



Design, Installation & Testing Instruction

R410A Heat Pump 50Hz



RXYQ5MY1B
RXYQ8MY1B
RXYQ10MY1B
RXYQ12MY1B
RXYQ14MY1B
RXYQ16MY1B
RXYQ18MY1B
RXYQ20MY1B
RXYQ22MY1B
RXYQ24MY1B
RXYQ26MY1B

RXYQ28MY1B
RXYQ30MY1B
RXYQ32MY1B
RXYQ34MY1B
RXYQ36MY1B
RXYQ38MY1B
RXYQ40MY1B
RXYQ42MY1B
RXYQ44MY1B
RXYQ46MY1B
RXYQ48MY1B

Preface

This system is a modular zone controllable air conditioning system of great sophistication which is capable of assembly in a variety of different configurations. It would, however, be no exaggeration to say that the full potential of the system's functions can only be achieved in combination with the skills of those involved in the design of the equipment itself and those responsible for the installation work.

As the move towards intelligent buildings has gathered momentum, so we have also been seeing ever more a growing demand for a wider range of independently controllable building related functions.

Against this background there have also quite naturally been calls for the development of more distributed types of air conditioning systems while at the same time taking full account of the need to use energy economically by demand matching in view of the huge annual increases in the demand for electric power seen in recent years.

We have therefore prepared this installation manual to enable installation work to be handled confidently on the basis of a clear understanding of the special features of this system. We have paid particular attention to points of difference in installation procedure between this system and the more traditional package and room air conditioning system.

The manual is designed specifically to cater for those supervising installation work and concentrates on those products which are currently on the market. Essential points which need to be taken into consideration when designing an appropriate configuration for the system and in each of the separate installation processes have also been included.

We have also added a section covering problems which have arisen in connection with installation work undertaken to date in an attempt to prevent the recurrence of the same problems.

Please be sure to read this manual thoroughly before starting installation work in order to ensure that all such work is carried out with maximum efficiency and to maximum effect.

The following technical documents are also available from Daikin. Please use these documents together with this manual to conduct efficient servicing.

Service Manual VRVII R410A Heat Pump 50Hz Series Si39-303 April. 2003.

July, 2003

After Sales Service Division

VRV II System R410A PLUS Series

Part 1 General Information 1

1. Product Outline	2
1.1 Model Names of Indoor/Outdoor Units	2
1.2 External Appearance	3
1.3 Combination of Outdoor Units	5
1.4 Model Selection	6
2. Points to Bear in Mind at the System Design	8
2.1 Points Relating to the Performance of the Air Conditioning Units	8
2.2 The Installation is of Vital Importance	9
2.3 Striking a Balance between System Installation and General Construction Work (Comprehensive Flow Chart)	10
2.4 Points to Bear in Mind when Preparing the Contract Drawings	11
3. Installation	14
3.1 Step by Step Installation Procedure	14
3.2 Work Involved in Individual Operations and Points to be Borne in Mind	15
4. Test Operation	62
4.1 Procedure and Outline	62
4.2 Operation When Power is Turned On	65
4.3 Outdoor Unit PC Board Layout	66
4.4 Field Setting	67
5. Caution for Refrigerant Leaks	102
5.1 Caution for Refrigerant Leaks	102
6. Hand Over to Customer	105
6.1 Operational Steps	105
7. Appendix	106
7.1 Operating Noise of Indoor Units	106
7.2 Piping Installation Point	108
7.3 Allowable Piping Length	110
7.4 Refrigerant branch kit selection	113
7.5 Pipe size selection	115
7.6 How to calculate the additional refrigerant to be charged	117
7.7 Outdoor Unit Multi Connection Piping Kit	119
7.8 REFNET Pipe Connections for VRV II R410A Series	126
7.9 VRV Inspection Sheet	129
7.10 Piping System Diagrams	134
7.11 Wiring Diagrams	138
7.12 Bad Examples and Good Examples in Installation	144

Part 2 Installation Manual 153

1. Introduction	155
1.1 Combination	155

1.2	Standard Operation Limit	156
1.3	Standard Supplied Accessories	156
1.4	Option Accessory	157
1.5	Technical Specifications	158
1.6	Electrical Specifications.....	160
2.	Main Components	161
3.	Selection of Location	162
4.	Inspecting and Handling the Unit	164
5.	Unpacking and Placing the Unit	165
6.	Refrigerant Piping	167
6.1	Selection of Piping Material	167
6.2	Connecting the Refrigerant Piping	168
6.3	Example of Connection	173
6.4	Leak test and Vacuum Drying	175
6.5	Pipe Insulation.....	177
6.6	Additional refrigerant charge	178
7.	Field Wiring	180
7.1	Optional Parts Cool / Heat Selector	180
7.2	Power Circuit and Cable Requirements	181
7.3	General.....	182
7.4	Examples.....	183
8.	Before Operation.....	191
8.1	Checks Before Initial Start-up.....	191
8.2	Test Run.....	192
9.	Caution for Refrigerant Leaks	194
9.1	Caution for Refrigerant Leaks	194

Part 3 Operation Manual 197

1.	Safety Cautions	199
2.	What to Do Before Operation	202
3.	Remote Controller and Changeover Switch: Name and Function of Each Switch and Display	203
4.	Warning.....	205
4.1	Never Do the Following	205
5.	Operation Range.....	206
6.	Operation Procedure	207
6.1	Cooling, Heating and Fan Only Operation	207
6.2	Program Dry Operation	209
6.3	Adjusting the Air Flow Direction (Only for Double-flow, Multi-flow, Corner, Ceiling-suspended and Wall-mounted)	210
6.4	Programming Start and Stop of the System with Timer	211
6.5	Setting the Master Remote Controller	212
6.6	Precautions for group control system or two remote controller control system.....	213
7.	Optimum Operation.....	214
8.	Following Symptoms are not Air Conditioner Troubles	215
8.1	The System does not operate	215
8.2	Cool/Heat cannot be Changed Over	215
8.3	Fan Operation is Possible, but Cooling and Heating do not Work	215
8.4	The Fan Strength does not Correspond to the Setting.....	215

8.5	The Fan Direction does not Correspond to the Setting	215
8.6	White Mist comes out of a Unit.....	216
8.7	Noise of Air Conditioners.....	216
8.8	Dust comes out of the Unit	216
8.9	The Units can Give off Odours	216
8.10	The Outdoor Unit Fan does not Spin.....	216
8.11	The Display Shows "88"	217
8.12	The Compressor in the Outdoor Unit does not Stop after a Short Heating Operation	217
8.13	The Inside of an Outdoor Unit is Warm even when the Unit has stopped	217
9.	Troubleshooting	218

Part 4 Precautions for New Refrigerant (R410A) 221

1.	Precautions for New Refrigerant (R410A).....	222
1.1	Outline	222
1.2	Refrigerant Cylinders.....	224
1.3	Service Tools.....	225

Part 1

General Information

1. Product Outline	2
1.1 Model Names of Indoor/Outdoor Units.....	2
1.2 External Appearance.....	3
1.3 Combination of Outdoor Units	5
1.4 Model Selection.....	6
2. Points to Bear in Mind at the System Design	8
2.1 Points Relating to the Performance of the Air Conditioning Units	8
2.2 The Installation is of Vital Importance	9
2.3 Striking a Balance between System Installation and General Construction Work (Comprehensive Flow Chart)	10
2.4 Points to Bear in Mind when Preparing the Contract Drawings	11
3. Installation	14
3.1 Step by Step Installation Procedure	14
3.2 Work Involved in Individual Operations and Points to be Borne in Mind	15
4. Test Operation	62
4.1 Procedure and Outline	62
4.2 Operation When Power is Turned On	65
4.3 Outdoor Unit PC Board Layout.....	66
4.4 Field Setting	67
5. Caution for Refrigerant Leaks	102
5.1 Caution for Refrigerant Leaks	102
6. Hand Over to Customer	105
6.1 Operational Steps.....	105
7. Appendix	106
7.1 Operating Noise of Indoor Units	106
7.2 Piping Installation Point	108
7.3 Allowable Piping Length	110
7.4 Refrigerant branch kit selection	113
7.5 Pipe size selection.....	115
7.6 How to calculate the additional refrigerant to be charged	117
7.7 Outdoor Unit Multi Connection Piping Kit	119
7.8 REFNET Pipe Connections for VRV II R410A Series	126
7.9 VRV Inspection Sheet	129
7.10 Piping System Diagrams	134
7.11 Wiring Diagrams.....	138
7.12 Bad Examples and Good Examples in Installation.....	144

1. Product Outline

1.1 Model Names of Indoor/Outdoor Units

Indoor Units

Type		Model Name											Power Supply
Ceiling mounted cassette type (Double flow)	FXCQ	20M	25M	32M	40M	50M	63M	80M	—	125M	—	—	VE
Ceiling mounted cassette type (Multi flow) 600×600	FXZQ	20M	25M	32M	40M	50M	—	—	—	—	—	—	
Ceiling mounted cassette type (Multi flow)	FXFQ	—	25M	32M	40M	50M	63M	80M	100M	125M	—	—	
Ceiling mounted cassette corner	FXKQ	—	25M	32M	40M	—	63M	—	—	—	—	—	
Ceiling mounted built-in type	FXSQ	20M	25M	32M	40M	50M	63M	80M	100M	125M	—	—	
Ceiling mounted duct type	FXMQ	—	—	—	40M	50M	63M	80M	100M	125M	200M	250M	
Ceiling suspended type	FXHQ	—	—	32M	—	—	63M	—	100M	—	—	—	
Wall mounted type	FXAQ	20M	25M	32M	40M	50M	63M	—	—	—	—	—	
Floor standing type	FXLQ	20M	25M	32M	40M	50M	63M	—	—	—	—	—	
Concealed Floor standing type	FXNQ	20M	25M	32M	40M	50M	63M	—	—	—	—	—	

Outdoor Units (Inverter Series)

Series		Model Name												Power Supply
Inverter	Heat Pump	RXYQ	5M	8M	10M	12M	14M	16M	18M	20M	22M	24M	26M	Y1B

Series		Model Name												Power Supply
Inverter	Heat Pump	RXYQ	28M	30M	32M	34M	36M	38M	40M	42M	44M	46M	48M	Y1B

VE: 1φ, 220~240V, 50Hz, 1φ, 220V, 60Hz

Y1B: 3φ, 380~415V, 50Hz

1.2 External Appearance

1.2.1 Indoor Units

Ceiling mounted cassette type (Double flow) FXCQ20M FXCQ25M FXCQ32M FXCQ40M FXCQ50M FXCQ63M FXCQ80M FXCQ125M 	Ceiling mounted duct type FXMQ40M FXMQ50M FXMQ63M FXMQ80M FXMQ100M FXMQ125M FXMQ200M FXMQ250M  FXMQ40~125M  FXMQ200 · 250M
Ceiling mounted cassette type (Multi flow) 600x600 FXZQ20M FXZQ25M FXZQ32M FXZQ40M FXZQ50M 	Ceiling suspended type FXHQ32M FXHQ63M FXHQ100M 
Ceiling mounted cassette type (Multi flow) FXFQ25M FXFQ32M FXFQ40M FXFQ50M FXFQ63M FXFQ80M FXFQ100M FXFQ125M 	Wall mounted type FXAQ20M FXAQ25M FXAQ32M FXAQ40M FXAQ50M FXAQ63M 
Ceiling mounted cassette corner type FXKQ25M FXKQ32M FXKQ40M FXKQ63M 	Floor standing type FXLQ20M FXLQ25M FXLQ32M FXLQ40M FXLQ50M FXLQ63M 
Ceiling mounted built-in type FXSQ20M FXSQ25M FXSQ32M FXSQ40M FXSQ50M FXSQ63M FXSQ80M FXSQ100M FXSQ125M 	Concealed floor standing type FXNQ20M FXNQ25M FXNQ32M FXNQ40M FXNQ50M FXNQ63M 

1.2.2 Outdoor Units

RXYQ5M



5HP

RXYQ8M,10M



8,10HP

RXYQ12M,14M,16M



12,14,16HP

RXYQ18M, 20M



18, 20HP

RXYQ22M, 24M, 26M



22, 24, 26HP

RXYQ28M, 30M, 32M



28, 30, 32HP

RXYQ34M, 36M



34, 36HP

RXYQ38M, 40M, 42M



38, 40, 42HP

RXYQ44M, 46M, 48M



44, 46, 48HP

1.3 Combination of Outdoor Units

System Capacity	Number of units	Module					
		5	8	10	12	14	16
5HP	1	●					
8HP	1		●				
10HP	1			●			
12HP	1				●		
14HP	1					●	
16HP	1						●
18HP	2		●	●			
20HP	2			● ●			
22HP	2			●	●		
24HP	2			●		●	
26HP	2			●			●
28HP	2				●		●
30HP	2					●	●
32HP	2						● ●
34HP	3			● ●		●	
36HP	3			● ●			●
38HP	3			●	●		●
40HP	3			●		●	●
42HP	3			●			● ●
44HP	3				●		● ●
46HP	3					●	● ●
48HP	3						● ● ●

★18~48HP are realized by combining 8, 10, 12, 14 and 16HP.

1.4 Model Selection

VRV II Heat Pump Series

Connectable indoor units number and capacity

HP	5HP	8HP	10HP	12HP	14HP	16HP
System name	RXYQ5M	RXYQ8M	RXYQ10M	RXYQ12M	RXYQ14M	RXYQ16M
Outdoor unit 1	RXYQ5M	RXYQ8M	RXYQ10M	RXYQ12M	RXYQ14M	RXYQ16M
Outdoor unit 2	—	—	—	—	—	—
Outdoor unit 3	—	—	—	—	—	—
Total number of connectable indoor units	8	13	16	19	20	20
Total capacity of connectable indoor units (kW)	7.0~18.2	11.2~29.1	14.0~36.4	16.8~43.6	20.0~52.0	22.5~58.5

HP	18HP	20HP	22HP	24HP	26HP	28HP
System name	RXYQ18M	RXYQ20M	RXYQ22M	RXYQ24M	RXYQ26M	RXYQ28M
Outdoor unit 1	RXYQ8M	RXYQ10M	RXYQ10M	RXYQ10M	RXYQ10M	RXYQ12M
Outdoor unit 2	RXYQ10M	RXYQ10M	RXYQ12M	RXYQ14M	RXYQ16M	RXYQ16M
Outdoor unit 3	—	—	—	—	—	—
Total number of connectable indoor units	20	20	22	32	32	32
Total capacity of connectable indoor units (kW)	25.2~65.5	28.0~72.8	30.8~80.0	34.0~88.4	36.5~94.9	39.3~102.1

HP	30HP	32HP	34HP	36HP	38HP	40HP
System name	RXYQ30M	RXYQ32M	RXYQ34M	RXYQ36M	RXYQ38M	RXYQ40M
Outdoor unit 1	RXYQ14M	RXYQ16M	RXYQ10M	RXYQ10M	RXYQ10M	RXYQ10M
Outdoor unit 2	RXYQ16M	RXYQ16M	RXYQ10M	RXYQ10M	RXYQ12M	RXYQ14M
Outdoor unit 3	—	—	RXYQ14M	RXYQ16M	RXYQ16M	RXYQ16M
Total number of connectable indoor units	32	32	34	36	38	40
Total capacity of connectable indoor units (kW)	42.5~110.5	45.0~117.0	48.0~124.8	50.5~131.3	53.3~138.5	56.5~146.9

HP	42HP	44HP	46HP	48HP
System name	RXYQ42M	RXYQ44M	RXYQ46M	RXYQ48M
Outdoor unit 1	RXYQ10M	RXYQ12M	RXYQ14M	RXYQ16M
Outdoor unit 2	RXYQ16M	RXYQ16M	RXYQ16M	RXYQ16M
Outdoor unit 3	RXYQ16M	RXYQ16M	RXYQ16M	RXYQ16M
Total number of connectable indoor units	40	40	40	40
Total capacity of connectable indoor units (kW)	59.0~153.4	61.8~160.6	65.0~169.0	67.5~175.5

Connectable indoor unit

Type		Model Name											Power Supply
Ceiling mounted cassette type (Double flow)	FXCQ	20M	25M	32M	40M	50M	63M	80M	—	125M	—	—	VE
Ceiling mounted cassette type (Multi flow) 600×600	FXZQ	20M	25M	32M	40M	50M	—	—	—	—	—	—	
Ceiling mounted cassette type (Multi flow)	FXFQ	—	25M	32M	40M	50M	63M	80M	100M	125M	—	—	
Ceiling mounted cassette corner	FXKQ	—	25M	32M	40M	—	63M	—	—	—	—	—	
Ceiling mounted built-in type	FXSQ	20M	25M	32M	40M	50M	63M	80M	100M	125M	—	—	
Ceiling mounted duct type	FXMQ	—	—	—	40M	50M	63M	80M	100M	125M	200M	250M	
Ceiling suspended type	FXHQ	—	—	32M	—	—	63M	—	100M	—	—	—	
Wall mounted type	FXAQ	20M	25M	32M	40M	50M	63M	—	—	—	—	—	
Floor standing type	FXLQ	20M	25M	32M	40M	50M	63M	—	—	—	—	—	
Concealed Floor standing type	FXNQ	20M	25M	32M	40M	50M	63M	—	—	—	—	—	

Indoor unit capacity

New refrigerant model code	P20 type	P25 type	P32 type	P40 type	P50 type	P63 type	P80 type	P100 type	P125 type	P200 type	P250 type
Selecting model capacity	2.2 kW	2.8 kW	3.5 kW	4.5 kW	5.6 kW	7.0 kW	9.0 kW	11.2 kW	14.0 kW	22.4 kW	28.0 kW
Equivalent output	0.8HP	1HP	1.25HP	1.6HP	2.0HP	2.5HP	3.2HP	4HP	5HP	8HP	10HP

Use the above tables to determine the capacities of indoor units to be connected. Make sure the total capacity of indoor units connected to each outdoor unit is within the specified value (kW).

- The total capacity of connected indoor units must be within a range of 50 to 130% of the rated capacity of the outdoor unit.
- In some models, it is not possible to connect the maximum number of connectable indoor units. Select models so the total capacity of connected indoor units conforms to the specification.

2. Points to Bear in Mind at the System Design

2.1 Points Relating to the Performance of the Air Conditioning Units

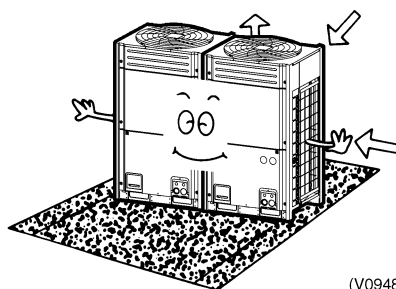
A number of points need to be borne in mind at the system design stage in order to ensure the mechanical efficiency of the air conditioning units.

1. Path of refrigerant piping between outdoor and indoor units, height difference and pipe length.

- Path of refrigerant piping should be determined such that length of piping is kept to a minimum.
- Piping should be kept within permissible limits in terms of length and height difference.

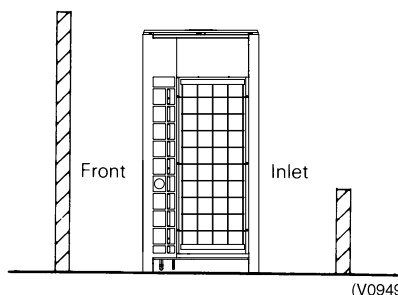
2. Positioning of outdoor unit

- Position such that maintenance and repairs can be carried out. (leave room for servicing)
- Avoid reduction of airflow and short circuiting



(V0948)

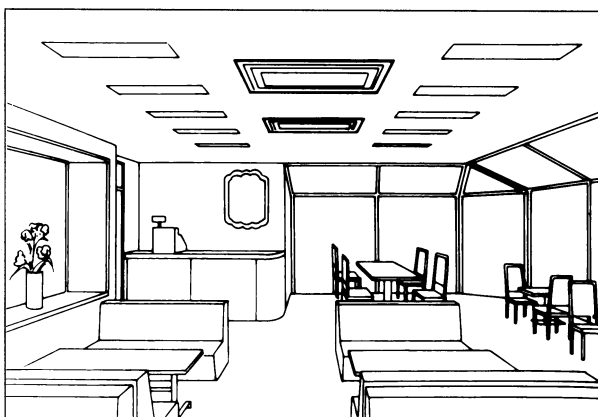
- Avoid reduction of airflow and short circuiting



(V0949)

3. Positioning of indoor unit

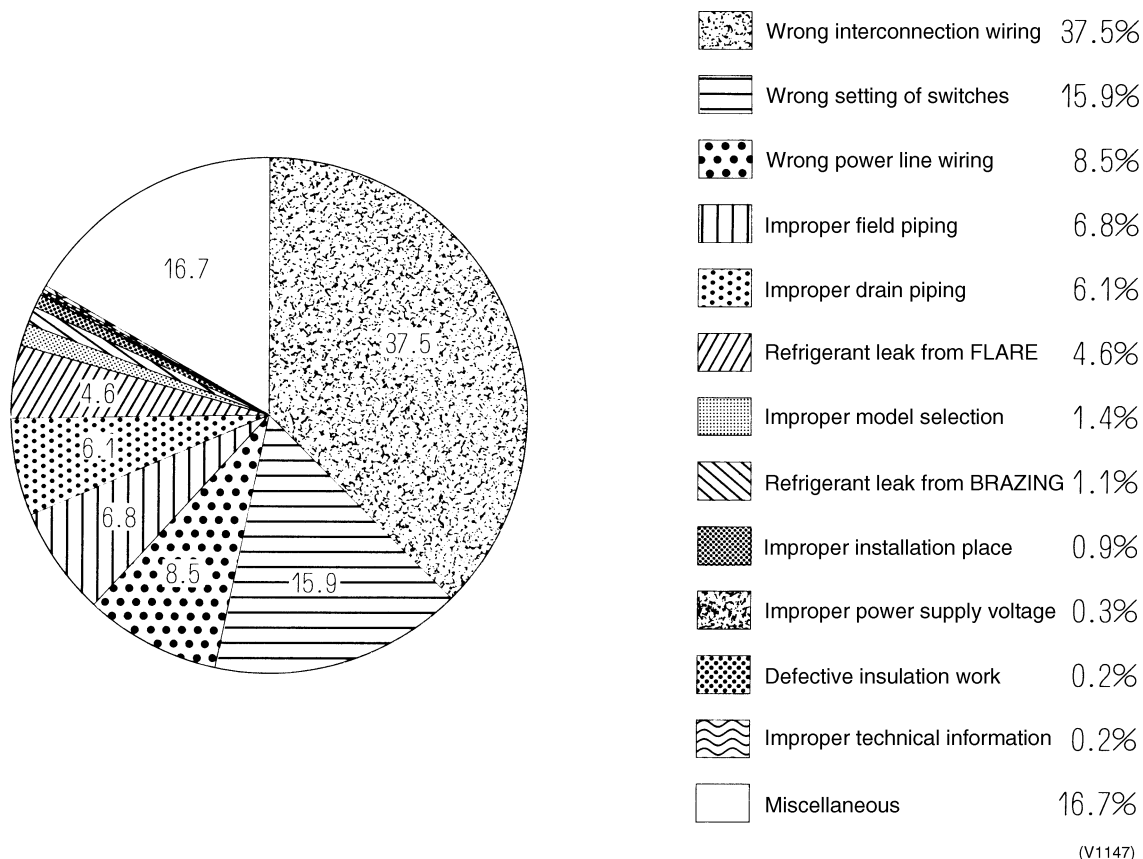
- Position such that maintenance and repairs can be carried out. (inspection port positions and size check)
- Avoid short circuiting
- Ensure sufficient drain pipe gradient (need for drain-up kit etc.)
- In the case of a ceiling mounted type make sure ceiling depth is sufficient (need for high performance filter, etc.)



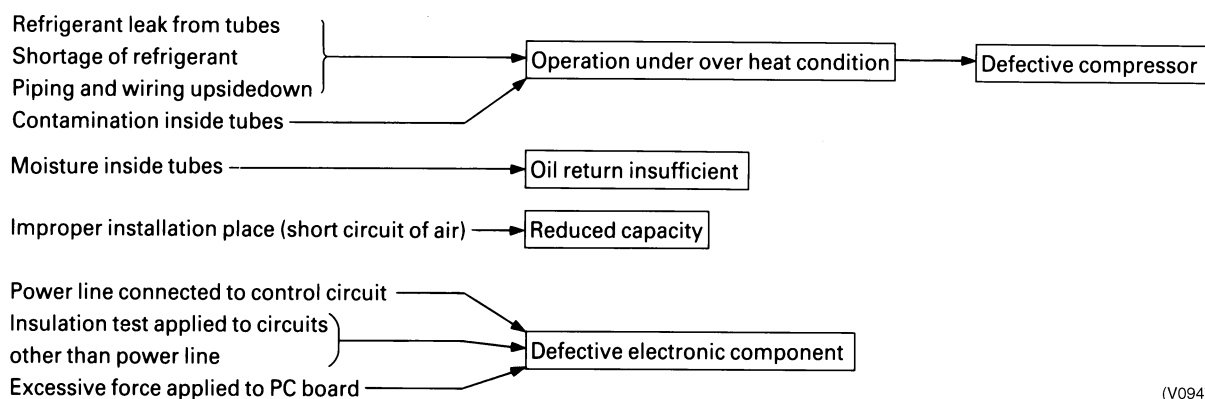
(V0951)

2.2 The Installation is of Vital Importance

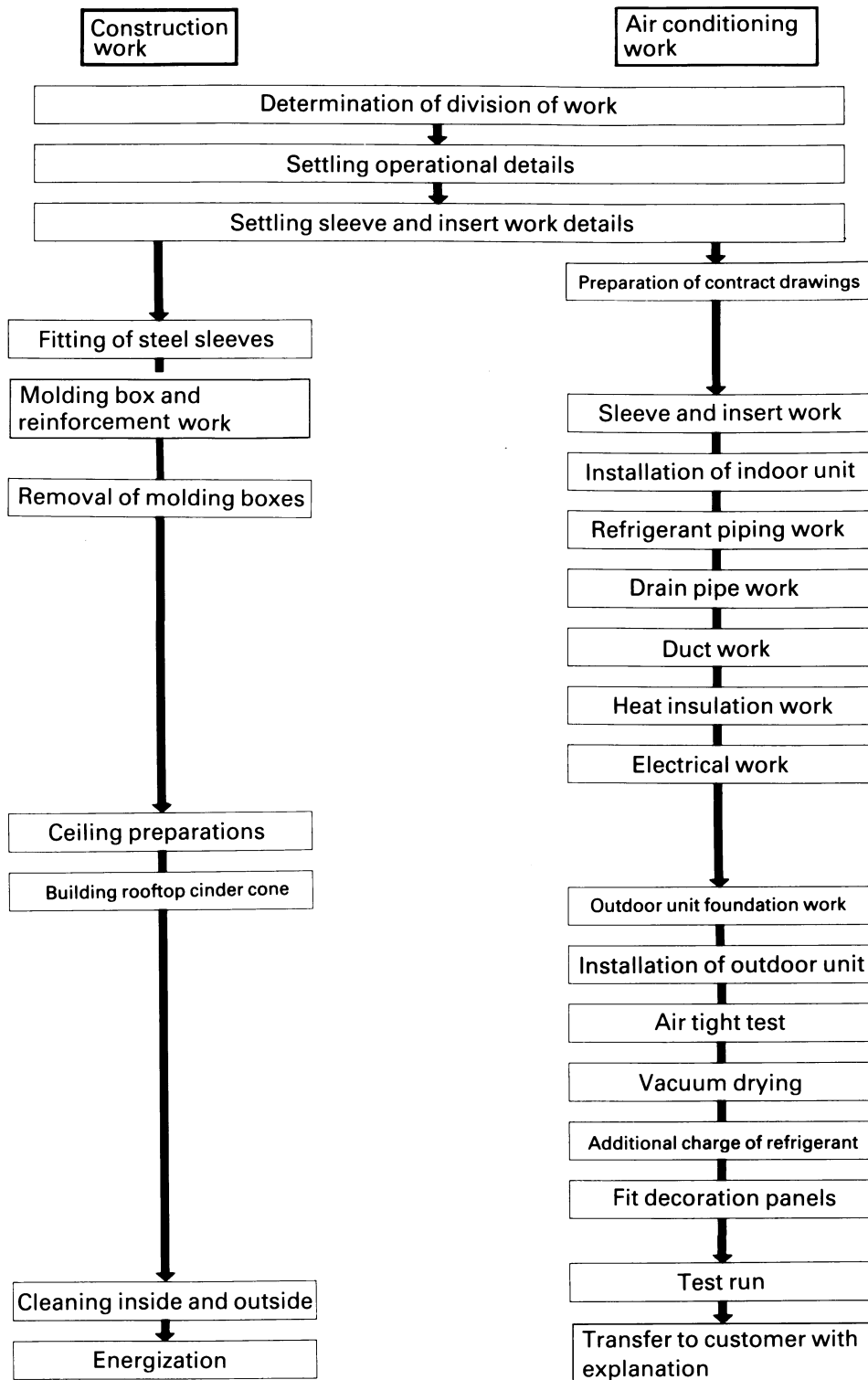
The analysis of major installation problems experienced during the year of 1988 is shown below;



How these installation problems affect an equipment are shown below:



2.3 Striking a Balance between System Installation and General Construction Work (Comprehensive Flow Chart)



(V0952)

**Note:**

1. The division of the work should be thoroughly clarified. (This applies particularly to work relating to the connection of control wiring, fitting of remote controller and central control panel, boundary work on areas such as connection of drain piping and humidification supply piping, inspection and foundation)
2. Keep a constant check on the progress of the construction work to avoid deviations from the air conditioning work schedule.
3. For sleeve and insert work the positions of ceiling girders should be confirmed and sleeve and insert requirement, hole diameters, positioning and numbers decided. This is particularly important in the case of sleeves for drain piping.

2.4 Points to Bear in Mind when Preparing the Contract Drawings

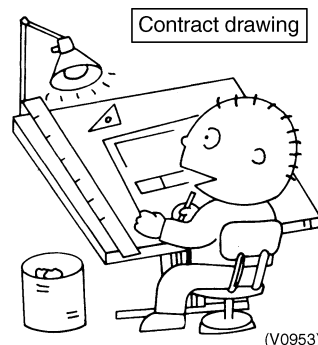
The following points should be borne in mind when preparing the contract drawings from the original drawings and the execution drawings.

The contract drawings for the air conditioning system are blueprints for the performance of the necessary work which are drawn up on the basis of the original drawings in such a way that a working balance is achieved between the specific requirements of each individual aspect of the work.

Contract Drawing

Objectives include:

- The drawings should be easily comprehensible to those carrying out the work.
- The contents of the drawings should not be subject to subsequent alteration.



(V0953)

The following is a list of the main points to be considered when preparing contract drawings for the **VRV II** System and should be used as a reference during this stage of the work:

2.4.1 At the Contract Drawing Stage the Following Points are Critical!!

	Check points	
Arrangement of units	1. Have you left the access passages clear and allowed sufficient room for servicing? 2. Have you taken full account of the possibility of short circuits? (Both indoor and outdoor units) 3. Can the air filters be replaced easily? 4. Have you indicated the size and location of the ceiling inspection ports? (Make sure there no other installations in the area above) 5. Have you taken into account the depth of the installation area? (In case of ceiling built-in type) 6. Have you specified the position of the indoor unit clearly? (Have you taken full account of relevant features of the local ventilation, humidity and lighting?)	
Refrigerant piping	1. Is the piping system correctly connected? 2. Are the rise and fall pipes correctly connected? 3. Are the lengths and height differences of the pipes within the recommended limits?	(Example of a contract drawing)
Operational control	1. Are the interconnections between the piping and wiring of the indoor and outdoor units clearly shown? 2. Are the numbers of the local setting switches clearly shown? (Group No. and Unit No.) 3. Are the wiring connections between the remote controller and the centralized and remote controls clearly shown? Refer to the notes relating to the preparation of the control wiring system diagrams (see next page) 4. Are the different types of wires clearly marked? 5. Are there any problems with the way the power supply cables and control wiring have been separated or bound together? 6. Are the inter-floor connections of the control wiring correct? 7. Is the position of the remote controller clearly marked?	
Miscellaneous	1. Have you checked the gradient of the drain piping? (Must be at least 1/100)	

2.4.2 Main Considerations in Preparation of Control Circuit Diagrams

In addition to the design of the appropriate this system configuration it is also essential that the control system be made amply clear. If the system is designed and installed without a clear, comprehensive plan then problems are inevitably going to occur during the test run.

Servicing too will become much more time consuming than necessary. However, if control circuit diagrams are prepared along with the contract drawings in order to make the total system clearly visible then the essential points relating to the electrical connections will be easily understood, the test run will go off without a hitch and the whole system will be rendered fully effective.

Step 1: Compiling a System List

1. Mark each outdoor unit with a code.
2. Add field settings and data for outdoor units, and outdoor unit No. if using sequential start.
3. Add the model number of each indoor unit connected to each refrigerant circuit.
4. Assign each indoor unit a code.
5. Fill in the location of each indoor unit.
6. Group indoor units controlled by one or two remote controllers. (group or individual control).
7. Assign central group Nos. if using centralized control.
8. Add field settings and optional equipment for indoor units.
9. Add unit No. if making separate field settings for each indoor unit under group control.



Note:

With the VRV II R410A Heat Pump Series, unit No. is determined through automatic addressing, therefore readout unit Nos. after activating the power.

Example: System list

Outdoor Unit		Indoor Unit						
Model Name (code)	Field Settings	Model Name	System Name	Location	Remote Controller Group	Centralized Control Group No.	Unit No.	Optional equipment, field settings, etc.
RXYQ16M (PAC1)	Cool/Heat selector: Indoor unit Low noise operation (L.N.O.P): Individual control Sequential start: ON Defrost: Earlier Sequential start No.	FXCQ32M	2F01	2nd floor office	A	1-00		
		FXSQ63M	2F02	2nd floor office	A	(1-00)		
		FXCQ40M	2F03	2nd floor office	A	(1-00)		
		FXHQ63M	2F04	2nd floor office	B	1-01		
		FXCQ50M	2F05	2nd floor office	B	(1-01)		
RXYQ18M (PAC2)	Cool/Heat selector: Indoor unit Low noise operation (L.N.O.P): Individual control Sequential start: ON Defrost: Earlier	FXSQ32M	3F01	3rd floor office	C	1-02		
		FXCQ40M	3F02	3rd floor office	C	(1-02)		
		FXSQ40M	3F03	3rd floor office	C	(1-02)		
		FXCQ50M	3F04	3rd floor office	D	1-03		

For details on field settings and centralized control group No., refer to the installation manual and system reference materials.

Step 2: Preparation of the Control Circuit Diagrams

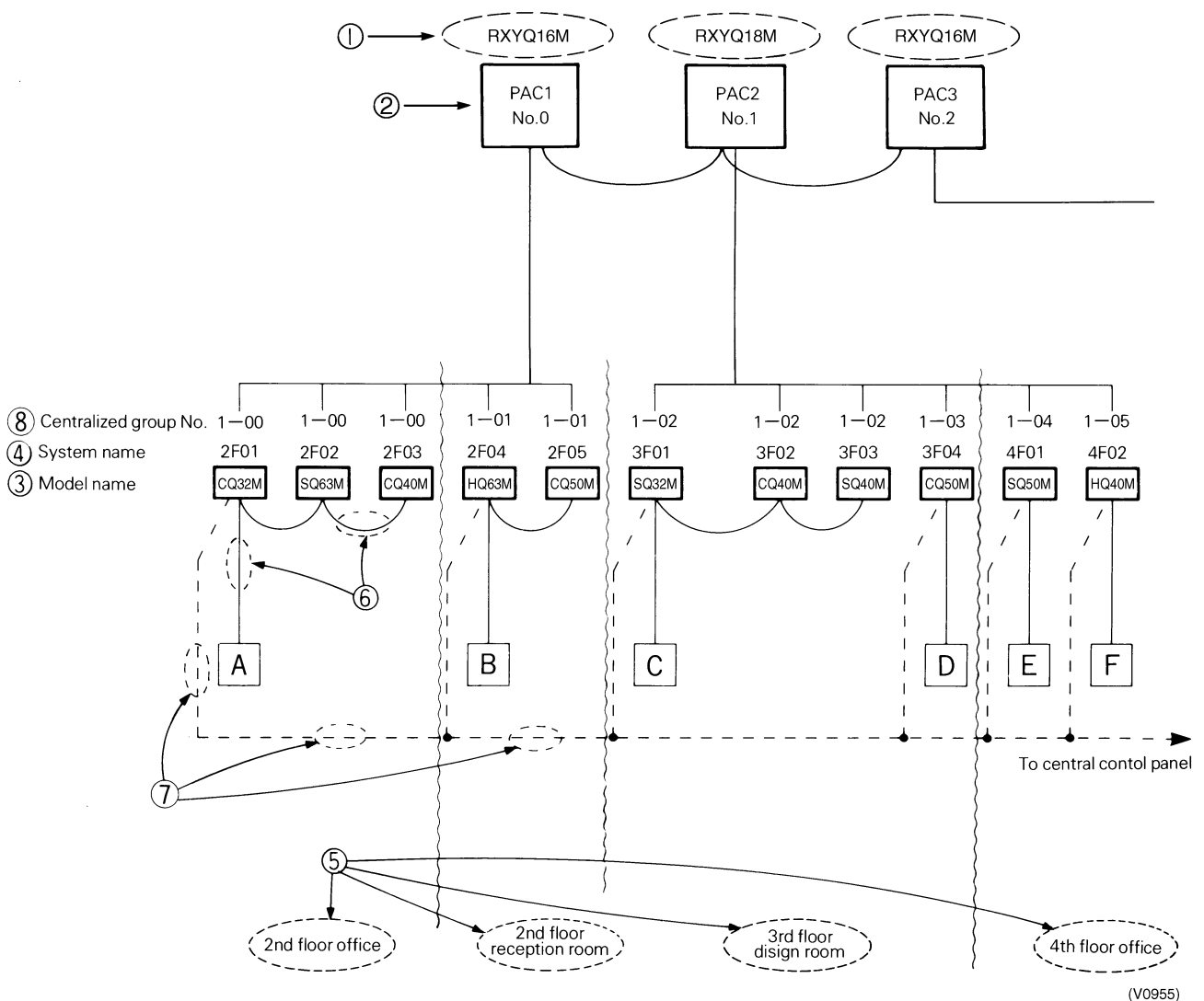
The following sequence should be followed in order to prepare control circuit diagrams in accordance with the system list which has already been completed:

- ① Diagrams should be prepared for each individual outdoor unit. The outdoor unit model number should be inserted into the diagram. (RXYQ16M)
- ② Insert name of refrigerant system. (PAC1, PAC2)
- ③ Insert name of indoor unit. (FXCQ32M→CQ32M)
- ④ Insert system name of indoor unit.
- ⑤ Insert installation position. (Do this when demarcation is possible)
- ⑥ Insert remote controller control wiring. (Group) Indicated by solid line.Solid line.
- ⑦ Insert centralized control wiring.Dotted line
- ⑧ Insert Group No. (G No. for each indoor unit with U No. 0)

The control circuit diagrams are now complete.

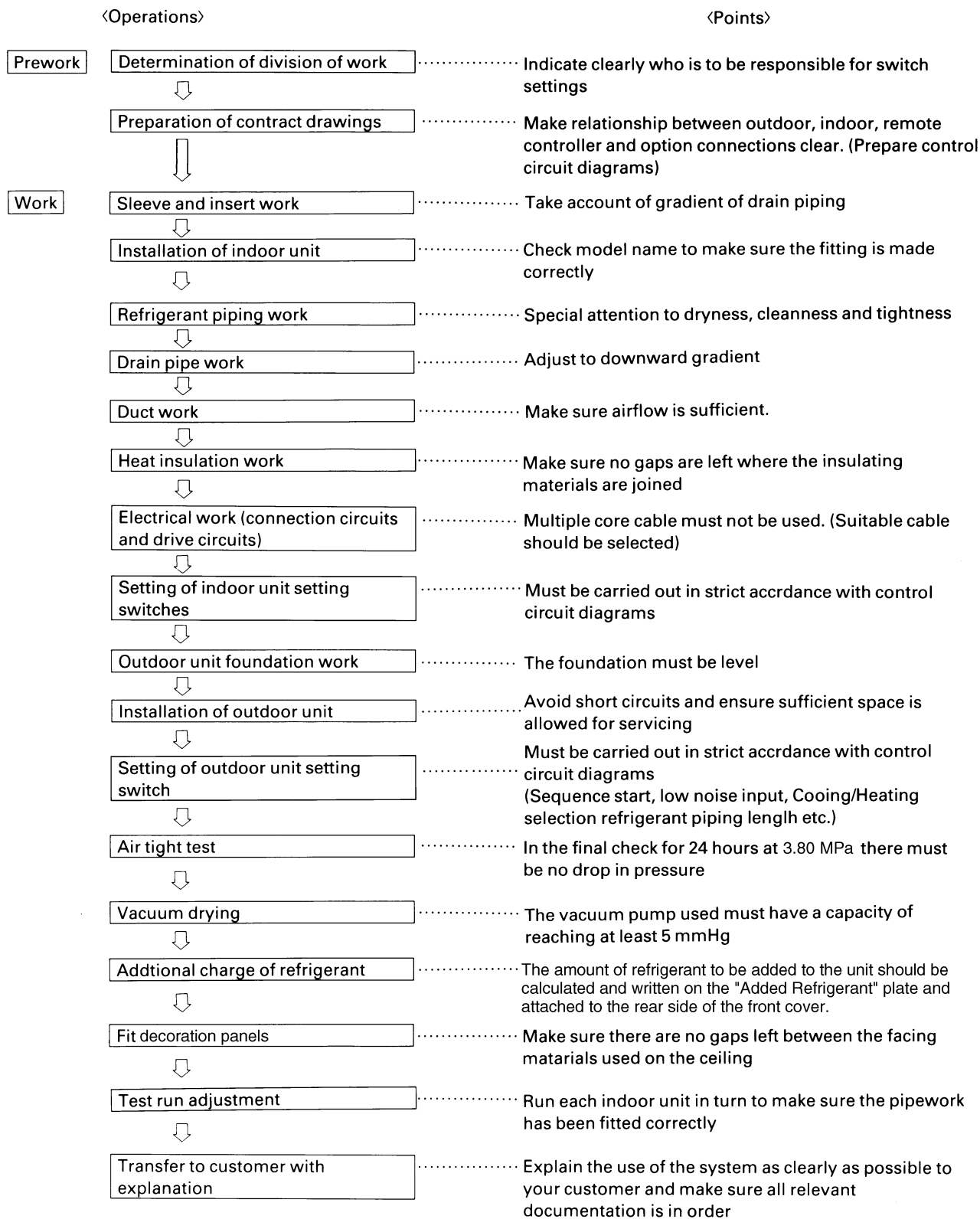
Example: Control circuit diagram

Example: Control circuit diagram



3. Installation

3.1 Step by Step Installation Procedure



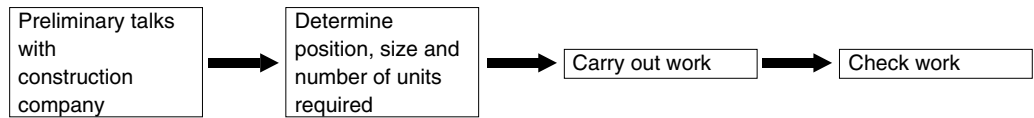
(V1351)

The above list indicates the order in which the individual work operations are normally carried out but this order may be varied where local conditions warrant such a change

3.2 Work Involved in Individual Operations and Points to be Borne in Mind

3.2.1 Sleeve and Insert Work

■ Operational steps

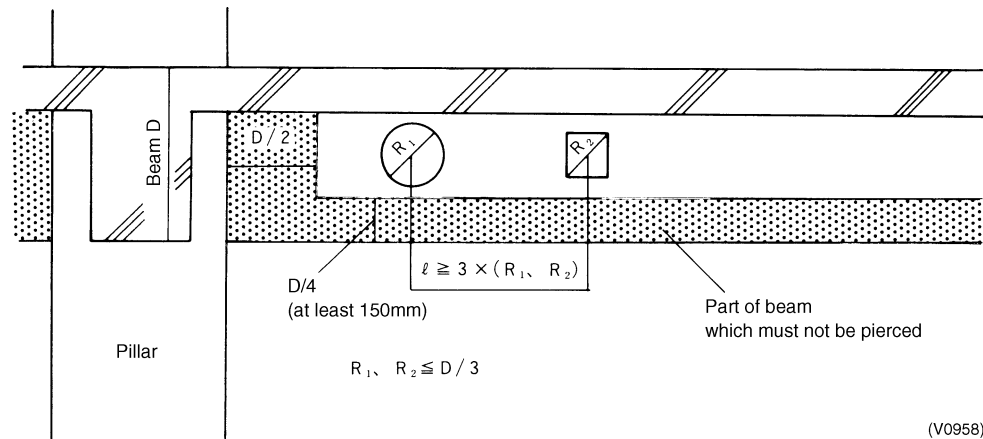


(V0957)

Positioning of the Pipe Holes

- The through holes for the drain piping should be positioned such that the pipes have a downward gradient. (The gradient must be at least 1/100. The thickness of the insulating materials must also be taken into consideration.)
- The diameter of the through holes for the refrigerant piping should include an allowance for the thickness of the heat insulation materials. (It is a good idea to think of the liquid and gas pipes as pairs.)
- Attention should be paid to the construction of the beam themselves since there are sometimes parts of the beam which cannot be used to accommodate through holes.

Example: Through holes in a reinforced concrete beam

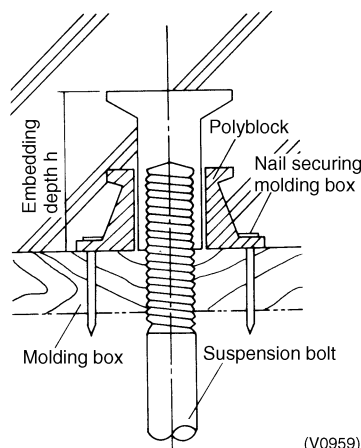


(V0958)

Positioning the Insert

- An insert is a metal tool which is inserted into a floor or a beam before the concrete is set such that fittings such as ducts, pipes or suspension bolts for hanging units can be fitted into place later. **The positions of the inserts must be decided early.**

Example: Steel insert



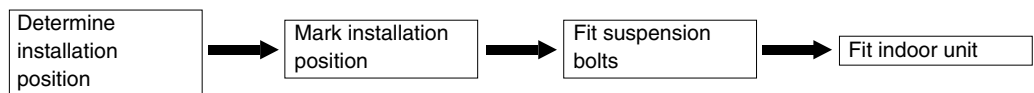
(V0959)

Important point:

- The weight of the fitting to be suspended must be taken into account when choosing the insert.

3.2.2 Installation of Indoor Unit

■ Operational steps

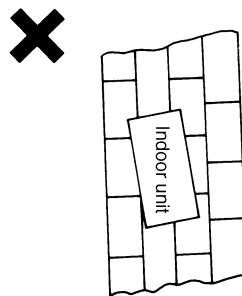
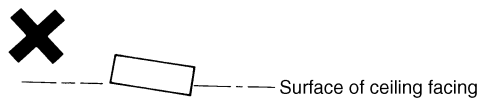
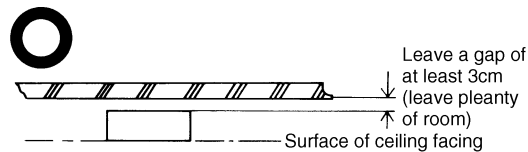


(V0960)

Positioning

3 essential points when installing an indoor unit

1. Height: Take care to account for final ceiling facing surface level
2. Level: Level fitting is essential. (within ± 1 degree of horizontal)
3. Direction: The unit must be fitted in line with the ultimately visible ceiling joints

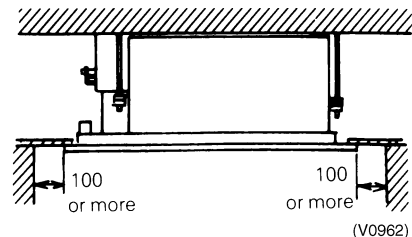
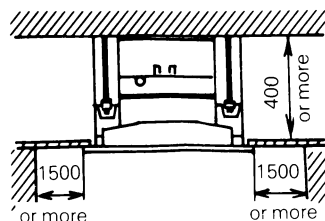


(V0961)

Important points

1. The suspension bolts must be strong enough to support the weight of the indoor unit.
2. Optional features must be added to the indoor unit prior to installation.
3. The model name should be checked prior to installation.
4. Take care to align the main unit correctly. (Bearing in mind piping layout and direction of blow out)
5. Leave sufficient space for servicing to be carried out.
6. Make inspection holes for model which need them.
7. Fit the unit to ensure proper drainage.

