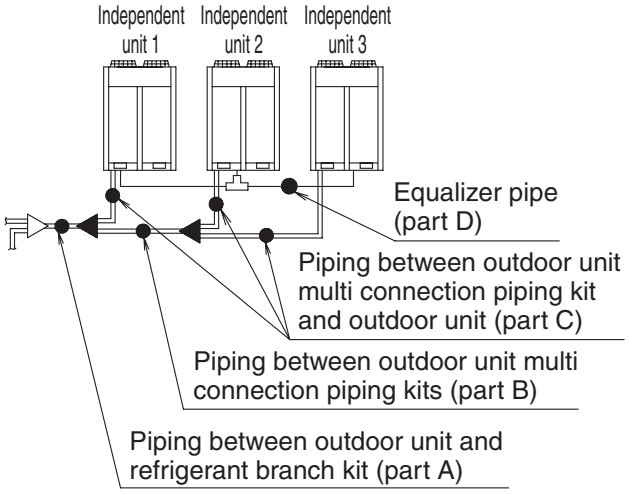
Pipe size selection

⚠ The thickness of the pipes in the table shows the requirements of Japanease High Pressure Gas Controll low. (As of Jan. 2003)
The thickness and material shall be selected in accordance with local code.

<In case of single outdoor unit system>



<In case of multi outdoor unit system>



Piping between outdoor unit (*2) and refrigerant branch

- Choose from the following table in accordance with the outdoor unit

Piping between outdoor unit multi connection piping kits

- Choose from the following table in accordance with the to
  the outdoor units connected upstream.

Outdoor unit capacity type	Piping size (O. D.)	
	Suction gas pipe	HP/LP gas pipe
8HP type	ϕ19.1	ϕ15.9
10HP type	ϕ22.2	ϕ19.1
12HP type	ϕ28.6	
14,16HP type		ϕ22.2
18HP type		
20,22HP type		ϕ28.6
24HP type	ϕ34.9	
26~34HP type		
36HP type	ϕ41.3	
38~48HP type		ϕ34.9

Piping between outdoor unit multi connection piping kit and ou

- Choose from the following table in accordance with the c
  outdoor unit connected.

Outdoor unit capacity type	Piping size (O. D.)	
	Suction gas pipe	HP/LP gas pipe
8,10HP type	ϕ22.2	ϕ19.1
12HP type	ϕ28.6	
14,16HP type		ϕ22.2

Temper grade and wall thickness for pipes

(Temper grade, O type and 1/2H type indicate the material typ

Copper tube O. D.	ϕ6.4	ϕ9.5	ϕ12.7	ϕ15.9	ϕ19.1	ϕ22
Temper grade	O type					
Wall thickness (Min. requirement)	0.80	0.80	0.80	0.99	0.80	0.8

rom the outdoor unit side,
outdoor unit capacity type.

branch kit name
T
T+KHRP25M72TP
T+KHRP25M73TP

e following table in accordance
below the REFNET joint.

branch kit name	
	2 pipes
	KHRP26A22T
	KHRP26A33T
TP	KHRP26A72T
TP	—

How to select the REFNET header.

- Choose from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET header.
- 250 type undoor unit can not be connected below the REFNET header.

Indoor unit total capacity index	Refrigerant branch kit name	
	3 pipes	2 pipes
x < 200	KHRP25M33H	KHRP26M22H or KHRP26M33H
200 ≤ x < 290		KHRP26M33H
290 ≤ x < 640	KHRP25M72H+KHRP25M72HP	KHRP26M72H
640 ≤ x	KHRP25M73H+KHRP25M73HP	KHRP26M73H+KHRP26M73HP

How to select the outdoor unit multi connection piping kit
(This is required when the system is multi outdoor unit system.)

- Choose from the following table in accordance with the number of outdoor units.

Number of outdoor unit	Connecting piping kit name
2 units	BHFP26P90
3 units	BHFP26P136

Example REFNET joint B : Indoor units 7 + 8
Example REFNET header : Indoor units 1 + 2 + 3 + 4 + 5 + 6

Example REFNET header :
Indoor units 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8

ch kit (part A)
nit system capacity type.
its (part B)
e total capacity of all
(unit : mm)

	Liquid pipe
	ϕ9.5
	ϕ12.7
	ϕ15.9
	ϕ19.1

outdoor unit (part C)
e capacity type of the
(unit : mm)

	Liquid pipe
	ϕ9.5 × 0.8
	ϕ12.7

Piping between refrigerant branch kits
Piping between refrigerant branch kit and BS unit
Piping between BS unit and refrigerant branch kit

- Choose from the following table in accordance with the total capacity type of all the indoor units connected downstream.

*1 Connection piping must not exceed the refrigerant Piping size between outdoor unit and refrigerant branch kit (part A).

*2 When selecting 2 pipes line (gas pipe and liquid pipe), use Suction gas pipe column for gas pipe and Liquid pipe column for liquid pipe.

(unit : mm)

Indoor capacity index	Piping size (O. D.)		
	Suction gas pipe	HP/LP gas pipe	Liquid pipe
x < 150	ϕ15.9	ϕ12.7	ϕ9.5
150 ≤ x < 200	ϕ19.1	ϕ15.9	
200 ≤ x < 290	ϕ22.2	ϕ19.1	
290 ≤ x < 420	ϕ28.6		ϕ12.7
420 ≤ x < 640		ϕ28.6	ϕ15.9
640 ≤ x < 920	ϕ34.9		ϕ19.1
920 ≤ x	ϕ41.3		

Piping between refrigerant branch kit, BS unit and indoor unit

- Match to the size of the connection piping on the indoor unit.

(unit : mm)

Indoor unit capacity type	Piping size (O. D.)	
	gas pipe	Liquid pipe
20 · 25 · 32 · 40 · 50 type	ϕ12.7	ϕ6.4
63 · 80 · 100 · 125 type	ϕ15.9	ϕ9.5
200 type	ϕ19.1	
250 type	ϕ22.2	

Equalizer pipe (part D) (outdoor multi system only)

(unit : mm)

Piping size (O. D.)	ϕ19.1

type specified in JIS H 3300.)