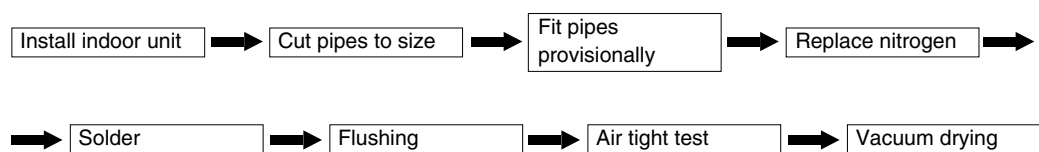
Example: Ceiling mounted cassette type (FXCQ63M)



(V0962)

3.2.3 Refrigerant Pipe Work

■ Operational steps



(V0963)

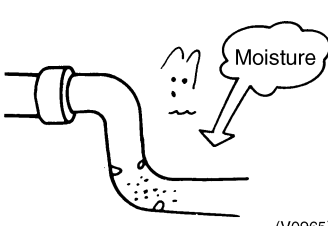
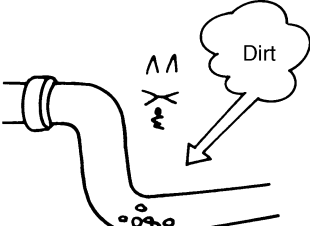

The 3 Principles of Refrigerant Piping

The “3 principles of refrigerant piping” must be strictly observed

	Cause of problem	Actoin to avoid problem
Dry	<ul style="list-style-type: none"> ● Rainwater, work water, etc. gets into pipes from outside ● Moisture generated inside pipes due to condensation 	Pipe covering → Flushing → Vacuum drying
Clean	<ul style="list-style-type: none"> ● Formation of oxides inside pipes during soldering ● Dirt, dust or other extraneous material gets into pipes from outside 	Replace nitrogen → Flushing Pipe covering → Flushing
Air tight	<ul style="list-style-type: none"> ● Leak from soldered area ● Leak from flared area ● Leak from flange area 	Use the proper materials (copper pipe, solder, etc.) Adhere strictly to standard soldering work practice Adhere strictly to standard flaring work practice Adhere strictly to standard flange connection work parctice → Air tight test

(V0964)

The 3 principles of refrigerant piping

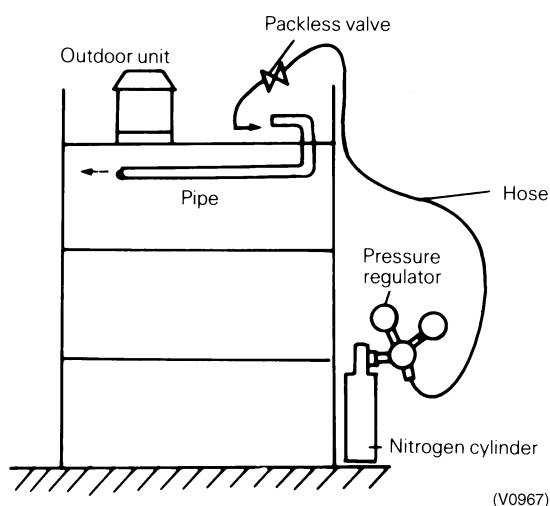
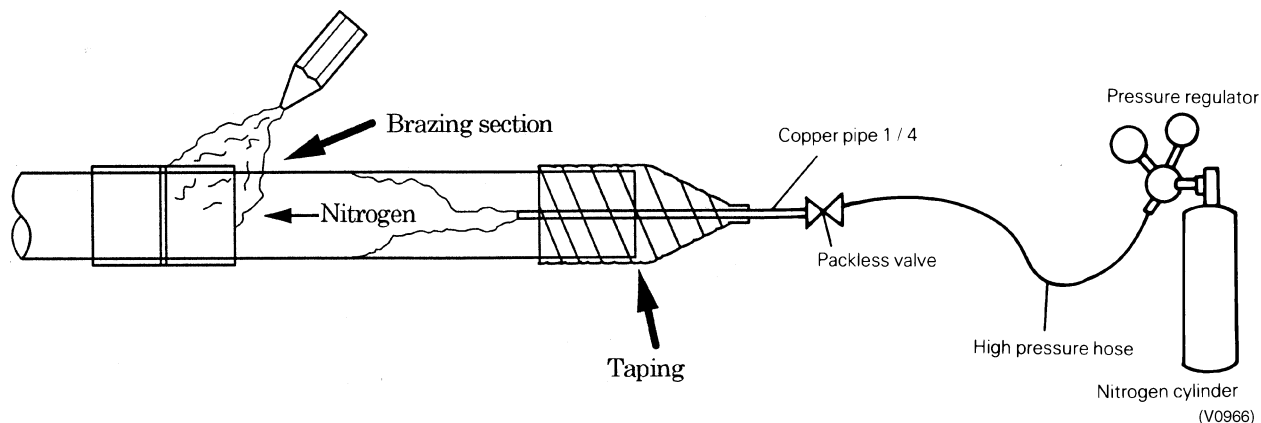
Dry	Clean	Air tight
Make sure there is no moisture inside the pipes	Make sure there is no dirt inside the pipe	Make sure the refrigerant does not leak out
 (V0965)	 (V1148)	 (V1149)

Method for Replacing Nitrogen (Brazing)

If brazing work is carried out without passing nitrogen gas through the pipes which are being brazed then this allows the formation of oxidation bubbles on the inside surface of the pipes. These oxidation bubbles are then carried along inside the pipes to cause damage to various members of the system such as valves or compressors and the system ceases to function properly.

In order to avoid this problem **nitrogen is passed through the pipes while the soldering work is being carried out**. This operation is known as nitrogen replacement. (Air is replaced by nitrogen)

This is **standard work practice for all brazing work**.



Important points:

1. The gas used must be nitrogen (oxygen, carbon dioxide and flon should not be used.)
2. A pressure regulator must be used.

Covering of Refrigerant Pipes

Covering is an extremely important operation as it prevents water, dirt or dust from getting inside the pipes. Moisture inside the pipes was a constant source of trouble in the past. The utmost care is required to nip this problem in the bud.

The end of each pieces of pipe must be covered. “Pinching” is the most effective method but “taping” is an simple alternative which may be used according to the work area and term of work.

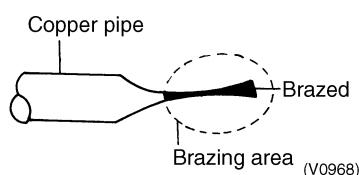
Location	Term of Work	Covering Method
Outdoors	1 months or more	Pinching
	Less than 1 months	Pinching or taping
Indoors	Irrelevant	Pinching or taping

1. Pinching method

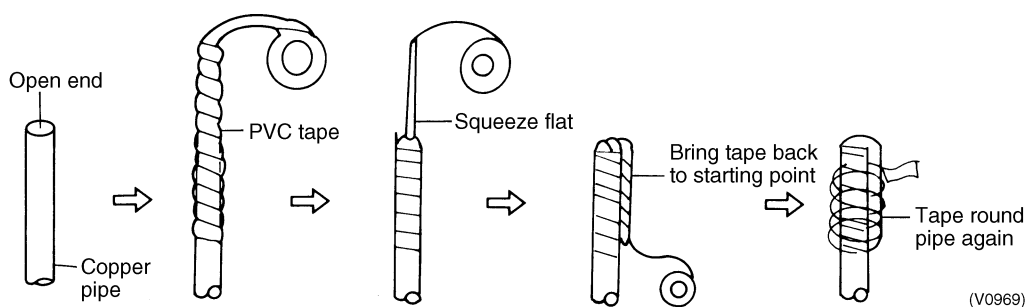
The end of the copper pipe is squeezed together and the gap brazed.

2. Taping method

The end of the copper pipe is covered with PVC tape (vinyl tape).

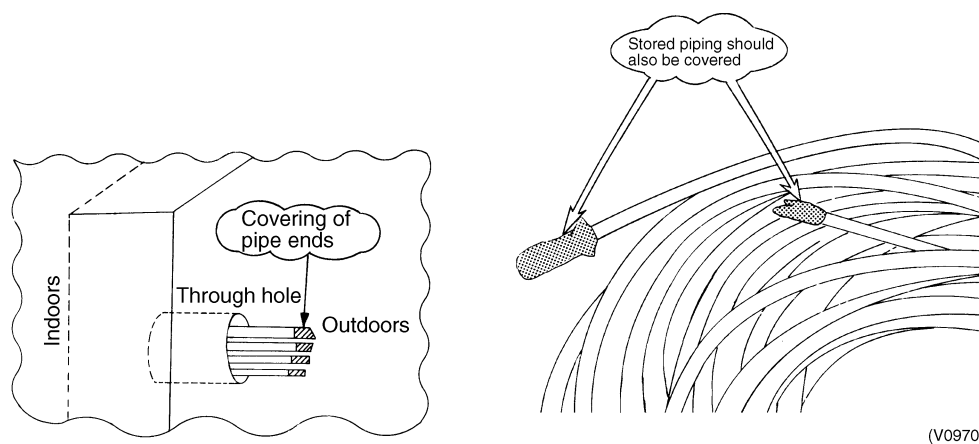


<Taping method>



Particular care should be taken during the following operations:

- When passing copper pipe through a penetration hole (Dirt easily gets into the pipe).
- When copper pipe is located outside (Rainwater gets in)
(Special care is needed when the pipes are standing vertically outside)



Refrigerant Pipe Flushing

Flushing is a method of cleaning extraneous matter out of pipes using pressurized gas.

[3 major effects]

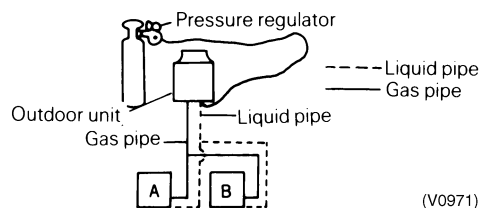
1. Removal of oxidation bubbles formed inside copper pipes when "nitrogen replacement is insufficient" during soldering work
2. Removal of extraneous material and moisture from pipes when covering has been insufficient
3. Checks connections in pipes linking outdoor and indoor units (Both liquid and gas pipes)

[Example of procedure]

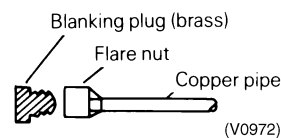
1. Set pressure regulator on nitrogen cylinder.

*The gas used must be nitrogen.

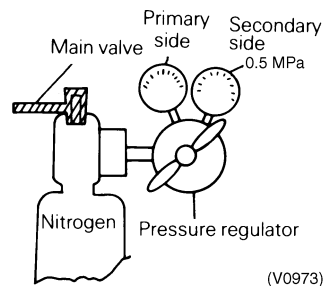
(There is a danger of condensation if freon or carbon dioxide are used and oxygen carries the risk of explosions.)



2. Connect the charge hose from the pressure regulator to the service port on the liquid pipe side of the outdoor unit.
3. Fit blanking plugs to all indoor units (B) other than unit A.



4. Open the main valve on the nitrogen cylinder and set the pressure regulator to 0.5MPa.



5. Check that the nitrogen is passing through the unit A liquid pipe.

6. Flushing.

- Block the end of the pipe with the insulation of your hand.

↓

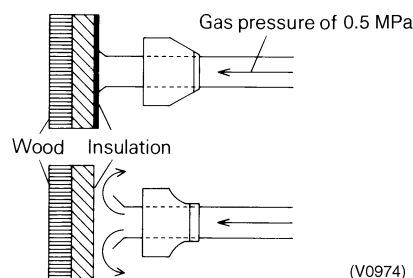
- When the gas pressure becomes too great to contain remove insulation quickly. (First flush)

↓

- Block the end of the pipe with insulation again.

↓

(Carry out second flushing)



(The nature and amount of the extraneous material inside the pipe can be checked during flushing by placing a rag lightly over the end of the pipe. In the unlikely case that even a small quantity of moisture is found then the inside of the pipe should be dried out thoroughly.)

Action:

1. Flush the inside of the pipe with nitrogen gas. (Until such time as the moisture disappears.)
2. Carry out a thorough vacuum drying operation. (See page 31)
 - ① Close the main valve on the nitrogen cylinder.
 - ② Repeat the above operation for unit B.
 - ③ When the liquid pipe operations have been completed then do the same with the gas pipes.

Choice of Materials for Refrigerant Piping

a) Refrigerant piping

- The piping used must meet the requirements of the JIS standard or equivalent. (Size, material, thickness, etc.)

Specification: **Oxidized phosphorous seamless copper pipe**

- Long pipe lengths or coiled pipe (copper pipe with heat insulation coating) should be used to avoid the necessity for frequent brazing.

(* Make sure the thickness and material shall be selected in accordance with following table.)

■ Size of Refrigerant Piping







Outside Diameter (mm)	Material
φ6.4	0
φ9.5	0
φ12.7	0
φ15.9	0
φ19.1	1/2H
φ22.2	1/2H
φ25.4	1/2H
φ28.6	1/2H
φ31.8	1/2H
φ34.9	1/2H
φ38.1	1/2H
φ41.3	1/2H

*The thickness and material shall be selected in accordance with local code.

b) Brazed joints and special branches

1. General use (L bend joint, socket joint, T joint, etc.)
 - Joints must meet the requirements of the relevant JIS standard. (Size, materials, thickness, etc.)
2. Special branches
 - The Daikin outdoor unit multi connection kit, REFNET joint, REFNET header or Reducing socket should be used.

Example: R410A RXYQ-M Series

	REFNET joint	REFNET header	
		4 branches	8 branches
Liquid pipe (with heat insulation coating)			
Gas pipe (with heat insulation coating)			

(V0975)



Refer detail of DAIKIN REFNET joint and REFNET header on page 126.

c) Brazing

The Multi-System requires only copper/copper jointing and the jointing method is explained below.

- The use of “hard solder” is essential.

Type	Solder: JIS mark	Soldering temperature (°C)	Breaking strength (kg/mm ²)	Soldering method	Jointing distance (mm)	Example for reference (product name)	Flux (example for reference)	Remarks
Hard solder	BCup-2 (Phosphor copper solder)	735 / 840	Approx. 25	0.05 / 0.2	Gas	NEiS # 2BD	Not required	BCup reacts easily with sulfur to form a fragile water-soluble compound and should not therefore be used where the environment is not suitable.
	BAG-2 (Silver solder)	700 / 845	Approx. 20	0.05 / 0.2	Gas	NEiS # 107	NEiS # 103	Suitable for environments with a high sulfur content

This is used under
normal conditions.
(V0976)

The R410A Heat Pump RXYQ-M Series uses a wide range of piping sizes. You should therefore be careful when selecting the nozzle tip. If a small nozzle tip is used for brazing piping of large diameters such as $\phi 38.1$ and $\phi 44.5$, brazing flow becomes poor.

Table 1: Correlation of nozzle tip and size of refrigeration piping

		Nozzle tip No.							Brazing filler diameter ϕ		
		# 200	# 225	# 250	# 315	# 400	# 450	# 500	1.6	2.4	3.2
Piping size	6.4										
	9.5										
	12.7										
	15.9										
	19.1										
	22.2										
	25.4										
	28.6										
	31.8										
	34.9										
	38.1										
	41.3										

(V0977)

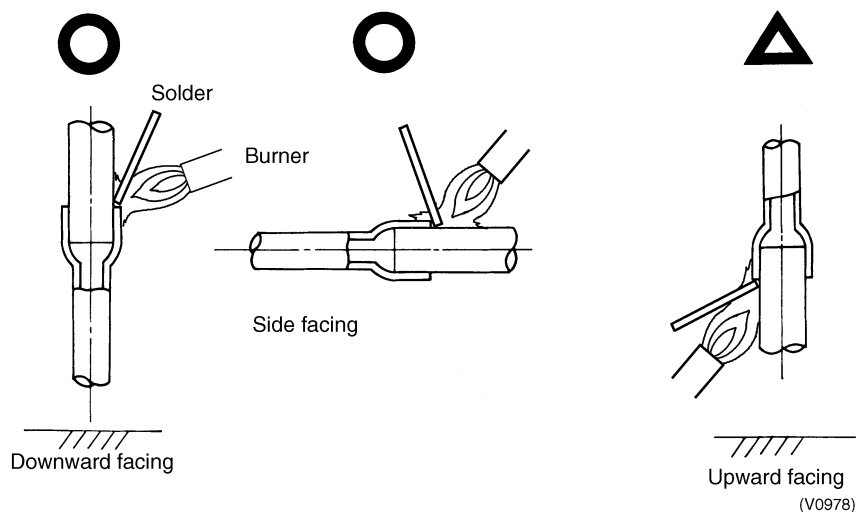


Note: The values in the table above are for type B torch (French).

Brazing

- a) Brazing work should be carried out such that the final result is directed either downwards or sideways. An upward direction should be avoided wherever possible. (to prevent leakage)

<Recommended method>



- b) Liquid and gas pipe branches should always be dealt with in the specified way with attention being paid to the direction of the fitting and its angle. (to prevent oil return or drift) For example see page 148.
c) It is standard working practice to use the nitrogen replacement method when brazing.

Important points

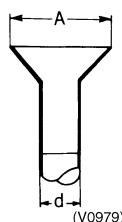
1. Every effort must be made to avoid fire. (Clean area where brazing is to be performed and make sure that fire fighting equipment and water are ready to hand.)
 2. Be careful of burns.
 3. Make sure that the gap between the pipe and the joint is correct. (To prevent leaks)
 4. Is the pipe adequately supported?
- As a rule the gaps between supports for horizontal piping (copper pipe) are as follows:

Copper pipe support spacing		(From HASS 107-1977)	
Nominal diameter	20 or less	25~40	50
Maximum gap (m)	1.0	1.5	2.0

- The copper pipe should not be secured directly by metal brackets.

Flare Connection

- Stiffened pipe must always be annealed at least once prior to the flaring work.
- A pipe cutter must be used to cut the pipe. (A large pipe cutter must be used where the pipe has a large diameter. When cutting a pipe which is too big for the pipe cutter a metal saw may be used but care must be taken to ensure that the debris from sawing does not get into the pipe.)
- Set the flaring tool to make sure the flare size remains within the prescribed limits.



Nominal diameter	External diameter of pipe d	Pipe widening dimensions A
1/4	6.35	9.1
3/8	9.52	13.2
1/2	12.7	16.6
5/8	15.88	19.7
3/4	19.05	24.0

New Rank Compatible Flare Tool

Compared to previous refrigerants, the components of a HFC refrigerant is small. R410A also has a higher pressure than other refrigerants. Therefore, in order to strengthen the intensity of the form and size of the flare section used for R410A (class 2) apparatus, unlike the specification of the conventional refrigerants, it was set up with different standards.

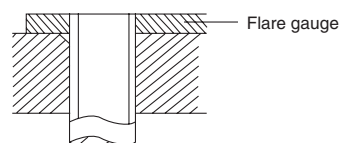
When carrying out flare processing, use a new rank compatible flare tool or a conventional flare tool.

Flare Gauge (Adapter Corresponding to the New Rank)

When using the later, use a flare gauge to take out the pipe from the gauge bar, adjust it, and then carry out the flare processing.



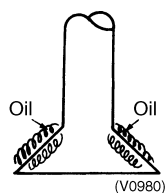
Size 12mm×72mm
Thickness 1.0×0.5mm Each



Size from the dice surface to the copper tip (in mm)

Name	Outer diameter	Wall thickness	Previous refrigerant (R22, R407C etc.)	R410A
			The conventional flare tool	The conventional flare tool
			Clutch type	Clutch type
1/4	6.35	0.8	0~0.5	1.0~1.5
3/8	9.52	0.8	0~0.5	1.0~1.5
1/2	12.70	0.8	0~0.5	1.0~1.5
5/8	15.88	1.0	0~0.5	1.0~1.5

- Coat the inner and outer surface of the flare with refrigerator oil (Ester or ether oil). (this ensures that the flare nut passes smoothly, preventing the pipe from twisting.)
Do not use SUNISO-4GS oil.



Important points

- Burrs should be carefully removed.
- 2 spanners should be used to grip the flare nuts.
- The flare nut must be inserted before starting the flaring operation.
- The appropriate amount of torque should be used to tighten the flare nut.

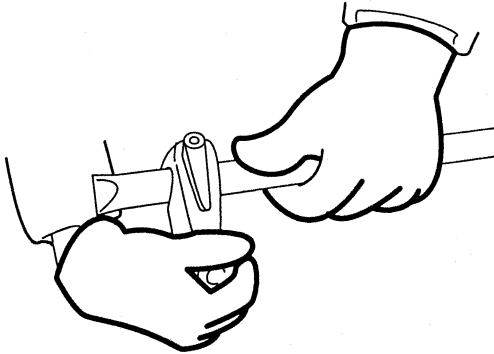
Standard torques for tightening flare nut ±10%

Size	Torque	
	(kgf-cm)	(N-cm)
1/4(6.4φ)	144~176	1420~1720
3/8(9.5φ)	333~407	3270~3990
1/2(12.7φ)	504~616	4950~6030
5/8(15.9φ)	630~770	6180~7540
3/4(19.1φ)	990~1210	9270~11860

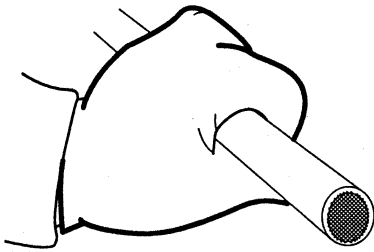
- Check that there is no superficial damage to the surface of the flare.

Flaring Procedure

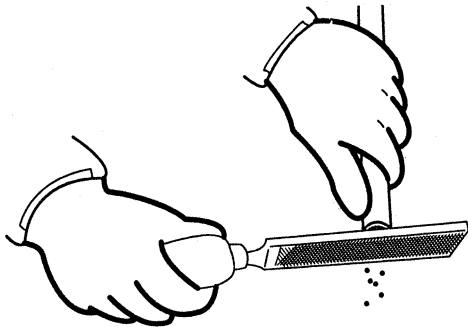
- ① Cut the pipe using a pipe cutter.



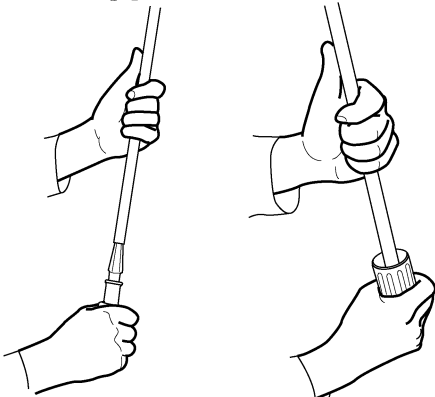
- ② The cut edge has burrs.
(The amount of burrs becomes larger when the pipe wall is thick.)



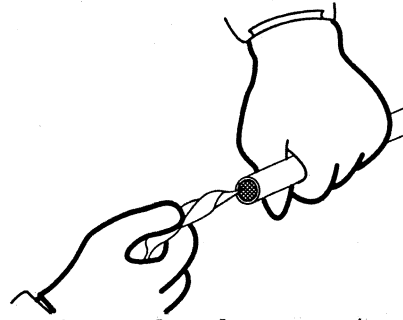
- ③ Remove the burrs using a file.
(Be careful not to let particles enter the pipe. Point the pipe end downward during filing.)



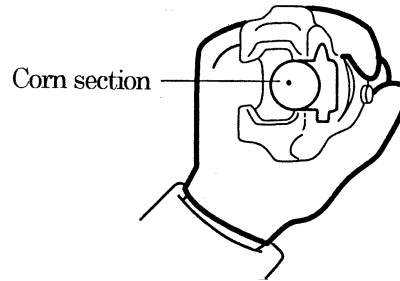
- ④ Remove the burrs using a reamer
(Be careful not to let particles enter the pipe. Point the pipe end downward during cutting.)



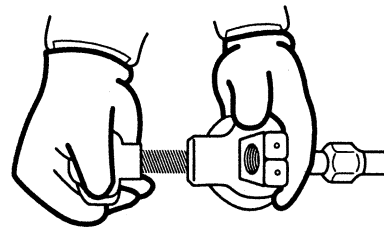
- ⑤ Clean the inside of the pipe.
(Use a thin stick with a cloth wrapped around it.)



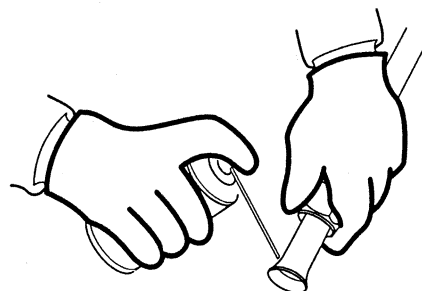
- ⑥ Before flaring, clean the cone section of the flaring tool.



- ⑦ Flare the pipe.
Rotate the flaring tool 3 or 4 turns after a clicking sound is produced. This results in a clean flared surface.

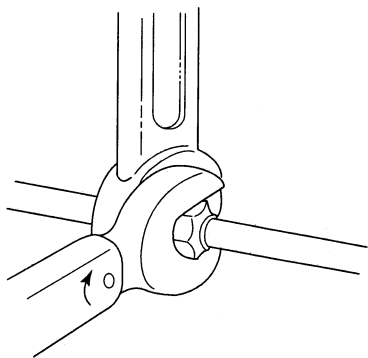


- ⑧ Apply refrigerant oil (Ester or ether oil) on the inside and outside of the flared section. (Do not apply SUNISO oil.)
(Be careful to keep dust away.)

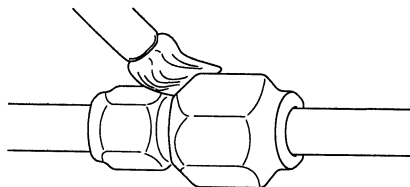


(V1352)

- ⑨ Tighten the flare nut.
(Use a torque wrench to apply the proper tightening force.)

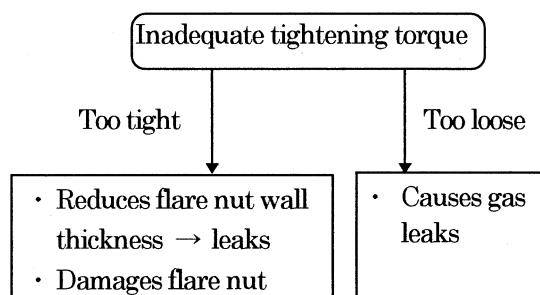


- ⑩ Check for gas leaks.
(Check at the threaded section of the flare nut for gas leaks.)
Spray-type gas leak detecting products are available on the market. Soap water may be used to check for leaks, but use only neutral soap to prevent corrosion of the flare nut.
Be sure to wipe the nut area clean after the gas leak check.



Tighten the flare nut with proper torque.

It takes a lot of experience to tighten the flare nut properly without the use of a torque wrench.



(V0984)

Not recommendable but in case of emergency

You must use a torque wrench but if you are obliged to install the unit without a torque wrench, you may follow the installation method mentioned below.

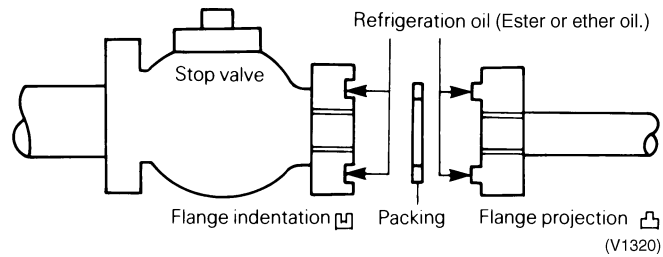
After the work is finished, make sure to check that is no gas leak.

When you keep on tightening the flare nut with a spanner, there is a point where the tightening torque suddenly increases. From that position, further tighten the flare nut the angle shown below:

Pipe size	Further tightening angle	Recommended arm length of tool
6.4 (1/4")	60 to 90 degrees	Approx. 150mm
9.5 (3/8")	60 to 90 degrees	Approx. 200mm
12.7 (1/2")	30 to 60 degrees	Approx. 250mm
15.9 (5/8")	30 to 60 degrees	Approx. 300mm
19.1 (3/4")	20 to 35 degrees	Approx. 450mm

Flange Connection

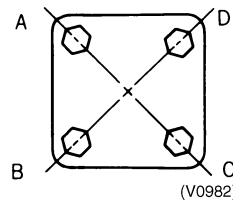
- The flange sheet surface should be clean and undamaged. (Clean any dirt away with a cloth and check that there has been no damage.)
- Coat the flange sheet surface with refrigeration oil (Ester or ether oil) and then insert the packing. (Do not use SUNISO oil.)



- Tighten the bolts in opposite corners first to ensure that the connection is true.

[Example]

Order: A→C→B→D



The bolts should be tightened little by little in the above order such that the same degree of torque is applied evenly to each corner.

Important points

- Only clean refrigeration/oil should be used to coat the flange. (i.e. free from dirt or water)
- The correct amount of torque should be applied when tightening the flange bolts.

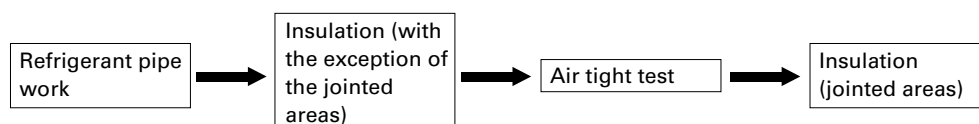
Standard torques for tightening screws and bolts

ISO hexagonal bolt

Size	Class	5.8(5T)		10.9(10T)	
		kgf-cm $\pm 15\%$	N-m $\pm 15\%$	kgf-cm $\pm 15\%$	N-m $\pm 15\%$
M8		125	1230	302	2960
M10		257	2520	620	6080
M12		436	4280	1,050	10,300
M16		1,030	10,100	2,480	24,300
M20		2,050	20,100	4,950	48,500

3.2.4 Thermal Insulation Work (Refrigerant Piping)

■ Operational steps



(V0985)

Materials

The thermal insulation materials which are used must be well able to withstand the heat from the pipes.

Example:

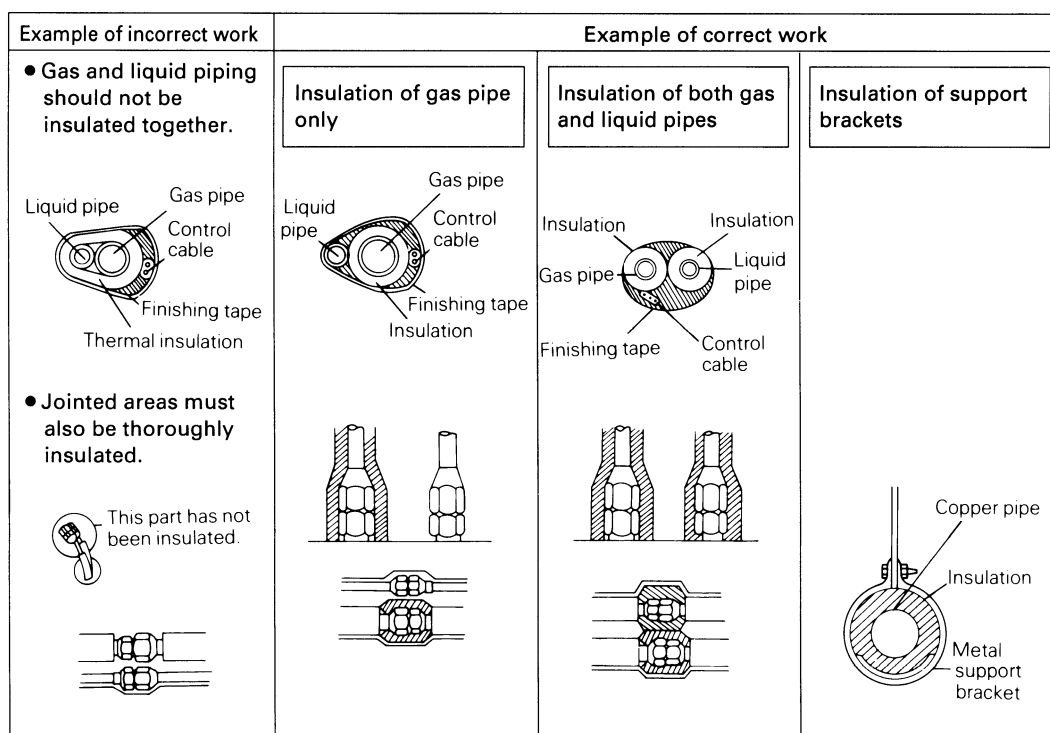
Heat pump type: Heat resistant polyethylene foam (heat resistance of at least 120°C)

Cooling only: Polyethylene foam (heat resistance of 100°C or more)

Essential Points of Thermal Insulation

The insulation of jointed areas such as the soldered, flared or flanged sections should only be carried out after the successful completion of the air tight test.

Attention should be paid to the unit model and its operating conditions since there are occasions when the gas and liquid pipes also need to be thermally insulated.



(V0986)

■ Important points

1. The thickness of the thermal insulation material must be determined in the light of the pipe sizes.

Pipe size	Thickness of insulation material
6.4mm~25.4mm	10mm or more
28.6mm~38.1mm	15mm or more

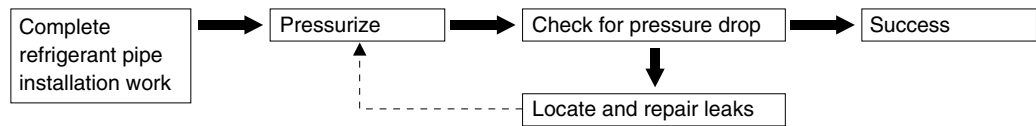
2. It will be necessary to increase the values in the above table for top floors or where conditions are hot and humid.

3. Where a customer supplies his own specifications then these must be adhered to.

4. Where it is anticipated that the air conditioning unit will be operated at external air temperatures of 10°C or less then thermal insulation will also be required for the liquid pipes.

3.2.5 Air Tight Test

■ Operational steps



(V0987)

Essential Points of Testing (Maintaining Pressure Over a Period)

The key to successful testing is strict adherence to the following procedure:

- a) The liquid and gas piping in each refrigerant system should be pressurized in turn in accordance with the following steps. (Nitrogen gas must be used.)

- **Step 1: increase pressure to 0.3MPa for 3 minutes or more**
 - **Step 2: increase pressure to 1.5MPa for 3 minutes or more**
 - **Step 3: increase pressure to 3.80MPa for approx. 24 hours**
- } Indicates existence of major leaks
- } Indicates existence of minor leaks

*Increasing the system pressure to 3.80MPa does not guarantee the identification of minor leaks if pressure is maintained for only a short time. It is therefore recommended that the system remain pressurized in accordance with Step 3 above for at least 24 hours.



Note:

The pressure must on no account be increased beyond 3.80MPa.

- b) Check for pressure drop

If there is no drop in pressure then the test is deemed a success.

If the pressure drops then the leak must be located. See following page.

However, if there is a change in the ambient temperature between the pressurizing stage and the time when you check for a drop in pressure then you will have to adjust your calculations accordingly since a change of 1°C can account for a pressure change of approximately 0.01MPa.

Compensating adjustment value:

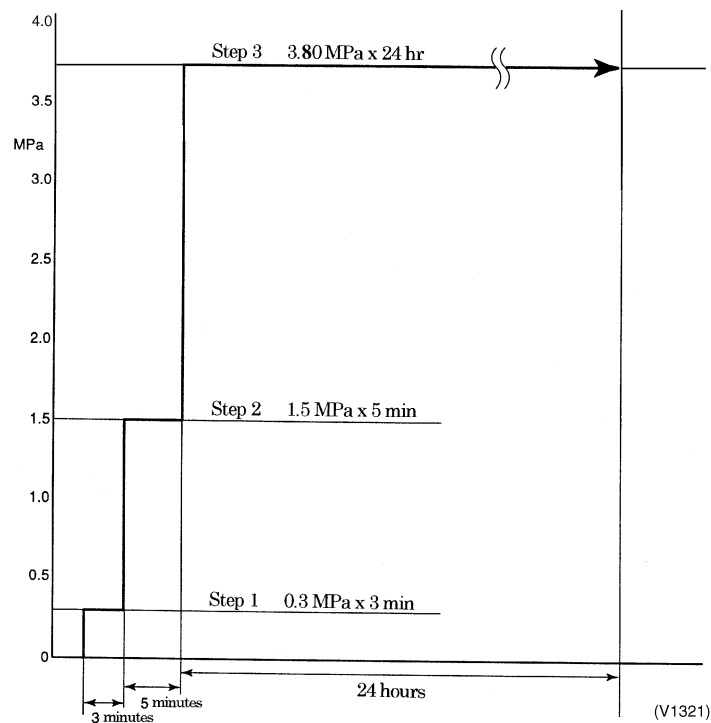
(temperature at time of pressurizing – temperature at time of checking) × 0.01

Example:

Time of pressurizing: 3.80MPa 25°C

24 hours later: 3.75MPa 20°C

The pressure drop in such a case is deemed to be zero (successful test).



(V1321)

Checking for Leaks

[Check 1] (Where pressure falls while carrying out Steps 1 to 3 described on previous page)

- Check by ear.....Listen for the sound of a major leak.
- Check by hand.....Check for leak by feeling around jointed sections with hand.
- Soap and water check (*Snoop).....Bubbles will reveal the presence of a leak.

[Check 2] (When searching for a minor leak or when there has been a fall in pressure while the system has been fully pressurized but the source of the leak cannot be traced.)

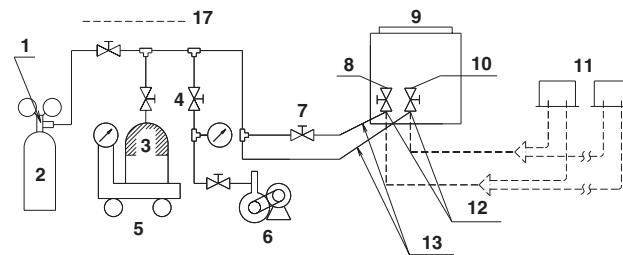
1. Release the nitrogen until the pressure reaches 0.3MPa.
2. Increase pressure to 1.5MPa using gaseous flon gas (R410A). (Nitrogen and flon gas mixed)
3. Search for the source of the leak using a leak detector.
4. If the source of the leak still cannot be traced then repressurize with nitrogen up to 3.80MPa and check again. (The pressure must not be increased to more than 3.80MPa.)

Setup of Air-light Test

As for the air-tight test, the setup of devices shown in the following figure is recommended with considerations given to “vacuum drying and refrigerant additional charging”, which are operation steps following the air-tightness test.

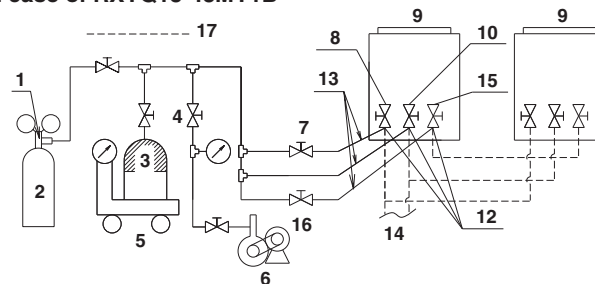
In order to conduct the air-tight test, with stop valves of 8.Gas side, 10.liquid side and 15.Oil equalization piping and those of the refrigerant and vacuum pump all closed, then open the nitrogen gas stop valve, 7.Valve A, and 16.Valve B while adjusting the nitrogen gas pressure regulating valve, thus increasing the pressure.

One outdoor unit installed: In case of RXYQ5-16MY1B



- 1.Pressure reducing valve
- 2.Nitrogen
- 3.Refrigerant cylinder
- 4.Siphon system
- 5.Measuring instrument
- 6.Vacuum pump
- 7.Valve A
- 8.Gas side
- 9.Outdoor unit
- 10.Liquid side
- 11.Indoor unit

When multiple outdoor units installed: In case of RXYQ18-48MY1B



- 12.Shutoff valve service port
- 13.Charge hose
- 14.To indoor unit
- 15.Oil-equalizing line
- 16.Valve B
- 17.Dotted lines represent onsite piping

■ Important points

1. Where the lengths of piping involved are particularly long then the air tight test should be carried out block by block.

Example:

1. Indoor side
2. Indoor side + vertical pipes
3. Indoor side + vertical pipes + outdoor side

3.2.6 Vacuum Drying

What is vacuum drying?

Vacuum drying is:

“The use of a vacuum pump to vaporize (gasify) the moisture (liquid) inside the pipes and expel it leaving the pipes completely dry inside.”

At 1 atm (760 mmHg) the boiling point (evaporating temperature) of water is 100°C but if a vacuum is created inside the pipes using a vacuum pump then the boiling point is rapidly reduced as the degree of the vacuum is increased. If the boiling point is reduced to a level below that of the ambient temperature then the moisture in the pipes will evaporate.

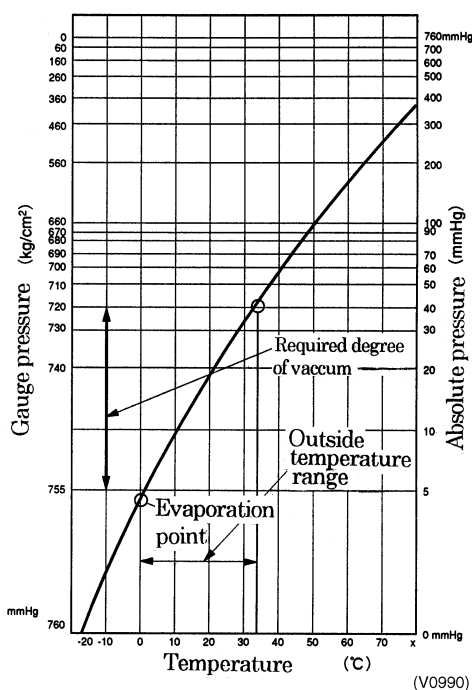
Boiling point of water (°C)	Pressure		
	*mmHg	Pa	Torr
40	-705	7333	55
30	-724	4800	36
26.7	-735	3333	25
24.4	-738	3066	22
22.2	-740	2666	20
20.6	-742	2400	18
17.8	-745	2000	15
15.0	-747	1733	13
11.7	-750	1333	10
7.2	-752	1066	8
0	-755	667	5

<Example>

When outside temperature is 72°C

As shown in the table on the right, the degree of vacuum must be lowered below -75.2mmHg. →

Above figures (mmHg) are gauge pressure readings.



The evacuation of air conditioner piping provides the following effects.

1. Vacuum drying
2. Removes air and nitrogen (used in air-tightness test) from the inside of pipes.

Therefore, it is necessary to ensure that the both purposes have been achieved in the vacuum drying operation.

Key points

Lower the degree of vacuum to below -755mmHg

(V1216)

Choosing a Vacuum Pump

General

Refrigerant piping content volume of the VRV R410A Series is larger than the VRV Inverter Series, and consequently takes more time for vacuum drying. If you have time to spare, you may use the same vacuum pump, but if you want to save time, you will have to use a pump with higher exhaust velocity (exhaust volume).

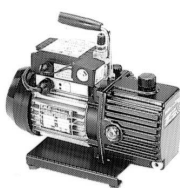
The Necessity for Counter Flow Prevention

After the vacuum process of the refrigerant cycle, the inside of the hose will be vacuumed after stopping the vacuum pump, and the vacuum pump oil may flow back. Moreover, if the vacuum pump stops during the operation by some reason, the same thing happens.

In such cases, different oil mixes in the HFC system refrigerant apparatus cycle, and becomes the cause of a refrigerant circuit trouble. Therefore, in order to prevent the counter flow from the vacuum pump, a check valve is needed.

Vacuum pump with check valve or vacuum pump adapter

Vacuum pump with check valve



Vacuum pump adapter
(Reverse flow preventive vacuum adapter)



1. Vacuum pump performance

The 2 most important things for determining vacuum pump performance are as follows:

- (1) Exhaust velocity
- (2) Degree of vacuum

(1) Exhaust velocity

Exhaust volume is usually expressed as l/min or m³/h. The larger the number, the faster vacuum is achieved.

Generally speaking, the faster the exhaust velocity, the larger and heavier the vacuum pump itself is. Commercially available vacuum pumps (exhaust velocity of 20 - 30 l/min) usually take an extremely long time to achieve vacuum. (We recommend a vacuum pump of approx. 60 - 100 l/min.)

(2) Degree of vacuum

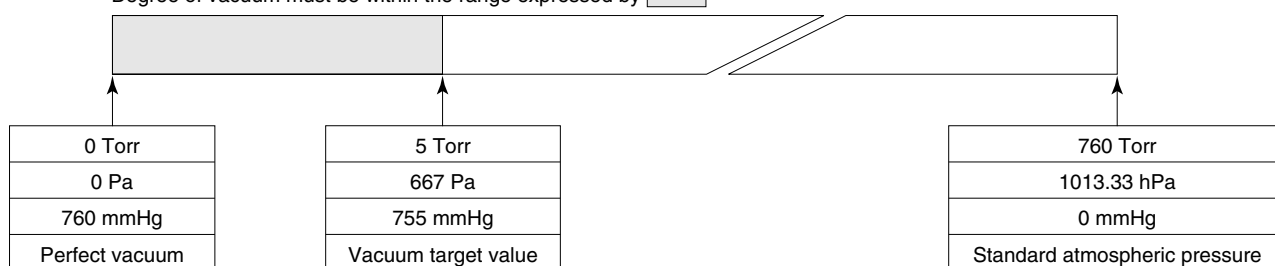
Ultimate vacuum varies largely according to use of the vacuum pump. Vacuum pumps used for vacuum forming cannot be used for vacuum drying. (A vacuum pump with a high degree of vacuum is required.)

When selecting a vacuum, you should select one which is capable of achieving 0.2 Torr of ultimate vacuum.

Degree of vacuum is expressed in Torr, micron, mmHg, and Pascal (Pa). The units correlate as follows:

	Unit	Standard atmospheric pressure	Perfect vacuum
Gauge Pressure	kg/cm ²	0	-1.033
Absolute Pressure	kg/cm ² abs	1.033	0
Torr	Torr	760	0
Micron	Micron	760000	0
*mmHg	mmHg	0	760
Pa	hPa	1013.33	0

Degree of vacuum must be within the range expressed by



(V0992)

2. Vacuum pump maintenance

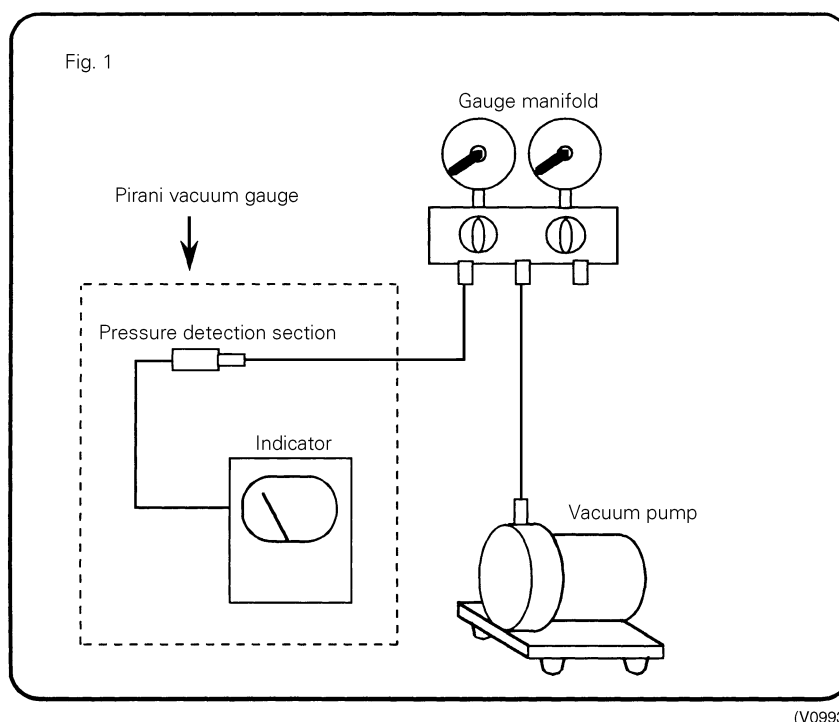
Because of their nature, most vacuum pumps contain large amounts of oil which lubricates bearings, etc., and functions to enhance airtightness of pistons. When using a vacuum pump to discharge air from refrigerant piping, moisture in the air tends to get mixed in with the oil. You must therefore change oil periodically and make sure the proper oil level is maintained. (Perform periodic inspections in accordance with the operating instructions.)

3. Degree of vacuum measurement

An extremely accurate vacuum gauge is required to test degree of vacuum. You cannot accurately measure degree of vacuum with the compound gauge on the gauge manifold. A Pirani vacuum gauge is required to measure degree of vacuum accurately. Because Pirani gauges are very sensitive and require extreme care when using, they are not very suitable for use in the field. You should therefore use the Pirani gauge to calibrate the attached vacuum gauge on the gauge manifold and the degree of vacuum of the vacuum pump.

4. Calibration method

1. Connect a Pirani vacuum gauge and the gauge manifold vacuum gauge (0 - 760 mmHg) to the vacuum pump at the same time, and run the pump for about 3 minutes.
2. Make sure the reading of the Pirani vacuum gauge is 5 Torr (667 Pa) or less. The reading of conventional vacuum pumps lowers to about 0.2 Torr.
If the reading is not 5 Torr or less, check the vacuum pump oil. (Oil is low in many cases.)
3. Check the attached gauge on the gauge manifold. Adjust the gauge if the reading is not exactly correct.
4. Adjust the gauge manifold valve so that the Pirani vacuum gauge reads 5 Torr.
5. Mark the position indicated by the gauge manifold gauge with an oil based ink pen.
6. Use the mark of the gauge manifold as a target when vacuuming in the field.



(Reference) Types of vacuum pump with respective maximum degree of vacuum

Type	Maximum Degree of Vacuum		Use	
	Expulsion Capacity		Vacuum Drying	Air Expulsion
Oil Rotary (Oil Using)	0.02 mmHg	100 l/min	Suitable	Suitable
Oilless Rotary (No Need of Oil)	10 mmHg	50 l/min	Unsuitable	Suitable
	0.02 mmHg	40 l/min	Suitable	Suitable

← Many handy pumps fall into this category

Vacuum Drying Procedure

There are two vacuum drying methods and the appropriate one should always be chosen to conform with individual local conditions.

[Normal vacuum drying].....The standard method

[Operational steps]

1. Vacuum drying (1st time): Connect a manifold gauge to the service port of the liquid or gas pipe and operate the vacuum pump for at least 2 hours.

(The degree of vacuum produced should be in excess of 5 mmHg)

If after 2 hours the vacuum produced has not exceeded 5 mmHg then either there is moisture in the pipe or there is a leak. Operate the vacuum pump for a further hour.

If, even after 3 hours, the vacuum has not reached 5 mmHg then check the system for a leak.

2. Carry out maintained vacuum test.

Produce a vacuum in excess of -755 mmHg and do not release it for an hour or more. Check the vacuum gauge to make sure that it has not risen. (If the gauge does rise then there is still moisture in the pipe or there is a leak somewhere.)

3. Additional charge of refrigerant.

Connect the charging cylinder to the liquid pipe service port and charge with the required amount of refrigerant.

4. Open stop valve to the full.

Open the stop valves on the liquid and the gas pipes to the full.

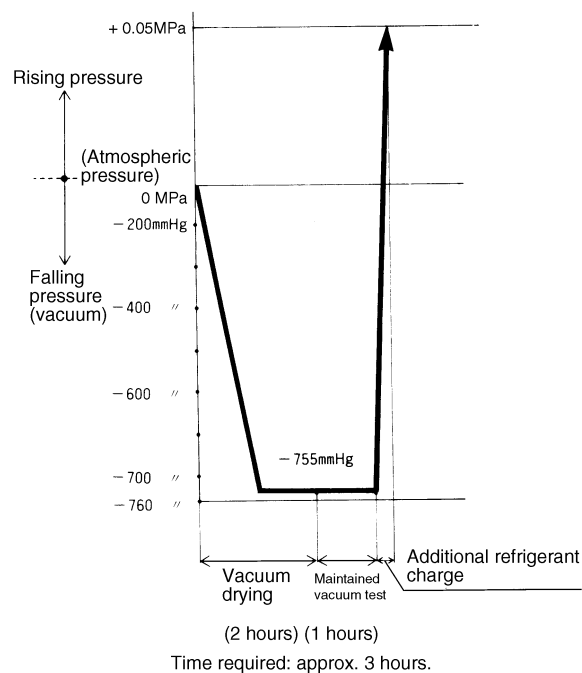


Note:

Vacuums should be produced in both the liquid and the gas pipes.

(Because there are a large number of functional components in the indoor unit which cut off the vacuum mid-way through)

[Standard vacuum drying time chart]



(V0991)

Special vacuum drying

This vacuum drying method is selected when there is a suspicion that there may be moisture in the pipes. For example:

- When moisture was discovered during the refrigerant pipe flushing operation
- When there is a risk of condensation forming inside the pipes during periods of heavy rainfall
- When there is a risk of condensation forming inside the pipes due to a long term of works
- When there is a risk that rainwater may have entered the pipes during installation

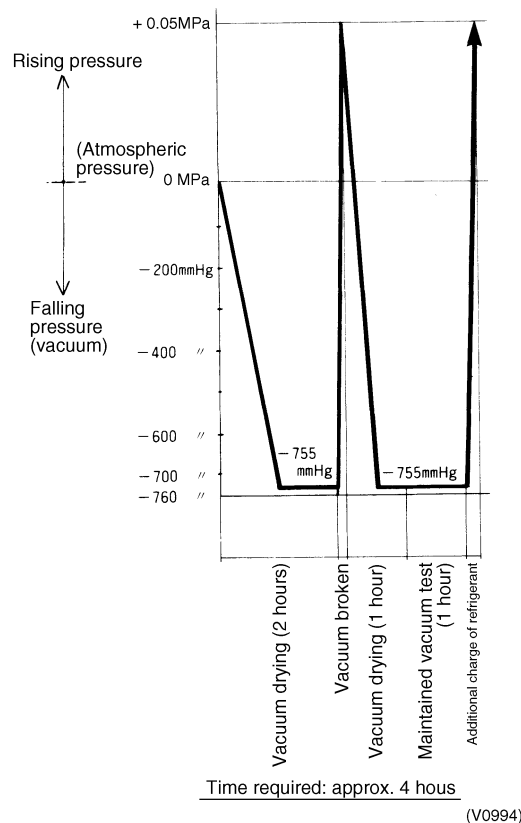
The special vacuum drying method is the same as the standard method except that nitrogen is introduced into the pipes to break the vacuum on one or more occasions during the course of the operation.

[Operational steps]

1. Vacuum drying (1st time): 2 hours
2. Vacuum breaking (1st time): Use nitrogen to raise pressure to +0.05MPa.
(Since the nitrogen gas used to break the vacuum is dry nitrogen this process serves only to enhance the overall drying effect of the vacuum drying operation itself.
However, since the effectiveness of this process is severely impaired by a high moisture level inside the pipes, the utmost care is required during installation to see that water does not enter or form inside the refrigerant pipes.)
3. Vacuum drying (2nd time): Operate the vacuum pump for at least 1 hour.
(Observations: Degree of vacuum has reached 5 mmHg. If the degree of vacuum has not reached 5 mmHg after 2 hours or more then repeat the operations at 2 (vacuum breaking) and 3 (vacuum drying) above.)
4. Carry out maintained vacuum test: 1 hour
5. Additional charge of refrigerant
6. Open stop valve to the full

- * The gas used for the vacuum breaking operation must be nitrogen.
(The use of oxygen brings a serious risk of explosions)

[Special vacuum drying time chart]



3.2.7 Additional Charge of Refrigerant at installation time

■ Operational steps

Use the length of the piping to calculate the amount of refrigerant required



Additional charge of refrigerant

(V0995)

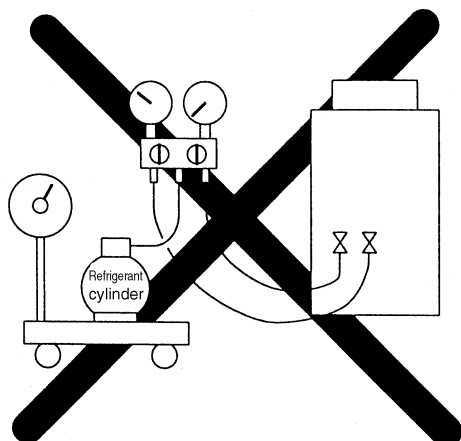
Important points

1. The results of all calculations must be recorded. (Make a list.)
2. The refrigerant will need to be additionally charged whenever the distance between the outdoor unit and the most distant indoor unit is more than 10m.
3. The additional charging operation should be carried out by input of liquid from Service port at liquid stop valve following completion of the vacuum drying operation.
4. When the additional charging operation cannot be satisfactorily completed use the action of the compressor to complete the additional charging during the test run.

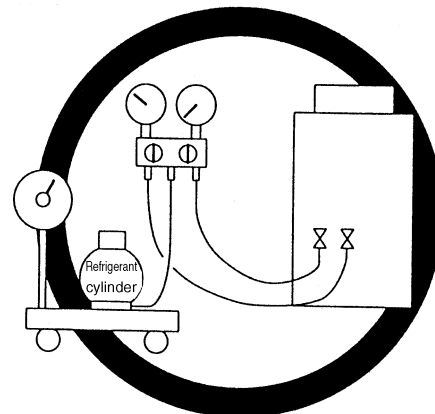
Refrigerant Charging Instructions

HFC401A are Quasi-azeotropic* refrigerants. Therefore, these refrigerants must be charged in the liquid state. When charging the refrigerant into equipment from the refrigerant cylinder, turn the refrigerant cylinder upside down.

Important: Make sure that the refrigerant (liquid) is taken out from the bottom part of the refrigerant cylinder. Do not take out the refrigerant (gas) at the upper part of the refrigerant cylinder for charging.



(V0996)



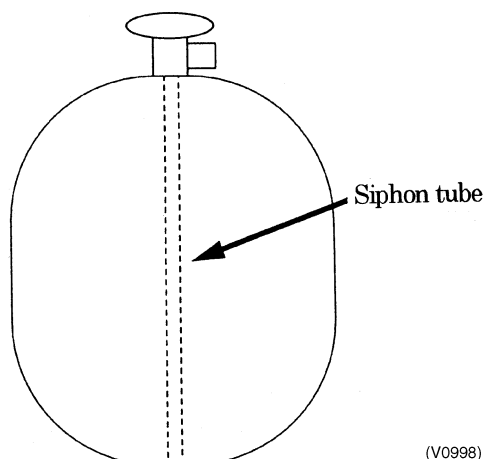
(V0997)



Caution

Since some refrigerant cylinders differ in the internal mechanism, it is necessary to examine the cylinder carefully. (Some cylinders have a siphon tube to eliminate the need for turning it upside down.)

Siphon tube



(V0998)

<*Non-azeotropic refrigerants or Quasi-azeotropic refrigerants>

When a refrigerant is a mixture of two or more types with different evaporation temperature, it is called a non-azeotropic refrigerant. If all refrigerant components evaporate at the same temperature, the mixture is called an azeotropic refrigerant.

If a non-azeotropic refrigerant is charged into equipment in the gaseous state, the refrigerant components that evaporate sooner than others enter the equipment, and the refrigerant that evaporate after others remain in the refrigerant cylinder.

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

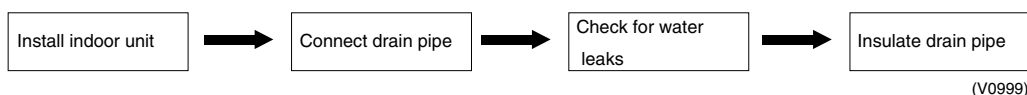
Caution items

The following devices designed for R-22 cannot be used to charge the new refrigerants. Be sure to use the devices specifically designed for the new refrigerants.

1. Charging cylinder...(Pressure resisting specification is different.)
2. Gauge manifold (including hose)...(same as above)

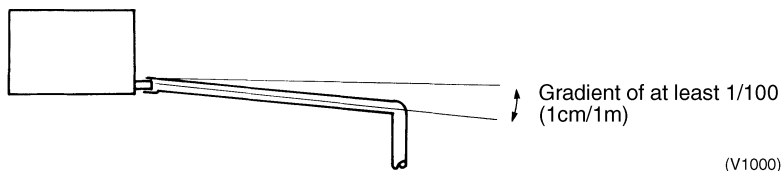
3.2.8 Drain Pipe Work (Indoor)

■ Operational steps



Drain Pipe Gradient and Support

- a) The drain pipe must be fitted at a gradient of at least 1/100.
The drain pipe should be as short as possible and free from airlocks.



- b) Suspension bolts should be used to support long stretches of drain pipe in order to ensure that a gradient of 1/100 is maintained. (PVC pipes should not be bent)

Spacing of supports for horizontal piping

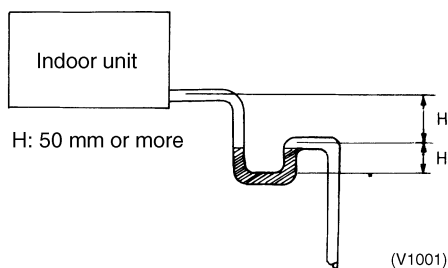
Class	Nominal diameter	Spacing
Rigid PVC pipe	25~40mm	1~1.5m

- c) The length of pipe laid horizontally should be kept to a minimum.

Drain Trap

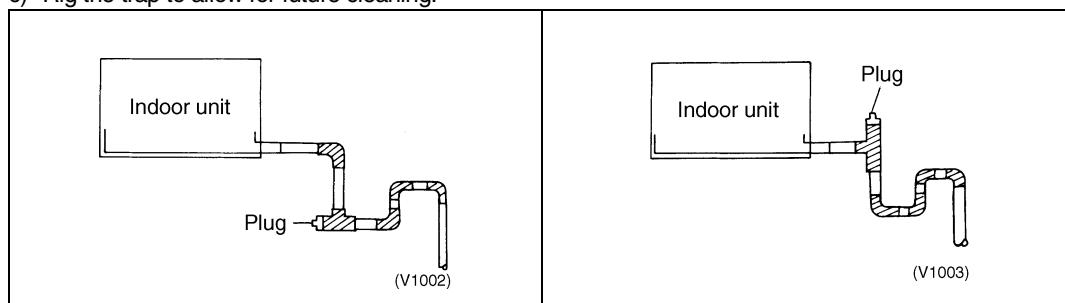
Fit any indoor unit whose drain pipe connection is subjected to negative pressure, with a drain trap.
(FXYMP40~125 only)

- a) Rig the drain trap as shown in the drawing bellow.



- b) Provide one trap per unit. A single trap for converging units will prove ineffective.

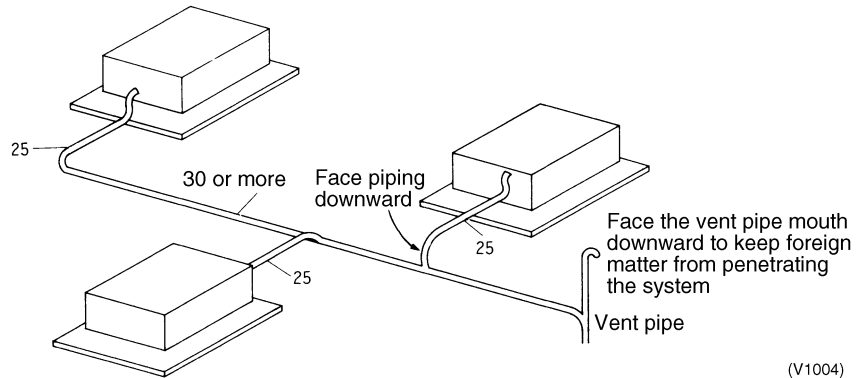
- c) Rig the trap to allow for future cleaning.



Grouped Drain Piping

1. It is standard work practice to make connections to the main pipe from above. The pipe down from the combination should be as large as possible.

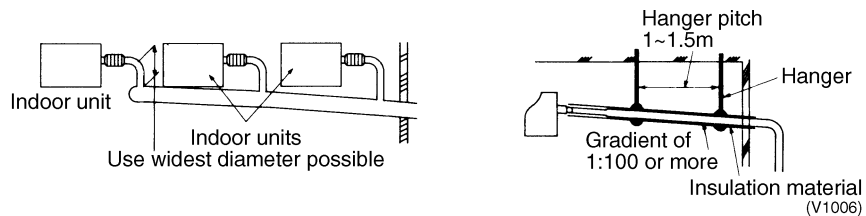
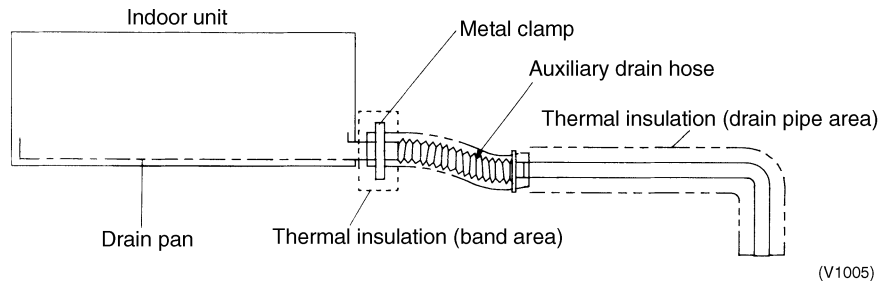
Grouped drain pipes from multiple units



2. The pipework should be kept as short as possible and the number of indoor units per group kept to a minimum.

Use of an Auxiliary Drain Hose (Flexible)

If a drain pan made of polystyrene foam is used then an auxiliary drain hose (flexible) is also essential. A flexible drain hose permits the drain socket and drain pipe to be connected without difficulty and prevents any undue strain being placed on the drain pan.



Important points

1. The drain pipe should be at least equal in size to that of the indoor unit.
2. The drain pipe is thermally insulated to prevent the formation of condensation inside the pipe.
3. The drain up mechanism should be fitted before the indoor unit is installed and when the electricity has been connected some water should be added to the drain pan and the drain pump checked to see that it is functioning correctly.
4. All connections should be secure. (Special care is needed with PVC pipe)
The use of a colored adhesive with PVC pipes will help you to remember to connect them up.)

Piping Diameter for Grouped Drain Pipes

- Select piping diameter from the below table in accordance with the amount of condensation drained by all units with a common drain pipe.
- Consider 2 l/hr of drainage for every 1 HP. For example, drainage from 3 units running at 2 HP and 2 units running at 3 HP is calculated as follows.
 $2 \text{ (l/hr)} \times 2 \text{ (HP)} \times 3 \text{ (units)} + \{ 2 \text{ (l/hr)} \times 3 \text{ (HP)} \times 2 \text{ (units)} \} = 24 \text{ l/hr}$

1. Relationship between horizontal pipe diameter and allowable drainage (for extended ventilation system)

JIS nominal	Vinyl chloride pipe diameter (mm)	Allowable flow rate (l/hr)		Remarks
		Piping gradient 1:50	Piping gradient 1:100	
VP20	20	39	27	(Reference value) Cannot be used in grouped piping.
VP25	25	70	50	
VP30	31	125	88	Can be used in grouped piping.
VP40	40	247	175	
VP50	51	473	334	



Notes:

- Calculations have been made with water area inside the pipe as 10%.
- Allowable flow rate figures below the decimal have been discarded.
- Use VP30 or larger pipe after the convergence point.

2. Relationship between riser diameter and allowable drainage (for extended ventilation system)

JIS nominal	Vinyl chloride pipe diameter (mm)	Allowable flow rate (l/hr)	Remarks
VP20	20	220	(Reference value) Cannot be used in grouped piping.
VP25	25	410	
VP30	31	730	Can be used in grouped piping.
VP40	40	1440	
VP50	51	2760	
VP65	67	5710	
VP75	77	8280	



Notes:

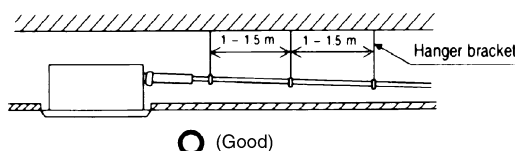
- Allowed flow rate figures below the decimal have been discarded.
- Use VP30 or larger pipe in risers.
- Use the same drain pipe for the humidifier as the indoor unit.

3.2.9 Drain Piping for Each Model

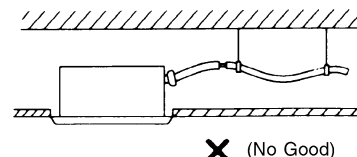
Ceiling Mounted Cassette Type (FXCQ-M Double flow)

1. Rig drain piping

- The diameter of the drain pipe should be greater than or equal to the diameter of the connecting pipe (vinyl tube, pipe size: 25 mm; outer dimension: 32 mm).
- Keep the drain pipe short and sloping downwards at a gradient of at least 1/100 to prevent air pockets from forming.
- If the drain hose cannot be sufficiently set on a slope, execute the drain raising piping.
- To keep the drain hose from sagging, space hanging wires every 1 to 1.5 m.



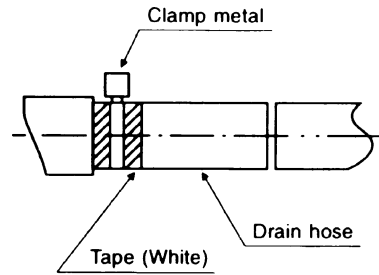
(V0615)



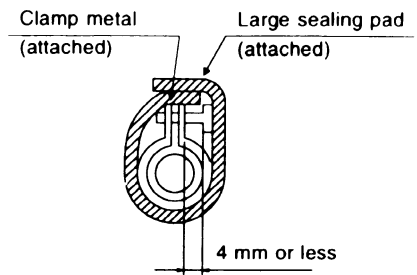
(V0616)

- Use the attached drain hose and clamp metal.
Insert the drain hose into the drain socket, up to the white tape. Tighten the clamp until the screw head is less than 4mm from the hose.
- Wrap the attached sealing pad over the clamp and drain hose to insulate.

- Insulate the drain hose inside the building.



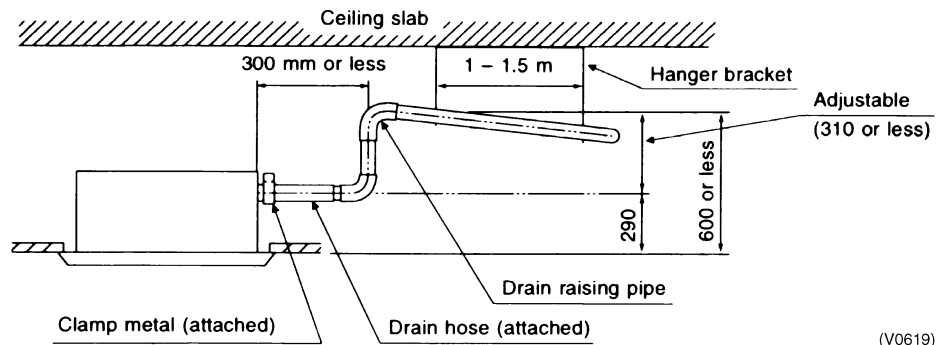
(V0617)



(V0618)

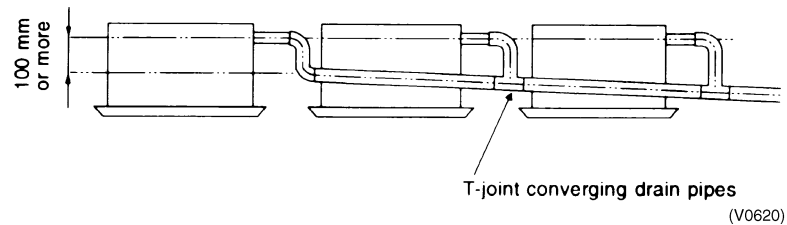
(PRECAUTIONS FOR DRAIN RAISING PIPING)

- Install the drain raising pipes at a height of less than 310 mm.
- Install the drain raising pipes at a right angle to the indoor unit and no more than 300 mm from the unit.



(V0619)

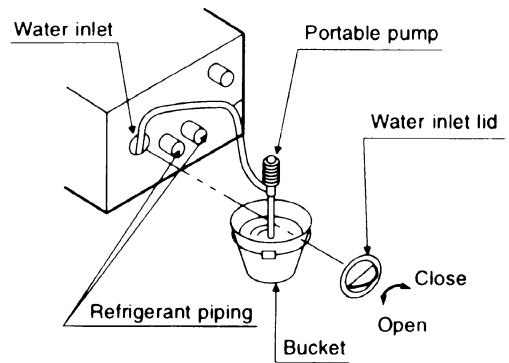
- If converging multiple drain pipes, install according to the procedure shown below.



(V0620)

Select converging drain pipes whose gauge is suitable for the operating capacity of the unit.

2. After piping work is finished, check drainage flows smoothly.
- Open the water inlet lid, add approximately 2500 cc of water gradually and check drainage flow.








(V0621)

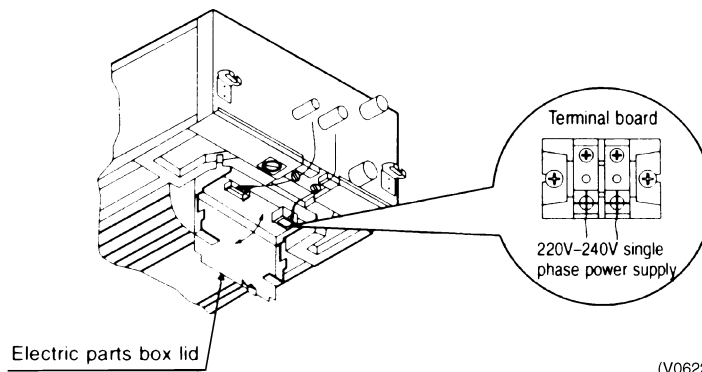
WHEN ELECTRIC WIRING WORK IS FINISHED

- Check drainage flow during COOL running, explained under "TEST OPERATION".

WHEN ELECTRIC WIRING WORK IS NOT FINISHED

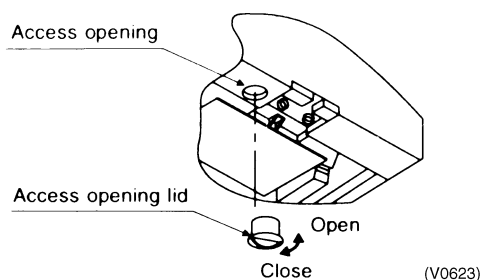
- Remove the electric parts box lid, connect a power supply and remote controller to the terminals. (Refer to the **How to CONNECT WIRINGS** (Refer to Installation Manual))

Next, press the inspection/test operation button “” on the remote controller. The unit will engage the test operation mode. Press the operation mode selector button “” until selecting FAN OPERATION “”. Then, press the ON/OFF button “”. The indoor unit fan and drain pump will start up. Check that the water has drained from the unit. Press “” to go back to the first mode.



(V0622)

- You can check whether drainage is satisfactory or not by removing the access opening lid and checking the water level of the drain pan through the access opening.
- **Be careful when doing so because the fan is turning at the same time.**



(V0623)

Ceiling Mounted Cassette Type (FXFQ-M Multi- flow)

1. Rig drain piping

- Lay pipes so as to ensure that drainage can occur with no problems.
- Employ a pipe with either the same diameter or with the diameter larger (excluding the raising section) than that of the connecting pipe (PVC pipe, nominal diameter 25 mm, outside diameter 32 mm).
- Keep the drain pipe short and sloping downwards at a gradient of at least 1/100 to prevent air pockets from forming.
- If the drain hose cannot be sufficiently set on a slope, execute the drain raising piping.
- To keep the drain hose from sagging, space hanging wires every 1 to 1.5 m.

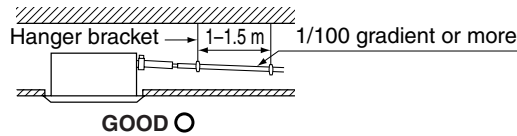


Fig. 18

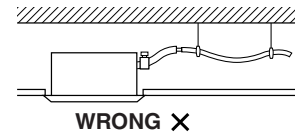


Fig. 19

- Use the attached drain hose (1) and clamp (2).
- Insert the drain hose into the drain socket up to the base, and tighten the clamp securely within the portion of a white tape of the hose-inserted tip. Tighten the clamp until the screw head is less than 4 mm from the hose.
- Wrap the attached sealing pad (10) over the clamp and drain hose to insulate.
- Make sure that heat insulation work is executed on the following 2 spots to prevent any possible water leakage due to dew condensation.
 - Indoor drain pipe
 - Drain socket

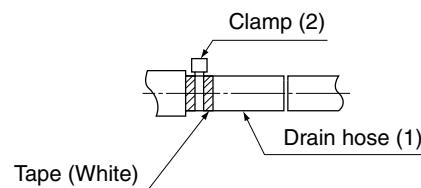


Fig. 20

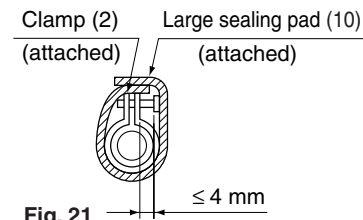


Fig. 21

<PRECAUTIONS FOR DRAIN RAISING PIPING>

- Install the drain raising pipes at a height of less than 550 mm.
- Install the drain raising pipes at a right angle to the indoor unit and no more than 300 mm from the unit.

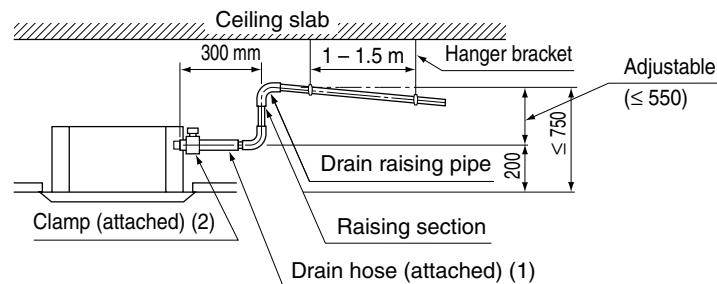


Fig. 22



Note:

- To ensure no excessive pressure is applied to the included drain hose (1), do not bend or twist when installing. (This may cause leakage.)
- If converging multiple drain pipes, install according to the procedure shown below.

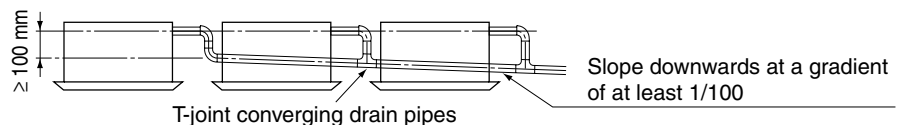


Fig. 23

Select converging drain pipes whose gauge is suitable for the operating capacity of the unit.

2 After piping work is finished, check if drainage flows smoothly.






- Add approximately 2000 cc of water slowly from the air outlet and check drainage flow.

WHEN ELECTRIC WIRING WORK IS FINISHED

- Check drainage flow during COOL running, explained under “TEST OPERATION”.

WHEN ELECTRIC WIRING WORK IS NOT FINISHED

- Remove the terminal box lid connect a power supply and remote controller to the terminals.
(Refer to the Installation Manual)

Next, press the inspection/test operation button “” on the remote controller. The unit will engage the test operation mode. Press the operation mode selector button “” until selecting FAN OPERATION “”. Then, press the ON/OFF button “”. The indoor unit fan and drain pump will start up. Check that the water has drained from the unit. Press “” to go back to the first mode.

- **Note that the fan also starts rotating.**
- Attach the terminal box lid as before.

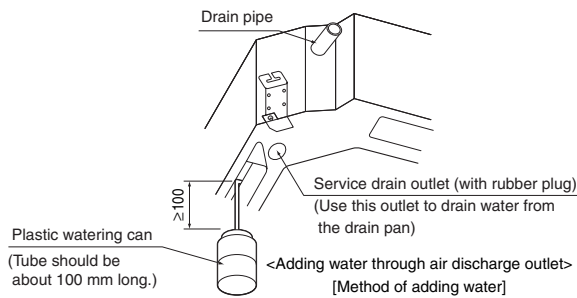
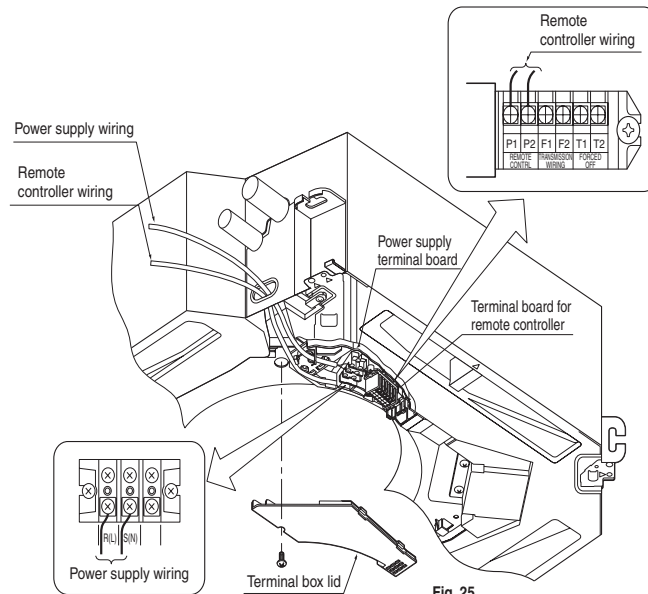


Fig. 24



Caution:

Drain piping connections

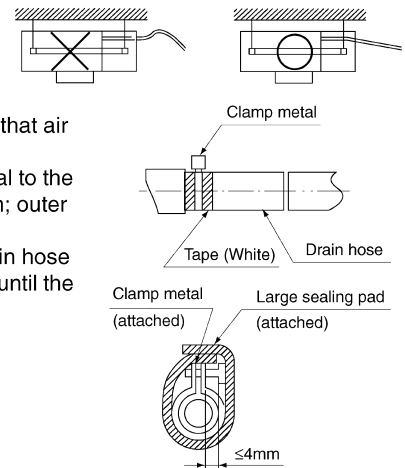
Do not connect the drain piping directly to sewage pipes that smell of ammonia. The ammonia in the sewage might enter the indoor unit through the drain pipes and corrode the heat exchanger.

Ceiling Mounted Cassette Corner Type (FXKQ-M)

Drain Piping

«Rig the drain pipe as shown below and take measures against condensation. Improperly rigged piping could lead to leaks and eventually wet furniture and belongings.»

- 1 Install the drain pipes.
 - Keep piping as short as possible and slope it downwards so that air may not remain trapped inside the pipe.
The diameter of the drain pipe should be greater than or equal to the diameter of the connecting pipe (vinyl tube; pipe size: 25 mm; outer dimension: 32 mm).
Use the attached drain hose and clamp metal. Insert the drain hose into the drain socket, up to the white tape. Tighten the clamp until the screw head is less than 4 mm from the hose.



Caution

Setting the unit at an angle opposite to the drain piping might cause leaks.

Wrap the attached sealing pad over the clamp and drain hose to insulate.

Insulate the drain hose inside the building.

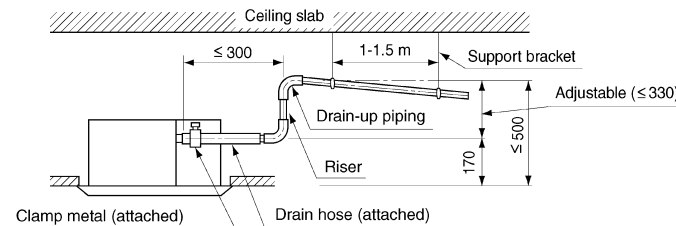
While referring to the figure on the right, insulate the clamp and drain hose with the attached large sealing pad. If the drain hose cannot be sufficiently set on a slope, execute the drain raising piping.

Secure a downward gradient of 1/100 or more for the drain pipe. To accomplish this, mount supporting brackets at an interval of 1 - 1.5 m.

⟨Precautions when doing drain-up piping work.⟩

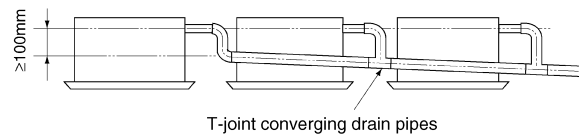
Make sure the drain-up piping is at most 330 mm high.

Stand the drain-up piping horizontally, and make sure it is not further than 300 mm from the base of the drain socket.



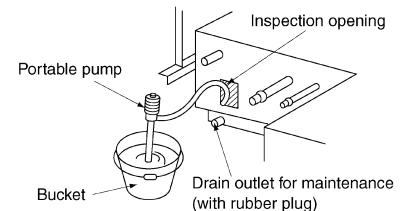
Use the following outline if laying concentrated drain piping.

If converging multiple drain pipes, install according to the procedure shown below.



Select converging drain pipes whose gauge is suitable for the operating capacity of the unit.

- 2** After piping work is finished, check drainage flows smoothly.
Open the inspection opening, add approximately 1000 cc of water slowly into the drain pan and check drainage flow.



3P086156-4A-9








Note: Use the drain outlet for maintenance to drain water from the drain pan.

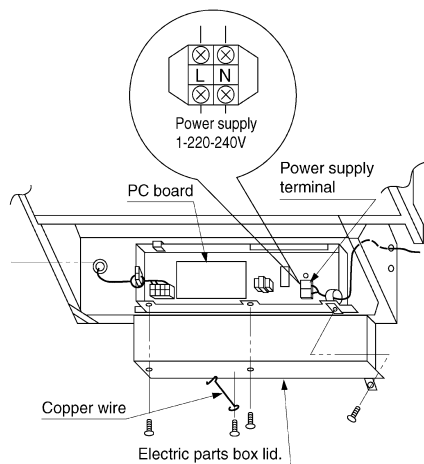
WHEN ELECTRIC WIRING WORK IS FINISHED

- Check drainage flow during COOL running, explained under “TEST OPERATION”.

WHEN ELECTRIC WIRING WORK IS NOT FINISHED

Remove the electric parts box lid, connect a power supply and remote controller to the terminals.
(Refer to the **Installation Manuals**)

Next, press the inspection/test operation button “” on the remote controller. The unit will engage the test operation mode. Press the operation mode selector button “” until selecting FAN OPERATION “”. Then, press the ON/OFF button “”. The indoor unit fan and drain pump will start up. Check that the water has drained from the unit. Press “” to go back to the first mode.



3P086156-4A-10

**Caution**

Drain piping connections

Do not connect the drain piping directly to sewage pipes that smell of ammonia. The ammonia in the sewage might enter the indoor unit through the drain pipes and corrode the heat exchanger.

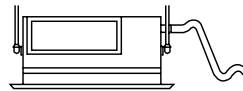
Ceiling Mounted Built-in Type (FXSQ-M)

Drain Piping

Rig the drain pipe as shown below and take measures against condensation. Improperly rigged piping could lead to leaks and eventually wet furniture and belongings.

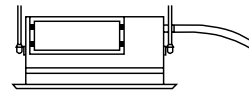
(1) Rig drain piping

- The diameter of the drain pipe should be greater than or equal to the diameter of the connecting pipe (vinyl tube; pipe size: 25 mm; outer dimension: 32 mm).
- Keep the drain pipe short and sloping downwards at a gradient of at least 1/100 to prevent air pockets from forming.
- If the drain hose cannot be sufficiently set on a slope, execute the drain raising piping.
- To keep the drain hose from sagging, space hanging wires every 1 to 1.5 m.



×

No Good



○

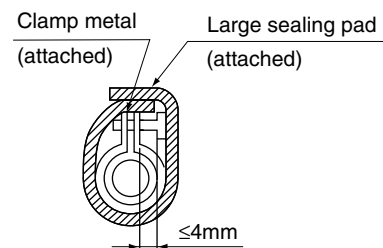
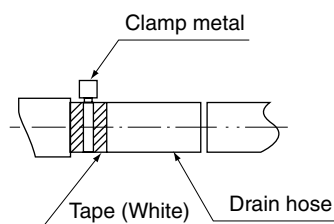
Good



Caution

Setting the unit at an angle opposite to the drain piping might cause leaks.

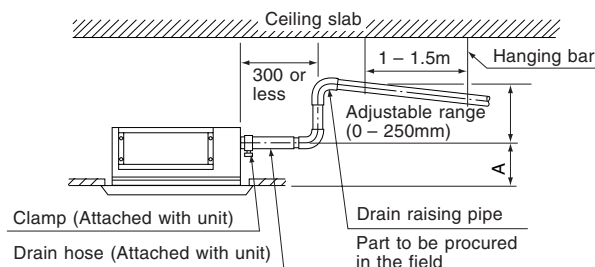
- Use the attached drain hose and clamp metal. Tighten the clamp firmly. Insert the drain hose into the drain socket, up to the white tape. Tighten the clamp until the screw head is less than 4 mm from the hose.
- Wrap the attached sealing pad over the clamp and drain hose to insulate.
- Insulate the drain hose inside the building.



〈 PRECAUTIONS FOR DRAIN RAISING PIPING 〉

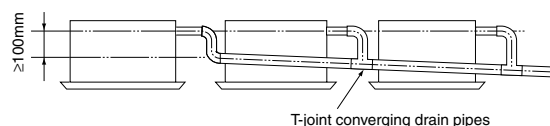
〈 HOW TO INSTALL PIPING 〉

- (1) Connect the drain hose to the drain raising pipes, and insulate them.
- (2) Connect the drain hose to the drain outlet on the indoor unit, and tighten it with the clamp.
- (3) Insulate both metal clamp and drain hose with the attached sealing pad.



	A
When canvas duct is installed	350 - 530
When air inlet panel is directly installed	275

- If converging multiple drain pipes, install according to the procedure shown below.

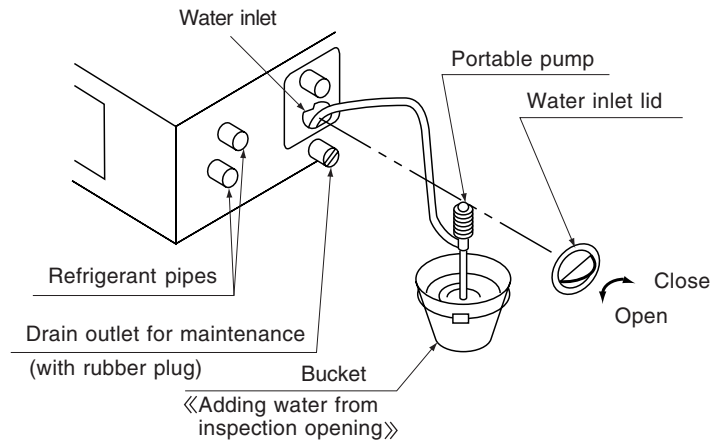


3P086156-3A-9

Select converging drain pipes whose gauge is suitable for the operating capacity of the unit.

(2) After piping work is finished, check drainage flows smoothly.

- Open the water inlet lid, add approximately 1000 cc of water gradually and check drainage flow.



Note: Use this outlet to drain water from the drain pan.

[WHEN ELECTRIC WIRING WORK IS FINISHED]

- Check drainage flow during COOL running, explained under "TEST OPERATION."

[WHEN ELECTRIC WIRING WORK IS NOT FINISHED]

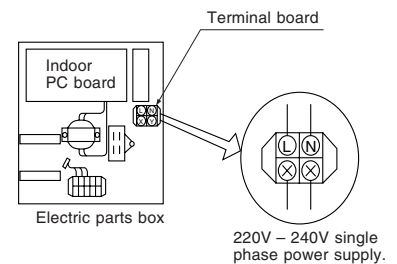
Remove the electric parts box lid, connect a power supply and remote controller to the terminals.
(Refer to the "Installation Manuals")

Next, press the inspection/test operation button "TEST" on the remote controller. The unit will engage the test operation mode.

Press the operation mode selector button "FAN" until selecting FAN OPERATION "FAN". Then, press the ON/OFF button "ON". The indoor unit fan and drain pump will start up. Check that the water has drained from the unit. Press "TEST" to go back to the first mode.

You can check whether drainage is satisfactory or not by removing the access opening lid and checking the water level of the drain pan through the access opening.

Be careful when doing so because the fan is turning at the same time.



3P086156-3A-10

Ceiling Mounted Duct Type (FXMQ-M)

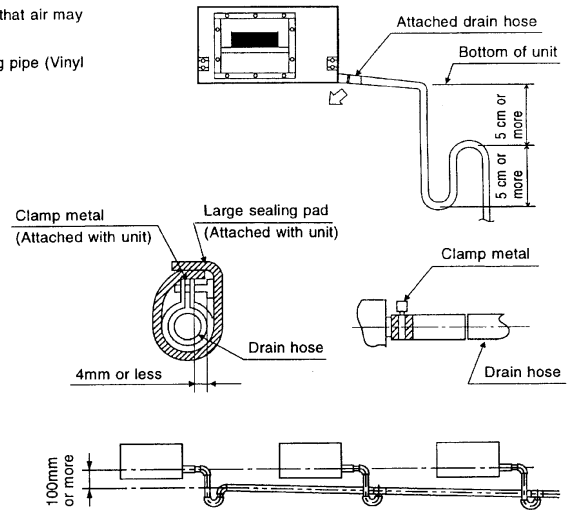
⟨⟨ Rig the drain pipe as shown below and take measures against condensation. Improperly rigged piping could lead to leaks and eventually wet furniture and belongings. ⟩⟩

<<Insulate the drain hose inside the buildings>>

(1) Install the drain pipes.

FXMQ40-125M

- Keep piping as short as possible and slope it downwards so that air may not remain trapped inside the pipe.
- Keep pipe size equal to or greater than that of the connecting pipe (Vinyl pipe of 25 mm nominal diam. and 32 mm outer diam.).
- Use the attached drain hose and clamp.
Tighten the clamp firmly.
- Insulate the clamp metal with the attached sealing pad.
- There is negative pressure inside the unit relative to atmospheric pressure when the unit is running, so be sure to provide drain trap on the drain outlet. (See the figure)
- In order to prevent foreign matter from building up inside the piping, you should avoid curves as much as possible, and arrange so the trap can be cleaned.



Note: If installing central drain piping, install according to the following right figure.
(Install a drain trap for each indoor unit.)

FXMQ200-250M

- A drain pipe need not be installed.
- The diameter of the piping is the same as that of the connecting pipe (PS1B), and should be kept equal to or greater than that of the connecting pipe.

(2) After piping work is finished, check drainage flows smoothly.

3P080156-2-8

Ceiling Suspended Type (FXHQ-M)

Rig the drain pipe as shown below and take measures against condensation. Improperly rigged piping could lead to leaks and eventually wet furniture and belongings.

(1) Rig drain piping

- For drain work, rig the pipes so that they drain reliably.
- The drain pipe outlet direction can be chosen from the right rear, right, left rear, and left. Refer to "REFRIGERANT PIPING WORK" for right rear and right direction, and refer to Fig. 20 for left rear and left direction.