ϕ22.2	ϕ25.4	ϕ28.6	ϕ31.8	ϕ34.9	ϕ38.1	ϕ41.3
1/2H type						
0.80	0.88	0.99	1.10	1.21	1.32	1.43

How to calculate the additional refrigerant to be charged

Additional refrigerant to be charged : R(kg)
(R should be rounded off in units of 0.1 kg.)

$$R = \left(\begin{array}{l} (\text{Total length(m) of liquid piping size at } \phi 22.2) \times 0.37 + (\text{Total length(m) of liquid piping size at } \phi 19.1) \times 0.26 \\ + (\text{Total length(m) of liquid piping size at } \phi 15.9) \times 0.18 + (\text{Total length(m) of liquid piping size at } \phi 12.7) \times 0.12 \\ + (\text{Total length(m) of liquid piping size at } \phi 9.5) \times 0.059 + (\text{Total length(m) of liquid piping size at } \phi 6.4) \times 0.022 \end{array} \right) \times$$

Example for refrigerant branch using REFNET joint and REFNET h

Outdoor system : REYQ34PY1
Total capacity of indoor unit : 116%

a : ϕ19.1 × 30r
b : ϕ19.1 × 20r
c : ϕ9.5 × 10m
d : ϕ9.5 × 10m

$$R = (\boxed{50 \times 0.26} + \boxed{1 \times 0.18} + \boxed{3 \times 0.12} + \boxed{156 \times 0.059} +$$

a, b u r c~n, s, t

$$= 27.148 \Longrightarrow \boxed{27.1\text{kg}}$$

Round off in units of 0.1 kg.

Note 1.
When the equivalent pipe length between outdor and indoor units is 90m or more, the size of main pipes on the liquid side (refer to figure 9) must be increased according to the right table.
(Never increase suction gas pipe and HP/LP gas pipe.)

System	Liquid pipe
REYQ8 ~ 10PY1	ϕ9.5 ? ϕ12.7
REYQ12 ~ 16PY1	ϕ12.7 ? ϕ15.9
REYQ18 ~ 24PY1	ϕ15.9 ? ϕ19.1
REYQ26 ~ 48PY1	ϕ19.1 ? ϕ22.2

(Refer to figure 9)
1.Outdoor unit
2.Main pipes
3.Increase only liquid pipe size
4.First refrigerant branch kit
5.BS unit
6.Indoor unit

Note 2. Allowable length after the first refrigerant branch kit to indoor units is 40m or less, however it can be extended up to 9(

Required Conditions	Example Drawings
1. It is necessary to increase the pipe size between the first branch kit and the final branch kit. (Reducers must be procured on site) However, the pipes that are same pipe size with main pipe must not be increased.	8 b+c+d+e+f+g+p? 90 m increase the pipe size of b, c, d, e, f, g
2. For calculation of Total extension length, the actual length of above pipes must be doubled. (except main pipe and the pipes that are not increased)	a+b×2+c×2+d×2+e×2+f×2+g×2 +h+i+j+k+l+m+n+p? 1000 m
3. Indoor unit to the nearest branch kit ? 40 m	h, i, j..... p ? 40 m
4. The difference between [Outdoor unit to the farthest indoor unit] and [Outdoor unit to the nearest indoor unit] ? 40 m	The farthest indoor unit 8 The nearest indoor unit 1 (a+b+c+d+e+f+g+p)-(a+h)? 40 m

*If available on the site, use this size. Otherwise it can not be increased.

(m) ng ×0.26

gth(m) piping 12.7 ×0.12

gth(m) piping 6.4 ×0.022

×1.02 +

HEAT RECOVER SYSTEM	
MODEL NAME	THE AMOUNT OF REFRIGERANT
REYQ8 ~ 16PY1	3.6kg
REYQ18 ~ 20PY1	1.0kg
REYQ22 ~ 24PY1	1.5kg
REYQ26PY1	2.0kg
REYQ28 ~ 30PY1	2.5kg
REYQ32 ~ 40PY1	3.0kg
REYQ42PY1	3.5kg
REYQ44 ~ 46PY1	4.0kg
REYQ48PY1	4.5kg

+

REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT		
INDOOR CONNECTION CAPACITY	MODEL NAME	
	REYQ8 ~ 32PY1	REYQ34 ~ 48PY1
MORE THAN 100% 120% OR LESS	0.5kg	
MORE THAN 120% 130% OR LESS	0.5kg	1.0kg

IET joint and REFNET header for the systems and each pipe length as shown below.

a : ϕ19.1 × 30m	e : ϕ9.5 × 10m	i : ϕ9.5 × 10m	m : ϕ9.5 × 20m	r : ϕ12.7 × 3m
b : ϕ19.1 × 20m	f : ϕ9.5 × 10m	j : ϕ9.5 × 10m	n : ϕ9.5 × 10m	s : ϕ9.5 × 3m
c : ϕ9.5 × 10m	g : ϕ9.5 × 10m	k : ϕ9.5 × 20m	o : ϕ6.4 × 10m	t : ϕ9.5 × 3m
d : ϕ9.5 × 10m	h : ϕ9.5 × 10m	l : ϕ9.5 × 20m	p : ϕ6.4 × 10m	u : ϕ15.9 × 1m

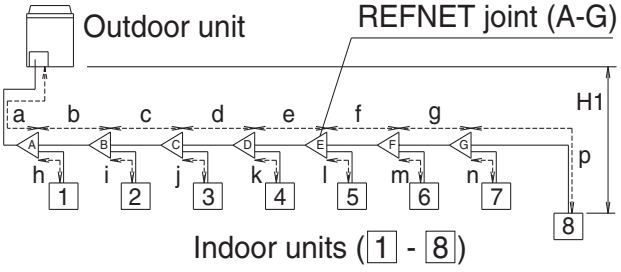
).12 + [156 × 0.059] + [20 × 0.022])×1.02 + [3.0] + [0.5]

c~n, s, t o, p REYQ34PY1 116%

kg.

	Liquid pipe
	ϕ9.5 ? ϕ12.7
l	ϕ12.7 ? ϕ15.9
l	ϕ15.9 ? ϕ19.1
l	ϕ19.1 ? ϕ22.2

an be extended up to 90m if all the following conditions are satisfied. (In case of "**Branch with REFNET joint**")

le Drawings	
? 90 m b, c, d, e, f, g	Increase the pipe size as follows ϕ 9.5 → ϕ12.7 ϕ15.9 → ϕ19.1 ϕ22.2 → ϕ25.4* ϕ34.9 → ϕ38.1* ϕ12.7 → ϕ15.9 ϕ19.1 → ϕ22.2 ϕ28.6 → ϕ31.8*
×2+f×2+g×2 ? 1000 m	
8 1) - (a + h) ? 40 m	

7. Thermistor Resistance / Temperature Characteristics

Indoor unit	For air suction	R1T
	For liquid pipe	R2T
	For gas pipe	R3T

Outdoor unit for fin thermistor R1T	Outdoor unit	For outdoor air R1T
		For coil R2T
		For suction pipe R4T
		For Receiver gas pipe R5T
		For Receiver outlet liquid pipe R6T

(kΩ)