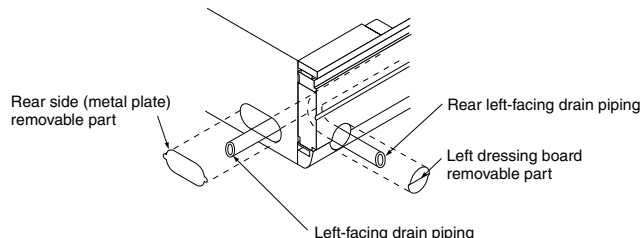


Fig. 20

- For left drain pipe outlet, remove the rubber plug and the insulation on the drain pipe connecting opening on the left side of the unit and change the position to the right side.

3PN01417-5K-1C

- Insert the rubber stopper securely, all the way to the base, in order to prevent water leakage.
- The diameter of the drain pipe should be greater than or equal to the diameter of the connecting pipe. (Vinyl tube; pipe size: 20 mm; outer dimension: 26 mm)
- Keep the drain pipe short and sloping downwards at a gradient of at least 1/100 to prevent air pockets from forming. **(Refer to Fig. 21)**
- Use the attached drain hose (1) and clamp (2).
Insert the drain hose into the drain socket, up to the gray tape. **(Refer to Fig. 22)**
Tighten the clamp until the screw head is less than 4 mm from the hose. **(Refer to Fig. 23)**
(Be careful of the installation direction. Install so that the clamp metal does not contact the intake grill.)
- Wrap the attached sealing pad (8) over the clamp and drain hose to insulate. **(Refer to Fig. 23)**
- No folding of drain hose inside the indoor unit. **(Refer to Fig. 24)**
(If there is slack in the drain hose, it may cause damage to the intake grill.)

(When drain hose is connected)

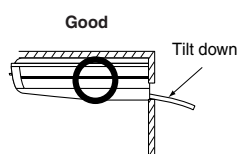


Fig. 21

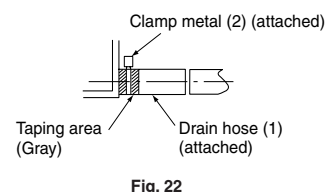
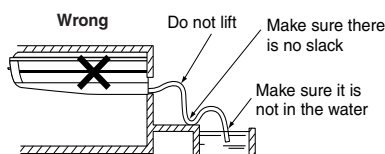


Fig. 22

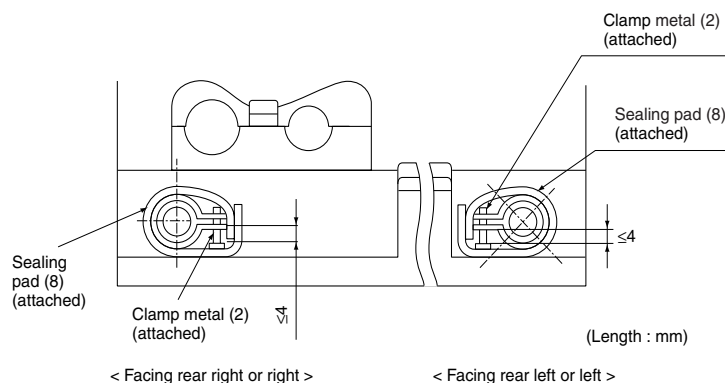


Fig. 23

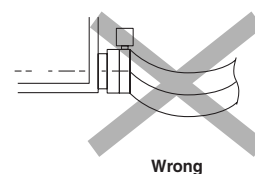


Fig. 24

(2) Confirm that smooth drainage is achieved after the piping work.

- Add 600 cc of water in the drain pan from the air outlet for confirming drainage. (Refer to Fig. 25)

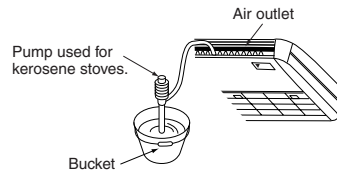


Fig. 25

3PN01417-5K-11



Caution

Drain piping connections

Do not connect the drain piping directly to sewage pipes that smell of ammonia. The ammonia in the sewage might enter the indoor unit through the drain pipes and corrode the heat exchanger.

**Wall Mounted
Type (FXAQ-M)**

(1) Install the drain piping. (Refer to Fig. 16)

- The drain pipe should be short with a downward slope and should prevent air pockets from forming.
- Watch out for the points in the figure 16 when performing drain work.

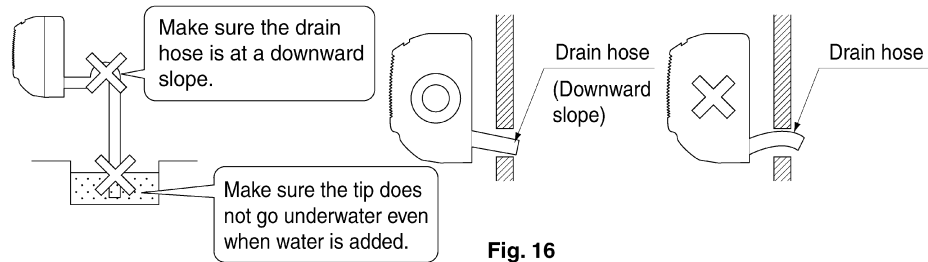


Fig. 16

- When extending the drain hose, use a commercially available drain extension hose, and be sure to insulate the extended section of the drain hose which is indoors. (Refer to Fig. 17)

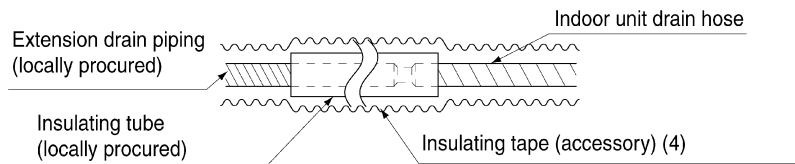


Fig. 17

- Make sure the diameter of the piping is the same as the piping (hard vinyl chloride, nominal diameter 13mm) or bigger.
- When directly connecting a hard vinyl chloride pipe joint (nominal diameter 13mm) to the drain hose connected to the indoor unit (i.e. for embedded piping, etc.), use a commercially available hard vinyl chloride pipe joint (nominal diameter 13mm). (Refer to Fig. 18)

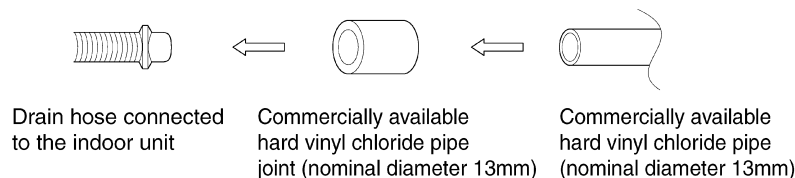
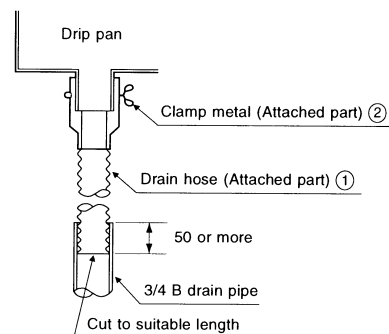


Fig. 18

Floor Standing/ Concealed Floor Standing Type (FXLQ-M, FXNQ- M)

« Rig the drain pipe as shown below and take measures against condensation. Improperly rigged piping could lead to leaks and eventually wet furniture and belongings. »

- ① Connect the drain hose ① using the attached hose and parts, as shown in the right drawing.
- ② After piping work is finished, check drainage flows smoothly.
- ③ Be sure to insulate all indoor pipes.



3PN86154-1-7

3.2.10 Electrical Work

Control Wiring

1. Compatible types of wire

Wiring Specifications

Wiring Type	Shield Wire (2 wire) (See NOTE 1, 2)
Size	0.75~1.25 mm ²



Notes:

1. Sheathed wire may be used for transmission wirings, but they do not comply with EMI (Electromagnetic Interference) (EN55014). When using sheathed wire, EMI must conform to Japanese standards stipulated in the Electric Appliance Regulatory Act. (If using a sheathed wire, the grounding shown in the figure on the left is unnecessary.)
2. For FXYAP indoor unit, use sheathed wire.

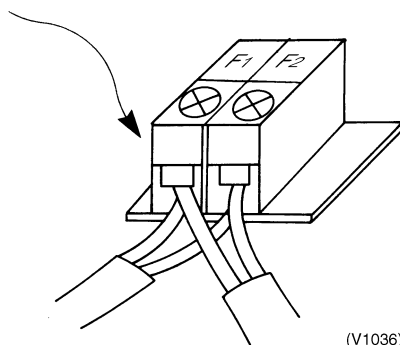
2. Problems arising from the use of unsuitable cable

a) When cable less than 0.75 mm² is used

Where the control wiring is particularly long the transmission signals may, for example, become unstable and the terminal relay cease to function. (Reduced voltage) The control system may become unduly subject to noise interference.

b) When cable more than 1.25 mm² is used

When wiring indoor units together, the terminal block will not be able to accommodate 2 cables simultaneously if the cables are larger than 1.25 mm².



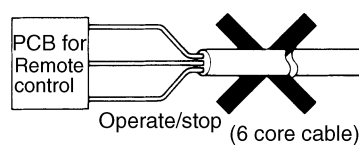
(V1036)

c) For multi-core cable

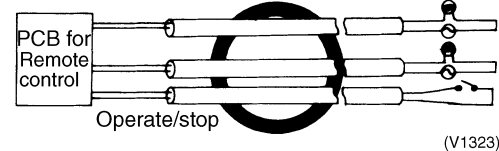
The greater play between wires, the more the transmitted wave is distorted and transmission destabilized.

- d) In the case of a remote controller with a three way selector for cooling, heating and ventilation, twin core cable should be used when the ventilation mode is not required and three core cable should be used when three way selection is required.
- e) Since there is a considerable risk of mixing high (220 to 240V) and low voltage in the case of, for example, a PCB for remote control, multiple core cable must not be used.
(Internal wiring regulations and dielectric strengths of cables are relevant here.)

[Example of incorrect method]



[Example of correct method]



- f) Other important points
1. The refrigerant circuit and the indoor/outdoor connecting cables must correspond exactly.
 2. A suitable gap must be left between the control cables and the power supply cables where these are laid alongside each other. (See "Separation of control and power supply cables" on page 54)

Power Supply (Cabling of Main Power Supply)

1. Choosing a circuit breaker

The power supply work must conform to local regulations. In Japan, the relevant regulations are the MITI ordinance determining technical standards for electrical equipment, and the Internal Wiring Provisions.

a) The indoor unit circuit breakers

- In accordance with the provisions for internal wiring (JEAC8001-1986), power may be supplied by means of crossover lines between the indoor units in a single system branch circuit.

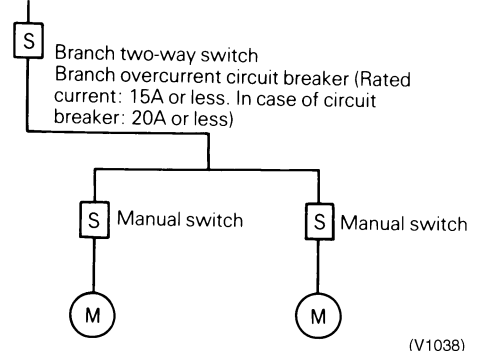
Branch circuit facility (Internal wiring provisions 305-2)

The motors must be set up with a dedicated branch circuit for each unit. However, where they correspond to any of the following situations, this limitation does not apply.

- ① When used in a 15A branch circuit of a 20A circuit breaker branch circuit

Note: It is recommended that the total rated capacity of the motors set up in a 15A branch circuit or a 20A circuit breaker branch circuit should be no more than 2.2kW.

Example of 15A branch circuit or 20A circuit breaker branch circuit



When using high static pressure indoor units the fan motors must have a large capacity. Single phase 220~240V branch circuits are therefore required for each indoor unit.

Example: Up to 10 × 2.5HP indoor units or 5 × 5HP indoor units can be wired together.

b) The outdoor unit circuit breaker

- A separate circuit breaker must be fitted for each unit.
- The motors incorporated into air conditioning system compressors are treated as special motors under the internal wiring provisions. The values which apply to normal motors are thus somewhat variance with those which apply to such compressor motors. You are recommended to adhere strictly to the procedures laid down in the technical materials included in, for example, the system design manuals.

Calculation of load (Refer to local regulation.)

With respect to the calculation of load for motors with special applications such as elevator, air conditioner and refrigerator motors, not only must the rated current be shown on the name plate of the said motor or piece of apparatus but it must also included all special characteristics or applications.



Note: The rated current for package air conditioners which use special purpose built-in compressor motors in their compressors in 1.2 times the operating current shown on the name plate.

2. Cable size

The thickness of the cables in the circuits (branch circuits) providing the main power supply to each item of apparatus must satisfy the following conditions:

1. To have a current tolerance of 40% or more of the rated current of the overcurrent circuit breaker (wiring circuit breaker, etc.).
2. To have a current tolerance of 125% or more of the rated current in cases where the rated current of the apparatus is 50A or less.
3. To have a current tolerance of 110% or more of the rated current in cases where the rated current of the apparatus is more than 50A.
4. To satisfy voltage drop standards.

3. Separation of control and power supply cables

- If control and power cables are run alongside each other then there is a strong likelihood of operational faults developing due to interference in the signal wiring caused by electrostatic and electromagnetic coupling.

The table below indicates our recommendations as to the appropriate spacing of control and power cables **where these are to be run side by side.**

Current capacity of power cable		Spacing (d)
100V or more	10A or less	300mm
	50A	500mm
	100A	1000mm
	100A or more	1500mm



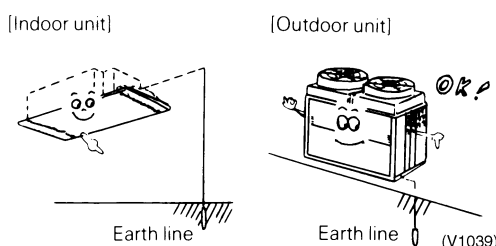
- Notes:**
1. The figures are based on an assumed length of parallel cabling up to 100m. For lengths in excess of 100m the figures will have to be recalculated in direct proportion to the additional length of cable involved.
 2. If the power supply waveform continues to exhibit some distortion the recommended spacing in the table should be increased.

If the cables are laid inside conduits then the following points must also be taken into account when grouping various cables together for introduction into the conduits.

1. Power cables (including power supply to the air conditioner) and signal cables must not be laid inside the same conduit. (Power cables and signal cables must each have their own individual conduits.)
2. In the same way, when grouping the cables, power and signal cables should not be bunched together.

■ Important points

1. Earthing

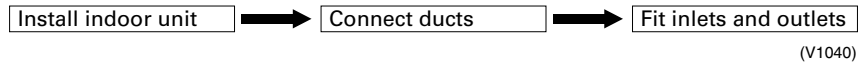


- Have the indoor and outdoor units both been earthed?

* If the apparatus is not properly earthed then there is always a risk of electric shocks. The earthing of the apparatus must be carried out by a qualified person.

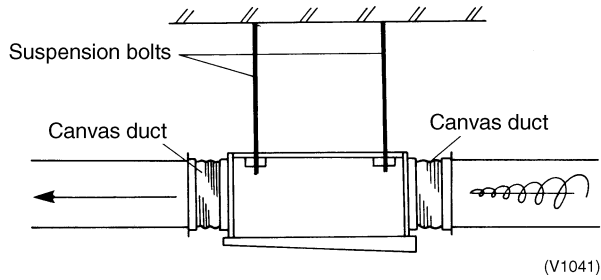
3.2.11 Duct Work (Indoor)

■ Operational steps



Taking Account of Noise and Vibration

- a) Canvas joints must be used between the main unit and the air suction and discharge ducts. These fittings are designed to inhibit secondary noise resulting from the transmission of vibrations and operating noise from the main unit to the ducts or to the rest of the building.



- b) The speed of the airflow should be taken into account when choosing air suction and distribution grills in order to keep wind noise to minimum.

■ Important points

1. The air discharge duct must be thermally insulated.
2. The canvas duct on the inlet side must be set in a metal framework.
3. The air suction and distribution grills should be positioned to take into account the possibility of short circuits.
4. Static pressure should be checked to ensure that the airflow is within the specified range.
5. The air filter must be easily detachable.

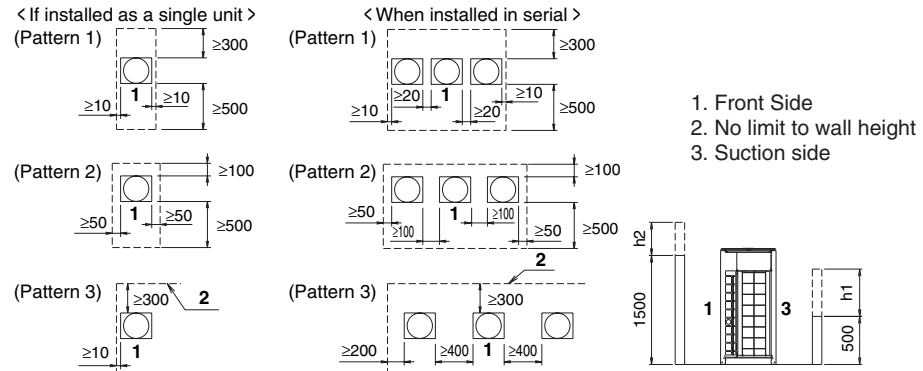
3.2.12 Selection of Location

This unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment. If installed as a household appliance it could cause electromagnetic interference.

The VRV OUTDOOR units should be installed in a location that meets the following requirements:

1. The foundation is strong enough to support the weight of the unit and the floor is flat to prevent vibration and noise generation.
2. The space around the unit is adequate for servicing and the minimum space for air inlet and air outlet is available.

(refer to figure below and choose one of both possibilities)

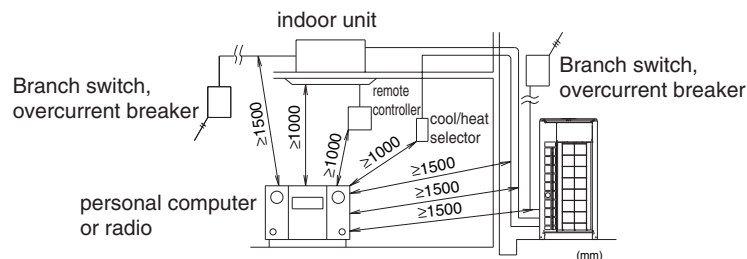


3. There is no danger of fire due to leakage of inflammable gas.
4. Ensure that water cannot cause any damage to the location in case it drips out the unit (e.g. in case of a blocked drain pipe).
5. The piping length between the outdoor unit and the indoor unit may not exceed the allowable piping length. (see "Example of connection")
6. Select the location of the unit in such a way that neither the discharged air nor the sound generated by the unit disturb anyone.
7. Make sure that the air inlet and outlet of the unit are not positioned towards the main wind direction. Frontal wind will disturb the operation of the unit. If necessary, use a windscreen to block the wind.



Caution

1. An inverter air conditioner may cause electronic noise generated from AM broadcasting. Examine where to install the main air conditioner and electric wires, keeping proper distances away from stereo equipment, personal computers, etc.

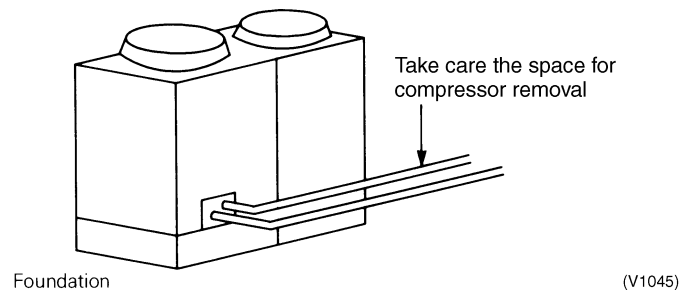


If the electric wave of AM broadcasting is particularly weak, keep distances of 3m or more and use conduit tubes for power and transmission lines.

2. In heavy snowfall areas, select an installation site where snow will not affect operation of the unit.
3. The refrigerant R410A itself is nontoxic, nonflammable and is safe. If the refrigerant should leak however, its concentration may exceed the allowable limit depending on room size. Due to this it could be necessary to take measures against leakage. Refer to the chapter "Caution for refrigerant leaks".
4. Do not install in the following locations.
 - Locations such as kitchens which contain a lot of mineral oil or steam in the atmosphere or where oil may splatter on the unit.
Resin parts may deteriorate, causing the unit to fall or leak.
 - Locations where sulfurous acids and other corrosive gases may be present in the atmosphere.
Copper piping and soldered joints may corrode, causing refrigerant to leak.
 - Locations where equipment that produces electromagnetic waves is found.
The electromagnetic waves may cause the control system to malfunction, preventing normal operation.
 - Locations where flammable gases may leak, where thinner, gasoline, and other volatile substances are handled, or where carbon dust and other incendiary substances are found in the atmosphere.
Leaked gas may accumulate around the unit, causing an explosion.

Service Space



It is extremely important that enough space is left when installing the equipment to allow routine servicing and maintenance to be carried out without undue hindrance. It is particularly important to bear in mind the work which will be required if the compressor needs to be replaced. (The layout of the pipework can sometimes cause considerable difficulties if the compressor needs to be changed.)

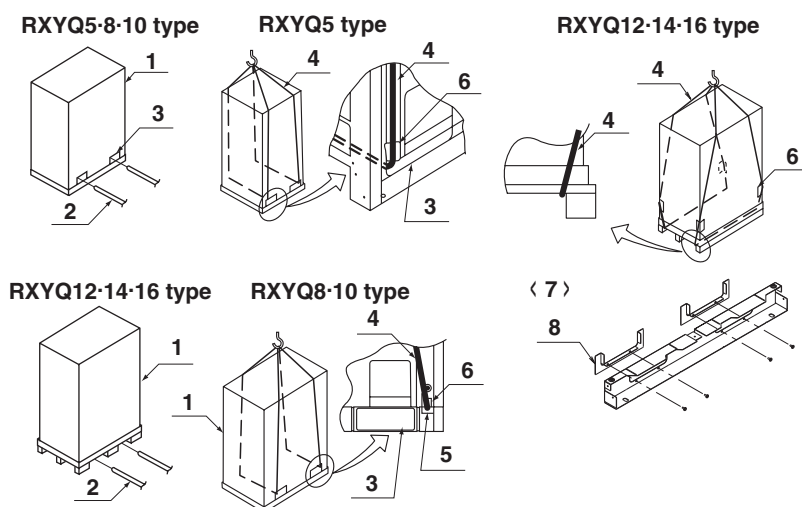


3.2.13 Inspecting and Handling the Unit

At delivery, the package should be checked and any damage should be reported immediately to the carrier claims agent.

When handling the unit, take into account the following:

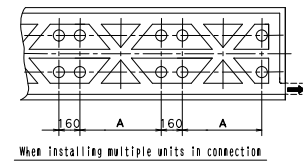
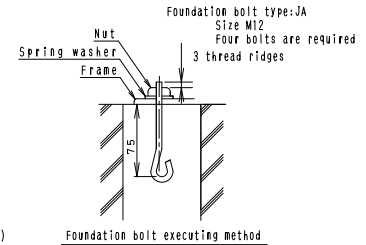
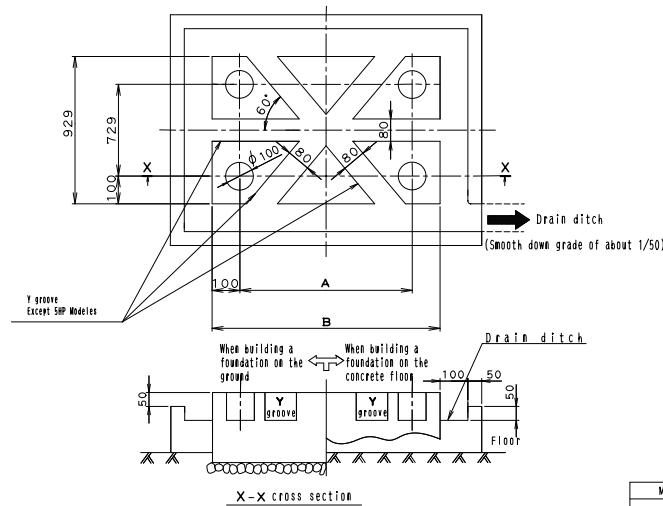
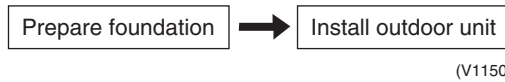
1.  Fragile, handle the unit with care.
2.  Keep the unit upright in order to avoid compressor damage.
2. Choose the path along which the unit is to be brought in ahead of time.
3. If a forklift is to be used, pass the forklift arms through the large openings on the bottom of the unit.
4. Lift the unit preferably with a crane and 2 belts of at least 8m long.
5. When lifting the unit with a crane, always use protectors to prevent belt damage and pay attention to the position of the unit's centre of gravity.
6. After installation, remove the transport clasps attached to the large openings.
7. Bring the unit as close to its final installation position in its original package to prevent damage during transport.



1. Packaging material
2. Forklift
3. Opening (Large)
4. Belt sling
5. Opening (Small) (40×30)
6. Wear plate
7. Removal of shipping brackets
8. Shipping bracket (Remove the screws.)

3.2.14 Installation of Outdoor Unit

■ Operational steps



Model		A	B
5HP	RXYQ5MY1B	497	697
8~10HP	RXYQ8~10MY1B REYQ8~10MY1B	792	992
12~14~16HP	RXYQ12~14~16MY1B REYQ12~14~16MY1B	1102	1302

3D040102A

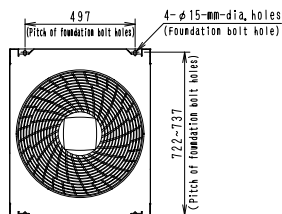


Notes:

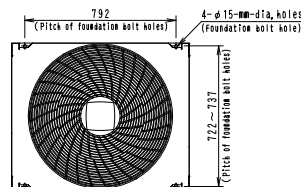
1. The proportions of cement : sand : gravel for the concrete shall be 1 : 2 : 4, and ten reinforcement bars that their diameter are 10mm, (approx. 300mm intervals) shall be placed.
2. The surface shall be finished with mortar. The corner edges shall be chamfered.
3. When the foundation is built on a concrete floor, rubble is not necessary. However, the surface of the section on which the foundation is built shall have rough finish.
4. A drain ditch shall be made around the foundation to thoroughly drain water from the equipment installation area.
5. When installing the equipment on a roof, the floor strength shall be checked, and water-proofing measures shall be taken.
6. Y groove unnecessary for 5HP Models.

■ Bolt pitch

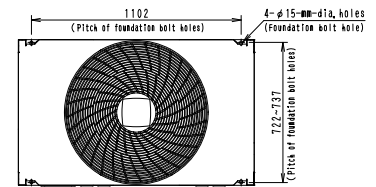
RXYQ5MY1B



RXYQ8, 10MY1B



RXYQ12~16MY1B



■ Caution in installation

- Execute the installation work by checking the foundation strength and levelness to avoid any occurrence of vibration and noise.
Fix the unit tightly with foundation bolts. (Prepare 4 sets of M12 foundation bolts with proper nuts and washers.)
The proper length of the foundation bolts from the surface of the base is 20mm.

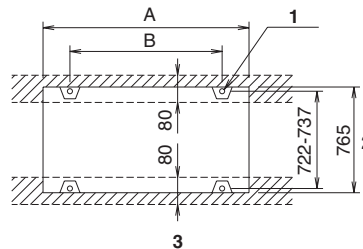
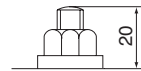


Caution

Install the unit securely in case of earthquake an typhoon, cyclone, hurricane or other strong wind. The unit may topple or cause another accident if improperly set up.

Unpacking and Placing the Unit

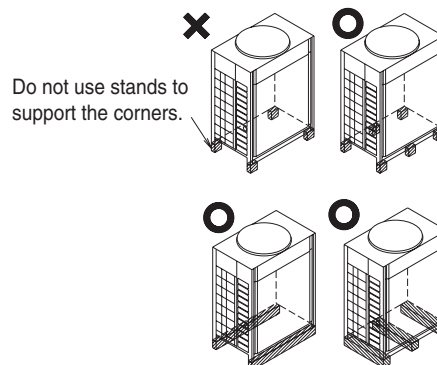
- Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise.
- Secure the unit to its base using foundation bolts. (Use four commercially available M12-type foundation bolts, nuts, and washers.)
- The foundation bolts should be inserted 20 mm.
- Make sure the base under the unit extended more than 765mm behind the unit.
- The height of the base should be at least 150mm from the floor.
- The unit must be installed on a solid longitudinal foundation (steel beam frame or concrete) as indicated in figure below.



- 1.Foundation bolt point (φ15 dia. : 4 positions)
- 2.Depth of product
- 3.Shape of indoor unit's support leg and foundation bolt positions

Model	A	B
Q5 type	635	497
Q8 · 10 type	930	792
Q12 · 14 · 16 type	1240	1102

Do not use stands to support the corners



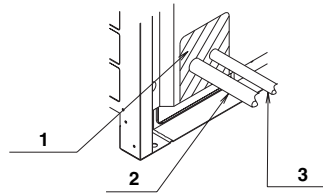
Caution

- Prepare a water drainage channel around the foundation to drain waste water from around the unit.
- If the unit is to be installed on a roof, check the strength of the roof and its drainage facilities first.
- If the unit is to be installed on a frame, install the waterproofing board within a distance of 150mm under the unit in order to prevent infiltration of water coming from under the unit.

[Precaution]

- When installing on a roof, make sure the roof floor is strong enough and be sure to water-proof all work.
- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation.
(Drain water is sometimes discharged from the outdoor unit when it is running.)
- Block all gaps in the holes for passing out piping and wiring using sealing material (locally procured).
(Small animals may enter the machine.)

Ex: passing piping out through the front



1. Plug the areas marked with "■".
(When the piping is routed from the front panel.)
2. Gas side piping
3. Liquid side piping



Caution Caution label

To the installer

<p>How to remove the front panel</p> <p>① Remove the screws.</p> <p>For 8 & 10 TYPE</p>	<p>② Keep pressing the front panel with your hands and slide the panel downward. (The panel stops by the stopper.)</p> <p>③ Pull the casing forward with your hands and slide the panel downward.</p> <p>For 5 & 12 to 16 TYPE</p>
<p>How to mount the front panel</p> <p>① Mount the front panel leaving some clearance at the upper part and hook the panel to the stopper.</p> <p>② Lift the panel and set the hole position.</p> <p>For 8 & 10 TYPE</p>	<p>③ Fasten the screws.</p> <p>For 5 & 12 to 16 TYPE</p>
<p>How to remove the transport fixtures</p> <p>After the unit is installed, remove the transport fixture mounted on the opening (large).</p>	

3P115922

⚠ Attention in installation of EL,COMP,BOX COVER

- Please install it, In the back side lower part and pasting up seal materials power supply terminal block compromise, and not to stop. (Right fig. reference)
- In the case of 8,10TYPE please install a cover before installation of an ex-board (a bottom). (There is the fear that seal materials come close)

<EL,COMP,BOX cross section(The left side)>

4P115178

4. Test Operation

4.1 Procedure and Outline

Follow the following procedure to conduct the initial test operation after installation.

4.1.1 Check work prior to turn power supply on

Check the below items.

- Power wiring
- Control transmission wiring between units
- Earth wire



Check on refrigerant piping



Check on amount of refrigerant charge

- Is the wiring performed as specified?
- Are the designated wires used?
- Is the grounding work completed?
 - Use a 500V megger tester to measure the insulation.
 - Do not use a megger tester for other circuits than 200V (or 240v) circuit.
- Are the setscrews of wiring not loose?
- Is pipe size proper? (The design pressure of this product is 3.8MPa.)
- Are pipe insulation materials installed securely?
 - Liquid and gas pipes need to be insulated. (Otherwise causes water leak.)
- Are respective stop valves on liquid, gas and oil equalizing lines securely open?
- Is refrigerant charged up to the specified amount?
 - If insufficient, charge the refrigerant from the service port of stop valve on the liquid side with outdoor unit in stop mode after turning power on.
- Has the amount of refrigerant charge been recorded on "Record Chart of Additional Refrigerant Charge Amount"?

(V3055)

4.1.2 Turn power on

Turn outdoor unit power on.



Carry out field setting on outdoor PC board



Turn indoor unit power on.

- Be sure to turn the power on 6 hours before starting operation to protect compressors. (to power on clankcase heater)
- For field settings, refer to "Field Settings" on and after P95.
 - After the completion of field settings, set to "Setting mode 1".

(V3056)

4.1.3 Check Operation

- * During check operation, mount front panel to avoid the misjudging.
- * Check operation is mandatory for normal unit operation.
(When the check operation is not executed, alarm code "U3" will be displayed.)

Press and hold the TEST OPERATION button (BS4) on outdoor unit PC board for 5 seconds.



Check on operation

○ The test operation is started automatically.

The following judgements are conducted within 15 minutes.

- "Check for wrong wiring"
- "Check refrigerant for over charge"
- "Check stop valve for not open"
- Pipe length automatic judgement

The following indications are conducted while in test operation.

- LED lamp on outdoor unit PC board — H2P flickers (test operation)
- Remote controller — Indicates "On Centralized Control" on upper right.
Indicates "Test Operation" on lower left

(V3057)

On completion of test operation, LED on outdoor unit PC board displays the following.

H3P ON: Normal completion

H2P and H3P ON: Abnormal completion → Check the indoor unit remote controller for abnormal display and correct it.

In the case of multi-outdoor-unit system, make setting on the master unit PC board. (Setting with the slave unit is disabled.)

[LED display in the case of multi-outdoor-unit system] (Same as that in emergency operation)

- * Discriminate the operating status of the master unit/slave units through the following LED display.

LED display (○:ON ●:OFF ◐:Blink)

H1P — — — H7P H8P

Master: ● ● ○ ● ● ● ● ○

Slave 1: ● ● ● ● ● ● ● ◐

Slave 2: ● ● ● ● ● ● ● ●

(Factory set)

Malfunction code

In case of an alarm code displayed on remote controller:

Cause of trouble due to faulty installation work	Alarm code	Countermeasure
Closed stop valve of outdoor unit	E3 E4 F3 UF	In case of RXYQ5 to 16M (Single outdoor installation) Liquid side stop valve : Open Gas side stop valve : Open Oil equalizing pipe stop valve : Close In case of RXYQ18 to 48M (Multi outdoor installation) Liquid side stop valve : Open Gas side stop valve : Open Oil equalizing pipe stop valve : Open
Reversed phase in power cable connection for outdoor unit	U1	Change connection of two wires among three for correct phasing.
Electric power for outdoor or indoor unit is not supplied. (Including open phase)	U4	Check that the power cable for outdoor unit is connected properly.
Incorrect wiring between units	UF	Check that the wiring between units corresponds correctly to refrigerant piping system.
Refrigerant overcharge	E3 F6 UF	Compute again optimum amount of refrigerant to be added based on the piping length, then, collect the excessive amount by using refrigerant collector to make the refrigerant amount proper.
Insufficient refrigerant	E4 F3	- Check that additional charging has been carried out. - Compute again the refrigerant amount to be added based on the piping length, and charge proper amount of refrigerant additionally.

4.1.4 Confirmation on normal operation

- Conduct normal unit operation after the check operation has been completed.
(When outdoor air temperature is 24°C or higher, the unit can not be operated with heating mode. See the instruction manual attached.)
Confirm that the indoor/outdoor units can be operated normally.
(When an abnormal noise due to liquid compression by the compressor can be heard, stop the unit immediately, and turn on the crankcase heater to heat up it sufficiently, then start operation again.)
- Operate indoor unit one by one to check that the corresponding outdoor unit operates.
- Confirm that the indoor unit discharges cold air (or warm air).
- Operate the air direction control button and flow rate control button to check the function of the devices.

4.2 Operation When Power is Turned On

4.2.1 When Turning On Power First Time

The unit cannot be run for up to 12 minutes to automatically set the master power and address (indoor-outdoor address, etc.).

Status

Outdoor unit

Test lamp H2P Blinks

Can also be set during operation described above.

Indoor unit

If ON button is pushed during operation described above, the "UH" malfunction indicator blinks. (Returns to normal when automatic setting is complete.)

4.2.2 When Turning On Power The Second Time and Subsequent

Tap the RESET button on the outdoor unit PC board. Operation becomes possible for about 2 minutes. If you do not push the RESET button, the unit cannot be run for up to 10 minutes to automatically set master power.

Status

Outdoor unit

Test lamp H2P Blinks

Can also be set during operation described above.

Indoor unit

If ON button is pushed during operation described above, the operation lamp lights but the compressor does not operate. (Returns to normal when automatic setting is complete.)

4.2.3 When an Indoor Unit or Outdoor unit Has Been Added, or Indoor or Outdoor Unit PC Board Has Been Changed

Be sure to push and hold the RESET button for 5 seconds. If not, the addition cannot be recognized. In this case, the unit cannot be run for up to 12 minutes to automatically set the address (indoor-outdoor address, etc.)

Status

Outdoor unit

Test lamp H2P ON

Can also be set during operation described above.

Indoor unit

If ON button is pushed during operation described above, the "UH" or "U4" malfunction indicator blinks. (Returns to normal when automatic setting is complete.)

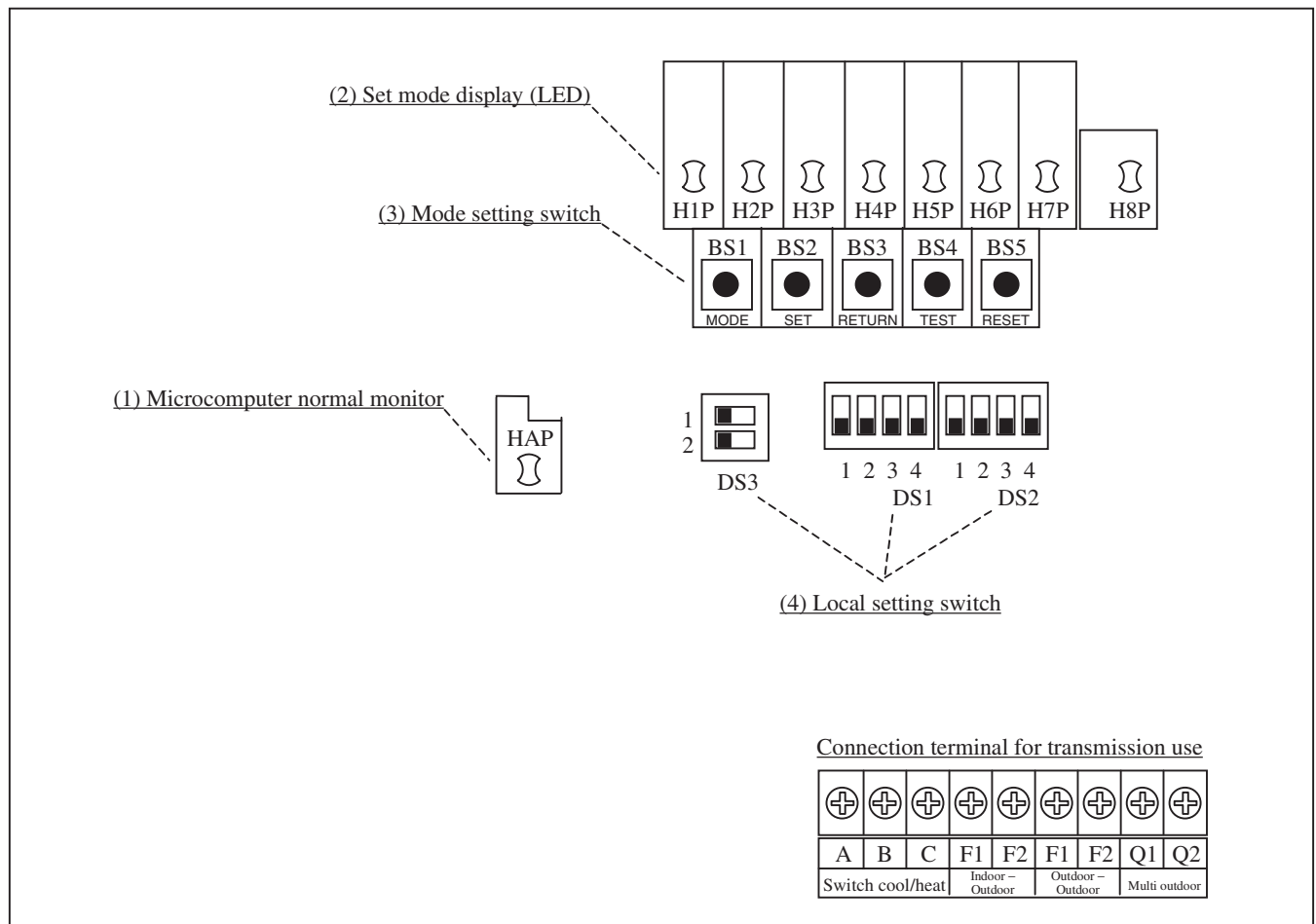


Caution When the 400 volt power supply is applied to "N" phase by mistake, replace Inverter P.C.B (A2P) and control transformer (T1R, T2R) in switch box together.

(V0847)

4.3 Outdoor Unit PC Board Layout

Outdoor unit PC board



(V3054)

- (1) Microcomputer normal monitor
This monitor blinks while in normal operation, and turns on or off when a malfunction occurs.
- (2) Set mode display (LED)
LEDs display mode according to the setting.
- (3) Mode setting switch
Used to change mode.
- (4) Local setting switch
Used to make local settings.

4.4 Field Setting

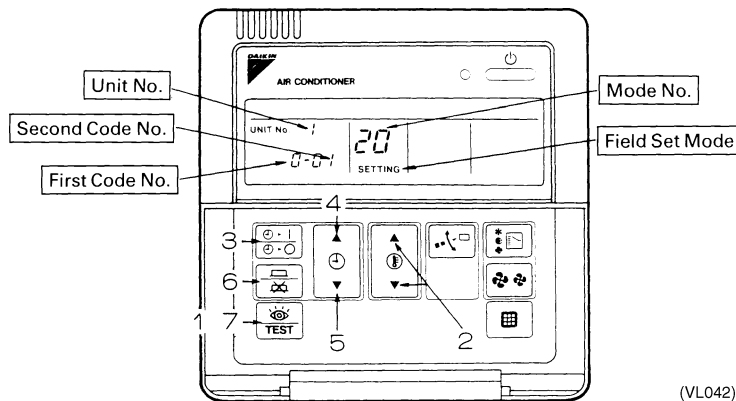
4.4.1 Field Setting from Remote Controller

Individual function of indoor unit can be changed from the remote controller. At the time of installation or after service inspection / repair, make the local setting in accordance with the following description.

Wrong setting may cause malfunction.

(When optional accessory is mounted on the indoor unit, setting for the indoor unit may be required to change. Refer to information in the option handbook.)

4.4.1.1 Wired Remote Controller <BRC1A61, 62>



(VL042)

1. When in the normal mode, push the button for 4 seconds or more, and operation then enters the "field set mode."
2. Select the desired "mode No." with the button.
3. During group control and you want to set by each individual indoor unit (when mode No. 20, 21, 22, 23, 25 has been selected), push the time mode button and select the "indoor unit No." to be set.

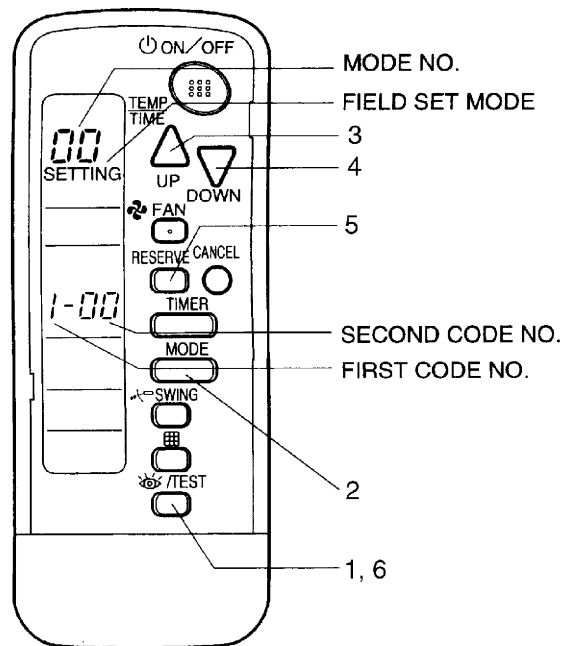
Note: This operation is not required when setting as a group.

4. Push the button and select the first code No.
5. Push the button and select the second code No.
6. Push the timer button one time and "define" the currently set contents.
7. Push the button to return to the normal mode.

(Example)

When setting the filter sign time to "Filter Dirtiness-High" in all group unit setting, set the Mode No. to "10", Mode setting No. to "0" and setting position No. to "02".

4.4.1.2 Wireless Remote Controller - Indoor Unit BRC7C type



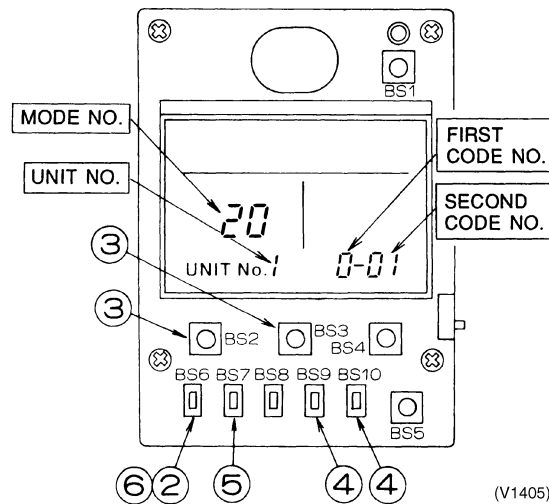
(V2770)

1. When in the normal mode, push the button for 4 seconds or more, and operation then enters the "field set mode."
2. Select the desired "mode No." with the button.
3. Pushing the button, select the first code No.
4. Pushing the button, select the second code No.
5. Push the timer button and check the settings.
6. Push the button to return to the normal mode.

(Example)

When setting the filter sign time to "Filter Dirtiness-High" in all group unit setting, set the Mode No. to "10", Mode setting No. to "0" and setting position No. to "02".

4.4.1.3 Simplified Remote Controller BRC2A51



■ Group No. setting by simplified remote controller.

1. Remove the cover of remote controller.
2. While in normal mode, press the [BS6] BUTTON (field set) to enter the FIELD SET MODE.
3. Select the mode No. [00] with [BS2] BUTTON (temperature setting ▲) and [BS3] BUTTON (temperature setting ▼).
4. Select the group No. with [BS9] BUTTON (set A) and [BS10] BUTTON (set B). (Group Nos. increase in the order of 1-00, 1-01.....1-15, 2-00,.....4-15. However, the unified ON/OFF controller displays only group No. set within the range of control.)
5. Press [BS7] BUTTON (set/cancel) to set group No.
6. Press [BS6] BUTTON (field set) to return to the NORMAL MODE.

4.4.1.4 Setting Contents and Code No. – VRV Unit

VRV system indoor unit settings	Mode No. Note 2	Setting Switch No.	Setting Contents		Second Code No.(Note 3)							
					01		02		03		04	
10(20)	0		Filter contamination heavy/light (Setting for display time to clean air filter) (Sets display time to clean air filter to half when there is heavy filter contamination.)	Super long life filter	Light	Approx. 10,000 hrs.	Heavy	Approx. 5,000 hrs.	—		—	
				Long life filter		Approx. 2,500 hrs.		Approx. 1,250 hrs.				
				Standard filter		Approx. 200 hrs.		Approx. 100 hrs.				
	1		Long life filter type		Long life filter		Super long life filter		—		—	
	2		Thermostat sensor in remote controller		Use		No use		—		—	
	3		Display time to clean air filter calculation (Set when filter sign is not to be displayed.)		Display		No display		—		—	
	12(22)	0	Optional accessories output selection (field selection of output for adaptor for wiring)		Indoor unit turned ON by thermostat				Operation output		Malfunction output	
		1	ON/OFF input from outside (Set when ON/OFF is to be controlled from outside.)		Forced OFF		ON/OFF control		—		—	
		2	Thermostat differential changeover (Set when remote sensor is to be used.)		1°C		0.5°C		—		—	
		3	OFF by thermostat fan speed		LL		Set fan speed		—		—	
		4	Automatic mode differential (automatic temperature differential setting for VRV system heat recovery series cool/heat)		01:0	02:1	03:2	04:3	05:4	06:5	07:6	08:7
		5	Power failure automatic reset		Not equipped		Equipped		—		—	
	13(23)	0	High air outlet velocity (Set when installed in place with ceiling higher than 2.7 m.)		N		H		S		—	
		1	Selection of air flow direction (Set when a blocking pad kit has been installed.)		F (4 directions)		T (3 directions)		W (2 directions)		—	
		3	Air flow direction adjustment (Set at installation of decoration panel.)		Equipped		Not equipped				—	
		4	Field set air flow position setting		Draft prevention		Standard		Ceiling Soiling prevention		—	
		5	Field set fan speed selection (fan speed control by air discharge outlet for phase control)		Standard		Optional accessory 1		Optional accessory 2		—	
15(25)		1	Thermostat OFF excess humidity		Not equipped		Equipped		—		—	
		2	Direct duct connection (when the indoor unit and heat reclaim ventilation unit are connected by duct directly.) *Note 6		Not equipped		Equipped		—		—	
		3	Drain pump humidifier interlock selection		Not equipped		Equipped		—		—	
		5	Field set selection for individual ventilation setting by remote controller		Not equipped		Equipped		—		—	
		6	Field set selection for individual ventilation setting by remote controller		Not equipped		Equipped		—		—	

**Notes:**

- Settings are made simultaneously for the entire group, however, if you select the mode No. inside parentheses, you can also set by each individual unit. Setting changes however cannot be checked except in the individual mode for those in parentheses.
- The mode numbers inside parentheses cannot be used by wireless remote controllers, so they cannot be set individually. Setting changes also cannot be checked.
- Marked are factory set.
- Do not make settings other than those described above. Nothing is displayed for functions the indoor unit is not equipped with.
- “88” may be displayed to indicate the remote controller is resetting when returning to the normal mode.
- If the setting mode to “Equipped”, heat reclaim ventilation fan conducts the fan residual operation by linking to indoor unit.

4.4.1.5 Applicable Range of Field setting

	Ceiling mounted cassette type			Ceiling mounted built-in type	Ceiling mounted duct type	Ceiling suspended type	Wall mounted type	Floor standing type	Concealed Floor standing type
	Multi flow	Double flow	Corner type						
	FXFQ	FXCQ	FXKQ	FXSQ	FXMQ	FXHQ	FXAQ	FXLQ	FXNQ
Filter sign	○	○	○	○	○	○	○	○	○
Ultra long life filter sign	○	○	—	—	—	—	—	—	—
Remote controller thermostat sensor	○	○	○	○	○	○	○	○	○
Set fan speed when thermostat OFF	○	○	○	○	○	○	○	○	○
Air flow adjustment Ceiling height	○	—	—	—	—	○	—	—	—
Air flow direction	○	—	—	—	—	—	—	—	—
Air flow direction adjustment (Down flow operation)	—	—	○	—	—	—	—	—	—
Air flow direction adjustment range	○	○	○	—	—	—	—	—	—
Field set fan speed selection	○	—	—	—	—	○	—	—	—

4.4.1.6 Detailed Explanation of Setting Modes

Filter Sign Setting

If switching the filter sign ON time, set as given in the table below.

Set Time

Setting	Filter Specs.	Standard	Long Life	Ultra Long Life Filter
Contamination Light		200 hrs.	2,500 hrs.	10,000 hrs.
Contamination Heavy		100 hrs.	1,250 hrs.	5,000 hrs.

Ultra-Long-Life Filter Sign Setting

When a Ultra-long-life filter is installed, the filter sign timer setting must be changed.

Setting Table

Mode No.	Setting Switch No.	Setting Position No.	Setting
10 (20)	1	01	Long-Life Filter
		02	Ultra-Long-Life Filter (1)
		03	—

Fan Speed Changeover When Thermostat is OFF

By setting to “Set Fan Speed,” you can switch the fan speed to the set fan speed when the heating thermostat is OFF.

* Since there is concern about draft if using “fan speed up when thermostat is OFF,” you should take the setup location into consideration.

Setting Table

Mode No.	First Code No.	Second Code No.	Setting
12(22)	3	01	LL Fan Speed
		02	Set Fan Speed

Auto Restart after Power Failure Reset

For the air conditioners with no setting for the function (same as factory setting), the units will be left in the stop condition when the power supply is reset automatically after power failure reset or the main power supply is turned on again after once turned off. However, for the air conditioners with the setting, the units may start automatically after power failure reset or the main power supply turned on again (return to the same operation condition as that of before power failure).

For the above reasons, when the unit is set enabling to utilize “Auto restart function after power failure reset”, utmost care should be paid for the occurrence of the following situation.



- Caution**
- 1. The air conditioner starts operation suddenly after power failure reset or the main power supply turned on again. Consequently, the user might be surprised (with question for the reason why).**
 - 2. In the service work, for example, turning off the main power switch during the unit is in operation, and turning on the switch again after the work is completed start the unit operation (the fan rotates).**

Air Flow Adjustment - Ceiling Height

Make the following setting according to the ceiling height. The setting position No. is set to "01" at the factory.

■ In the Case of FXAQ, FXHQ

Mode No.	Setting Switch No.	Setting Position No.	Setting
13(23)	0	01	Wall-mounted type : Standard
		02	Wall-mounted type : Slight increase
		03	Wall-mounted type : Normal increase

■ In the Case of FXFQ25~80

Mode No.	First code No.	Second code No.	Setting	Ceiling height		
				4-way Outlets	3-way Outlets	2-way Outlets
13 (23)	0	01	Standard (N)	Lower than 2.7 m	Lower than 3.0 m	Lower than 3.5 m
		02	High Ceiling (H)	Lower than 3.0 m	Lower than 3.3 m	Lower than 3.8 m
		03	Higher Ceiling (S)	Lower than 3.5 m	Lower than 3.5 m	—

■ In the Case of FXFQ100~125

Mode No.	First code No.	Second code No.	Setting	Ceiling height		
				4-way Outlets	3-way Outlets	2-way Outlets
13 (23)	0	01	Standard (N)	Lower than 3.2 m	Lower than 3.6 m	Lower than 4.2 m
		02	High Ceiling (H)	Lower than 3.6 m	Lower than 4.0 m	Lower than 4.2 m
		03	Higher Ceiling (S)	Lower than 4.2 m	Lower than 4.2 m	—

Air Flow Direction Setting

Set the air flow direction of indoor units as given in the table below. (Set when optional air outlet blocking pad has been installed.) The second code No. is factory set to "01."

Setting Table

Mode No.	First Code No.	Second Code No.	Setting
13 (23)	1	01	F : 4-direction air flow
		02	T : 3-direction air flow
		03	W : 2-direction air flow

Setting of Air Flow Direction Adjustment

Only the model FXKQ has the function.

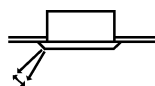
When only the front-flow is used, sets yes/no of the swing flap operation of down-flow.

Setting Table

Setting	Mode No.	First Code No.	Second Code No.
Down-flow operation: Yes	13 (23)	3	01
Down-flow operation: No			02

Setting of Air Flow Direction Adjustment Range

Make the following air flow direction setting according to the respective purpose.



(S2537)

Setting Table

Mode No.	First Code No.	Second Code No.	Setting
13 (23)	4	01	Upward (Draft prevention)
		02	Standard
		03	Downward (Ceiling soiling prevention)







Air Flow Rate Switching at Discharge Grille for Field Air Flow Rate Switching

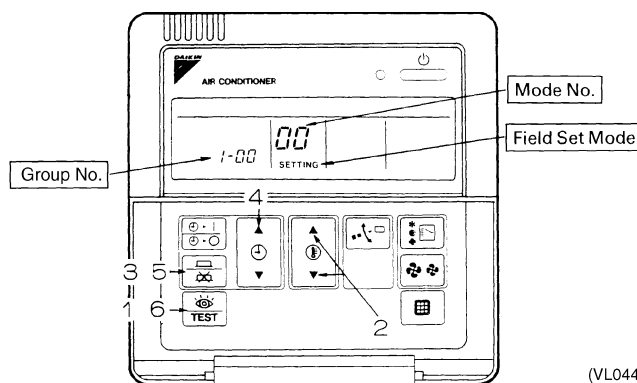
When the optional parts (high performance filter, etc.) is installed, sets to change fan speed for securing air flow rate.

Follow the instruction manual for the optional parts to enter the setting numbers.

4.4.1.7 Centralized Control Group No. Setting

BRC1A Type






- If carrying out centralized control by central remote controller or unified ON/OFF controller, group No. must be set for each group individually by remote controller.
 - Group No. setting by remote controller for centralized control
1. When in the normal mode, push the  button for 4 seconds or more, and operation then enters the “field setting mode.”
 2. Set mode No. “00” with the  button. *
 3. Push the  button to inspect the group No. display.
 4. Set the group No. for each group with the  button (The group No. increases in the manner of 1-00, 1-01, ..., 1-15, 2-00,...4-15. However, the unified ON/OFF controller displays only the group No. within the range selected by the switch for setting each address.)
 5. Push the timer  button to define the selected group No.
 6. Push the  button to return to the normal mode.



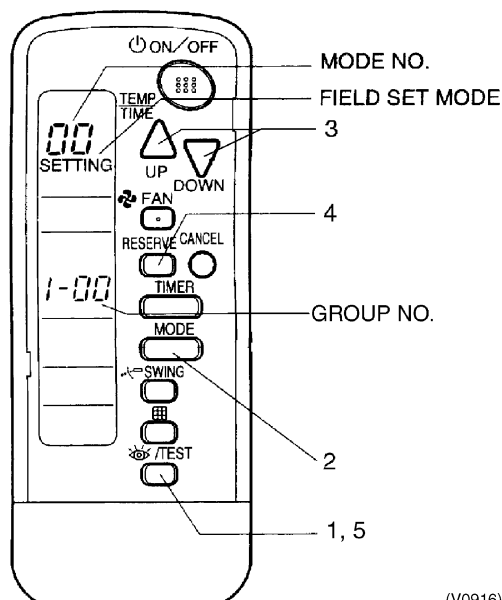
(VL044)

- Even if not using a remote controller, connect the remote controller when setting the group No., set the group No. for centralized control, and disconnect after making the setting.
- Set the group No. after turning on the power supply for the central remote controller, unified ON/OFF controller, and indoor unit.

BRC7C Type

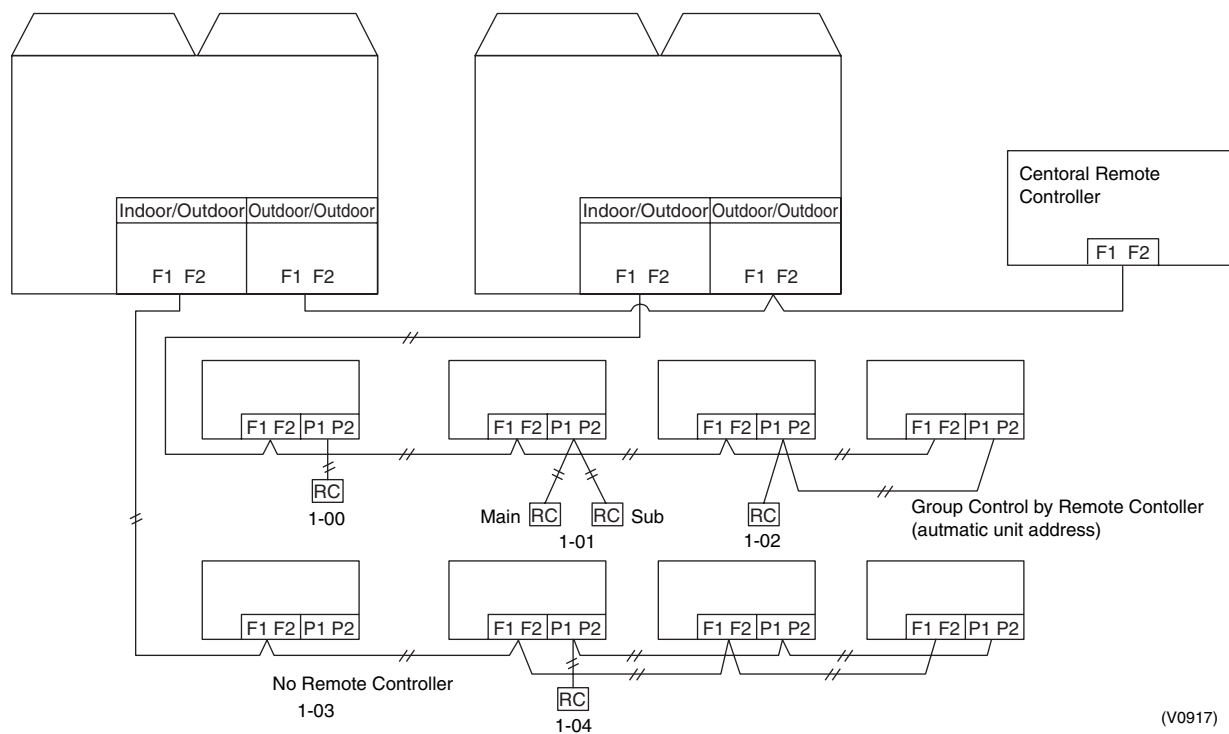
- Group No. setting by wireless remote controller for centralized control
1. When in the normal mode, push  button for 4 seconds or more, and operation then enters the “field set mode.”
 2. Set mode No. “00” with  button.
 3. Set the group No. for each group with  button (advance/backward).
 4. Enter the selected group numbers by pushing  button.
 5. Push  button and return to the normal mode.

BRC7C Type



(V0916)

Group No. Setting Example



Caution

When turning the power supply on, the unit may often not accept any operation while "88" is displaying after all indications were displayed once for about 1 minute on the liquid crystal display. This is not an operative fault.

4.4.1.8 Setting of Operation Control Mode from Remote Controller (Local Setting)

The operation control mode is compatible with a variety of controls and operations by limiting the functions of the operation remote controller. Furthermore, operations such as remote controller ON/OFF can be limited in accordance with the combination conditions. (Refer to information in the table below.)

Centralized controller is normally available for operations. (Except when centralized monitor is connected)

4.4.1.9 Contents of Control Modes

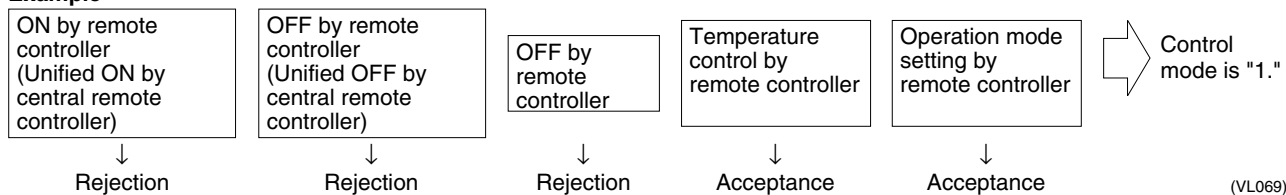
Twenty modes consisting of combinations of the following five operation modes with temperature and operation mode setting by remote controller can be set and displayed by operation modes 0 through 19.

- ◆ ON/OFF control impossible by remote controller
Used when you want to turn on/off by central remote controller only.
(Cannot be turned on/off by remote controller.)
- ◆ OFF control only possible by remote controller
Used when you want to turn on by central remote controller only, and off by remote controller only.
- ◆ Centralized
Used when you want to turn on by central remote controller only, and turn on/off freely by remote controller during set time.
- ◆ Individual
Used when you want to turn on/off by both central remote controller and remote controller.
- ◆ Timer operation possible by remote controller
Used when you want to turn on/off by remote controller during set time and you do not want to start operation by central remote controller when time of system start is programmed.

How to Select Operation Mode

Whether operation by remote controller will be possible or not for turning on/off, controlling temperature or setting operation mode is selected and decided by the operation mode given on the right edge of the table below.

Example

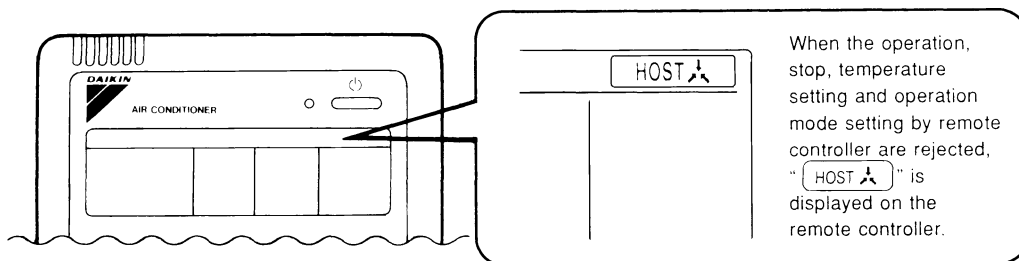


Control mode	Control by remote controller					Control mode
	Operation		OFF	Temperature control	Operation mode setting	
	Unified operation, individual operation by central remote controller, or operation controlled by timer	Unified OFF, individual stop by central remote controller, or timer stop				
ON/OFF control impossible by remote controller	Rejection (Example)	Rejection (Example)	Rejection (Example)	Rejection	Acceptance	0
					Rejection	10
				Acceptance (Example)	Acceptance (Example)	1(Example)
					Rejection	11
OFF control only possible by remote controller			Acceptance	Rejection	Acceptance	2
					Rejection	12
				Acceptance	Acceptance	3
					Rejection	13
Centralized	Acceptance			Rejection	Acceptance	4
					Rejection	14
				Acceptance	Acceptance	5
					Rejection	15
Individual		Acceptance		Rejection	Acceptance	6
					Rejection	16
				Acceptance	Acceptance	7 *1
					Rejection	17
Timer operation possible by remote controller	Acceptance (During timer at ON position only)	Acceptance (During timer at ON position only)		Rejection	Acceptance	8
					Rejection	18
				Acceptance	Acceptance	9
					Rejection	19

Do not select "timer operation possible by remote controller" if not using a remote controller.

Operation by timer is impossible in this case.

*1. Factory setting



(VL070)

4.4.2 Field Setting from Outdoor Unit

4.4.2.1 Field Setting from Outdoor Unit

■ Setting by dip switches

The following field settings are made by dip switches on PC board.

Dipswitch		Setting item	Description
No.	Setting		
DS1-1	ON	Cool / Heat select	Used to set cool / heat select by remote controller equipped with outdoor unit.
	OFF (Factory set)		
DS1-2 ~DS1-4	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		
DS2-1 ~4	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		
DS3-1, 2	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		

■ Setting by pushbutton switches

The following settings are made by pushbutton switches on PC board.

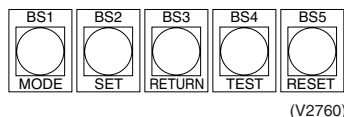
In case of multi-outdoor unit system, various items should be set with the master unit.

(Setting with the slave unit is disabled.)

The master unit and slave unit can be discriminated with the LED indication as shown below.

	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
Master unit	●	●	○	●	●	●	●	○
Slave unit 1	●	●	●	●	●	●	●	◐
Slave unit 2	●	●	●	●	●	●	●	●

(Factory setting)



There are the following three setting modes.

① **Setting mode 1 (H1P off)**

Initial status (when normal) : Used to select the cool/heat setting. Also indicates during “abnormal”, “low noise control” and “demand control”.

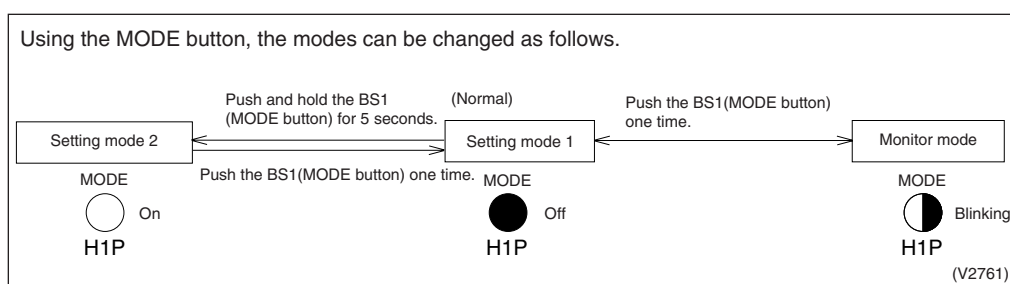
② **Setting mode 2 (H1P on)**

Used to modify the operating status and to set program addresses, etc. Usually used in servicing the system.

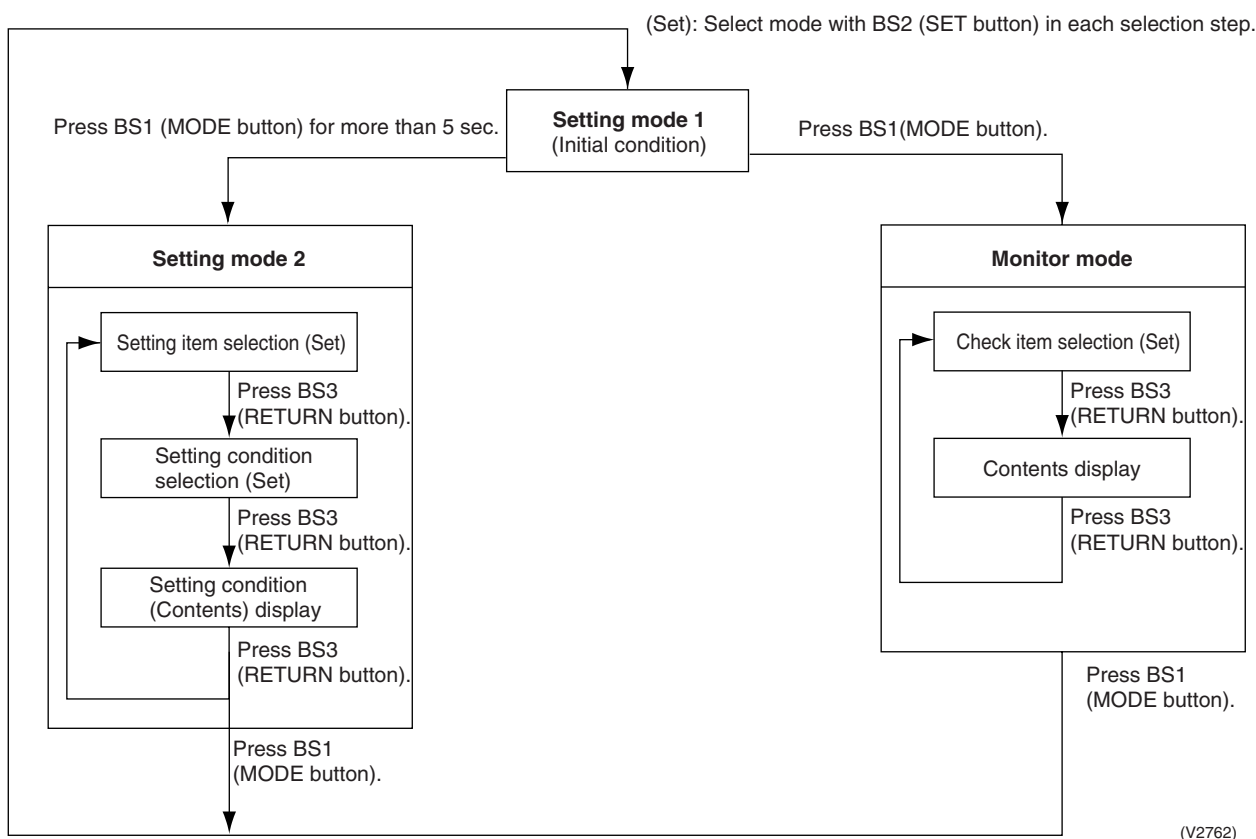
③ **Monitor mode (H1P blinks)**

Used to check the program made in Setting mode 2.

■ **Mode changing procedure**



■ **Mode changing procedure**



a. “Setting mode 1”

“Normally, “Setting mode 1” is set.
In case of other status, push MODE
button (BS1) one time and set to
“Setting mode 1”.

<Selection of setting items>

Push the SET button (BS2) and set
LED display to a setting item you
want.

- Regarding setting item No. 1,5,6,
only the present status is
displayed. For the respective
description, refer to the table
shown on lower right.
- The cool/heat selection setting can
be changed on setting item 2, 3, 4.
→ After setting, push the RETURN
button (BS3) and decide the
item.

When the RETURN button (BS3) is
pushed, the status becomes the initial
status of “Setting mode 1”.

(V2763)

No.	Setting (displaying) item	LED display example						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P
1	Display for malfunction / preparing / test run *	●	●	○	●	●	●	●
2	C/H selector (individual)	●	●	○	●	●	●	●
3	C/H selector (Master)	●	●	●	○	●	●	●
4	C/H selector (Slave)	●	●	●	●	○	●	●
5	Low noise operation *	●	●	○	●	●	●	●
6	Demand operation *	●	●	○	●	●	●	●

* Setting No. 1, 5, 6 are the present status display only.

Display for malfunction/preparing/test-run

Normal	●	●	○	●	●	●	●
Malfunction	●	○	○	●	●	●	●
Preparing/Test-run	●	●	○	●	●	●	●

Display during low noise operation

Normal	●	●	○	●	●	●	●
During low noise operation	●	●	○	●	●	○	●

H3P to H5P LED
display changes
depending on
setting No. 2, 3, 4.

Display during demand operation

Normal	●	●	○	●	●	●	●
During demand operation	●	●	○	●	●	●	○

H3P to H5P LED
display changes
depending on
setting No. 2, 3, 4.

○ : ON
● : OFF
◐ : Blinking

b. "Setting mode 2"

Push and hold the MODE button (BS1) for 5 seconds and set to "Setting mode 2".

<Selection of setting items>

Push the SET button (BS2) and set the LED display to a setting item shown in the table on the right.
↓
Push the RETURN button (BS3) and decide the item. (The present setting condition is blinked.)

<Selection of setting conditions>

Push the SET button (BS2) and set to the setting condition you want.
↓
Push the RETURN button (BS3) and decide the condition.

Push the RETURN button (BS3) and set to the initial status of "Setting mode 2".

* If you become unsure of how to proceed, push the MODE button (BS1) and return to setting mode 1.

(V2764)

No.	Setting item	Description
0	EMG (Emergency operation 1)	Operates by Standard compressor only when inverter compressor malfunctions. Temporary operation until the compressor is replaced. Since the comfortability is extremely deteriorated, immediately replace the compressor. (This setting is not applicable to RXYQ5M.)
1	Cool/heat unified address	Sets address for cool/heat unified operation.
2	Low noise/demand address	Address for low noise/demand operation
5	Indoor unit forced fan H	Allows forced operation of indoor unit fan while unit is stopped. (H tap)
6	Indoor unit forced operation	Allows forced operation of indoor unit.
8	Te setting	Target evaporation temperature for cooling
9	Tc setting	Target condensation temperature for heating
10	Defrost changeover setting	Changes the temperature condition for defrost and sets to quick defrost or slow defrost.
11	Sequential operation setting	Sets sequential operation
12	External low noise setting / Demand setting	Reception of external low noise or demand signal
13	AIRNET address	Set address for AIRNET.
18	High static pressure setting	Make this setting in the case of operating in high static pressure mode with diffuser duct mounted.
19	Emergency operation (STD compressor operation prohibited)	Used to operate system only with inverter compressor when STD compressor malfunctions. This is a temporary operation extremely impairing comfortable environment. Therefore, prompt replacement of the compressor is required. (This operation, however, is not set with RXYQ5M.)
20	Additional refrigerant charge operation setting	Carries out additional refrigerant charge operation.
21	Refrigerant collection mode setting	Sets to refrigerant collection mode.
22	Night-time low noise setting	Sets automatic nighttime low noise operation in a simple way. The operating time is based on "Starting set" and "Ending set".
25	Low noise setting	Sets low noise level when the low noise signal is input from outside.
26	Night-time low noise control starting setting	Sets starting time of nighttime low noise operation. (Nighttime low noise setting is also required.)
27	Night-time low noise control ending setting	Sets ending time of nighttime low noise operation. (Nighttime low noise setting is also required.)
28	Power transistor check mode *Check after disconnection of compressor wires	Used for trouble diagnosis of DC compressor. Since the waveform of inverter is output without wiring to the compressor, it is convenient to probe whether the trouble comes from the compressor or PC board.
29	Capacity precedence setting	If the capacity control is required, the low noise control is automatically released by this setting during carrying out low noise operation and nighttime low noise operation.
30	Demand setting 1	Changes target value of power consumption when demand control 1 is input.
32	Normal demand setting	Normally enables demand control 1 without external input. (Effective to prevent a problem that circuit breaker of small capacity is shut down due to large load.

No.	Setting item	Description
38	Emergency operation (Setting for the master unit operation prohibition in multi-outdoor-unit system)	Used to temporarily prohibit the applicable outdoor unit from operating should there be any faulty part in multi-outdoor-unit system. Since the comfortable environment is extremely impaired, prompt replacement of the part is required.
39	Emergency operation (Setting for the slave unit 1 operation prohibition in multi-outdoor-unit system)	
40	Emergency operation (Setting for the slave unit 2 operation prohibition in multi-outdoor-unit system)	

No.	Setting item display								Setting condition display	
	Setting item	MODE H1P	TEST H2P	C/H selection			Low noise H6P	Demand H7P		
				IND H3P	Master H4P	Slave H5P				* Factory set
0	EMG (emergency operation) INV compressor operation inhibited.	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Normal operation	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> *
									Emergency operation	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
1	Cool / Heat Unified address	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Address 0	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> *
									Binary number 1	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
									(6 digits)	~
									31	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
2	Low noise/demand address	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Address 0	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> *
									Binary number 1	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
									(6 digits)	~
									31	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
5	Indoor forced fan H	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Normal operation	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> *
									Indoor forced fan H	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
6	Indoor forced operation	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Normal operation	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> *
									Indoor forced operation	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
8	Te setting	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	High	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
									Normal (factory setting)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> *
									Low	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
9	Tc setting	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	High	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
									Normal (factory setting)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> *
									Low	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
10	Defrost setting	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Quick defrost	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
									Normal (factory setting)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> *
									Slow defrost	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
11	Sequential operation setting	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
									ON	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> *
12	External low noise/ demand setting	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	External low noise/demand: NO	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> *
									External low noise/demand: YES	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
13	Airnet address	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Address 0	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> *
									Binary number 1	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
									(6 digits)	~
									63	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
18	High static pressure setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	High static pressure setting: OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> *
									High static pressure setting: ON	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
19	Emergency operation (STD compressor is inhibited to operate.)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> *
									STD 1, 2 operation: Inhibited	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
									STD 2 operation: Inhibited	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
20	Additional refrigerant operation setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Refrigerant charging: OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> *
									Refrigerant charging: ON	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
21	Refrigerant recovery mode setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Refrigerant recovery: OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> *
									Refrigerant recovery: ON	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
22	Night-time low noise setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> *
									Level 1 (outdoor fan with 8 step or lower)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
									Level 2 (outdoor fan with 7 step or lower)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
									Level 3 (outdoor fan with 6 step or lower)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
25	Low noise setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Level 1 (outdoor fan with 8 step or lower)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
									Level 2 (outdoor fan with 7 step or lower)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> *
									Level 3 (outdoor fan with 6 step or lower) *	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>

No.	Setting item display								Setting condition display
	Setting item	MODE H1P	TEST H2P	C/H selection			Low noise H6P	Demand H7P	
				IND H3P	Master H4P	Slave H5P			* Factory set
26	Night-time low noise operation start setting	○	●	○	○	●	○	●	About 20:00 ○ ● ● ● ● ● ● ○
									About 22:00 (factory ○ ● ● ● ● ● ● ○ ● *
									About 24:00 ○ ● ● ● ● ○ ● ●
27	Night-time low noise operation end setting	○	●	○	○	●	○	○	About 6:00 ○ ● ● ● ● ● ● ○
									About 7:00 ○ ● ● ● ● ● ● ○ ●
									About 8:00 (factory setting) ○ ● ● ● ● ○ ● ● *
28	Power transistor check mode	○	●	○	○	○	●	●	OFF ○ ● ● ● ● ● ● ○ *
									ON ○ ● ● ● ● ● ○ ●
29	Capacity precedence setting	○	●	○	○	○	●	○	OFF ○ ● ● ● ● ● ● ○ *
									ON ○ ● ● ● ● ● ○ ●
30	Demand setting 1	○	●	○	○	○	○	●	60% demand ○ ● ● ● ● ● ● ○
									70% demand ○ ● ● ● ● ● ○ ● *
									80% demand ○ ● ● ● ● ○ ● ●
32	Continuous demand setting	○	○	●	●	●	●	●	OFF ○ ● ● ● ● ● ● ○ *
									ON ○ ● ● ● ● ● ○ ●
38	Emergency operation (Master unit with multi-outdoor-unit system is inhibited to operate.)	○	○	●	●	○	○	●	OFF ○ ● ● ● ● ● ● ○ *
									Master unit operation: Inhibited ○ ● ● ● ● ● ○ ●
39	Emergency operation (Slave unit 1 with multi-outdoor-unit system is inhibited to operate.)	○	○	●	●	○	○	○	OFF ○ ● ● ● ● ● ● ○ *
									Slave unit 1 operation: Inhibited ○ ● ● ● ● ● ○ ●
40	Emergency operation (Slave unit 2 with multi-outdoor-unit system is inhibited to operate.)	○	○	●	○	●	●	●	OFF ○ ● ● ● ● ● ● ○ *
									Slave unit 2 operation: Inhibited ○ ● ● ● ● ○ ● ●

c. Monitor mode

To enter the monitor mode, push the MODE button (BS1) when in "Setting mode 1".

<Selection of setting item>

Push the SET button (BS2) and set the LED display to a setting item.

<Confirmation on setting contents>

Push the RETURN button (BS3) to display different data of set items.

Push the RETURN button (BS3) and switches to the initial status of "Monitor mode".

* Push the MODE button (BS1) and returns to "Setting mode 1".

(V2765)

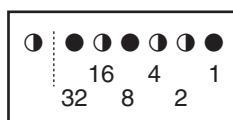
No.	Setting item	LED display							Data display
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	
0	Number of units for sequential starting, and others	●	●	●	●	●	●	●	See below
1	C/H unified address	●	●	●	●	●	●	○	Lower 6 digits
2	Low noise/demand address	●	●	●	●	●	○	●	
3	Not used	●	●	●	●	●	○	○	
4	Airnet address	●	●	●	●	○	●	●	
5	Number of connected indoor units	●	●	●	●	○	●	○	
6	Number of connected BS units	●	●	●	●	○	○	●	
7	Number of connected zone units (excluding outdoor and BS unit)	●	●	●	●	○	○	○	Lower 4 digits: upper
8	Number of outdoor units	●	●	●	○	●	●	●	
9	Number of connected BS units	●	●	●	○	●	●	○	Lower 4 digits: lower
10	Number of connected BS units	●	●	●	○	●	○	●	Lower 6 digits
11	Number of zone units (excluding outdoor and BS unit)	●	●	●	○	●	○	○	Lower 4 digits: upper
12	Number of terminal blocks	●	●	●	○	○	●	●	Lower 4 digits: lower
13	Number of terminal blocks	●	●	●	○	○	●	○	

Setting item 0 Display contents of "Number of units for sequential start, and others"

Number of units for sequential start	1 unit	●	●	●	●	●	●	●
	2 units	●	●	○	●	●	●	●
	3 units	●	●	○	●	●	●	●
EMG operation /backup operation setting	ON	●	●	●	○	●	●	●
	OFF	●	●	●	●	●	●	●
Defrost select setting	Short	●	●	●	●	○	●	●
	Medium	●	●	●	●	○	●	●
	Long	●	●	●	●	●	●	●
Te setting	H	●	●	●	●	●	○	●
	M	●	●	●	●	●	○	●
	L	●	●	●	●	●	●	●
Tc setting	H	●	●	●	●	●	●	○
	M	●	●	●	●	●	●	○
	L	●	●	●	●	●	●	●

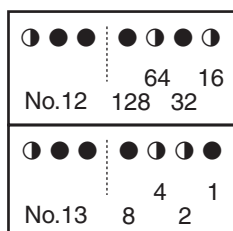
Push the SET button and match with the LEDs No. 1 - 15, push the RETURN button, and enter the data for each setting.

★ Data such as addresses and number of units is expressed as binary numbers; the two ways of expressing are as follows:



The No. 1 cool/heat unified address is expressed as a binary number consisting of the lower 6 digits. (0 - 63)

In ① the address is 010110 (binary number), which translates to $16 + 4 + 2 = 22$ (base 10 number). In other words, the address is 22.



The number of terminal blocks for No. 12 and 13 is expressed as an 8-digit binary number, which is the combination of four upper, and four lower digits for No. 12 and 13 respectively. (0 - 128)

In ② the address for No. 12 is 0101, the address for No. 13 is 0110, and the combination of the two is 01010110 (binary number), which translates to $64 + 16 + 4 + 2 = 86$ (base 10 number). In other words, the number of terminal block is 86.

★ See the preceding page for a list of data, etc. for No. 0 - 22.

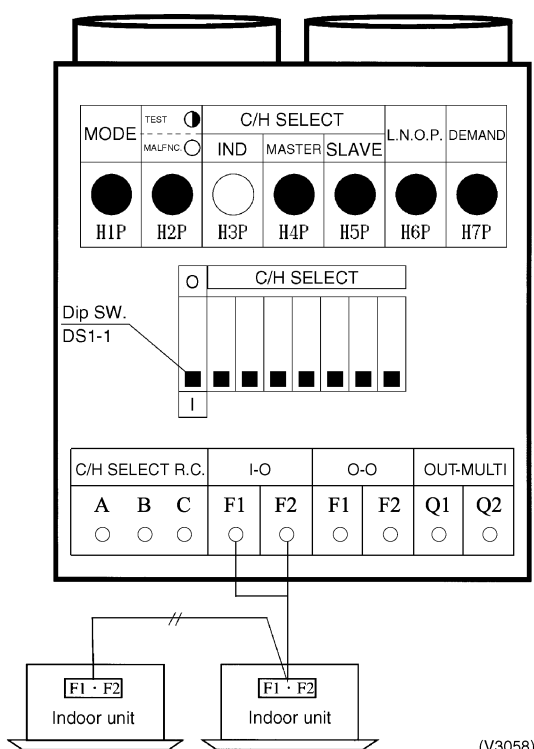
4.4.2.2 Cool / Heat Mode Switching

There are the following 5 cool/heat switching modes.

- ① Set cool/heat separately for each outdoor unit system by indoor unit remote controller.
- ② Set cool/heat separately for each outdoor unit system by cool/heat switching remote controller.
- ③ Set cool/heat for more than one outdoor unit system simultaneously in accordance with unified master outdoor unit by indoor unit remote controller.
- ④ Set cool/heat for more than one outdoor unit system simultaneously in accordance with unified master outdoor unit by cool/heat switching remote controller.

① **Set Cool/Heat Separately for Each Outdoor System by Indoor Unit Remote Controller**

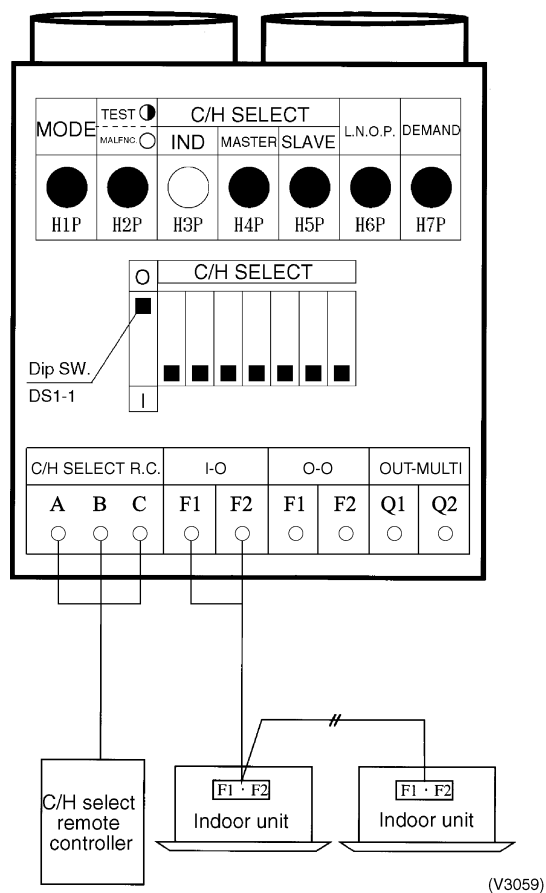
- ◆ It does not matter whether or not there is outdoor - outdoor unit wiring.
- ◆ Set outdoor unit PC board DS1-1 to "indoor" (factory set).
- ◆ Set cool/heat switching to "individual" for "Setting mode 1" (factory set).



(V3058)

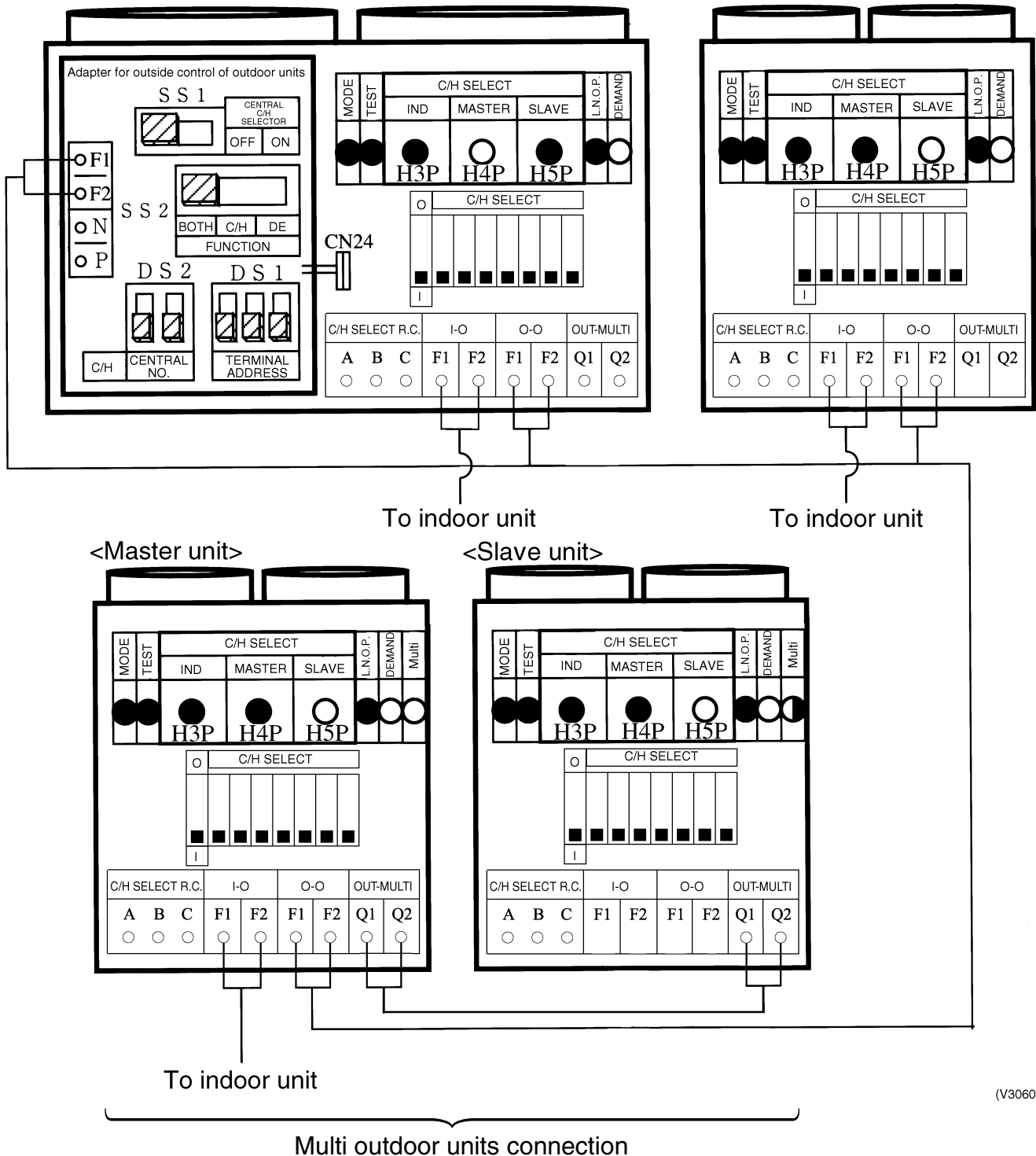
② Set Cool / Heat Separately for Each Outdoor Unit System by Cool/Heat Switching Remote Controller

- ◆ It does not matter whether or not there is outdoor - outdoor unit wiring.
- ◆ Set outdoor unit PC board DS1-1 to "outdoor" (factory set).
- ◆ Set cool/heat switching to "individual" for "Setting mode 1" (factory set).



③ Set Cool / Heat for More Than One Outdoor Unit System Simultaneously in Accordance with Unified Master Outdoor Unit by Indoor Unit Remote Controller

- ◆ Install the outdoor unit external control adapter on either the outdoor-outdoor, indoor-outdoor, or transmission line.
- ◆ Set outdoor unit PC board DS1-1 to "Indoor" (factory set).
- ◆ In setting mode 1, set the outdoor unit you want to give cool/heat selection permission to as the group master, and set the other outdoor units as group slave units.
- ◆ Set the outdoor unit external control adapter SS1 to Unified (factory set) or Cool, and SS2 to No (factory set).



(V3060)

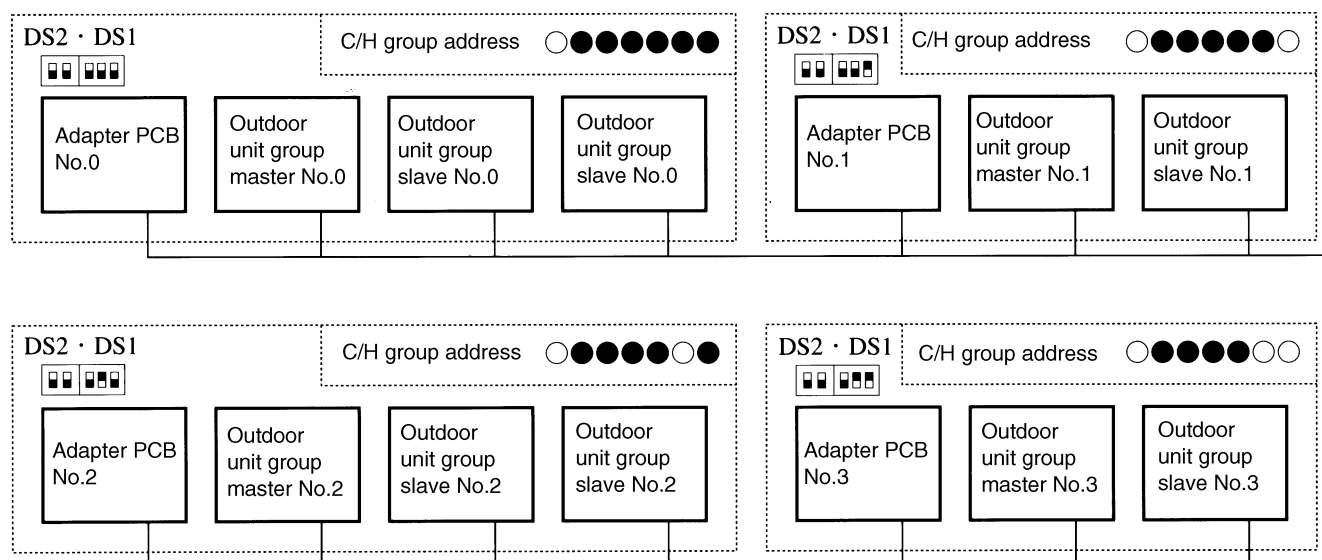
④ **Set Cool / Heat for More Than One Outdoor Unit System Simultaneously in Accordance with Unified Master Outdoor Unit by Cool/Heat Switching Remote Controller**

◆ Add and change the following items to ③.