T°C	0.0
-10	-
-8	-
-6	88.0
-4	79.1
-2	71.1
0	64.1
2	57.8
4	52.3
6	47.3
8	42.9
10	38.9
12	35.3
14	32.1
16	29.2
18	26.6
20	24.3
22	22.2
24	20.3
26	18.5
28	17.0
30	15.6
32	14.2
34	13.1
36	12.0
38	11.1
40	10.3
42	9.5
44	8.8
46	8.2
48	7.6
50	7.0
52	6.7
54	6.0
56	5.5
58	5.2
60	4.79
62	4.46
64	4.15
66	3.87
68	3.61
70	3.37
72	3.15
74	2.94
76	2.75
78	2.51
80	2.41
82	2.26
84	2.12
86	1.99
88	1.87
90	1.76
92	1.65
94	1.55
96	1.46
98	1.38

T°C	0.0	0.5
-20	197.81	192.08
-19	186.53	181.16
-18	175.97	170.94
-17	166.07	161.36
-16	156.80	152.38
-15	148.10	143.96
-14	139.94	136.05
-13	132.28	128.63
-12	125.09	121.66
-11	118.34	115.12
-10	111.99	108.96
-9	106.03	103.18
-8	100.41	97.73
-7	95.14	92.61
-6	90.17	87.79
-5	85.49	83.25
-4	81.08	78.97
-3	76.93	74.94
-2	73.01	71.14
-1	69.32	67.56
0	65.84	64.17
1	62.54	60.96
2	59.43	57.94
3	56.49	55.08
4	53.71	52.38
5	51.09	49.83
6	48.61	47.42
7	46.26	45.14
8	44.05	42.98
9	41.95	40.94
10	39.96	39.01
11	38.08	37.18
12	36.30	35.45
13	34.62	33.81
14	33.02	32.25
15	31.50	30.77
16	30.06	29.37
17	28.70	28.05
18	27.41	26.78
19	26.18	25.59
20	25.01	24.45
21	23.91	23.37
22	22.85	22.35
23	21.85	21.37
24	20.90	20.45
25	20.00	19.56
26	19.14	18.73
27	18.32	17.93
28	17.54	17.17
29	16.80	16.45
30	16.10	15.76

T°C	0.0	0.5
30	16.10	15.76
31	15.43	15.10
32	14.79	14.48
33	14.18	13.88
34	13.59	13.31
35	13.04	12.77
36	12.51	12.25
37	12.01	11.76
38	11.52	11.29
39	11.06	10.84
40	10.63	10.41
41	10.21	10.00
42	9.81	9.61
43	9.42	9.24
44	9.06	8.88
45	8.71	8.54
46	8.37	8.21
47	8.05	7.90
48	7.75	7.60
49	7.46	7.31
50	7.18	7.04
51	6.91	6.78
52	6.65	6.53
53	6.41	6.53
54	6.65	6.53
55	6.41	6.53
56	6.18	6.06
57	5.95	5.84
58	5.74	5.43
59	5.14	5.05
60	4.96	4.87
61	4.79	4.70
62	4.62	4.54
63	4.46	4.38
64	4.30	4.23
65	4.16	4.08
66	4.01	3.94
67	3.88	3.81
68	3.75	3.68
69	3.62	3.56
70	3.50	3.44
71	3.38	3.32
72	3.27	3.21
73	3.16	3.11
74	3.06	3.01
75	2.96	2.91
76	2.86	2.82
77	2.77	2.72
78	2.68	2.64
79	2.60	2.55
80	2.51	2.47

Outdoor Unit Thermistors for Discharge Pipe (R3T, R31~33T)

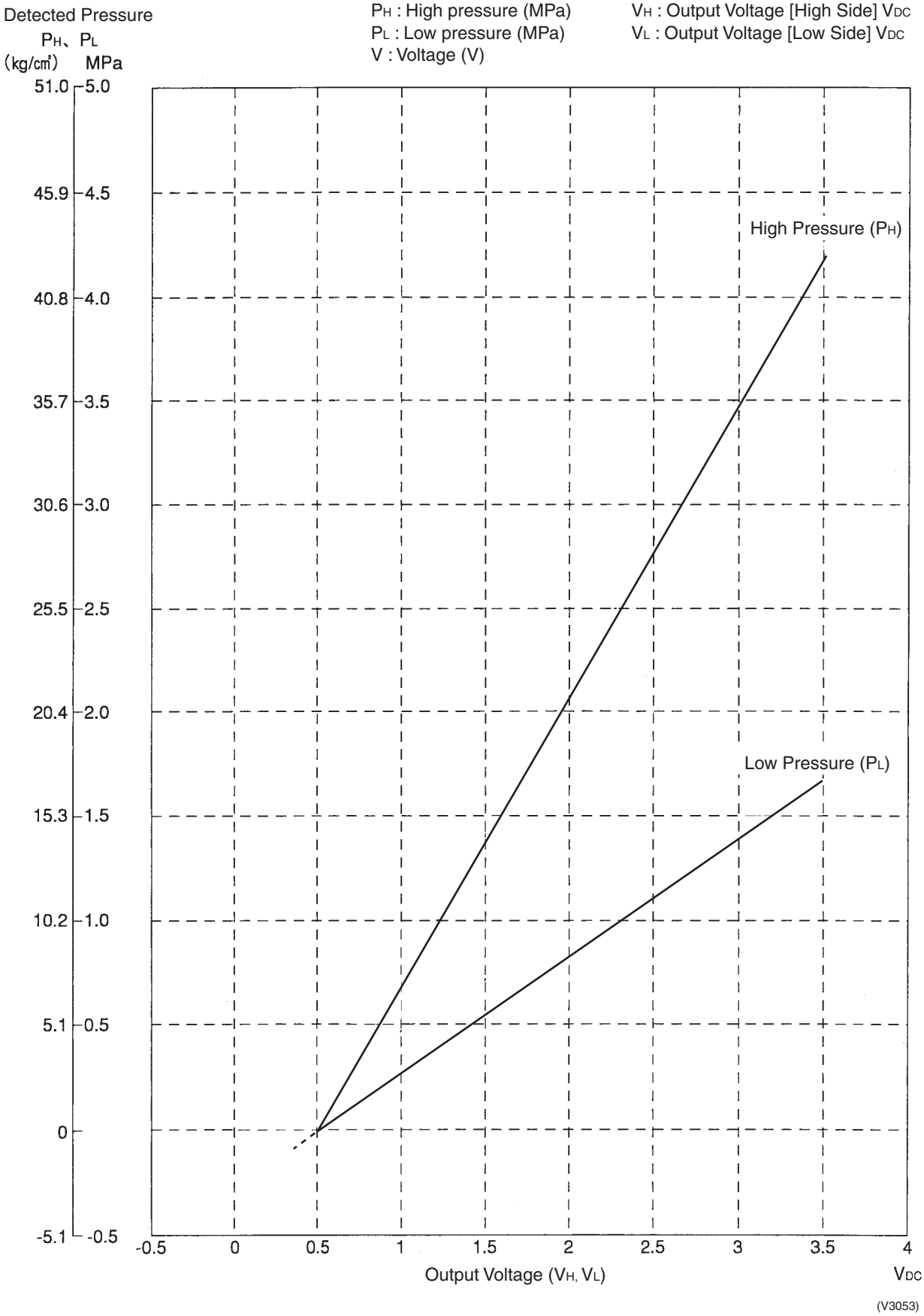
(kΩ))