- ★ Install cool/heat switching remote controller on the group master outdoor unit.
- ★ Set SS1 on the group master outdoor unit PC board.


















































Supplementation on ③ and ④.

When switching cool/heat for each adapter PC board with the use of more than one adapter PC board, set the address of the adapter PC board DS1 and DS2 so that it matches the unified cool/heat address of outdoor unit PC board.



(V2723)

Address setting for ③ and ④ (Set lower 5 digits with binary number.) [No.0 to No.31]

Address No.	Outdoor unit PCB LED Set with setting mode 2		Adapter PCB	
			DS2	DS1
No 0	 	0	 	   0
No 1	 	1	 	   1
No 2	 	2	 	   2
No 3	 	3	 	   3
No 4	 	4	 	   4
}	}		}	
No 30	 	30	 	   30
No 31	 	31	 	   31

○ ON

● OFF



Upper position (ON)



lower position (OFF)

(The shaded part shows knob)

(V2724)

4.4.2.3 Setting of Low Noise Operation and Demand Operation

Setting of Low Noise Operation

By connecting the external contact input to the low noise input of the outdoor unit external control adapter (optional), you can lower operating noise by 2-3 dB.

A. When the low noise operation is carried out by external instructions (with the use of the outdoor unit external control adapter)

1. Set "External low noise / Demand YES/NO setting" to "External low noise / Demand YES". (Set by Setting Mode 2)
2. Set "External low noise level setting" on the outdoor unit PC board, as the need arises. (Lower noise operation can be carried out by "Mode 2" than by "Mode 1", and by "Mode 3" than by "Mode 2".)
3. Set "Capacity precedence setting" on the outdoor unit PC board, as the need arises. (If set to "ON", when air conditioning load gets higher, the low noise instructions are neglected to switch to normal operation.) (Set by Setting Mode 2)

B. When the low noise operation is carried out automatically at night (The outdoor unit external control adapter is not required)

1. Set "Night-time low noise setting" on the outdoor unit PC board. (Set by Setting Mode 2) (Lower noise operation can be carried out by "Mode 2" than by "Mode 1", and by "Mode 3" than by "Mode 2".)
2. Set "Night-time low noise start setting" on the outdoor unit PC board, as the need arises. (Set by Setting Mode 2) (Since the time is presumed in accordance with the outdoor temperature, the starting time is a target only.)
3. Set "Night-time low noise end setting" on the outdoor unit PC board, as the need arises. (Set by Setting Mode 2) (Since the time is presumed in accordance with the outdoor temperature, the ending time is a target only.)
4. Set "Capacity precedence setting" on the outdoor unit PC board, as the need arises. (Set by Setting Mode 2) (If set to "ON", when air conditioning load gets higher, the status is switched to normal operation even at night.)

Image of operation in the case of A

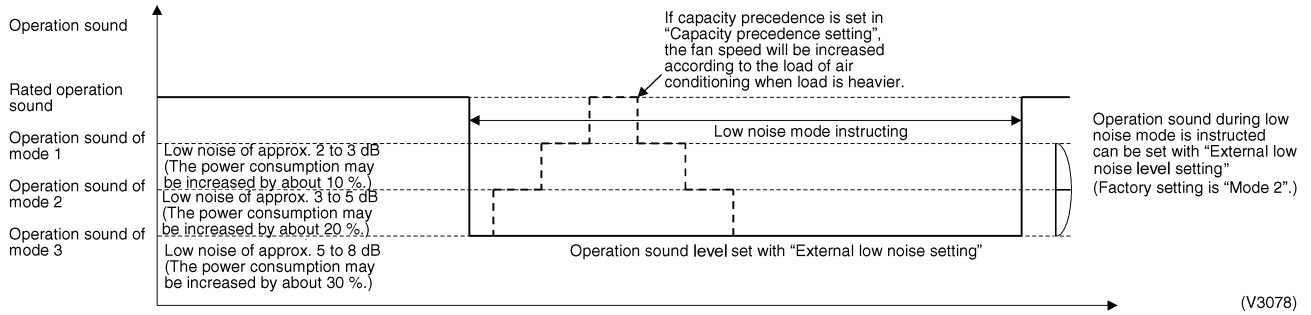


Image of operation in the case of B

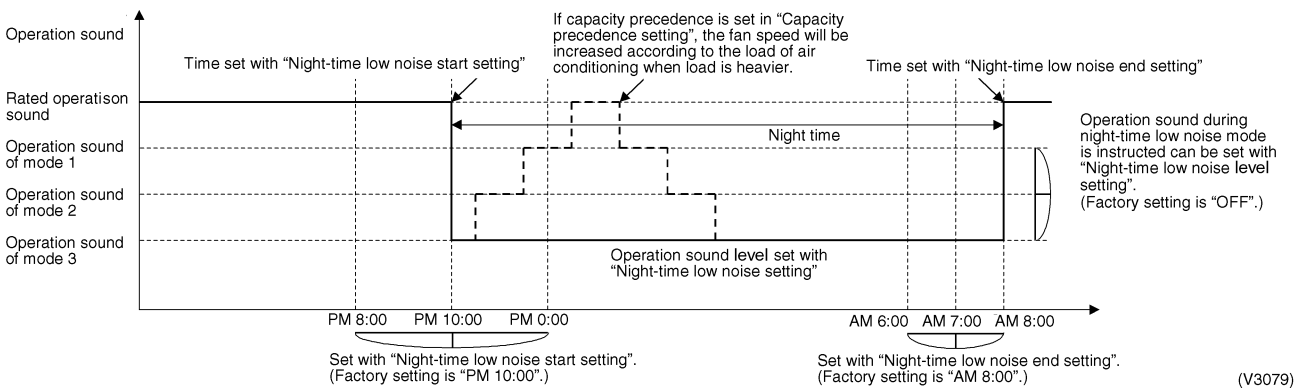
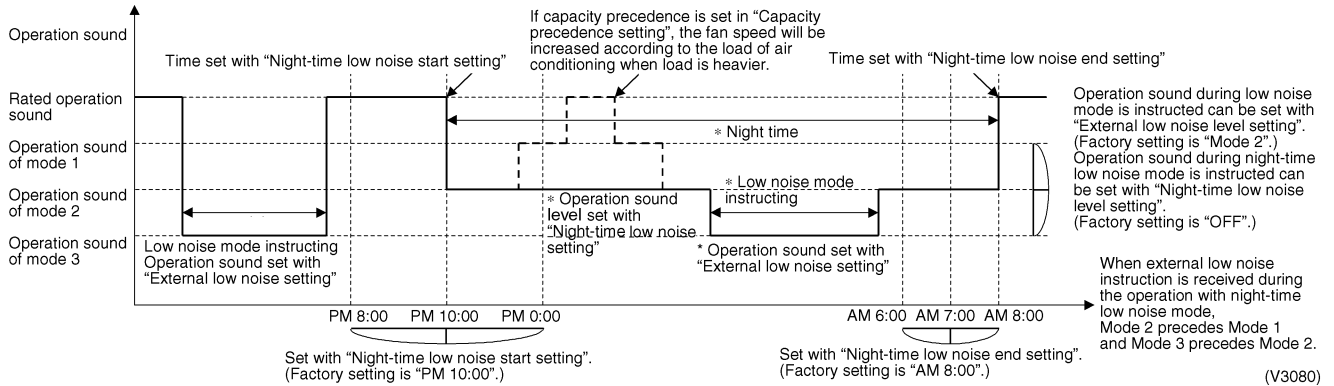


Image of operation in the case of A, B



**Setting of
Demand
Operation**

By connecting the external contact input to the demand input of the outdoor unit external control adapter (optional), the power consumption of unit operation can be saved suppressing the compressor operating condition.

A. When the demand operation is carried out by external instructions (with the use of the outdoor unit external control adapter).

- Set the "External low noise/Demand YES/NO setting" switch on the outdoor unit PCB to the "External low noise/Demand YES".
(Set by Setting Mode 2)
- Set the "Demand 1 level setting" on the outdoor unit PCB, as the need arises.
(During the demand level 1 instruction, the power consumption can be saved to 80%, 70% or 60% of the rated value respectively.)

B. When the continuous demand operation is carried out. (Use of the outdoor unit external control adapter is not required.)

- Set the "Continuous demand setting" on the outdoor unit PCB.
- If the "Continuous demand setting" is set to the "Continuous demand 1 fixing", set the "Demand 1 setting" on the outdoor unit PCB, as the need arises.
(During the continuous demand level 1 operation, the power consumption can be saved to 80%, 70% or 60% of the rated value respectively.)

Image of operation in the case of A

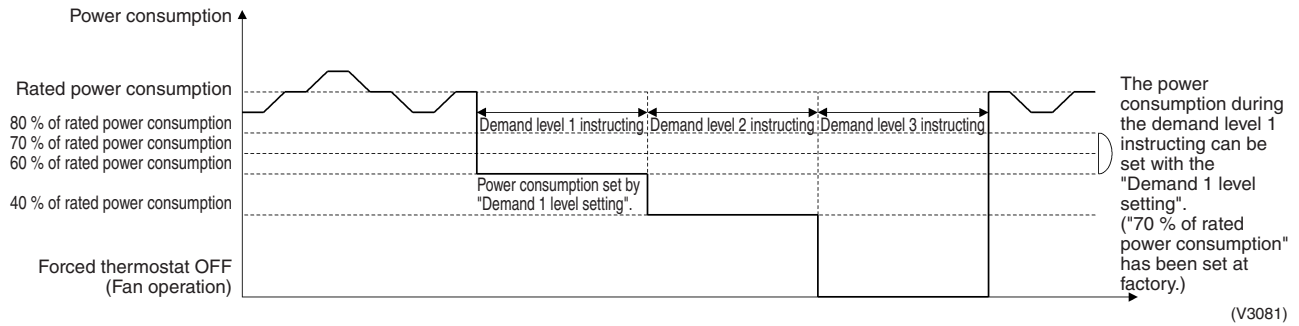


Image of operation in the case of B

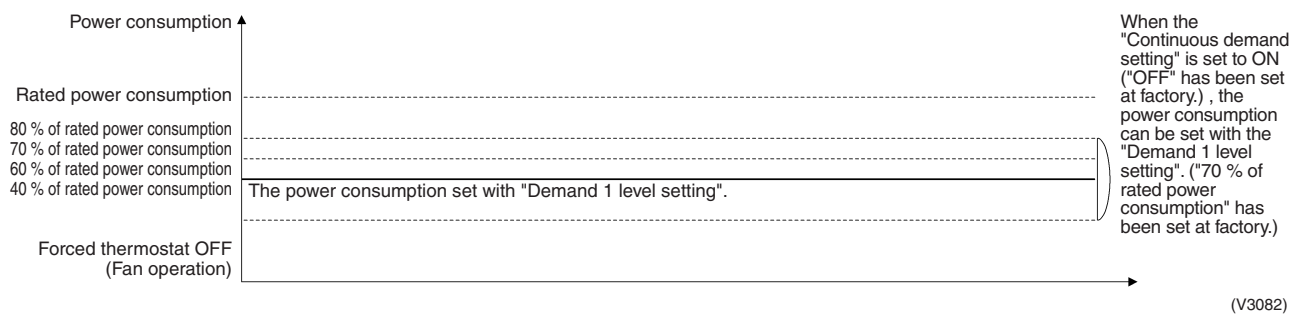
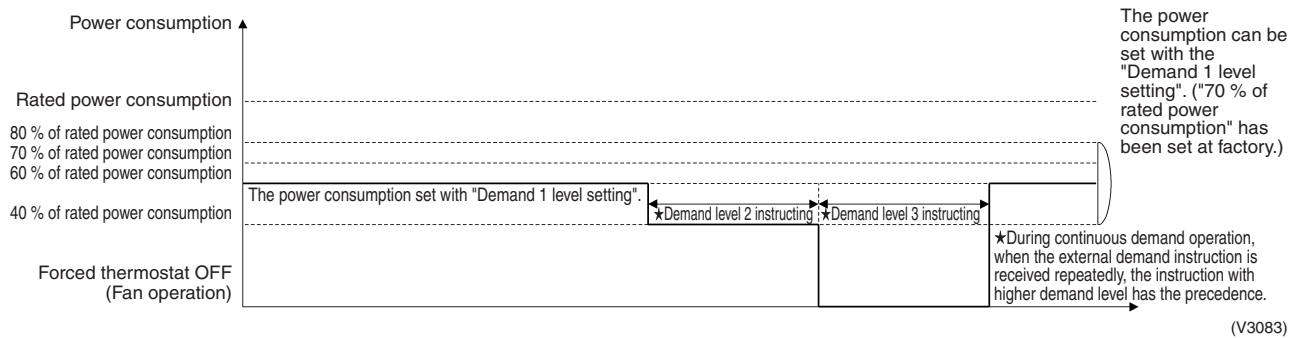


Image of operation in the case of A and B




**Detailed Setting
Procedure of Low
Noise Operation
and Demand
Control****1. Setting mode 1 (H1P off)**


- ① In setting mode 2, push the BS1 (MODE button) one time. → Setting mode 2 is entered and H1P lights.
During the setting mode 1 is displayed, “In low noise operation” and “In demand control” are displayed.


2. Setting mode 2 (H1P on)

- ① In setting 1, push and hold the BS1 (MODE button) for more than 5 seconds. → Setting mode 2 is entered and H1P lights.
② Push the BS2 (SET button) several times and match the LED display with the Setting No. you want.
③ Push the BS3 (RETURN button) one time, and the present setting content is displayed.
→ Push the BS2 (SET button) several times and match the LED display with the setting content (as shown below) you want.
④ Push the BS3 (RETURN button) two times. → Returns to ①.
⑤ Push the BS1 (MODE button) one time. → Returns to the setting mode 1 and turns H1P off.

Setting No.	Setting contents	① Setting No. indication							② Setting No. indication							Setting contents	③ Setting contents indication (Initial setting)						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P		H1P	H2P	H3P	H4P	H5P	H6P	H7P
22	Night-time low noise setting	○	●	●	●	●	●	●	○	●	○	●	○	○	●	OFF (Factory setting)	○	●	●	●	●	●	●
																Mode 1	○	●	●	●	●	●	◎
																Mode 2	○	●	●	●	●	◎	◎
																Mode 3	○	●	●	●	●	◎	◎
25	External low noise setting								○	●	○	○	●	●	○	Mode 1	○	●	●	●	●	●	◎
																Mode 2 (Factory setting)	○	●	●	●	●	◎	●
																Mode 3	○	●	●	●	●	●	◎
26	Night-time low noise start setting								○	●	○	○	●	○	●	PM 8:00	○	●	●	●	●	◎	●
																PM 10:00 (Factory setting)	○	●	●	●	◎	●	●
																PM 0:00	○	●	●	●	●	●	◎
27	Night-time low noise end setting								○	●	○	○	●	○	○	AM 6:00	○	●	●	●	●	◎	●
																AM 7:00	○	●	●	●	◎	●	●
																AM 8:00 (Factory setting)	○	●	●	●	●	●	◎
29	Capacity precedence setting								○	●	○	○	○	●	○	Low noise precedence (Factory setting)	○	●	●	●	●	●	●
																Capacity precedence	○	●	●	●	●	◎	●
30	Demand setting 1								○	●	○	○	○	○	●	60% of rated power consumption	○	●	●	●	●	●	◎
																70% of rated power consumption (Factory setting)	○	●	●	●	●	◎	●
																80% of rated power consumption	○	●	●	●	◎	●	●
32	Continuous demand setting								○	●	●	●	●	●	●	OFF (Factory setting)	○	●	●	●	●	●	◎
																Continuous demand 1 fixed	○	●	●	●	●	◎	●
12	External low noise / Demand setting								○	●	●	○	○	●	●	NO (Factory set)	○	●	●	●	●	●	○
																YES	○	●	●	●	●	○	●

 Setting mode indication section

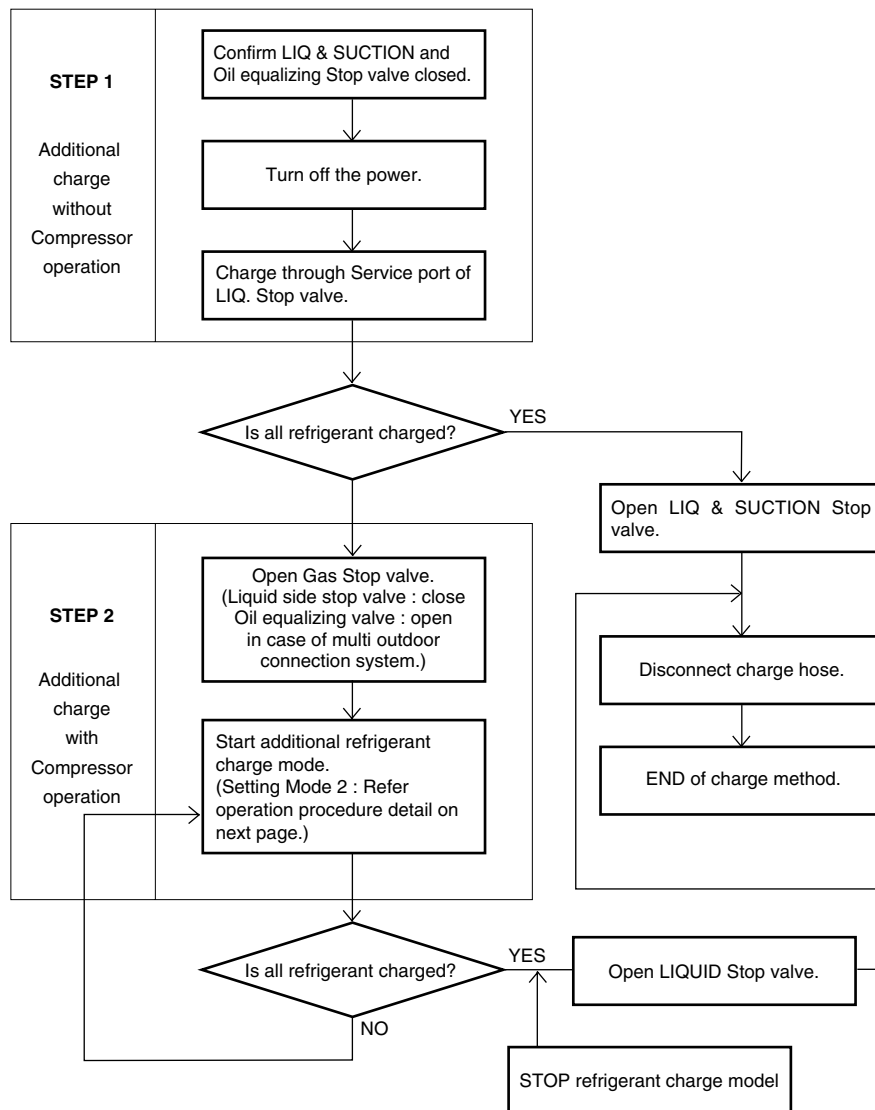
 Setting No. indication section

 Set contents indication section

4.4.2.4 Setting of Refrigerant Additional Charging Operation

When additional refrigerant is not charged all with outdoor unit in stop mode, operate the outdoor unit and charge the liquid refrigerant from the service port of liquid stop value. The additional charging operation is activated by pushbutton switch on the outdoor unit PC board.

[Additional refrigerant charge total flow]



(V2892)

[Operation procedure detail]

- ① After turning the respective remote switch of indoor and outdoor units off and charging the refrigerant, turn on the power of indoor and outdoor units.
Do not fail to turn the power off and charge the refrigerant with outdoor unit in stop mode before adding the refrigerant following this procedure, otherwise resulting in trouble.
- ② Fully open the stop valve on the gas side and oil equalizing valve for multi outdoor connection, and do not fail to fully close the stop valve on the liquid side. (If the stop valve on the liquid side is open, the refrigerant cannot be charged.)
- ③ In **Setting mode 2** (H1P : ON) with outdoor unit in stop mode, Set "A Additional refrigerant charging operation" switch to ON to start the operation. (H2P turns to display TEST OPERATION (blinks), and "TEST OPERATION" and "IN CENTRALIZED CONTROL" are displayed on the remote controller.)
- ④ When the refrigerant is charged up to the specified amount, press the RETURN button (BS3) to stop charging.
The charging operation is automatically stopped after operating for a maximum of about 30 minutes.
If the charging is not complete within 30 minutes, set the A Additional refrigerant charging operation again to start charging. When the charging immediately stops even by restarting, the refrigerant is charged excessively. The refrigerant cannot be charged any more.
- ⑤ **Do not fail to fully open the stop valve on the liquid side** as soon as disconnecting the refrigerant charging hose.
(The piping may be burst due to the liquid sealing.)

[Operation state]

- Compressor frequency : 210Hz
- Y1S, Y2S, Y3S Solenoid valve : Open
- Outdoor unit fan : High pressure control
- Indoor unit expansion valve (All unit) : 1024 pulse
- Indoor unit fan : H tap

4.4.2.5 Setting of Refrigerant Recovery Mode

When carrying out the refrigerant collection on site, fully open the respective expansion valve of indoor and outdoor units

[Operation procedure]

- ① In **setting mode 2** with units in stop mode, set "B Refrigerant Recovery / Vacuuming mode" to ON. The respective expansion valve of indoor and outdoor units are fully opened. (H2P turns to display "TEST OPERATION" (blinks), "TEST OPERATION" and "IN CENTRALIZED CONTROL" are displayed on the remote controller, and the operation is prohibited.
- ② Collect the refrigerant using a refrigerant recovery unit. (See the instruction attached to the refrigerant recovery unit for more detail.)
- ③ Press Mode button "BS1" once and reset "Setting Mode 2".

4.4.2.6 Setting of Vacuuming Mode

In order to perform vacuuming operation at site, fully open the expansion valves of indoor and outdoor units to turn on some solenoid valves.

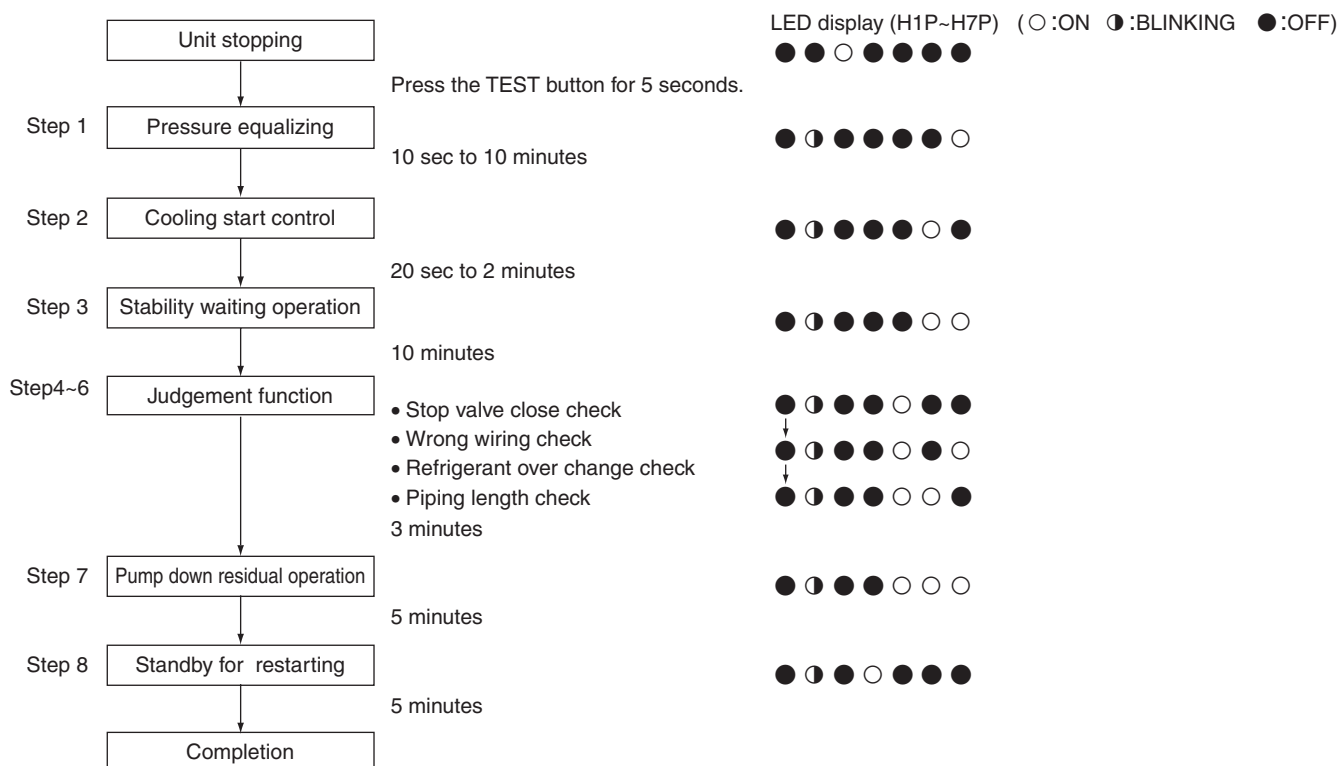
[Operating procedure]

- ① With **Setting Mode 2** while the unit stops, set (B) Refrigerant recovery / Vacuuming mode to ON. The expansion valves of indoor and outdoor units fully open and some of solenoid valves open.
(H2P blinks to indicate the test operation, and the remote controller displays "Test Operation" and "In Centralized control", thus prohibiting operation.)
After setting, do not cancel "Setting Mode 2" until completion of Vacuuming operation.
- ② Use the vacuum pump to perform vacuuming operation.
- ③ Press Mode button "BS1" once and reset "Setting Mode 2".

4.4.2.7 Check Operation

To prevent any trouble in the period of installation at site, the system is provided with a test operation mode enabling check for incorrect wiring, stop valve left in closed, coming out (or misplacing with suction pipe thermistor) of discharge pipe thermistor and judgment of piping length, refrigerant overcharging, and learning for the minimum opening degree of motorized valve.

CHECK OPERATION FUNCTION



5. Caution for Refrigerant Leaks

5.1 Caution for Refrigerant Leaks

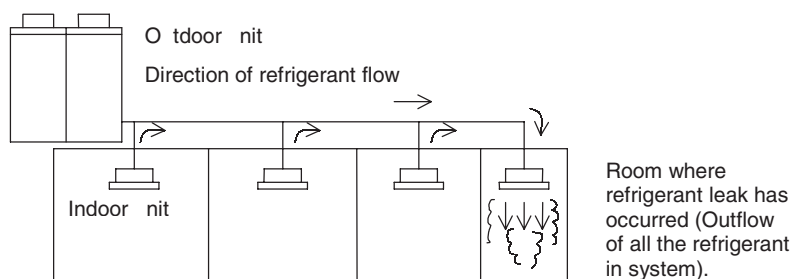
5.1.1 Introduction

Points to note in connection with refrigerant leaks

The installer and system specialist shall secure safety against leakage according to local regulations or standards. The following standards may be applicable if local regulations are not available.

5.1.2 Maximum Concentration Level

The maximum charge of refrigerant and the calculation of the maximum concentration of refrigerant is directly related to the humanly occupied space in to which it could leak. The unit of measurement of the concentration is kg/m^3 (the weight in kg of the refrigerant gas in 1m^3 volume of the occupied space). Compliance to the local applicable regulations and standards of the maximum allowable concentration level is required. In Australia the maximum allowed concentration level of refrigerant to a humanly space is limited to 0.35kg/m^3 for R407C and 0.44kg/m^3 for R410A.



Pay special attention to the place, such as a basement, etc, where refrigerant can stay, since refrigerant is heavier than air.

5.1.3 Procedure for Checking Dangerous Concentration

Check the Dangerous concentration in accordance with steps (1)-(4) below and take whatever action is necessary.

Step1:

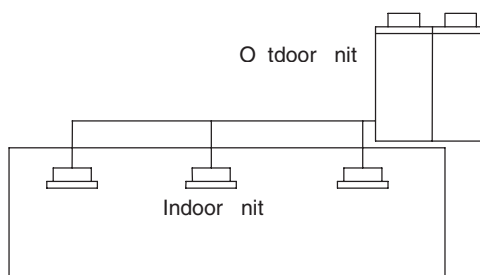
Calculate the amount of refrigerant (kg) charged to each system separately.

(Amount of refrigerant in a single indoor unit system)	+	(Additional charging amount)	=	Total amount of refrigerant (kg) in the system
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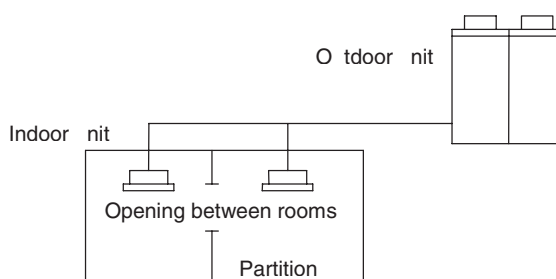
Step 2:**Calculate the smallest room volume (m³).**

In a case like the following calculate the volume of (a), (b) as a single room or as the smallest room.

(a) Where there are no smaller room divisions

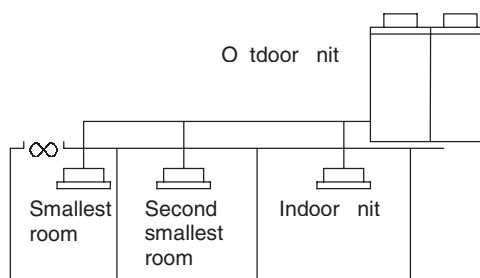


(b) Where there is a room division but there is an opening between the rooms sufficiently large to permit a free flow of air back and forth.



(Where there is an opening without a door or where there are openings above and below the door which are each equivalent in size to 0.15% or more of the floor area.)

(c) Where there is a gas leak detection alarm device linked to a mechanical ventilator in the smallest room then the next smallest room will become the measurement target.

**Step 3:****Calculate the refrigerant density using the results of the calculations in Step (1) and (2) above.**

$$\frac{\text{Total volume of refrigerant in the refrigerant system}}{\text{Size (m}^3\text{) of the smallest room in which there is an indoor unit installed}} \leq \text{Dangerous concentration (kg/m}^3\text{)}$$

in the case of: R407C = 0.35kg/m³, R410A = 0.44kg/m³

If the result of the above calculation exceeds the dangerous concentration level then make similar calculations for the second then third smallest room and so on until the result falls short of the concentration level.

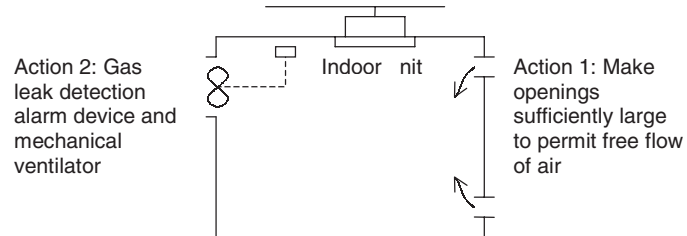
Step 4:**Dealing with situations where the result exceeds the dangerous concentration level.**

Where the installation of a facility results in a concentration in excess of the dangerous concentration level then it may be necessary to revise the system design to some extent or else take one of the following courses of action.

Action 1: Making openings which will allow the air to flow freely into the room.

Make openings above and below the door which are each equivalent in size to 0.15% or more of the floor area or make a doorless opening.

Action 2: Fit a mechanical ventilator linked to a gas leak detection alarm device.

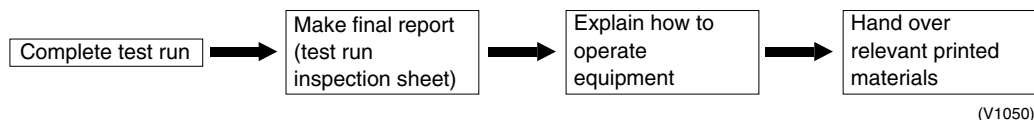
**Notes:**

This precaution shows the requirement of EN.

The precaution should be followed in accordance of local code.

6. Hand Over to Customer

6.1 Operational Steps



Important Points

- The measurements taken during the test run should be recorded and kept on a test run inspection sheet.
- Do not forget to record the **length of the refrigerant piping** and the **refrigerant additional charging volume** on the plate on the back of the outdoor unit external notice board, as this information will be required for servicing the system.
- Explain to the customer how to operate the equipment and let him try it.
- Assemble all the relevant diagrams and other printed matter which is required to operate the system and hand it all over to the customer (on the spot) and tell him to keep it.

List of equipment which has been delivered

Contract drawings

It is essential to prepare a control wiring diagram which clarifies the refrigerant system and the control system.

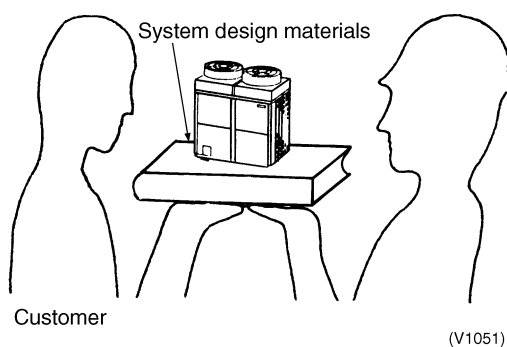
1 set of operation manuals

Names of those responsible for the work (emergency contact address)

Equipment guarantees.

(V1143)

- Make the service contact address clear.



7. Appendix

7.1 Operating Noise of Indoor Units

7.1.1 Difference between Catalogue Data and Actual Noise

Operating noise differs depending on the place of measurement (room) because of the various degrees with which the room reverberates the sound. To determine the amount of reverberation under uniform conditions, the unit has been measured in a dead room with results having been compiled in the below table. The actual sound produced in unit operation can be determined from Table 1.

Sound pressure rise due to room reverberation (Higher than catalogue data)

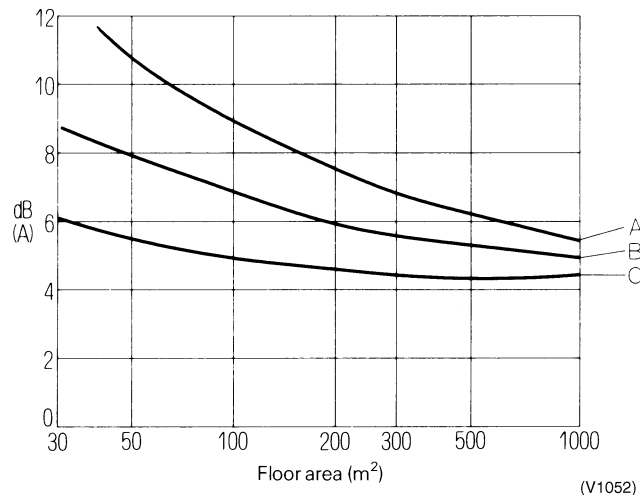


Table 1

		A	B	C
Room Interior Detection	Floor	Mortar	Linoleum tile	Carpet
	Walls	Mortar	Plaster	Fiberglass + Saroncross finish
	Ceiling	Mortar	mineral wool tile	Fiberglass + Saroncross finish
Average Absorbed Sound (Room with Approx. 50 m² Floor Area)		0.05	0.12	0.25
		Typical office		
Estimated value to be added to catalogue value		11~12	8~8.5	5~6

Classifications of indoor unit environments (reference data)

Table 2

Classification	Environment	Example	Faint Noises (NOTE 2)	Recommended Operating Noise on Site
1	Non-active places requiring silence	Reception rooms, libraries, sitting rooms, hospitals (examining rooms) (NOTE 1)	~35	~40
2	Sedate business activities that do not disturb people even over time	Quiet offices, classrooms, small conference rooms, lobbies	~40	~45
3	Somewhat quiet settings that permit soft-spoken conversation, typical activities	Small offices, large conferences rooms, quiet stores, restaurants	~45	~50
4	Somewhat loud settings that permit regular conversation, brisk activity	Large offices, typical stores, cafeterias	~50	~55
5	Loud places that permit conversation in a loud voice, highly active place with many people	Loud large-side offices, large cafeterias, loud stores	~55	~60
6	Rather loud settings	Factories, gymnasiums, recreational places like pachinko parlors	~60	~65



Notes:

1. Excluding bedrooms
2. Reference values of faint noises in the place of usage

7.1.2 Faint Noises and Correcting Operating Noise with Respect to Faint Noises

Faint noises are defined as peripheral sounds existing while the unit is not running, which are picked up when measuring operating noise. If these faint noises are 10 dB or more than the noise produced by the unit, the measured value can be taken as the operating noise of the unit. But, the difference must be corrected if less than 10 dB, because of the effect these noises have on the actual measured value. Also, when the sound meter remains unchanged even while the unit is stopped, we can determine the operational noise to be at least 10 dB less than the faint noises, but we cannot pinpoint the operating noise exactly.

For example, if the faint noises are some 65 dB and the noise produced by the unit in operation is 70 dB, the indicated difference comes to 5 dB. Using Table 3, we recommend you correct the operating noise by about 2 dB to 68 dB.

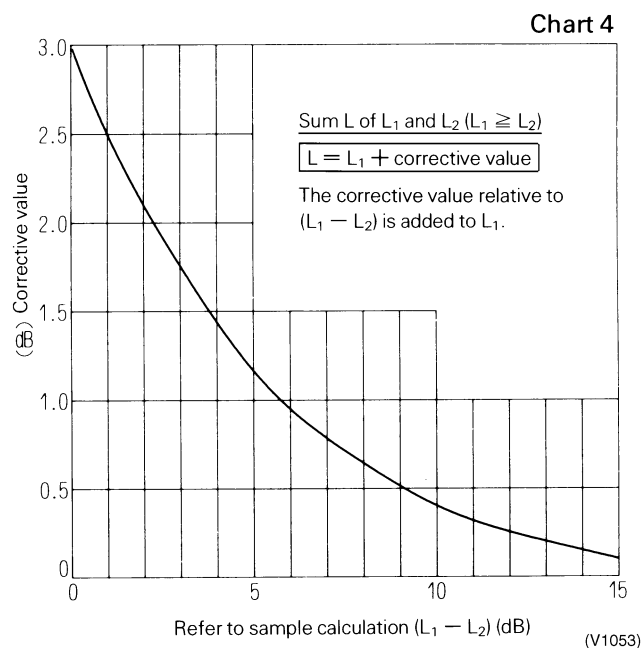
Table 3 Correcting the effect of faint noises

Unit: dB

Difference between when noise is produced and when not	1	2	3	4	5	6	7	8	9	10
Corrective Value	-6.9	-4.4	-3.0	-2.3	-1.7	-1.25	-0.95	-0.75	-0.60	-0.45

7.1.3 Calculating Operating Noise

When two or more units are running at the same time, the amount of operating noise they produce rises. The total amount of noise produced can be obtained ahead of time with Chart 4.



Sample calculation 1

L_1 and L_2 are given as compounded sounds of 50 and 49 dB respectively. Since $L_1 - L_2 = 50 - 49 = 1$, the corrective value is 2.5, therefore $50 + 2.5 = 52.5$ dB.

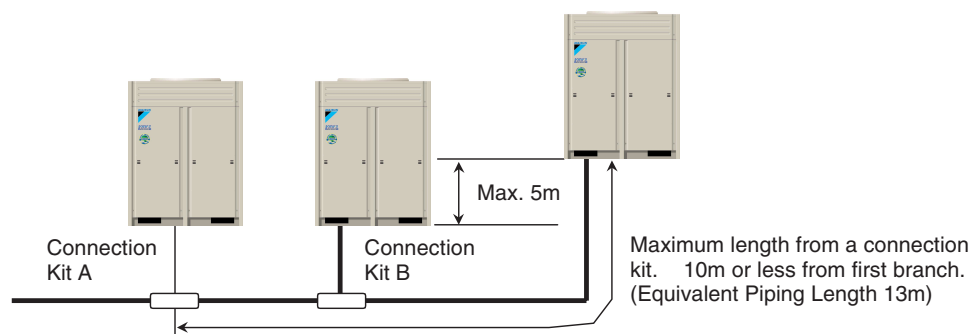
Sample calculation 2

When sounds of 40 dB, 38 dB, 37 dB and 40 dB are placed in order of magnitude, we obtain the following:

40 dB, 40 dB, 38 dB, 37 dB

To start, the difference between 40 dB and 40 dB is 0, therefore we take a corrective value of 3dB and obtain $40 + 3 = 43$ dB. The compounded sound of 43 dB and 38 dB has a 5.0 dB difference, thus a corrective value of 1.2 dB, which gives us 44.2 dB from $43 + 1.2$. In the same manner, the corrective value for 44.2 dB and 37 dB is approximately 0.7 dB, or in other words, $44.2 + 0.7 = 44.9$ dB.

7.2 Piping Installation Point



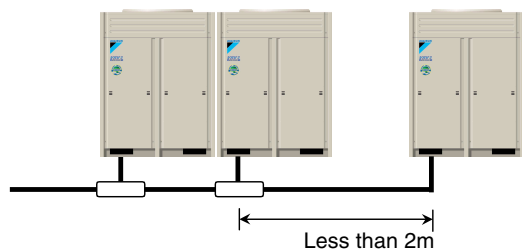
Since there is a possibility that oil may be collected on a stop machine side, install piping between outdoor units to go to level or go up to an outdoor unit, and to make a slope.

(V3084)

The projection part between multi connection piping kits

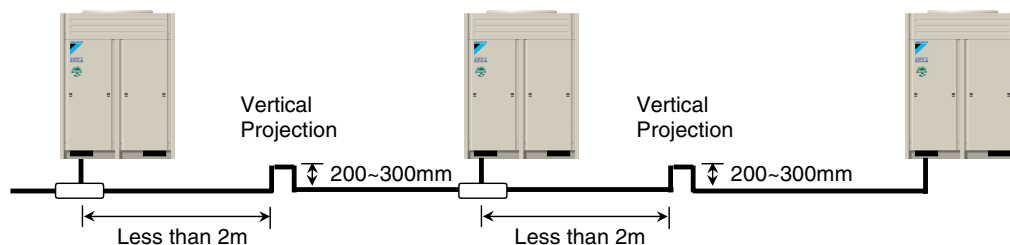
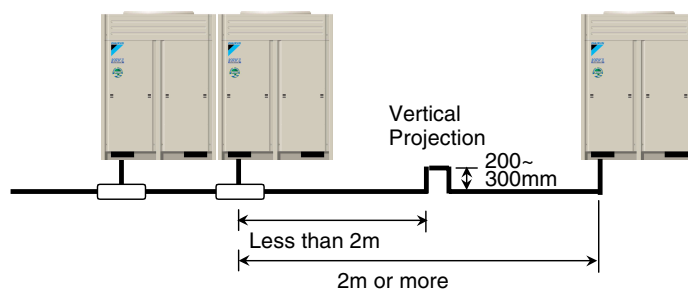
When the piping length between the multi connection kits or between multi connection kit and outdoor unit is 2m or more, prepare a vertical projection part (200mm or more as shown below) only on the gas pipe line location less than 2m from multi connection kit.

In the case of 2m or less



V3037

In the case of 2m or more



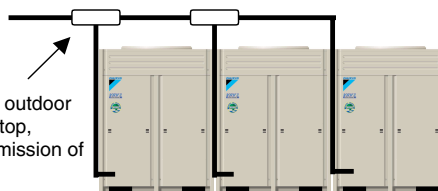
(V3085)

<The Example of A Wrong Pattern>

Wrong



Oil is collected to the outdoor unit at the time of a stop, because of bottom omission of piping.

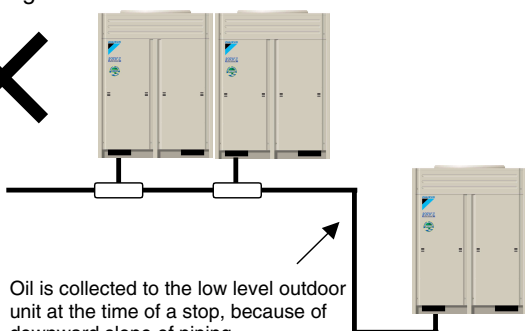


V3039

Wrong

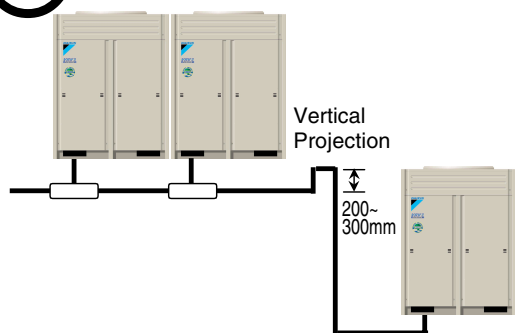


Oil is collected to the low level outdoor unit at the time of a stop, because of downward slope of piping.

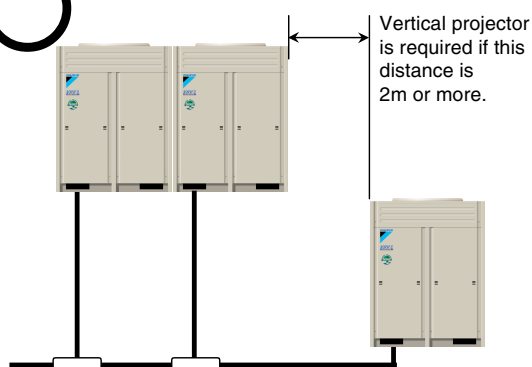


The example of installation on which oil is not collected.

Good



Good



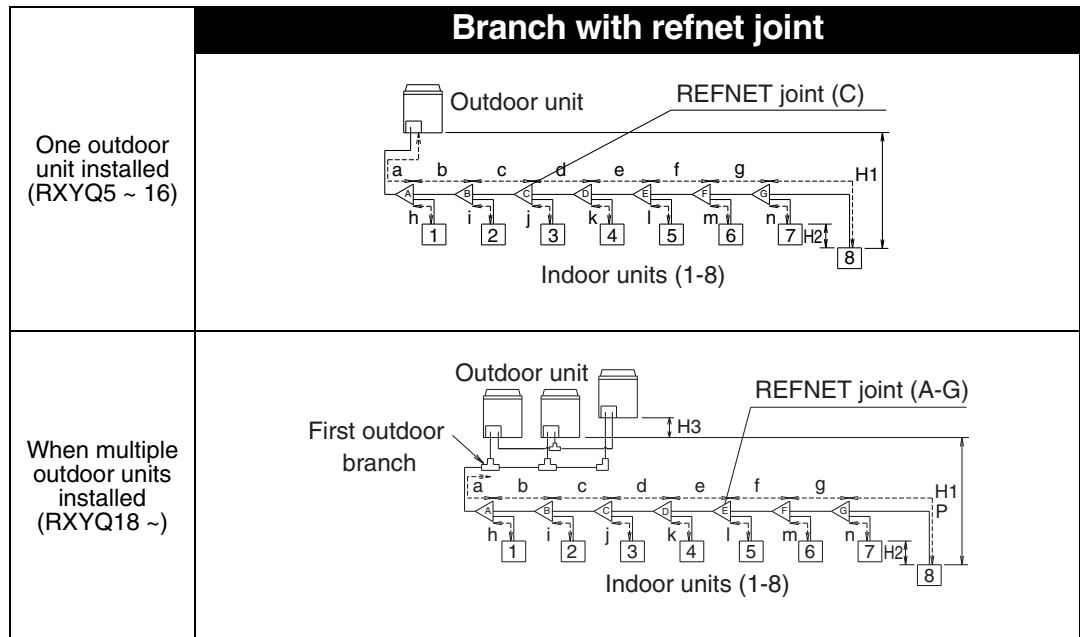
(V3086)

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 150m or less, equivalent length 175m or less, the total extension 300m or less
	REFNET Joint - Indoor Unit	Actual piping length 40m or less
Allowable Level Difference	Outdoor Unit - Outdoor Unit	5m or less
	Outdoor Unit - Indoor Unit	50m or less (when an outdoor unit is lower than indoor units : 40m or less)
	Indoor Unit - Indoor Unit	15m or less

7.3 Allowable Piping Length

7.3.1 Branch with refnet joint

(Connection of 8 indoor units Heat pump system)



*If the system capacity is RXYQ18 or more, re-read to the first outdoor branch as seen from the indoor unit.

Maximum allowable length

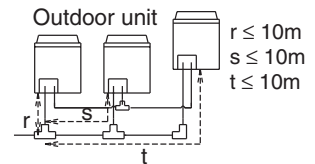
Between outdoor and indoor units

- Actual pipe length
Pipe length between outdoor and indoor units $\leq 150\text{m}$
Example unit 8: $a + b + c + d + e + f + g + p \leq 150\text{m}$
- Equivalent length
Equivalent pipe length between outdoor and indoor units $\leq 175\text{m}$
(assume equivalent pipe length of refnet joint to be 0.5m, that of refnet header to be 1m, calculation purposes)
- Total extension length
Total piping length from outdoor unit* to all indoor units $\leq 300\text{m}$

Between outdoor branch and outdoor unit

(Only for RXYQ18 or more)

- Actual pipe length
Piping length from outdoor branch to outdoor unit $\leq 10\text{m}$
(Approximately length: max 13m)



Allowable height length

Between outdoor and indoor units

- Difference in height
Difference in height between outdoor and indoor units ($H1$) $\leq 50\text{m}$
(Max 40m if the outdoor unit is below)

Between indoor and indoor units

- Difference in height
Difference in height between adjacent indoor units ($H2$) $\leq 15\text{m}$

Between outdoor and outdoor units

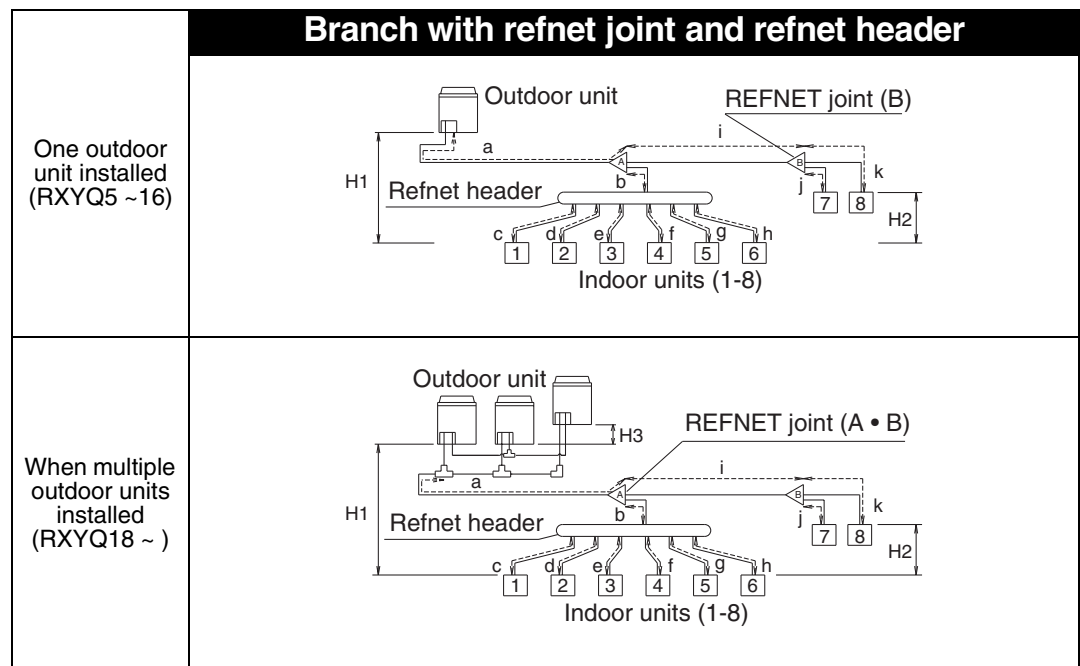
- Difference in height
Difference in height between outdoor unit (main) and outdoor unit (sub) ($H3$) $\leq 5\text{m}$

Allowable length after the branch

- Actual pipe length
Pipe length from first refrigerant branch kit (either refnet joint or refnet header) to indoor unit $\leq 40\text{m}$
Example unit 8: $b + c + d + e + f + g + p \leq 40\text{m}$

7.3.2 Branch with refnet joint and refnet header

(Connection of 8 indoor units Heat pump system)



*If the system capacity is RXYQ18 or more, re-read to the first outdoor branch as seen from the indoor unit.

Maximum allowable length

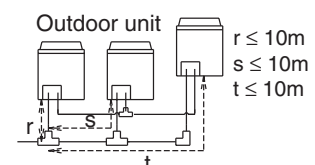
Between outdoor and indoor units

- Actual pipe length
Pipe length between outdoor and indoor units $\leq 150\text{m}$
Example unit 6: $a + b + h \leq 150\text{m}$, unit 8: $a + i + k \leq 150\text{m}$
- Equivalent length
Equivalent pipe length between outdoor and indoor units $\leq 175\text{m}$
(assume equivalent pipe length of refnet joint to be 0.5m, that of refnet header to be 1m, calculation purposes)
- Total extension length
Total piping length from outdoor unit* to all indoor units $\leq 300\text{m}$

Between outdoor branch and indoor unit

(Only for RXYQ18 or more)

- Actual pipe length
Piping length from outdoor branch to outdoor unit $\leq 10\text{m}$
(Approximately length: max 13m)



Allowable height length

Between outdoor and indoor units

- Difference in height
Difference in height between outdoor and indoor units ($H1$) $\leq 50\text{m}$
(Max 40m if the outdoor unit is below)

Between indoor and indoor units

- Difference in height
Difference in height between adjacent indoor units ($H2$) $\leq 15\text{m}$

Between outdoor and outdoor units

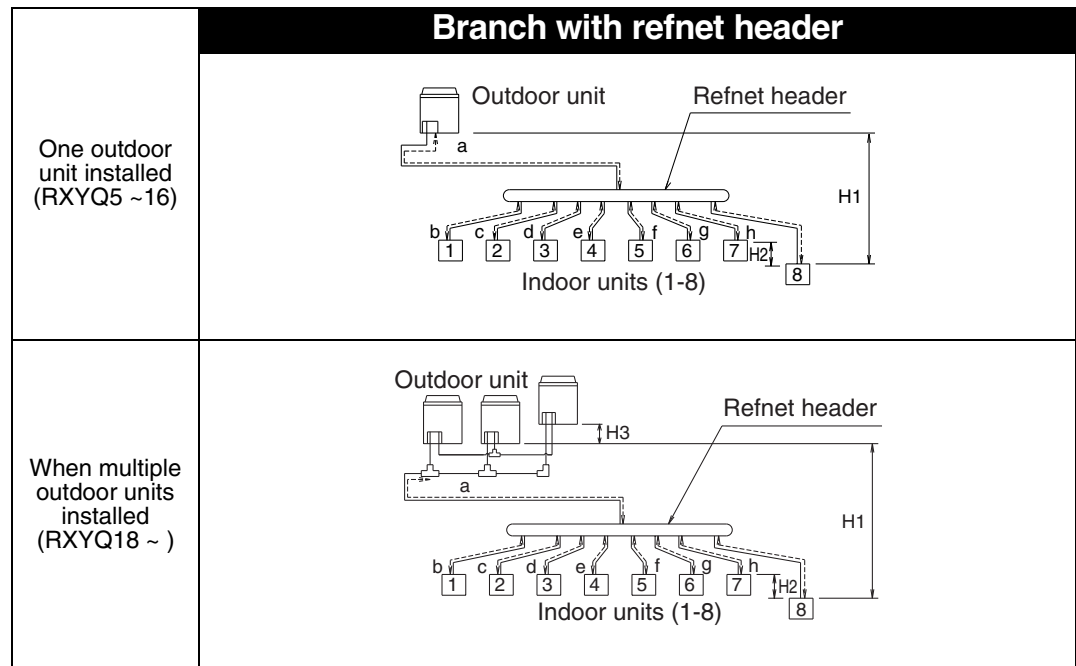
- Difference in height
Difference in height between outdoor unit (main) and outdoor unit (sub) ($H3$) $\leq 5\text{m}$

Allowable length after the branch

- Actual pipe length
Pipe length from first refrigerant branch kit (either refnet joint or refnet header) to indoor unit $\leq 40\text{m}$
Example unit 6: $b + h \leq 40\text{m}$, unit 8: $i + k \leq 40\text{m}$

7.3.3 Branch with refnet header

(Connection of 8 indoor units Heat pump system)



*If the system capacity is RXYQ18 or more, re-read to the first outdoor branch as seen from the indoor unit.

Maximum allowable length

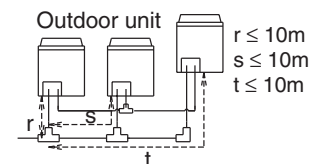
Between outdoor and indoor units

- Actual pipe length
Pipe length between outdoor and indoor units $\leq 150\text{m}$
Example unit 6: $a + i \leq 150\text{m}$
- Equivalent length
Equivalent pipe length between outdoor and indoor units $\leq 175\text{m}$
(assume equivalent pipe length of refnet joint to be 0.5m, that of refnet header to be 1m, calculation purposes)
- Total extension length
Total piping length from outdoor unit* to all indoor units $\leq 300\text{m}$

Between outdoor branch and indoor unit

(Only for RXYQ18 or more)

- Actual pipe length
Piping length from outdoor branch to outdoor unit $\leq 10\text{m}$
(Approximately length: max 13m)



Allowable height length

Between outdoor and indoor units

- Difference in height
Difference in height between outdoor and indoor units ($H1$) $\leq 50\text{m}$
(Max 40m if the outdoor unit is below)

Between indoor and indoor units

- Difference in height
Difference in height between adjacent indoor units ($H2$) $\leq 15\text{m}$

Between outdoor and outdoor units

- Difference in height
Difference in height between outdoor unit (main) and outdoor unit (sub) ($H3$) $\leq 5\text{m}$

Allowable length after the branch

- Actual pipe length
Pipe length from first refrigerant branch kit (either refnet joint or refnet header) to indoor unit $\leq 40\text{m}$
Example unit 8: $i \leq 40\text{m}$

7.4 Refrigerant branch kit selection

Refrigerant branch kits can only be used with R410A.

7.4.1 How to select the refnet joint

- When using refnet joints at the first branch counted from the outdoor unit side. Choose from the following table in accordance with the capacity of the outdoor unit.

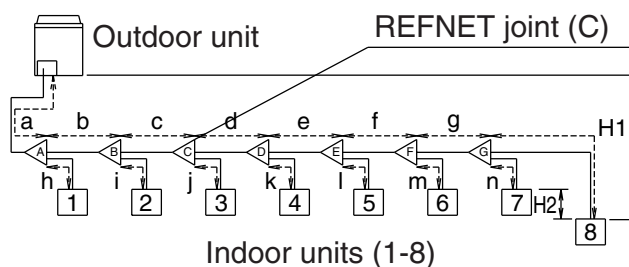
Outdoor unit capacity type	Refrigerant branch kit name
RXYQ5 type	KHRP26M22T
RXYQ8, 10type	KHRP26M33T
RXYQ12 ~ 22 type	KHRP26M72T
RXYQ24 type ~	KHRP26M73T + KHRP73TP

- For refnet joints other than the first branch, select the proper branch kit model based on the total capacity index of downstream indoor units.

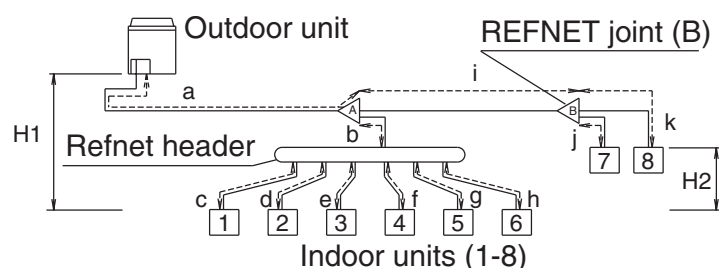
Indoor capacity index	Refrigerant branch kit name
< 200	KHRP26M22T
$200 \leq X < 290$	KHRP26M33T
$290 \leq X < 640$	KHRP26M72T
$640 <$	KHRP26M73T + KHRP73TP

*Example of downstream indoor units

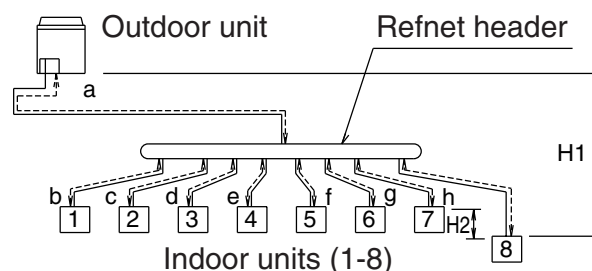
1. example in case of refnet joint C; indoor units 3 + 4 + 5 + 6 + 7 + 8,



2. example in case of refnet joint B indoor units 7 + 8
example in case of refnet joint header; indoor units 1 + 2 + 3 + 4 + 5 + 6



3. example in the case of refnet header; indoor units 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8



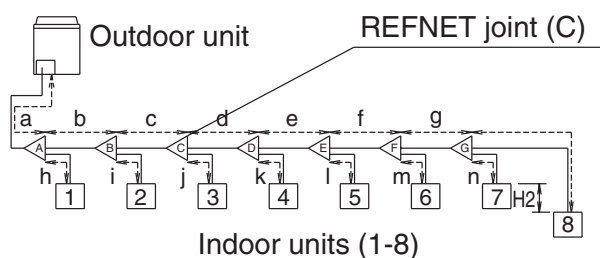
7.4.2 How to select the refnet header

- Choose from the following table in accordance with the total capacity of all the indoor units connected below the REFNET header.
- Note: 250 type cannot be connected below the REFNET header.

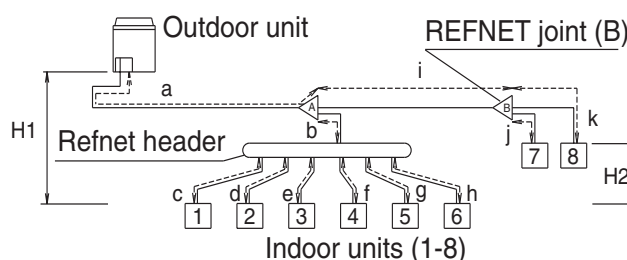
Indoor capacity index	Refrigerant branch kit name
< 200	KHRP26M22H (Max.4 kit)
< 290	KHRP26M33H (Max.8 kit)
$290 \leq X < 640$	KHRP26M72H (Max.8 kit)
$640 <$	KHRP26M73H(Max.8 kit) + KHRP26M73HP

*Example of downstream indoor units

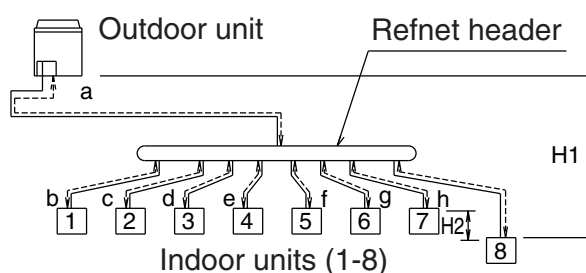
1. example in case of refnet joint C; indoor units 3 + 4 + 5 + 6 + 7 + 8



2. example in case of refnet joint B indoor units 7 + 8,
example in case of refnet header; indoor units 1 + 2 + 3 + 4 + 5 + 6



3. example in the case of refnet header; indoor units 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8



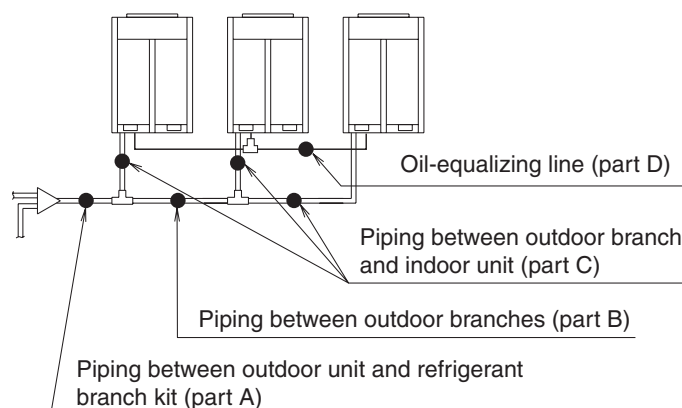
7.4.3 How to choose an outdoor branch kit (needed if the outdoor unit capacity type is RXYQ18 or more.)

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

Number of outdoor units	Branch kit name
2 unit	BHFP22M90 + BHFP22M90P
3 unit	BHFP22M135 + BHFP22M135P

7.5 Pipe size selection

For an outdoor unit multi installation (RXYQ18 ~ 48MY1B), make the settings in accordance with the following figure.



Piping between outdoor unit and refrigerant branch kit (part A)

- Match to the size of the connection piping on the outdoor unit.
Outdoor unit connection piping size

(Unit:mm)

Outdoor unit capacity type	Piping size (outer diameter)	
	Gas pipe	Liquid pipe
RXYQ5 type	ø15.9	ø9.5
RXYQ8 type	ø19.1	
RXYQ10 type	ø22.2	
RXYQ12,14,16 type	ø28.6	ø12.7
RXYQ18 ~ 22 type		ø15.9
RXYQ24 type	ø34.9	
RXYQ26 ~ 34 type		
RXYQ36 ~ 48 type	ø41.3	

Piping between refrigerant branch kits

- Choose from the following table in accordance with the total capacity of all the indoor units connected below this.
- Do not let the connection piping exceed the refrigerant piping size chosen by general system model name.

(Unit:mm)

Indoor capacity index	Piping size (outer diameter)	
	Gas pipe	Liquid pipe
< 200	ø15.9	ø9.5
200 ≤ x ≤ 290	ø22.2	
290 ≤ x ≤ 420	ø28.6	ø12.7
420 ≤ x < 640		ø15.9
640 ≤ x < 920	ø34.9	ø19.1
920 <	ø41.3	

Piping between outdoor branches (part B)

- Choose from the following table in accordance with the total capacity of all the outdoor units connected below this.

(Unit:mm)

Outdoor capacity index	Piping size (outer diameter)	
	Gas pipe	Liquid pipe
< 22HP	ø28.6	ø15.9
24HP	ø34.9	
26HP <		ø19.1

Between refrigerant branch kit and indoor unit

- Pipe size for direct connection to indoor unit must be the same as the connection size of indoor unit.

(Unit:mm)

indoor capacity type	Piping size (outer diameter)	
	Gas pipe	Liquid pipe
20, 25, 32, 40, 50 type	ø12.7	ø6.4
63, 80, 100, 125 type	ø15.9	ø9.5
200 type	ø19.1	
250 type	ø22.2	

Piping between outdoor branch and outdoor unit (part C)

(Unit:mm)

Outdoor capacity type	Piping size (outer diameter)	
	Gas pipe	Liquid pipe
RXYQ8 type	ø19.1	ø9.5
RXYQ10 type	ø22.2	
RXYQ12, 14, 16 type	ø28.6	ø12.7

Oil-equalizing line (Only for RXYQ18 or more) (part D)

Piping size (outer diameter)	ø6.4
------------------------------	------

(Unit:mm)

7.6 How to calculate the additional refrigerant to be charged

Additional refrigerant to be charged R (Kg)

R should be rounded off in units of 0.1Kg.



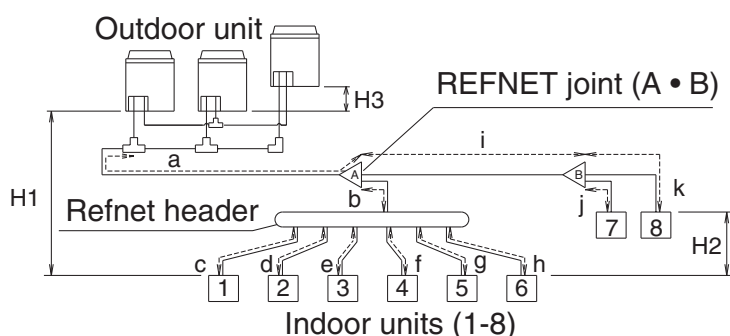
Note: If a negative result is gotten for R from the formula at right, no refrigerant needs to be added.

$$R = \left[\begin{array}{c} \text{Total length (m)} \\ \text{of liquid piping} \\ \text{size at } \phi 22.2 \end{array} \right] \times 0.35 + \left[\begin{array}{c} \text{Total length (m)} \\ \text{of liquid piping} \\ \text{size at } \phi 19.1 \end{array} \right] \times 0.25 + \left[\begin{array}{c} \text{Total length (m)} \\ \text{of liquid piping} \\ \text{size at } \phi 15.9 \end{array} \right] \times 0.17 + \left[\begin{array}{c} \text{Total length (m)} \\ \text{of liquid piping} \\ \text{size at } \phi 12.7 \end{array} \right] \times 0.11$$

$$+ \left[\begin{array}{c} \text{Total length (m)} \\ \text{of liquid piping} \\ \text{size at } \phi 9.5 \end{array} \right] \times 0.054 + \left[\begin{array}{c} \text{Total length (m)} \\ \text{of liquid piping} \\ \text{size at } \phi 6.4 \end{array} \right] \times 0.022 -$$

Model name	Amount of refrigerant
RXYQ5 ~ 16MY1B	0 kg
RXYQ18 ~ 32MY1B	3 kg
RXYQ34 ~ 48MY1B	6 kg

*Example for refrigerant branch using refnet joint and refnet header for RXYQ34MY1B



If the outdoor unit is RXYQ34MY1B and the piping lengths are as at right

a: $\phi 19.1 \times 30\text{m}$	d: $\phi 9.5 \times 10\text{m}$	g: $\phi 6.4 \times 10\text{m}$	j: $\phi 6.4 \times 10\text{m}$
b: $\phi 15.9 \times 10\text{m}$	e: $\phi 9.5 \times 10\text{m}$	h: $\phi 6.4 \times 20\text{m}$	k: $\phi 6.4 \times 9\text{m}$
c: $\phi 9.5 \times 10\text{m}$	f: $\phi 9.5 \times 10\text{m}$	i: $\phi 12.7 \times 10\text{m}$	

$$R = \boxed{30 \times 0.25} + \boxed{10 \times 0.17} + \boxed{10 \times 0.11} + \boxed{40 \times 0.054} + \boxed{40 \times 0.022} - 6 = 7.358$$

a

b

j

c+d+e+f

g+h+j+k

7.5



Note: The amount of refrigerant to be added to the unit should be written on the included "Added Refrigerant" plate and attached to the rear side of the front cover. Refer next page.

REQUEST FOR THE INDICATION OF ADDITIONAL REFRIGERANT CHARGING AMOUNT AND INSTALLATION DATE

BE SURE TO FILL THE BLANKS, WHICH ARE NEEDED FOR AFTER-SALE SERVICES.

1. CALCULATION OF ADDITIONAL REFRIGERANT CHARGING AMOUNT

- CALCULATE THE ADDITIONAL REFRIGERANT CHARGING AMOUNT BASED ON THE FORMULAE BELOW BEFORE REFRIGERANT SUPPLY OR CHARGING.
- WHEN RE-CHARGING TOTAL AMOUNT OF REFRIGERANT, CHARGE THE TOTAL OF THE AMOUNT CHARGED AT SHIPMENT (INDICATED ON THE MACHINE NAMEPLATE) AND THE ADDITIONAL AMOUNT SHOWN AS FOLLOWS :

OUTDOOR UNIT

ADDITIONAL CHARGING AMOUNT kg	=	TOTAL LENGTH OF LIQUID PIPE SIZE $\phi 22,2 \times 0,35$ (M) $\times 0,35$	+	TOTAL LENGTH OF LIQUID PIPE SIZE $\phi 19,1 \times 0,25$ (M) $\times 0,25$	+	TOTAL LENGTH OF LIQUID PIPE SIZE $\phi 15,9 \times 0,17$ (M) $\times 0,17$	-	OUTDOOR UNIT	
		+	TOTAL LENGTH OF LIQUID PIPE SIZE $\phi 12,7 \times 0,11$ (M) $\times 0,11$	+	TOTAL LENGTH OF LIQUID PIPE SIZE $\phi 9,5 \times 0,054$ (M) $\times 0,054$	+		TOTAL LENGTH OF LIQUID PIPE SIZE $\phi 6,4 \times 0,022$ (M) $\times 0,022$	MODEL NAME
								RXYQ5-16	0 Kg
								RXYQ18-32	3 Kg
								RXYQ34-48	6 Kg

2. RECORD OF INDOOR UNIT MODEL NAME AND INSTALLATION SITE

NO.	1	2	3	4	5	6	7	8	9	10
MODEL NAME										
INSTALLATION SITE										
NO.	11	12	13	14	15	16	17	18	19	20
MODEL NAME										
INSTALLATION SITE										
NO.	21	22	23	24	25	26	27	28	29	30
MODEL NAME										
INSTALLATION SITE										
NO.	31	32	33	34	35	36	37	38	39	40
MODEL NAME										
INSTALLATION SITE										

3. RECORD OF INSTALLATION DATE DA , MO , YR

4. AFTER EQUIPPING, PLEASE PUT IT ON THE BACK SIDE OF AN EX-BOARD.

3P114237A

7.7 Outdoor Unit Multi Connection Piping Kit

■ This kit includes the following parts.

● BHFP22M90

<p>● Gas side (1 pcs.)</p>	<p>● Liquid side (1 pcs.)</p>
<p>● Reducing socket (1 pcs.)</p>	<p>● Socket (1 pcs.)</p>

● BHFP22M135

<p>● Gas side (1 pcs.)</p>	<p>● Liquid side (1 pcs.)</p>
<p>● Gas side (1 pcs.)</p>	<p>● Liquid side (1 pcs.)</p>
<p>● Reducing socket (1 pcs.)</p>	<p>● T - joint for oil pressure equalizing pipe (1 pcs.)</p>



Note: Installation of outdoor units refer to INSTALLATION MANUAL of outdoor unit.
 Installation of refrigerant pipes between outdoor and indoor units need to arrange for REFNET JOINT and REFNET HEADER.
 Combination of outdoor units follow Engineering Data.

Field supply parts

Table 2

Parts	Quantity	Selection procedure
Insulation For Pipe	1 SET	FOR BHFP22M90 :Refer to Table4, 5
Refrigerant Pipes		FOR BHFP22M135 :Refer to Table7, 8, 9
Joint (For gas pipe angle of go degrees)	1 p c s.	Joint siize must be the same as gas side pipe size of the upper side outdoor unit. (Refer to Table 8)
Tape	1 SET	(FOR INSULATION)

Selection procedure

Table 3

NO. of outdoor units	Total capacity index of outdoor units	Kit name
2 units	$X \leq 550$	BHFP22M90
	$605 \leq X \leq 800$	BHFP22M90 BHFP22M90P
3 units		BHFP22M135 BHFP22M135P



Caution: Outdoor units multi connection piping connect right according to the INSTALLATION MANUAL of outdoor unit.

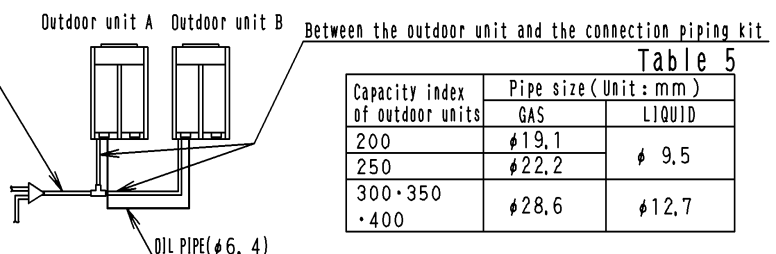
Pipe size selection and cutting position of JOINT

According to the following table cut the joint or reducer with a pipe cutter for use.

● BHFP22M90

Between the outdoor unit and the refrigerant branch kit
• Select the proper pipe size based on the total capacity index of outdoor units.

Total capacity index of outdoor units	Pipe size (Unit: mm)	
	GAS	LIQUID
$450 \leq X \leq 550$	φ28.6	φ15.9
605	φ34.9	
$650 \leq X \leq 800$		φ19.1

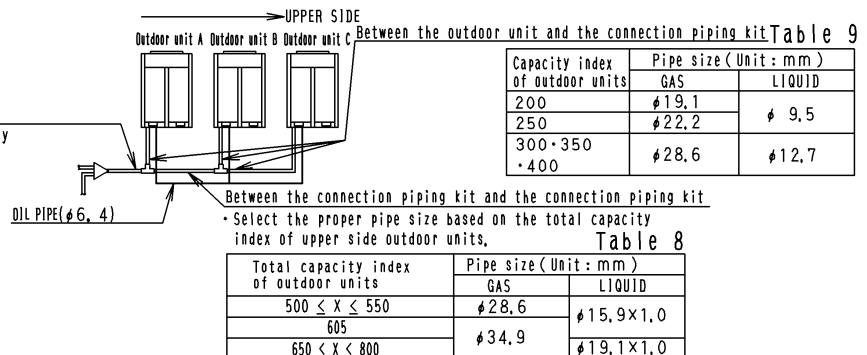


Capacity index of outdoor units	Pipe size (Unit: mm)	
	GAS	LIQUID
200	φ19.1	φ 9.5
250	φ22.2	
300・350 ・400	φ28.6	φ12.7

● BHFP22M135

Between the outdoor unit and the refrigerant branch kit
• Select the proper pipe size based on the total capacity index of outdoor units.

Total capacity index of outdoor units	Pipe size (Unit: mm)	
	GAS	LIQUID
855	φ34.9	φ19.1
$900 \leq X$	φ41.3	

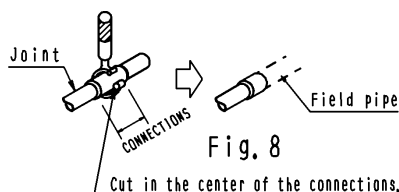


Capacity index of outdoor units	Pipe size (Unit: mm)	
	GAS	LIQUID
200	φ19.1	φ 9.5
250	φ22.2	
300・350 ・400	φ28.6	φ12.7

Between the connection piping kit and the connection piping kit
• Select the proper pipe size based on the total capacity index of upper side outdoor units.

Total capacity index of outdoor units	Pipe size (Unit: mm)	
	GAS	LIQUID
500 ≤ X ≤ 550	φ28.6	φ15.9×1.0
605	φ34.9	
650 < X < 800		φ19.1×1.0

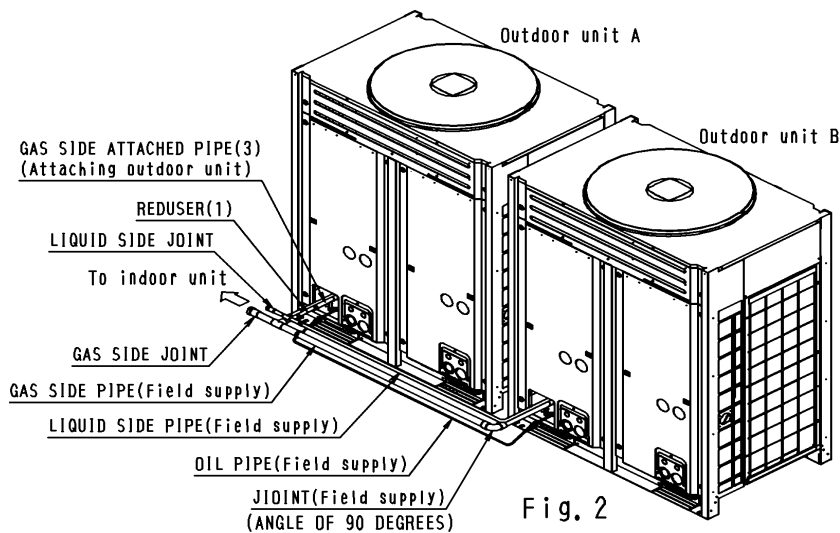
Cut the pipe with a pipe cutter.



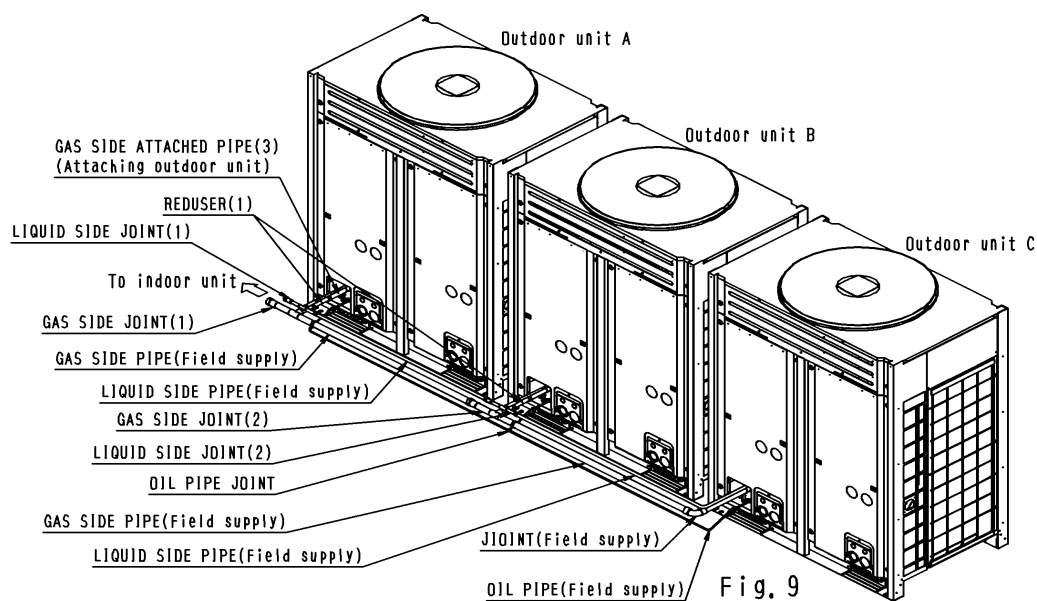
7.7.1 In case of Front Piping

Illustration

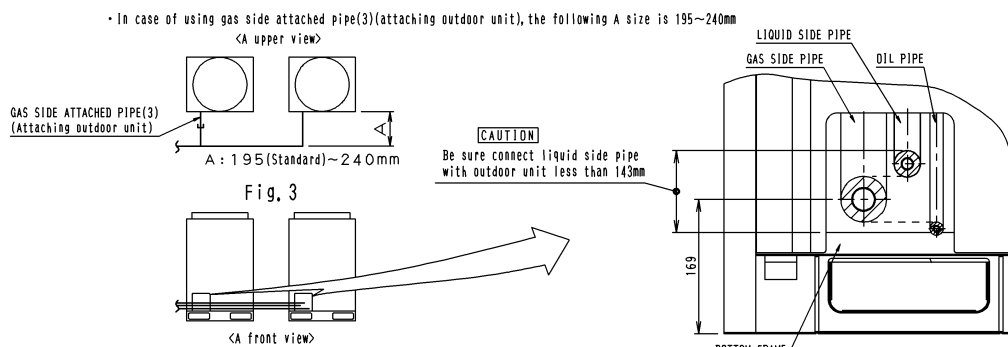
- External
- BHFP22M90



- BHFP22M135

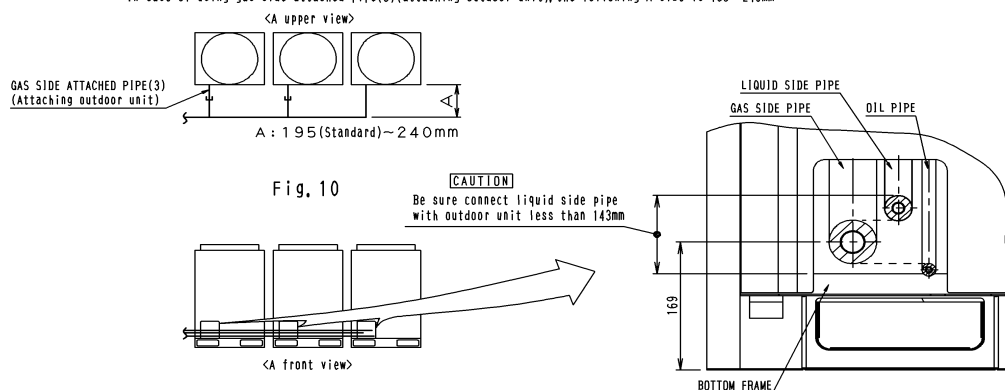


- BHFP22M90



● BHFP22M135

• In case of using gas side attached pipe(3)(attaching outdoor unit), the following A size is 195~240mm



Installation of Gas Side Pipes

■ Cutting the Reducer (1) and Gas Side Attached Pipe (3)

• According the following table cut the reducer(1) and gas side attached pipe(3)
(is no use.)

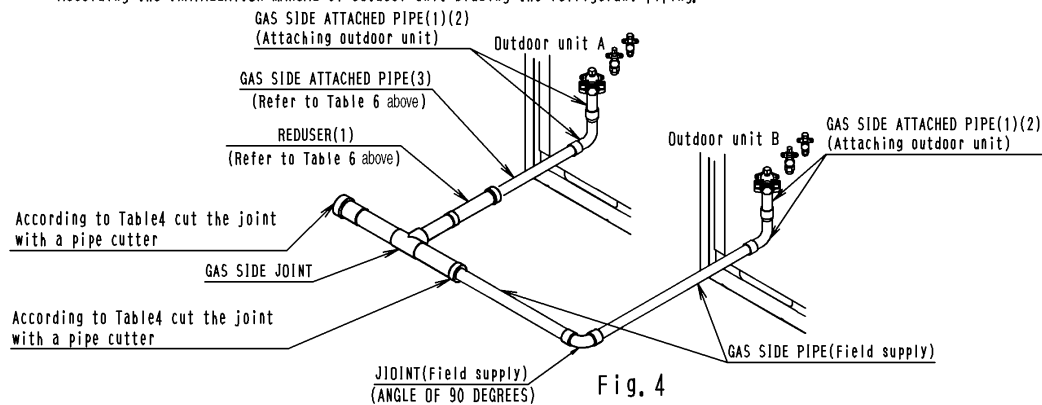
Table 6

Capacity index of outdoor units	REDUSER (1)		GAS SIDE ATTACHED PIPE(3) (Attaching outdoor unit)	
	A (mm)	TO GAS SIDE ATTACHED PIPE(3)	B (mm)	
200	76		60	
250	65			
300・350 ・400	0		74	

■ Connection Piping

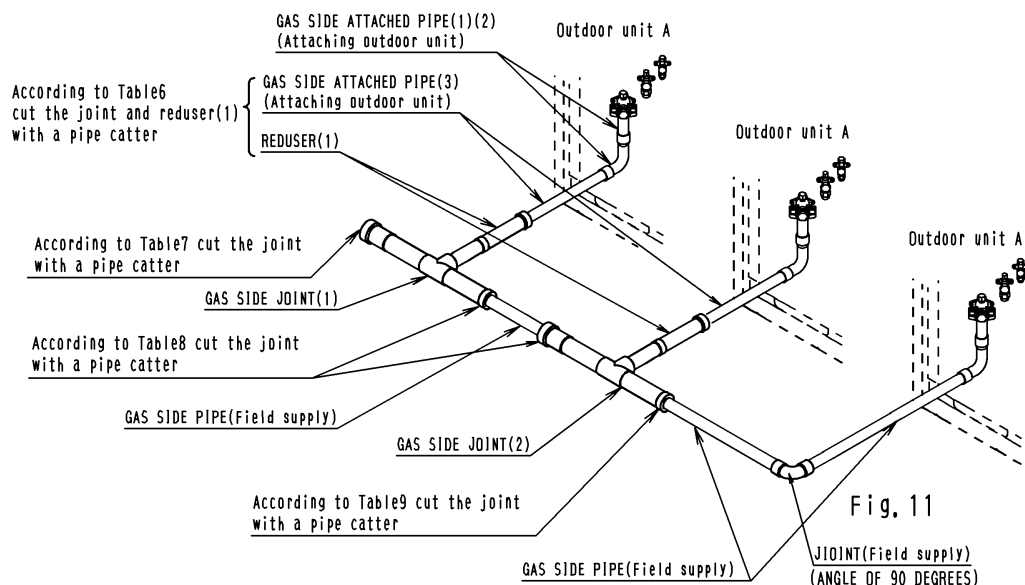
● BHFP22M90

- Connect gas side pipe with gas side joint(Refer to Fig.4)
- According the INSTALLATION MANUAL of outdoor unit brazing the refrigerant piping.



● BHFP22M135

- Connect gas side pipe with gas side joint(Refer to Fig.11)
- According the INATALLATION MANUAL of outdoor unit brazing the refrigerant piping.

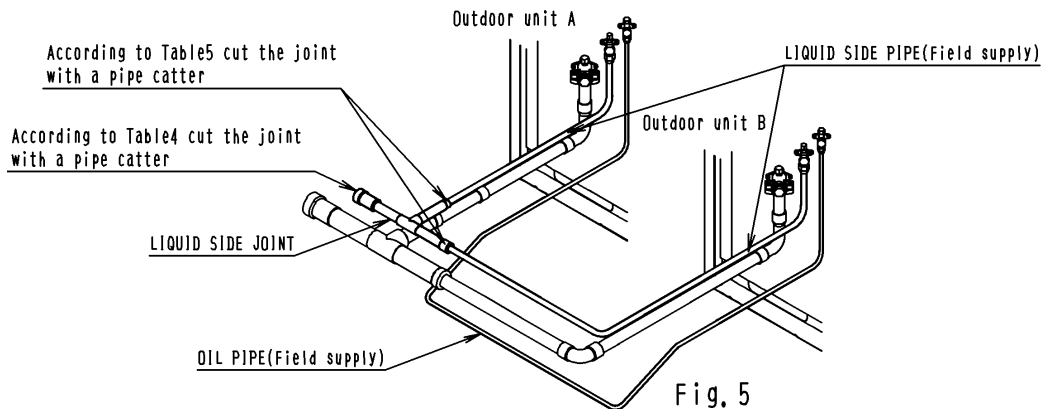


Refer to P. 122 for Table 6 and P. 120 for Table 7, 8 and 9.

Installation of liquid side pipes and oil pipe

● BHFP22M90

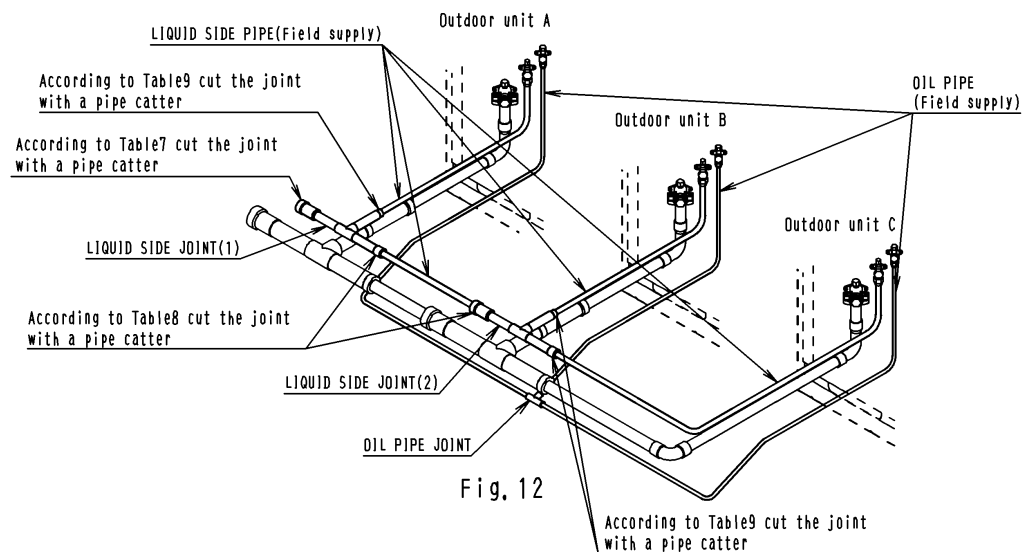
- Connect liquid side pipe with liquid side joint(Refer to Fig.5)
- According the INATALLATION MANUAL of outdoor unit brazing the refrigerant piping.




Refer to P. 120 for Table 4 and 5.

● BHFP22M135

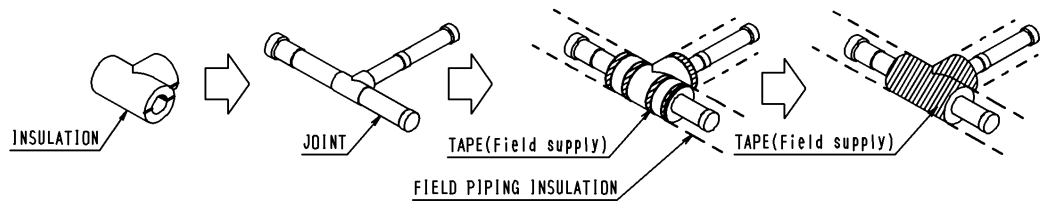
- Connect liquid side pipe with liquid side joint(Refer to Fig.12)
- According the INATALLATION MANUAL of outdoor unit brazing the refrigerant piping,



 Refer P. 120 for Table 7, 8 and 9.

After connection piping

- Connection piping between the outdoor unit and indoor unit
 - According to the INSTALLATION MANUAL of outdoor unit,
- Insulation of joint
 - Seal the insulation and field piping insulation joint with the tape, (▨part)



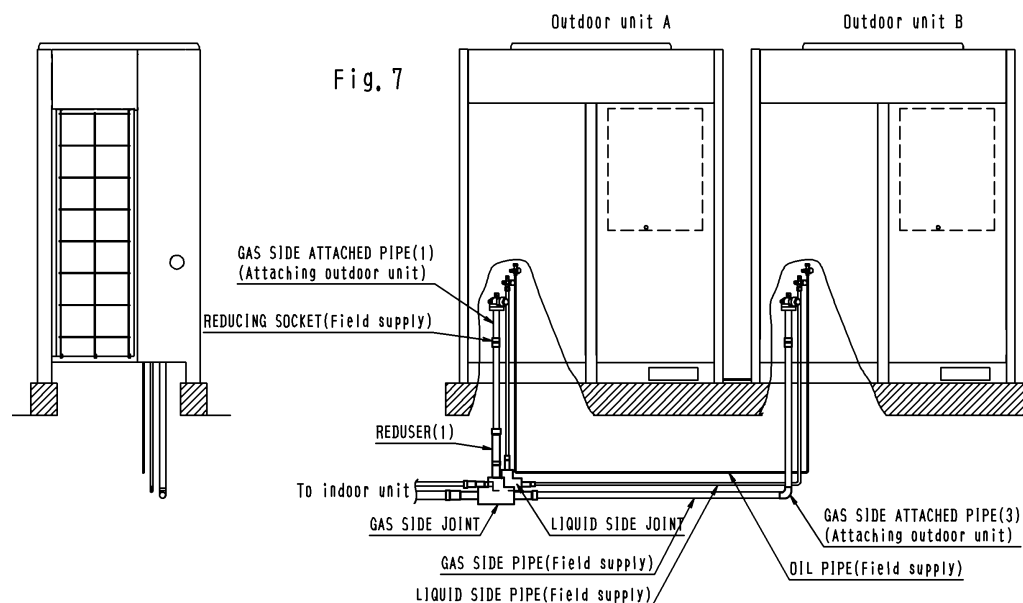
7.7.2 In case of Underside Piping

Illustration



Caution Be sure to secure space for brazing and piping work under the outdoor unit.