T°C	0.0	0.5	T°C	0.0	0.5	T°C	0.0	0.5
0	640.44	624.65	50	72.32	70.96	100	13.35	13.15
1	609.31	594.43	51	69.64	68.34	101	12.95	12.76
2	579.96	565.78	52	67.06	65.82	102	12.57	12.38
3	552.00	538.63	53	64.60	63.41	103	12.20	12.01
4	525.63	512.97	54	62.24	61.09	104	11.84	11.66
5	500.66	488.67	55	59.97	58.87	105	11.49	11.32
6	477.01	465.65	56	57.80	56.75	106	11.15	10.99
7	454.60	443.84	57	55.72	54.70	107	10.83	10.67
8	433.37	423.17	58	53.72	52.84	108	10.52	10.36
9	413.24	403.57	59	51.98	50.96	109	10.21	10.06
10	394.16	384.98	60	49.96	49.06	110	9.92	9.78
11	376.05	367.35	61	48.19	47.33	111	9.64	9.50
12	358.88	350.62	62	46.49	45.67	112	9.36	9.23
13	342.58	334.74	63	44.86	44.07	113	9.10	8.97
14	327.10	319.66	64	43.30	42.54	114	8.84	8.71
15	312.41	305.33	65	41.79	41.06	115	8.59	8.47
16	298.45	291.73	66	40.35	39.65	116	8.35	8.23
17	285.18	278.80	67	38.96	38.29	117	8.12	8.01
18	272.58	266.51	68	37.63	36.98	118	7.89	7.78
19	260.60	254.72	69	36.34	35.72	119	7.68	7.57
20	249.00	243.61	70	35.11	34.51	120	7.47	7.36
21	238.36	233.14	71	33.92	33.35	121	7.26	7.16
22	228.05	223.08	72	32.78	32.23	122	7.06	6.97
23	218.24	213.51	73	31.69	31.15	123	6.87	6.78
24	208.90	204.39	74	30.63	30.12	124	6.69	6.59
25	200.00	195.71	75	29.61	29.12	125	6.51	6.42
26	191.53	187.44	76	28.64	28.16	126	6.33	6.25
27	183.46	179.57	77	27.69	27.24	127	6.16	6.08
28	175.77	172.06	78	26.79	26.35	128	6.00	5.92
29	168.44	164.90	79	25.91	25.49	129	5.84	5.76
30	161.45	158.08	80	25.07	24.66	130	5.69	5.61
31	154.79	151.57	81	24.26	23.87	131	5.54	5.46
32	148.43	145.37	82	23.48	23.10	132	5.39	5.32
33	142.37	139.44	83	22.73	22.36	133	5.25	5.18
34	136.59	133.79	84	22.01	21.65	134	5.12	5.05
35	131.06	128.39	85	21.31	20.97	135	4.98	4.92
36	125.79	123.24	86	20.63	20.31	136	4.86	4.79
37	120.76	118.32	87	19.98	19.67	137	4.73	4.67
38	115.95	113.62	88	19.36	19.05	138	4.61	4.55
39	111.35	109.13	89	18.75	18.46	139	4.49	4.44
40	106.96	104.84	90	18.17	17.89	140	4.38	4.32
41	102.76	100.73	91	17.61	17.34	141	4.27	4.22
42	98.75	96.81	92	17.07	16.80	142	4.16	4.11
43	94.92	93.06	93	16.54	16.29	143	4.06	4.01
44	91.25	89.47	94	16.04	15.79	144	3.96	3.91
45	87.74	86.04	95	15.55	15.31	145	3.86	3.81
46	84.38	82.75	96	15.08	14.85	146	3.76	3.72
47	81.16	79.61	97	14.62	14.40	147	3.67	3.62
48	78.09	76.60	98	14.18	13.97	148	3.58	3.54
49	75.14	73.71	99	13.76	13.55	149	3.49	3.45
50	72.32	70.96	100	13.35	13.15	150	3.41	3.37

8. Pressure Sensor

P_H = 1.38V-0.69
P_L = 0.57V-0.28
P_H : High pressure (MPa)
P_L : Low pressure (MPa)
V : Voltage (V)

P_H : Detected Pressure [High Side] MPa
P_L : Detected Pressure [Low Side] MPa
V_H : Output Voltage [High Side] V_{DC}
V_L : Output Voltage [Low Side] V_{DC}



9. Method of Checking the Inverter's Power Transistors and Diode Modules

9.1 Method of Checking the Inverter's Power Transistors and Diode Modules

Checking failures in power semiconductors mounted on inverter PC board

Check the power semiconductors mounted on the inverter PC board by the use of a multiple tester.

<Items to be prepared>

h Multiple tester : Prepare the analog type of multiple tester.
For the digital type of multiple tester, those with diode check function are available for the checking.

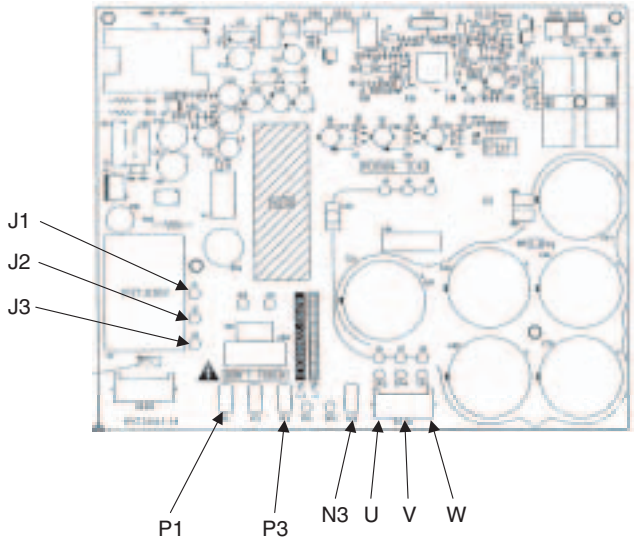
<Test points>

h Turn OFF the power supply. Then, after a lapse of 10 minutes or more, make measurement of resistance.

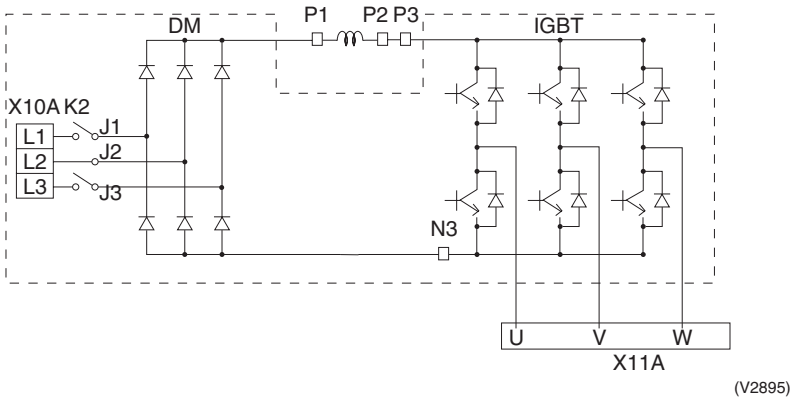
<Preparation>

h To make measurement, disconnect all connectors and terminals.

Inverter PC board



Electronic circuit



(V2895)

■ According to the checking aforementioned, it is probed that the malfunction results from the faulty inverter. The following section describes supposed causes of the faulty inverter.

- Faulty compressor (ground leakage)
- Faulty fan motor (ground leakage)
- Entry of conductive foreign particles
- Abnormal voltage (e.g. overvoltage, surge (thunder), or unbalanced voltage)

In order to replace the faulty inverter, be sure to check for the points aforementioned.

1. Power module checking

When using the analog type of multiple tester, make measurement in resistance measurement mode in the x1kΩ range.

No.	Measuring point		Criterion	Remark
	+	-		
1	P3	U	2 to 15kΩ	
2	P3	V		
3	P3	W		
4	U	P3	Not less than 15kΩ (including)	It may take time to determine the resistance due to capacitor charge or else.
5	V	P3		
6	W	P3		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	2 to 15kΩ	
11	V	N3		
12	W	N3		

When using the digital type of multiple tester, make measurement in diode check mode (→⊢).

No.	Measuring point		Criterion	Remark
	+	-		
1	P3	U	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge or else.
2	P3	V		
3	P3	W		
4	U	P3	0.3 to 0.7V	
5	V	P3		
6	W	P3		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge or else.
11	V	N3		
12	W	N3		

2. Diode module checking

When using the analog type of multiple tester, make measurement in resistance measurement mode in the x1kΩ range.

No.	Measuring point		Criterion	Remark
	+	-		
1	P1	J1	2 to 15kΩ	
2	P1	J2		
3	P1	J3		
4	J1	P1	Not less than 15kΩ (including)	It may take time to determine the resistance due to capacitor charge or else.
5	J2	P1		
6	J3	P1		
7	N3	J1		
8	N3	J2		
9	N3	J3		
10	J1	N3	2 to 15kΩ	
11	J2	N3		
12	J3	N3		

When using the digital type of multiple tester, make measurement in diode check mode ( ).

No.	Measuring point		Criterion	Remark
	+	-		
1	P1	J1	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge or else.
2	P1	J2		
3	P1	J3		
4	J1	P1	0.3 to 0.7V	
5	J2	P1		
6	J3	P1		
7	N3	J1		
8	N3	J2		
9	N3	J3		
10	J1	N3	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge or else.
11	J2	N3		
12	J3	N3		

Part 8
Precautions for New Refrigerant (R-410A)

1. Precautions for New Refrigerant (R-410A)

1.1 Outline

1.1.1 About Refrigerant R-410A

■ Characteristics of new refrigerant, R-410A

1. Performance
   Almost the same performance as R-22 and R-407C
2. Pressure
   Working pressure is approx. 1.4 times more than R-22 and R-407C.
3. Refrigerant composition
   Few problems in composition control, since it is a Quasi-azeotropic mixture refrigerant.

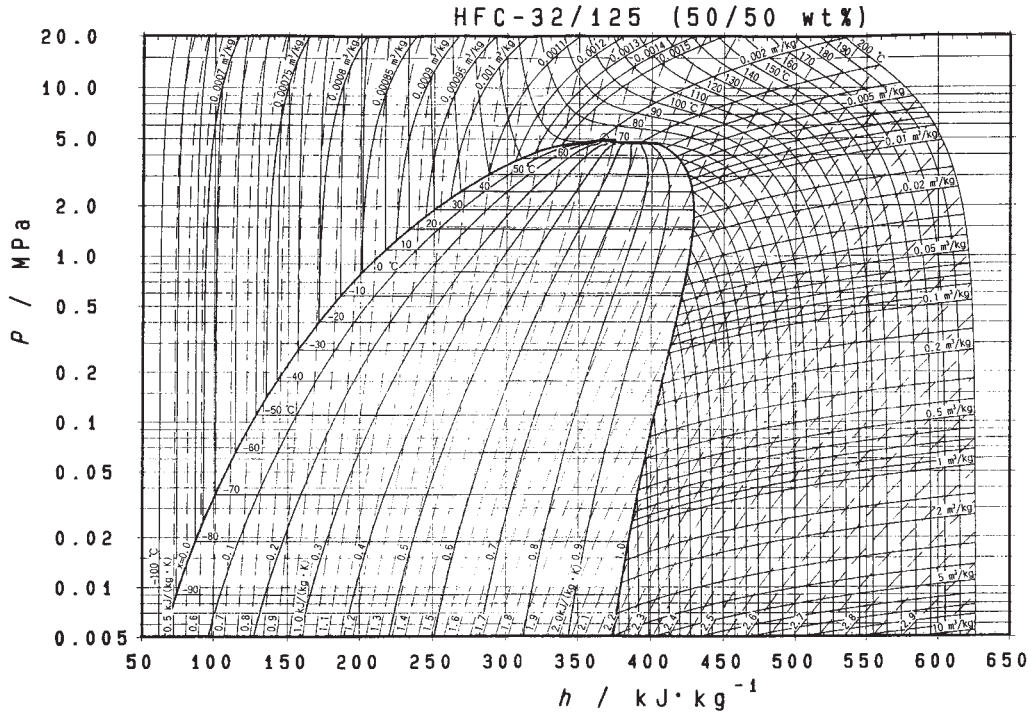
	HFC units (Units using new refrigerants)		HCFC units
Refrigerant name	R-407C	R-410A	R-22
Composing substances	Non-azeotropic mixture of HFC32, HFC125 and HFC134a (*1)	Quasi-azeotropic mixture of HFC32 and JFC125 (*1)	Single-component refrigerant
Design pressure	3.2 MPa (gauge pressure) = 32.6 kgf/cm^2	4.0 MPa (gauge pressure) = 40.8 kgf/cm^2	2.75MPa (gauge pressure) = 28.0 kgf/cm^2
Refrigerant oil	Synthetic oil (Ether)		Mineral oil (Suniso)
Ozone destruction factor (ODP)	0	0	0.05
Combustibility	None	None	None
Toxicity	None	None	None

★1. Non-azeotropic mixture refrigerant: mixture of two or more refrigerants having different boiling points.

★2. Quasi-azeotropic mixture refrigerant: mixture of two or more refrigerants having similar boiling points.

★3. The design pressure is different at each product. Please refer to the installation manual for each product.

(Reference) 1 MPa ≒ 10.19716 kgf / cm^2



Pressure-Enthalpy curves of HFC-32/125 (50/50wt%)

■ Thermodynamic characteristic of R-410A

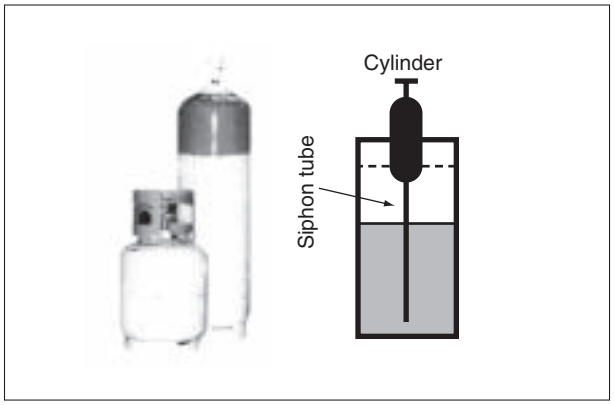
DAIREP ver2.0

Temperature (°C)	Steam pressure (kPa)		Density (kg/m³)		Specific heat at constant pressure (kJ/kgK)		Specific enthalpy (kJ/kg)		Specific entropy (kJ/KgK)	
	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor
-70	36.13	36.11	1410.7	1.582	1.372	0.695	100.8	390.6	0.649	2.074
-68	40.83	40.80	1404.7	1.774	1.374	0.700	103.6	391.8	0.663	2.066
-66	46.02	45.98	1398.6	1.984	1.375	0.705	106.3	393.0	0.676	2.058
-64	51.73	51.68	1392.5	2.213	1.377	0.710	109.1	394.1	0.689	2.051
-62	58.00	57.94	1386.4	2.463	1.378	0.715	111.9	395.3	0.702	2.044
-60	64.87	64.80	1380.2	2.734	1.379	0.720	114.6	396.4	0.715	2.037
-58	72.38	72.29	1374.0	3.030	1.380	0.726	117.4	397.6	0.728	2.030
-56	80.57	80.46	1367.8	3.350	1.382	0.732	120.1	398.7	0.741	2.023
-54	89.49	89.36	1361.6	3.696	1.384	0.737	122.9	399.8	0.754	2.017
-52	99.18	99.03	1355.3	4.071	1.386	0.744	125.7	400.9	0.766	2.010
-51.58	101.32	101.17	1354.0	4.153	1.386	0.745	126.3	401.1	0.769	2.009
-50	109.69	109.51	1349.0	4.474	1.388	0.750	128.5	402.0	0.779	2.004
-48	121.07	120.85	1342.7	4.909	1.391	0.756	131.2	403.1	0.791	1.998
-46	133.36	133.11	1336.3	5.377	1.394	0.763	134.0	404.1	0.803	1.992
-44	146.61	146.32	1330.0	5.880	1.397	0.770	136.8	405.2	0.816	1.987
-42	160.89	160.55	1323.5	6.419	1.401	0.777	139.6	406.2	0.828	1.981
-40	176.24	175.85	1317.0	6.996	1.405	0.785	142.4	407.3	0.840	1.976
-38	192.71	192.27	1310.5	7.614	1.409	0.792	145.3	408.3	0.852	1.970
-36	210.37	209.86	1304.0	8.275	1.414	0.800	148.1	409.3	0.864	1.965
-34	229.26	228.69	1297.3	8.980	1.419	0.809	150.9	410.2	0.875	1.960
-32	249.46	248.81	1290.6	9.732	1.424	0.817	153.8	411.2	0.887	1.955
-30	271.01	270.28	1283.9	10.53	1.430	0.826	156.6	412.1	0.899	1.950
-28	293.99	293.16	1277.1	11.39	1.436	0.835	159.5	413.1	0.911	1.946
-26	318.44	317.52	1270.2	12.29	1.442	0.844	162.4	414.0	0.922	1.941
-24	344.44	343.41	1263.3	13.26	1.448	0.854	165.3	414.9	0.934	1.936
-22	372.05	370.90	1256.3	14.28	1.455	0.864	168.2	415.7	0.945	1.932
-20	401.34	400.06	1249.2	15.37	1.461	0.875	171.1	416.6	0.957	1.927
-18	432.36	430.95	1242.0	16.52	1.468	0.886	174.1	417.4	0.968	1.923
-16	465.20	463.64	1234.8	17.74	1.476	0.897	177.0	418.2	0.980	1.919
-14	499.91	498.20	1227.5	19.04	1.483	0.909	180.0	419.0	0.991	1.914
-12	536.58	534.69	1220.0	20.41	1.491	0.921	182.9	419.8	1.003	1.910
-10	575.26	573.20	1212.5	21.86	1.499	0.933	185.9	420.5	1.014	1.906
-8	616.03	613.78	1204.9	23.39	1.507	0.947	189.0	421.2	1.025	1.902
-6	658.97	656.52	1197.2	25.01	1.516	0.960	192.0	421.9	1.036	1.898
-4	704.15	701.49	1189.4	26.72	1.524	0.975	195.0	422.6	1.048	1.894
-2	751.64	748.76	1181.4	28.53	1.533	0.990	198.1	423.2	1.059	1.890
0	801.52	798.41	1173.4	30.44	1.543	1.005	201.2	423.8	1.070	1.886
2	853.87	850.52	1165.3	32.46	1.552	1.022	204.3	424.4	1.081	1.882
4	908.77	905.16	1157.0	34.59	1.563	1.039	207.4	424.9	1.092	1.878
6	966.29	962.42	1148.6	36.83	1.573	1.057	210.5	425.5	1.103	1.874
8	1026.5	1022.4	1140.0	39.21	1.584	1.076	213.7	425.9	1.114	1.870
10	1089.5	1085.1	1131.3	41.71	1.596	1.096	216.8	426.4	1.125	1.866
12	1155.4	1150.7	1122.5	44.35	1.608	1.117	220.0	426.8	1.136	1.862
14	1224.3	1219.2	1113.5	47.14	1.621	1.139	223.2	427.2	1.147	1.859
16	1296.2	1290.8	1104.4	50.09	1.635	1.163	226.5	427.5	1.158	1.855
18	1371.2	1365.5	1095.1	53.20	1.650	1.188	229.7	427.8	1.169	1.851
20	1449.4	1443.4	1085.6	56.48	1.666	1.215	233.0	428.1	1.180	1.847
22	1530.9	1524.6	1075.9	59.96	1.683	1.243	236.4	428.3	1.191	1.843
24	1615.8	1609.2	1066.0	63.63	1.701	1.273	239.7	428.4	1.202	1.839
26	1704.2	1697.2	1055.9	67.51	1.721	1.306	243.1	428.6	1.214	1.834
28	1796.2	1788.9	1045.5	71.62	1.743	1.341	246.5	428.6	1.225	1.830
30	1891.9	1884.2	1034.9	75.97	1.767	1.379	249.9	428.6	1.236	1.826
32	1991.3	1983.2	1024.1	80.58	1.793	1.420	253.4	428.6	1.247	1.822
34	2094.5	2086.2	1012.9	85.48	1.822	1.465	256.9	428.4	1.258	1.817
36	2201.7	2193.1	1001.4	90.68	1.855	1.514	260.5	428.3	1.269	1.813
38	2313.0	2304.0	989.5	96.22	1.891	1.569	264.1	428.0	1.281	1.808
40	2428.4	2419.2	977.3	102.1	1.932	1.629	267.8	427.7	1.292	1.803
42	2548.1	2538.6	964.6	108.4	1.979	1.696	271.5	427.2	1.303	1.798
44	2672.2	2662.4	951.4	115.2	2.033	1.771	275.3	426.7	1.315	1.793
46	2800.7	2790.7	937.7	122.4	2.095	1.857	279.2	426.1	1.327	1.788
48	2933.7	2923.6	923.3	130.2	2.168	1.955	283.2	425.4	1.339	1.782
50	3071.5	3061.2	908.2	138.6	2.256	2.069	287.3	424.5	1.351	1.776
52	3214.0	3203.6	892.2	147.7	2.362	2.203	291.5	423.5	1.363	1.770
54	3361.4	3351.0	875.1	157.6	2.493	2.363	295.8	422.4	1.376	1.764
56	3513.8	3503.5	856.8	168.4	2.661	2.557	300.3	421.0	1.389	1.757
58	3671.3	3661.2	836.9	180.4	2.883	2.799	305.0	419.4	1.403	1.749
60	3834.1	3824.2	814.9	193.7	3.191	3.106	310.0	417.6	1.417	1.741
62	4002.1	3992.7	790.1	208.6	3.650	3.511	315.3	415.5	1.433	1.732
64	4175.7	4166.8	761.0	225.6	4.415	4.064	321.2	413.0	1.450	1.722

1.2 Refrigerant Cylinders

■ Cylinder specifications

- The cylinder is painted refrigerant color (pink).
- The cylinder valve is equipped with a siphon tube.



Refrigerant can be charged in liquid state with cylinder in upright position.

Caution: Do not lay cylinder on its side during charging, since it cause refrigerant in gas state to enter the system.

■ Handling of cylinders

(1) Laws and regulations

R-410A is liquefied gas, and the High-Pressure Gas Safety Law must be observed in handling them. Before using, refer to the High-Pressure Gas Safety Law.

The Law stipulates standards and regulations that must be followed to prevent accidents with high-pressure gases. Be sure to follow the regulations.

(2) Handing of vessels

Since R-410A is high-pressure gas, it is contained in high-pressure vessels.

Although those vessels are durable and strong, careless handling can cause damage that can lead to unexpected accidents. Do not drop vessels, let them fall, apply impact or roll them on the ground.

(3) Storage

Although R-410A is not flammable, it must be stored in a well-ventilated, cool, and dark place in the same way as any other high-pressure gases.

It should also be noted that high-pressure vessels are equipped with safety devices that releases gas when the ambient temperature reaches more than a certain level (fusible plug melts) and when the pressure exceeds a certain level (spring-type safety valve operates).

1.3 Service Tools

R-410A is used under higher working pressure, compared to previous refrigerants (R-22,R-407C). Furthermore, the refrigerating machine oil has been changed from Suniso oil to Ether oil, and if oil mixing is occurred, sludge results in the refrigerants and causes other problems. Therefore, gauge manifolds and charge hoses that are used with a previous refrigerant (R-22,R-407C) can not be used for products that use new refrigerants.
Be sure to use dedicated tools and devices.

■ Tool compatibility

Tool	Compatibility			Reasons for change
	HFC		HCFC	
	R-410A	R-407C	R-22	
Gauge manifold Charge hose	×			• Do not use the same tools for R-22 and R-410A. • Thread specification differs for R-410A and R-407C.
Charging cylinder	×		○	• Weighting instrument used for HFCs.
Gas detector	○		×	• The same tool can be used for HFCs.
Vacuum pump (pump with reverse flow preventive function)	○			• To use existing pump for HFCs, vacuum pump adapter must be installed.
Weighting instrument	○			
Charge mouthpiece	×			• Seal material is different between R-22 and HFCs. • Thread specification is different between R-410A and others.
Flaring tool (Clutch type)	○			• For R-410A, flare gauge is necessary.
Torque wrench	○			• Torque-up for 1/2 and 5/8
Pipe cutter	○			
Pipe expander	○			
Pipe bender	○			
Pipe assembling oil	×			• Due to refrigerating machine oil change. (No Suniso oil can be used.)
Refrigerant recovery device	Check your recovery device.			
Refrigerant piping	See the chart below.			• Only ϕ19.1 is changed to 1/2H material while the previous material is "O".

As for the charge mouthpiece and packing, 1/2UNF20 is necessary for mouthpiece size of charge hose.

■ Copper tube material and thickness

Pipe size	Ve-up		Ve-upII	
	R-407C		R-410A	
	Material	Thickness t (mm)	Material	Thickness t (mm)
ϕ6.4	O	0.8	O	0.8
ϕ9.5	O	0.8	O	0.8
ϕ12.7	O	0.8	O	0.8
ϕ15.9	O	1.0	O	1.0
ϕ19.1	O	1.0	1/2H	1.0
ϕ22.2	1/2H	1.0	1/2H	1.0
ϕ25.4	1/2H	1.0	1/2H	1.0
ϕ28.6	1/2H	1.0	1/2H	1.0
ϕ31.8	1/2H	1.2	1/2H	1.1
ϕ38.1	1/2H	1.4	1/2H	1.4
ϕ44.5	1/2H	1.6	1/2H	1.6

* O: Soft (Annealed)
H: Hard (Drawn)

1. Flaring tool

■ Specifications

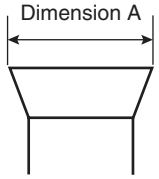
• Dimension A

Unit:mm

Nominal size	Tube O.D.	$A^{+0}_{-0.4}$	
	Do	Class-2 (R-410A)	Class-1 (Conventional)
1/4	6.35	9.1	9.0
3/8	9.52	13.2	13.0
1/2	12.70	16.6	16.2
5/8	15.88	19.7	19.4
3/4	19.05	24.0	23.3

■ Differences

• Change of dimension A



For class-1: R-407C
For class-2: R-410A

Conventional flaring tools can be used when the work process is changed.
(change of work process)
Previously, a pipe extension margin of 0 to 0.5mm was provided for flaring. For R-410A air conditioners, perform pipe flaring with a pipe extension margin of 1.0 to 1.5mm.
(For clutch type only)
Conventional tool with pipe extension margin adjustment can be used.

2. Torque wrench

■ Specifications

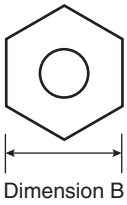
• Dimension B Unit:mm

Nominal size	Class-1	Class-2	Previous
1/2	24	26	24
5/8	27	29	27

No change in tightening torque
No change in pipes of other sizes

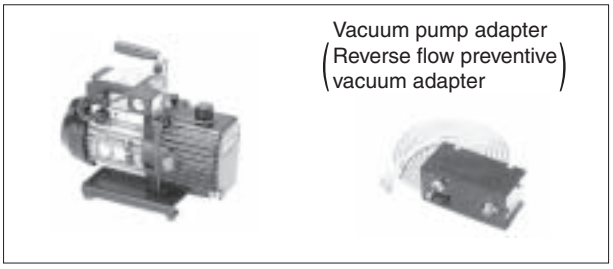
■ Differences

• Change of dimension B
Only 1/2", 5/8" are extended



For class-1: R-407C
For class-2: R-410A

3. Vacuum pump with check valve



■ Specifications

• Discharge speed
50 l/min (50Hz)
60 l/min (60Hz)
• Suction port UNF7/16-20(1/4 Flare)
UNF1/2-20(5/16 Flare) with adapter

● Maximum degree of vacuum
Select a vacuum pump which is able to keep the vacuum degree of the system in excess of –100.7 kPa (5 torr – 755 mmHg).

■ Differences

• Equipped with function to prevent reverse oil flow
• Previous vacuum pump can be used by installing adapter.

4. Leak tester

■ Specifications
- Hydrogen detecting type, etc.
- Applicable refrigerants
  R-410A, R-407C, R-404A, R-507A, R-134a, etc.

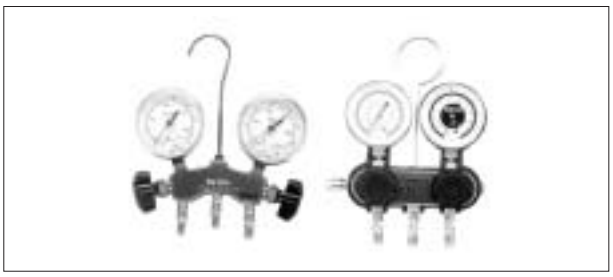
■ Differences
- Previous testers detected chlorine. Since HFCs do not contain chlorine, new tester detects hydrogen.

5. Refrigerant oil (Air compal)

■ Specifications
- Contains synthetic oil, therefore it can be used for piping work of every refrigerant cycle.
- Offers high rust resistance and stability over long period of time.

■ Differences
- Can be used for R-410A and R-22 units.

6. Gauge manifold for R-410A



■ Specifications
- High pressure gauge
  - 0.1 to 5.3 MPa (-76 cmHg to 53 kg/cm^2)
- Low pressure gauge
  - 0.1 to 3.8 MPa (-76 cmHg to 38 kg/cm^2)
- 1/4" → 5/16" (2min → 2.5min)
- No oil is used in pressure test of gauges.
  → For prevention of contamination

- Temperature scale indicates the relationship between pressure and temperature in gas saturated state.

■ Differences
- Change in pressure
- Change in service port diameter

7. Charge hose for R-410A

(Hose with ball valve)

■ Specifications
- Working pressure 5.08 MPa (51.8 kg/cm^2)
- Rupture pressure 25.4 MPa (259 kg/cm^2)
- Available with and without hand-operate valve that prevents refrigerant from outflow.

■ Differences
- Pressure proof hose
- Change in service port diameter
- Use of nylon coated material for HFC resistance

8. Charging cylinder

Can not be used

■ Specifications
- Use weigher for refrigerant charge listed below to charge directly from refrigerant cylinder.

■ Differences
- The cylinder can not be used for mixed refrigerant since mixing ratio is changed during charging.

  When R-410A is charged in liquid state using charging cylinder, foaming phenomenon is generated inside charging cylinder.

9. Weigher for refrigerant charge

■ Specifications
- High accuracy
  TA101A (for 10-kg cylinder) = ± 2g
  TA101B (for 20-kg cylinder) = ± 5g
- Equipped with pressure-resistant sight glass to check liquid refrigerant charging.
- A manifold with separate ports for HFCs and previous refrigerants is equipped as standard accessories.

■ Differences
- Measurement is based on weight to prevent change of mixing ratio during charging.

10. Charge mouthpiece

■ Specifications
- For R-410A, 1/4"→ 5/16" (2min → 2.5min)
- Material is changed from CR to H-NBR.

■ Differences
- Change of thread specification on hose connection side (For the R-410A use)
- Change of sealer material for the HFCs use.

Index

L

M

O

P

R

S

T

U

V

W

Drawings & Flow Charts

T

W

In all of us,
a green heart

Daikin's unique position as a manufacturer of air conditioning equipment, compressors and refrigerants has led to its close involvement in environmental issues. For several years Daikin has had the intension to become a leader in the provision of products that have limited impact on the environment. This challenge demands the eco design and development of a wide range of products and an energy management system, resulting in energy conservation and a reduction of waste.

Daikin Europe N.V. is approved by LRQA for its Quality Management System in accordance with the ISO9001 standard. ISO9001 pertains to quality assurance regarding design, development, manufacturing as well as to services related to the product.

ISO14001 assures an effective environmental management system in order to help protect human health and the environment from the potential impact of our activities, products and services and to assist in maintaining and improving the quality of the environment.

Daikin units comply with the European regulations that guarantee the safety of the product.

VRV products are not within the scope of the Eurovent certification programme.

DAIKIN EUROPE N.V.
Naamloze Vennootschap
Zandvoordestraat 300
B-8400 Oostende - Belgium
www.daikin.eu
BTW: BE 0412 120 336
RPR Oostende

SiENBE37-701 • 06/2008 • Copyright © Daikin
Prepared in Belgium by Lannoo. (www.lannooprint.be), a company whose concern for the environment is set in the EMAS and ISO 14001 systems.
Responsible Editor: Daikin Europe N.V., Zandvoordestraat 300, B- 8400 Oostende

SiENBE37-701