- **BHFP22M90**
- Cutting the joint and reducer
According to table 4 and 5 cut the joint and reducer for use.
- Connection piping
Connect pipes with joint (Refer to fig.7)



Refer to P. 120 for Table 4 and 5.

- **BHFP22M135**

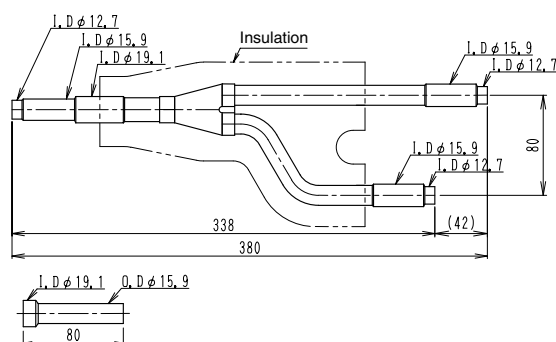
- Be sure to secure space for brazing and piping work under the outdoor unit.

7.8 REFNET Pipe Connections for VRV II R410A Series

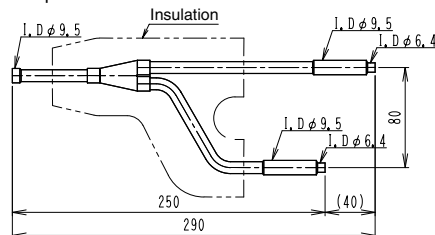
7.8.1 REFNET Joint

KHRP26M22T

• Gas Side



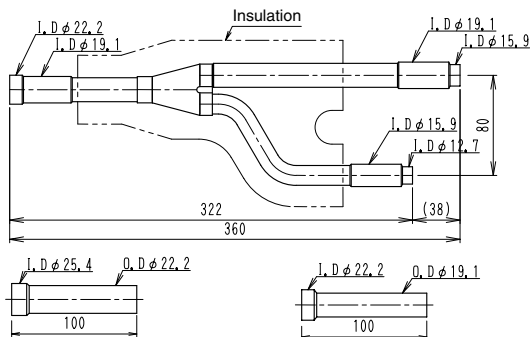
• Liquid Side



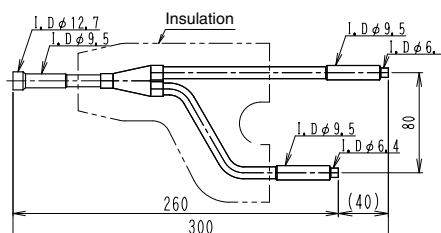
V3041

KHRP26M33T

• Gas Side



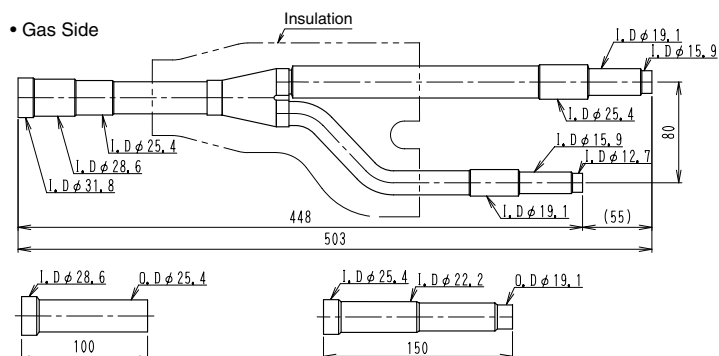
• Liquid Side



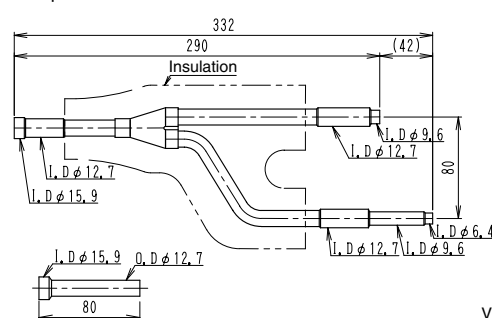
V3042

KHRP26M72T

• Gas Side



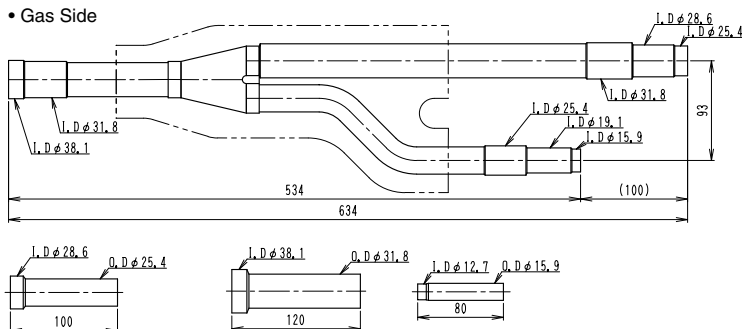
• Liquid Side



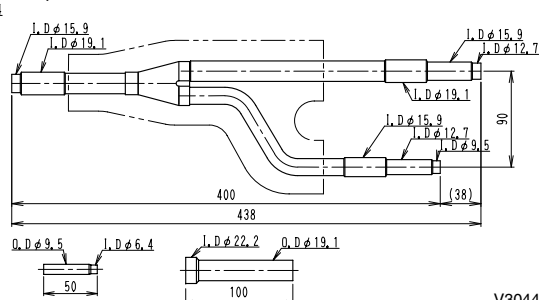
V3043

KHRP26M73T

• Gas Side



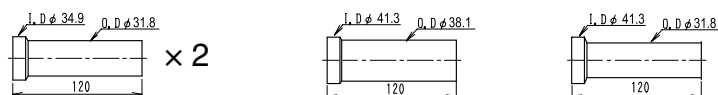
• Liquid Side



V3044

KHRP26M73TP

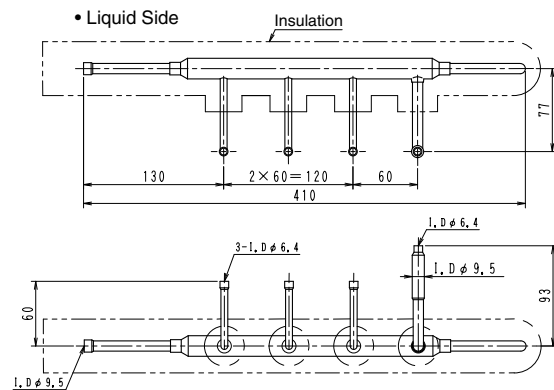
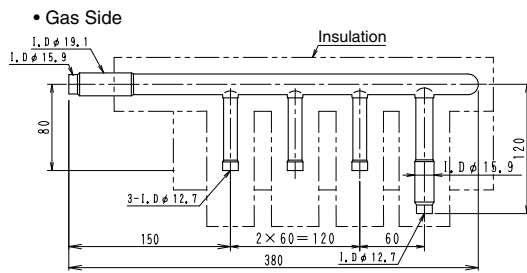
• Reducing Socket



V3045

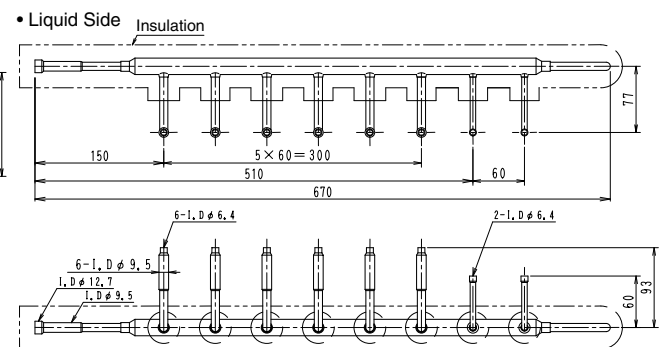
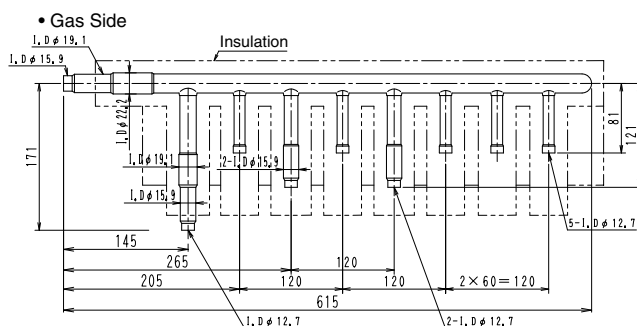
7.8.2 REFNET Header

KHRP26M22H



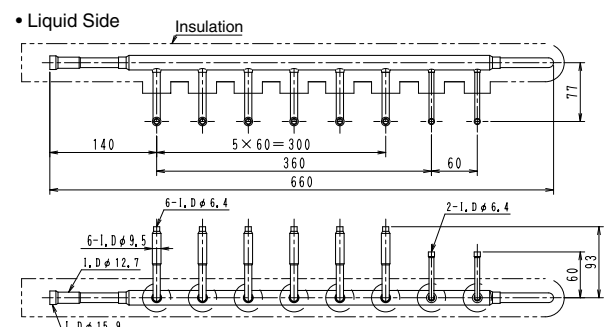
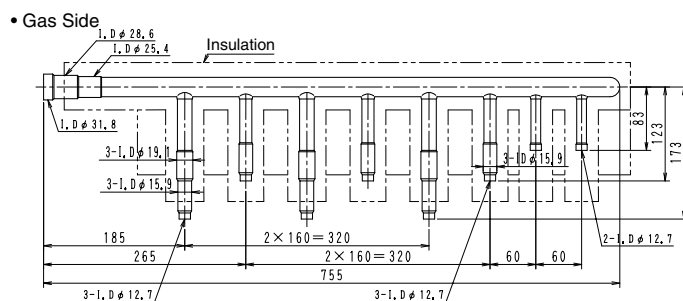
V3046

KHRP26M33H



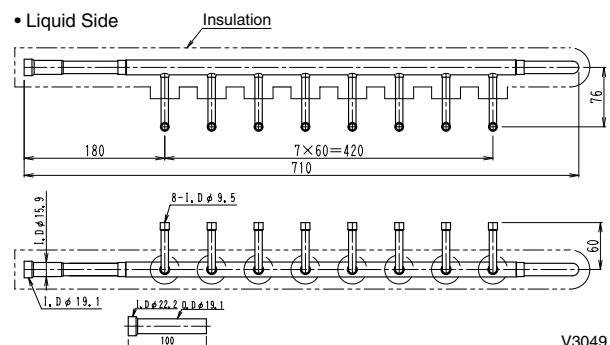
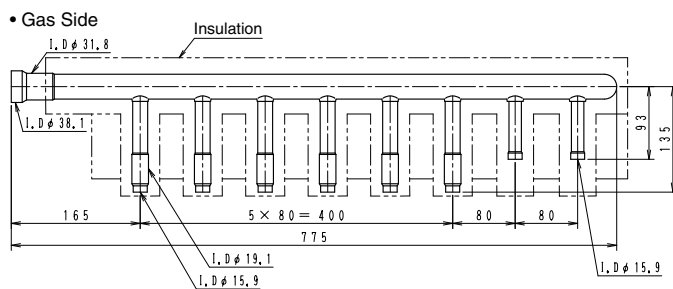
V3047

KHRP26M72H



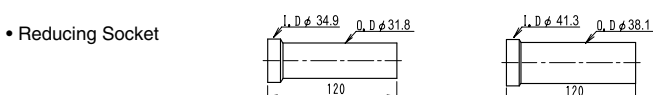
V3048

KHRP26M73H



V3049

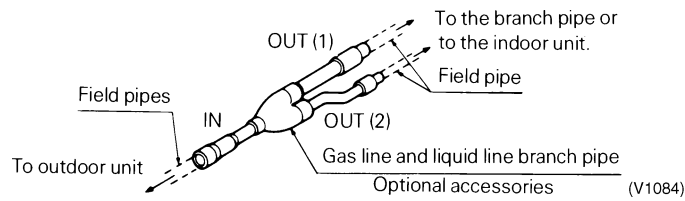
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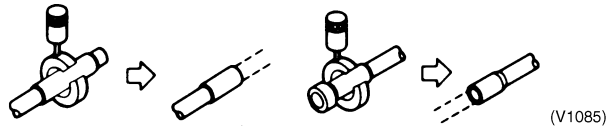
V3050

REFNET Joint and Header Installation

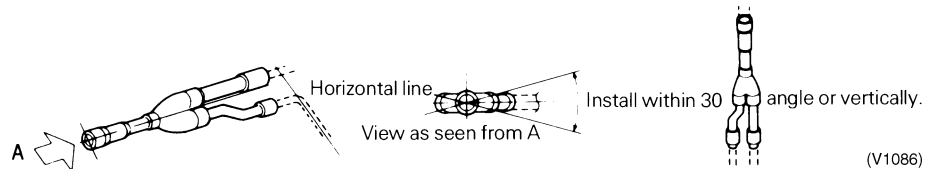
1. REFNET joint (Gas line and liquid line branch pipe)



- If the selected building pipe differs from the branch pipe in size, cut the connection with a pipe cutter as shown below.

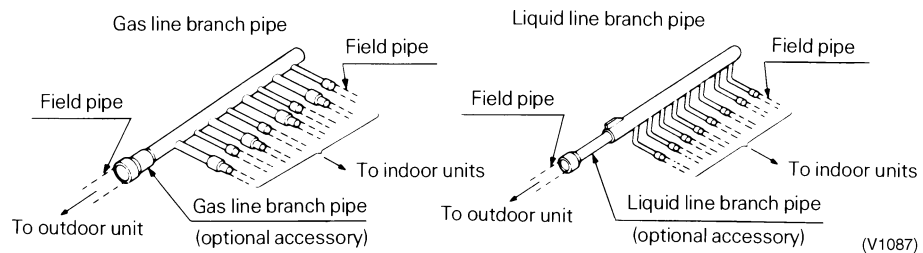


- Install the branch pipe either vertically or horizontally.

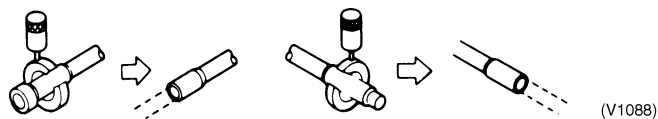


- Insulate the branch pipe as described in the kit installation manual.

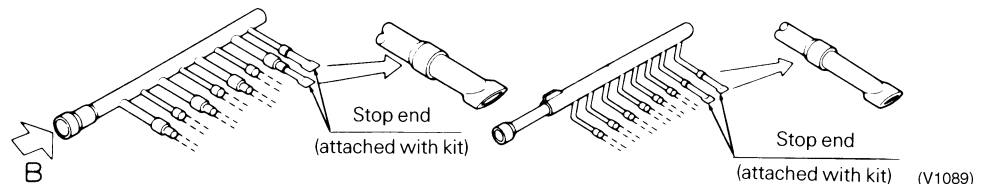
2. REFNET header



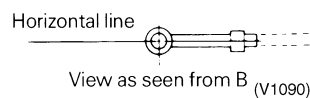
- If the selected field pipe differs from the branch pipe in size, cut the connection with a pipe cutter as shown below.



- Fit a stop end on all open branch pipe connections not in use.



- Install the branch pipe horizontally.



- Insulate the branch pipe as described in the kit installation manual.



Note:

- Install the REFNET joint horizontally or vertically, keeping it within a 30° angle when installed horizontally.
- Install the REFNET header so that it branches horizontally.
- Do not use a T-joint for the branch pipe.

7.9 VRV Inspection Sheet

Inspection date: _____

Delivery date: _____

Transfer date: _____

Owner		System name	
-------	--	-------------	--

Outdoor units

	Installation location	Model	Unit No.
Outdoor unit system name			
Outdoor unit 1			
Outdoor unit 2			
Outdoor unit 3			

Indoor units

No.	Installation	Model	Unit No.	Group No.	No.	Installation	Model	Unit No.	Group No.
1					21				
2					22				
3					23				
4					24				
5					25				
6					26				
7					27				
8					28				
9					29				
10					30				
11					31				
12					32				
13					33				
14					34				
15					35				
16					36				
17					37				
18					38				
19					39				
20					40				

Field settings

C/H SELECT (setting mode 1)			C/H SELECT setting (DS1-1)			Low noise operation			Sequential start	
IND	MASTER	SLAVE	ON		OFF	ON		OFF	ON	OFF
Tc			Te			Defrost SETTING			Refrigerant addition/replenishment	
H	M	L	H	M	L	H	M	L	kg	

Company name _____

Inspector _____

(V1091)

Before turning on the power

System name

	Inspection item	Inspection method	Standard (guideline)	Measurement values				Decision								
	Breaker capacity	Visual inspection	Specified capacity	G NG												
Outdoor unit 1	Refrigerant piping system	Gas detector	No leaks	G NG												
	Heat exchanger	Visual inspection	No clogging or damage	G NG												
	Terminal connection section	Screwdriver, etc.	No looseness	G NG												
	Fan motor electrical insulation	500-V megatester	1 MΩ or more	MΩ												
	Compressor electrical insulation	500-V megatester	1 MΩ or more	INV	MΩ	STD1	MΩ	STD2	MΩ							
	Installation	Visual inspection	Short circuit, etc.	G NG												
Outdoor unit 2	Refrigerant piping system	Gas detector	No leaks	G NG												
	Heat exchanger	Visual inspection	No clogging or damage	G NG												
	Terminal connection section	Screwdriver, etc.	No looseness	G NG												
	Fan motor electrical insulation	500-V megatester	1 MΩ or more	MΩ												
	Compressor electrical insulation	500-V megatester	1 MΩ or more													
	Installation	Visual inspection	Short circuit, etc.	G NG												
Outdoor unit 3	Refrigerant piping system	Gas detector	No leaks	G NG												
	Heat exchanger	Visual inspection	No clogging or damage	G NG												
	Terminal connection section	Screwdriver, etc.	No looseness	G NG												
	Fan motor electrical insulation	500-V megatester	1 MΩ or more	MΩ												
	Compressor electrical insulation	500-V megatester	1 MΩ or more													
	Installation	Visual inspection	Short circuit, etc.	G NG												
Indoor unit	Refrigerant system	Gas detector	No leaks	Room 1	G	NG	Room 2	G	NG	Room 3	G	NG	Room 4	G	NG	
				Room 5	G	NG	Room 6	G	NG	Room 7	G	NG	Room 8	G	NG	
				Room 9	G	NG	Room 10	G	NG	Room 11	G	NG	Room 12	G	NG	
				Room 13	G	NG	Room 14	G	NG	Room 15	G	NG	Room 16	G	NG	
				Room 17	G	NG	Room 18	G	NG	Room 19	G	NG	Room 20	G	NG	
				Room 21	G	NG	Room 22	G	NG	Room 23	G	NG	Room 24	G	NG	
				Room 25	G	NG	Room 26	G	NG	Room 27	G	NG	Room 28	G	NG	
				Room 29	G	NG	Room 30	G	NG	Room 31	G	NG	Room 32	G	NG	
				Room 33	G	NG	Room 34	G	NG	Room 35	G	NG	Room 36	G	NG	
				Room 37	G	NG	Room 38	G	NG	Room 39	G	NG	Room 40	G	NG	
	Air filter	Visual inspection	No clogging or damage	Room 1	G	NG	Room 2	G	NG	Room 3	G	NG	Room 4	G	NG	
				Room 5	G	NG	Room 6	G	NG	Room 7	G	NG	Room 8	G	NG	
				Room 9	G	NG	Room 10	G	NG	Room 11	G	NG	Room 12	G	NG	
				Room 13	G	NG	Room 14	G	NG	Room 15	G	NG	Room 16	G	NG	
				Room 17	G	NG	Room 18	G	NG	Room 19	G	NG	Room 20	G	NG	
				Room 21	G	NG	Room 22	G	NG	Room 23	G	NG	Room 24	G	NG	
				Room 25	G	NG	Room 26	G	NG	Room 27	G	NG	Room 28	G	NG	
				Room 29	G	NG	Room 30	G	NG	Room 31	G	NG	Room 32	G	NG	
				Room 33	G	NG	Room 34	G	NG	Room 35	G	NG	Room 36	G	NG	
				Room 37	G	NG	Room 38	G	NG	Room 39	G	NG	Room 40	G	NG	
	Heat exchanger	Visual inspection	No clogging or damage	Room 1	G	NG	Room 2	G	NG	Room 3	G	NG	Room 4	G	NG	
				Room 5	G	NG	Room 6	G	NG	Room 7	G	NG	Room 8	G	NG	
				Room 9	G	NG	Room 10	G	NG	Room 11	G	NG	Room 12	G	NG	
				Room 13	G	NG	Room 14	G	NG	Room 15	G	NG	Room 16	G	NG	
				Room 17	G	NG	Room 18	G	NG	Room 19	G	NG	Room 20	G	NG	
				Room 21	G	NG	Room 22	G	NG	Room 23	G	NG	Room 24	G	NG	
				Room 25	G	NG	Room 26	G	NG	Room 27	G	NG	Room 28	G	NG	
				Room 29	G	NG	Room 30	G	NG	Room 31	G	NG	Room 32	G	NG	
				Room 33	G	NG	Room 34	G	NG	Room 35	G	NG	Room 36	G	NG	
				Room 37	G	NG	Room 38	G	NG	Room 39	G	NG	Room 40	G	NG	

	Inspection item	Inspection method	Standard (guideline)	Measurement values				Decision
Indoor unit	Fan motor electrical insulation	500-V megatester	1 M Ω or more	Room 1 G NG	Room 2 G NG	Room 3 G NG	Room 4 G NG	
				Room 5 G NG	Room 6 G NG	Room 7 G NG	Room 8 G NG	
				Room 9 G NG	Room 10 G NG	Room 11 G NG	Room 12 G NG	
				Room 13 G NG	Room 14 G NG	Room 15 G NG	Room 16 G NG	
				Room 17 G NG	Room 18 G NG	Room 19 G NG	Room 20 G NG	
				Room 21 G NG	Room 22 G NG	Room 23 G NG	Room 24 G NG	
				Room 25 G NG	Room 26 G NG	Room 27 G NG	Room 28 G NG	
				Room 29 G NG	Room 30 G NG	Room 31 G NG	Room 32 G NG	
				Room 33 G NG	Room 34 G NG	Room 35 G NG	Room 36 G NG	
	Auxiliary heater electrical insulation	500-V megatester	1 M Ω or more	Room 37 G NG	Room 38 G NG	Room 39 G NG	Room 40 G NG	
				Room 1 G NG	Room 2 G NG	Room 3 G NG	Room 4 G NG	
				Room 5 G NG	Room 6 G NG	Room 7 G NG	Room 8 G NG	
				Room 9 G NG	Room 10 G NG	Room 11 G NG	Room 12 G NG	
				Room 13 G NG	Room 14 G NG	Room 15 G NG	Room 16 G NG	
				Room 17 G NG	Room 18 G NG	Room 19 G NG	Room 20 G NG	
				Room 21 G NG	Room 22 G NG	Room 23 G NG	Room 24 G NG	
				Room 25 G NG	Room 26 G NG	Room 27 G NG	Room 28 G NG	
				Room 29 G NG	Room 30 G NG	Room 31 G NG	Room 32 G NG	
	Installation	Visual inspection	Short circuit, etc.	Room 33 G NG	Room 34 G NG	Room 35 G NG	Room 36 G NG	
				Room 37 G NG	Room 38 G NG	Room 39 G NG	Room 40 G NG	
				Room 1 G NG	Room 2 G NG	Room 3 G NG	Room 4 G NG	
				Room 5 G NG	Room 6 G NG	Room 7 G NG	Room 8 G NG	
				Room 9 G NG	Room 10 G NG	Room 11 G NG	Room 12 G NG	
				Room 13 G NG	Room 14 G NG	Room 15 G NG	Room 16 G NG	
				Room 17 G NG	Room 18 G NG	Room 19 G NG	Room 20 G NG	
				Room 21 G NG	Room 22 G NG	Room 23 G NG	Room 24 G NG	
				Room 25 G NG	Room 26 G NG	Room 27 G NG	Room 28 G NG	
				Room 29 G NG	Room 30 G NG	Room 31 G NG	Room 32 G NG	
				Room 33 G NG	Room 34 G NG	Room 35 G NG	Room 36 G NG	
				Room 37 G NG	Room 38 G NG	Room 39 G NG	Room 40 G NG	

(V1092)

During operation

System name _____

	Inspection item	Inspection method	Standard (guideline)	Measurement values			Decision					
Outdoor unit 1	Main power supply voltage	Tester	Rated voltage ±10%	R-S	V	S-T	V	R-T	V			
	Operation circuit voltage	Tester	Rated voltage ±10%	V								
	Fan rotation direction	Visual inspection	Forward rotation	G						NG		
	Fan noise/vibration	Listening	No noise or vibration									
	Fan operation current	Clamp meter		RED						WHITE	BLACK	
				A						A	A	
	Suction air temperature	Thermometer	Temperature differential 9~11deg. when cooling, 2~3.5deg. when heating	°C								
	Discharge air temperature	Thermometer		°C								
	Compressor discharge pressure	Pressure gauge		MPa								
	Compressor suction pressure	Pressure gauge		MPa								
	Compressor operating current	Clamp meter	Phase differential within 1A	INV	U()A,	V()A,	W()A					
				STD1	R()A,	S()A,	T()A					
				STD2	R()A,	S()A,	T()A					
	Compressor operating frequency	Clamp meter		INV						Hz		
	Suction pipe temperature	Thermometer	3~15°C	INV	°C	STD1	°C	STD2	°C			
	Discharge pipe temperature	Thermometer	85~105°C	INV	°C	STD1	°C	STD2	°C			
Clank case heater	Touch	Warm	INV	G-NG	STD1	G-NG	STD2	G-NG				
Outdoor unit 2	Main power supply voltage	Tester	Rated voltage ±10%	R-S	V	R-S	V	R-S	V			
	Operation circuit voltage	Tester	Rated voltage ±10%	V								
	Fan rotation direction	Visual inspection	Forward rotation	G						NG		
	Fan noise/vibration	Listening	No noise or vibration									
	Fan operation current	Clamp meter		RED						WHITE	BLACK	
				A						A	A	
	Suction air temperature	Thermometer	Temperature differential 9~11deg. when cooling, 2~3.5deg. when heating	°C								
	Discharge air temperature	Thermometer		°C								
	Compressor discharge pressure	Pressure gauge		MPa								
	Compressor suction pressure	Pressure gauge		MPa								
	Compressor operating current	Clamp meter	Phase differential within 1A	INV	U()A,	V()A,	W()A					
				STD1	R()A,	S()A,	T()A					
				STD2	R()A,	S()A,	T()A					
	Compressor operating frequency	Clamp meter		INV						Hz		
	Suction pipe temperature	Thermometer	3~15°C	INV	°C	STD1	°C	STD2	°C			
	Discharge pipe temperature	Thermometer	85~105°C	INV	°C	STD1	°C	STD2	°C			
Clank case heater	Touch	Warm	INV	G-NG	STD1	G-NG	STD2	G-NG				
Outdoor unit 3	Main power supply voltage	Tester	Rated voltage ±10%	R-S	V	R-S	V	R-S	V			
	Operation circuit voltage	Tester	Rated voltage ±10%	V								
	Fan rotation direction	Visual inspection	Forward rotation	G						NG		
	Fan noise/vibration	Listening	No noise or vibration									
	Fan operation current	Clamp meter		RED						WHITE	BLACK	
				A						A	A	
	Suction air temperature	Thermometer	Temperature differential 9~11deg. when cooling, 2~3.5deg. when heating	°C								
	Discharge air temperature	Thermometer		°C								
	Compressor discharge pressure	Pressure gauge		MPa								
	Compressor suction pressure	Pressure gauge		MPa								
	Compressor operating current	Clamp meter	Phase differential within 1A	INV	U()A,	V()A,	W()A					
				STD1	R()A,	S()A,	T()A					
				STD2	R()A,	S()A,	T()A					
	Compressor operating frequency	Clamp meter		INV						Hz		
	Suction pipe temperature	Thermometer	3~15°C	INV	°C	STD1	°C	STD2	°C			
	Discharge pipe temperature	Thermometer	85~105°C	INV	°C	STD1	°C	STD2	°C			
Clank case heater	Touch	Warm	NV	G-NG	STD1	G-NG	STD2	G-NG				

(V1093)

During operation

System name

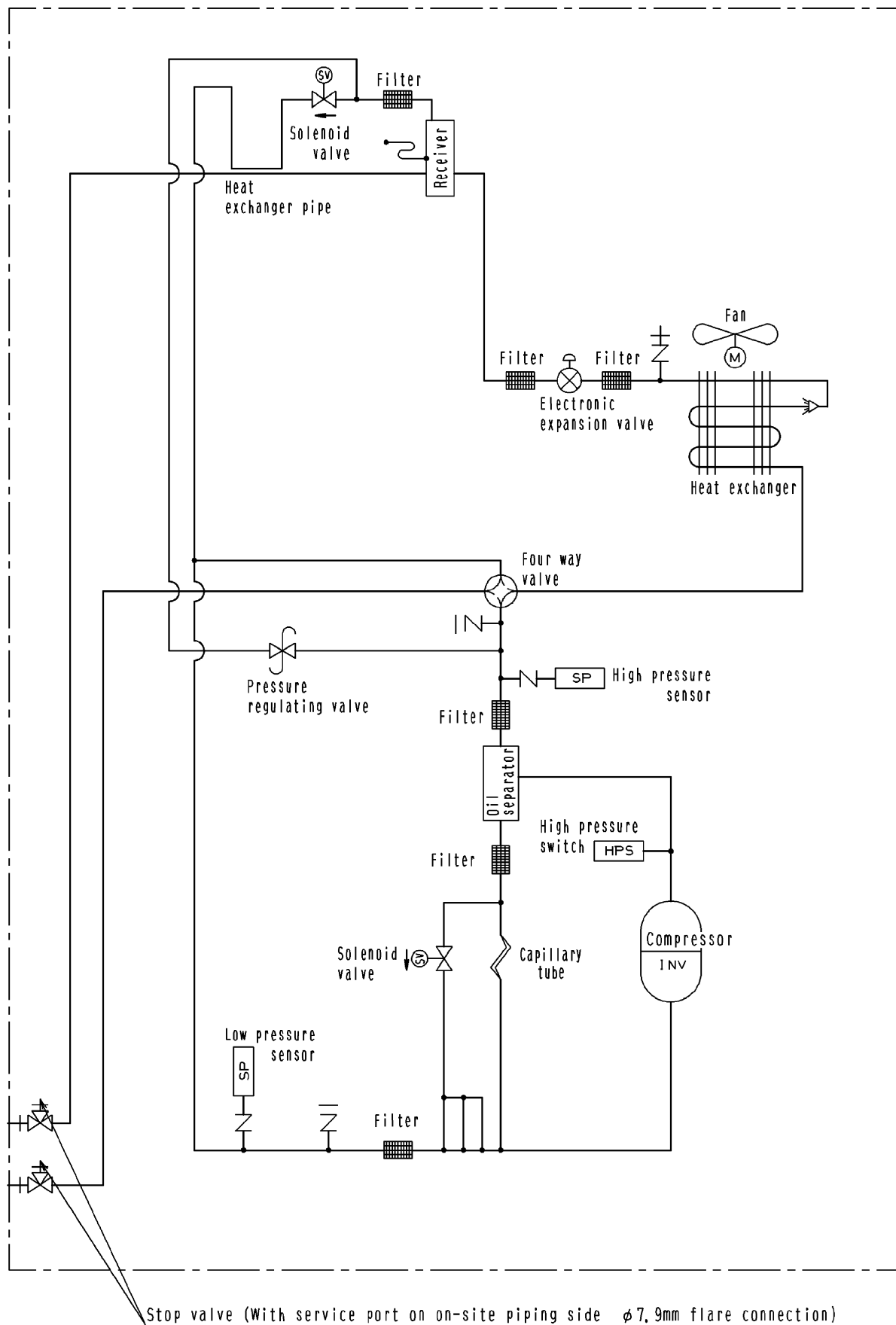
	Inspection item	Inspection method	Standard (guideline)	Measurement values								Decision	
Indoor unit	Powerly supply voltage	Tester	Rated voltage ±10%	Room 1	V	Room 2	V	Room 3	V	Room 4	V		
				Room 5	V	Room 6	V	Room 7	V	Room 8	V		
				Room 9	V	Room10	V	Room11	V	Room12	V		
				Room13	V	Room14	V	Room15	V	Room16	V		
				Room17	V	Room18	V	Room19	V	Room20	V		
				Room21	V	Room22	V	Room23	V	Room24	V		
				Room25	V	Room26	V	Room27	V	Room28	V		
				Room29	V	Room30	V	Room31	V	Room32	V		
				Room33	V	Room34	V	Room35	V	Room36	V		
	Room37	V	Room38	V	Room39	V	Room40	V					
	Suction air temperature	Thermometer	Thermometer differential 9~13 °C when cooling, 15~20 °C when heating	Room 1	°C	Room 2	°C	Room 3	°C	Room 4	°C		
				Room 5	°C	Room 6	°C	Room 7	°C	Room 8	°C		
				Room 9	°C	Room10	°C	Room11	°C	Room12	°C		
				Room13	°C	Room14	°C	Room15	°C	Room16	°C		
				Room17	°C	Room18	°C	Room19	°C	Room20	°C		
				Room21	°C	Room22	°C	Room23	°C	Room24	°C		
				Room25	°C	Room26	°C	Room27	°C	Room28	°C		
				Room29	°C	Room30	°C	Room31	°C	Room32	°C		
				Room33	°C	Room34	°C	Room35	°C	Room36	°C		
				Room37	°C	Room38	°C	Room39	°C	Room40	°C		
				Discharge air temperature	Room 1	°C	Room 2	°C	Room 3	°C	Room 4	°C	
					Room 5	°C	Room 6	°C	Room 7	°C	Room 8	°C	
					Room 9	°C	Room10	°C	Room11	°C	Room12	°C	
					Room13	°C	Room14	°C	Room15	°C	Room16	°C	
					Room17	°C	Room18	°C	Room19	°C	Room20	°C	
					Room21	°C	Room22	°C	Room23	°C	Room24	°C	
					Room25	°C	Room26	°C	Room27	°C	Room28	°C	
					Room29	°C	Room30	°C	Room31	°C	Room32	°C	
	Room33	°C	Room34		°C	Room35	°C	Room36	°C				
	Room37	°C	Room38	°C	Room39	°C	Room40	°C					
	Fan rotation direction	Visual inspection	Forward rotation	Room 1	G NG	Room 2	G NG	Room 3	G NG	Room 4	G NG		
				Room 5	G NG	Room 6	G NG	Room 7	G NG	Room 8	G NG		
				Room 9	G NG	Room 10	G NG	Room 11	G NG	Room 12	G NG		
				Room 13	G NG	Room 14	G NG	Room 15	G NG	Room 16	G NG		
				Room 17	G NG	Room 18	G NG	Room 19	G NG	Room 20	G NG		
				Room 21	G NG	Room 22	G NG	Room 23	G NG	Room 24	G NG		
				Room 25	G NG	Room 26	G NG	Room 27	G NG	Room 28	G NG		
				Room 29	G NG	Room 30	G NG	Room 31	G NG	Room 32	G NG		
				Room 33	G NG	Room 34	G NG	Room 35	G NG	Room 36	G NG		
	Room 37	G NG	Room 38	G NG	Room 39	G NG	Room 40	G NG					
	Fan noise/ vibration	Listening	No noise or vibration	Room 1	G NG	Room 2	G NG	Room 3	G NG	Room 4	G NG		
				Room 5	G NG	Room 6	G NG	Room 7	G NG	Room 8	G NG		
				Room 9	G NG	Room 10	G NG	Room 11	G NG	Room 12	G NG		
				Room 13	G NG	Room 14	G NG	Room 15	G NG	Room 16	G NG		
				Room 17	G NG	Room 18	G NG	Room 19	G NG	Room 20	G NG		
				Room 21	G NG	Room 22	G NG	Room 23	G NG	Room 24	G NG		
				Room 25	G NG	Room 26	G NG	Room 27	G NG	Room 28	G NG		
				Room 29	G NG	Room 30	G NG	Room 31	G NG	Room 32	G NG		
				Room 33	G NG	Room 34	G NG	Room 35	G NG	Room 36	G NG		
	Room 37	G NG	Room 38	G NG	Room 39	G NG	Room 40	G NG					
	Fan operating current	Clamp meter		Room 1	A	Room 2	A	Room 3	A	Room 4	A		
				Room 5	A	Room 6	A	Room 7	A	Room 8	A		
				Room 9	A	Room10	A	Room11	A	Room12	A		
				Room13	A	Room14	A	Room15	A	Room16	A		
				Room17	A	Room18	A	Room19	A	Room20	A		
				Room21	A	Room22	A	Room23	A	Room24	A		
				Room25	A	Room26	A	Room27	A	Room28	A		
				Room29	A	Room30	A	Room31	A	Room32	A		
Room33				A	Room34	A	Room35	A	Room36	A			
Room37	A	Room38	A	Room39	A	Room40	A						

(V1094)

7.10 Piping System Diagrams

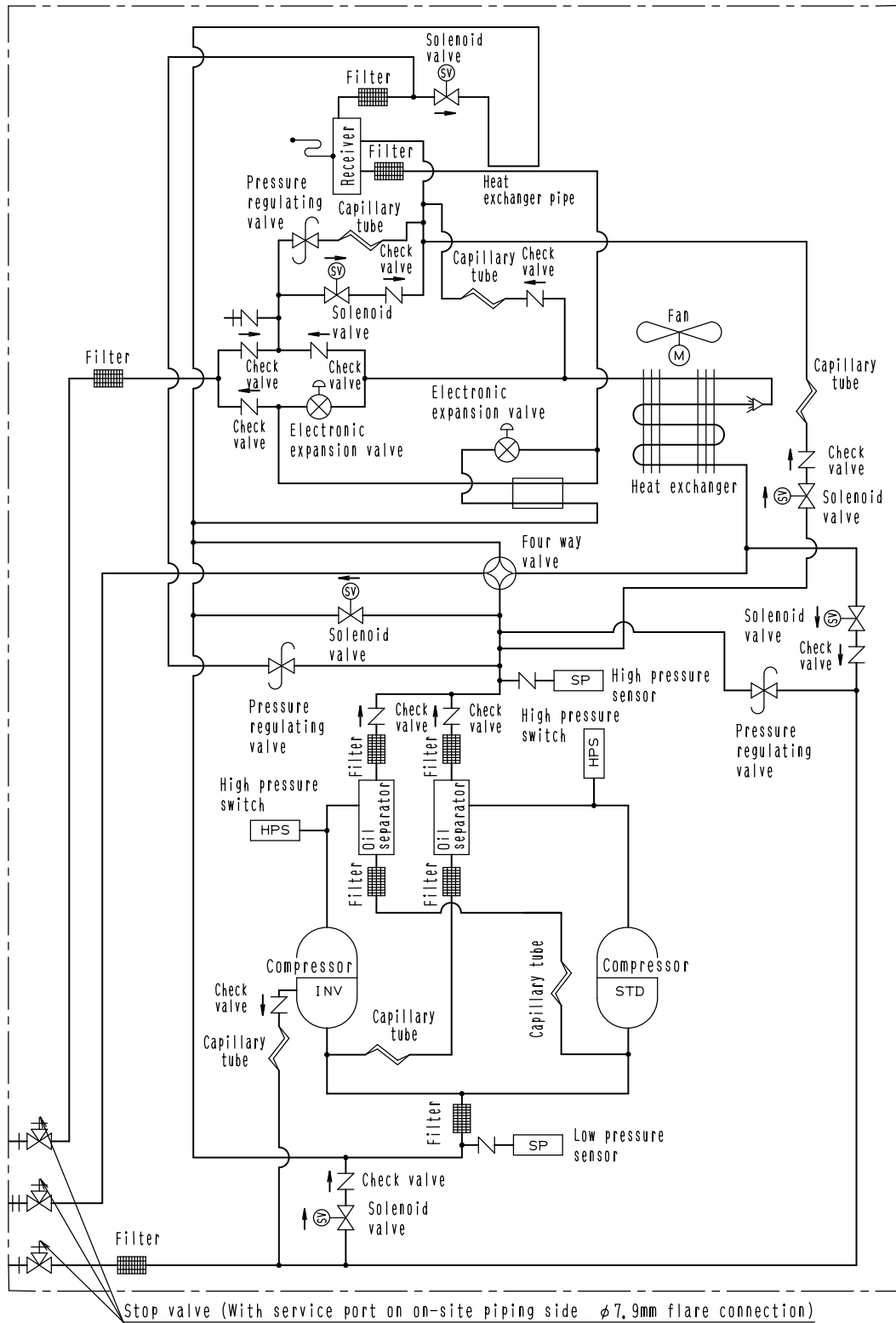
7.10.1 Outdoor Unit

RXYQ5MY1B



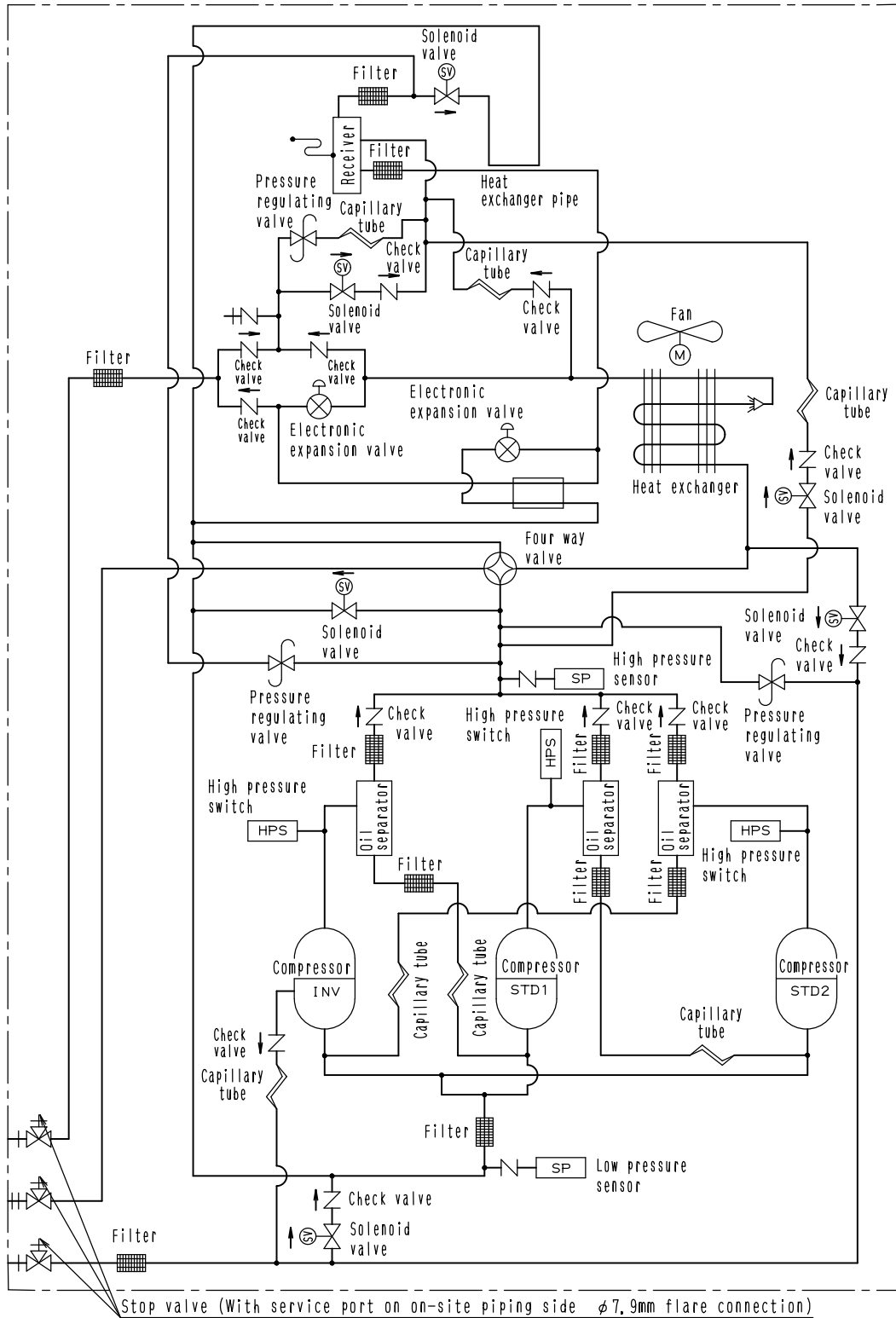
4D040337B

RXYQ8MY1B
RXYQ10MY1B
RXYQ12MY1B



4D040338A

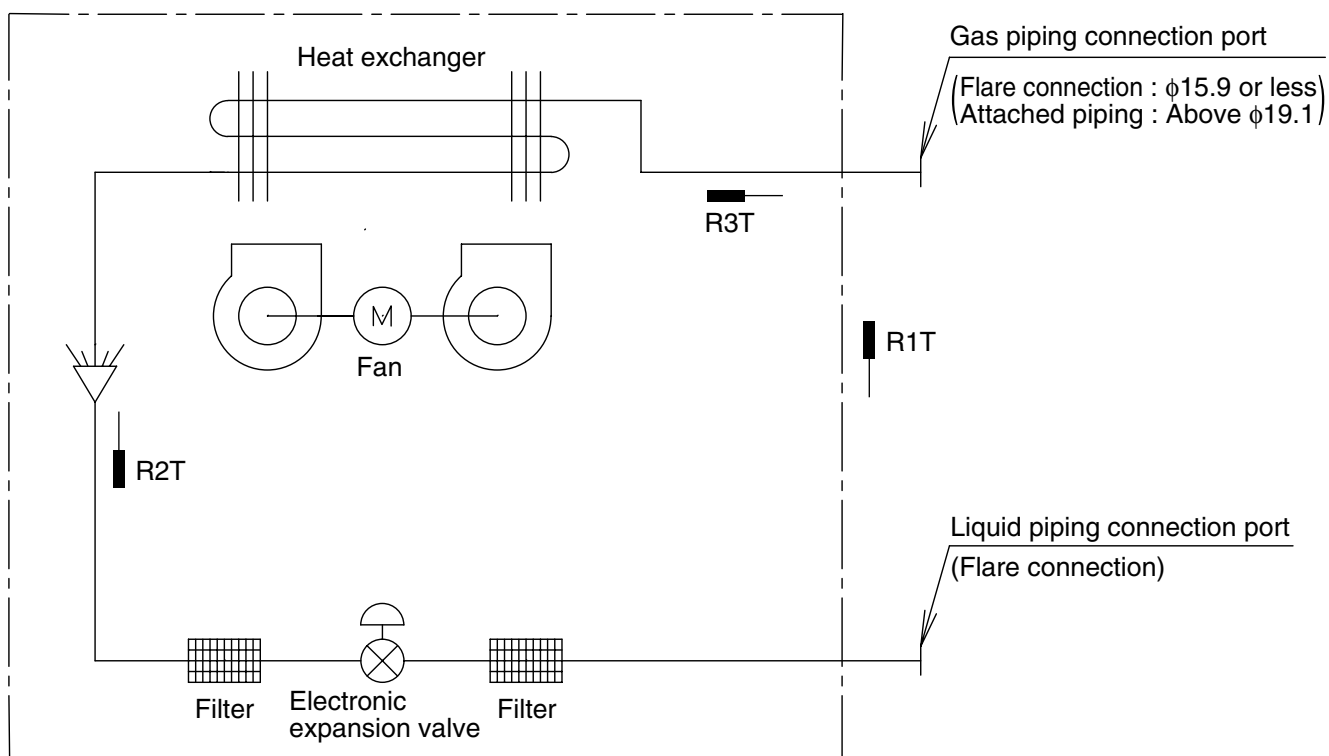
RXYQ14MY1B
RXYQ16MY1B



4D040339A

7.10.2 Indoor Unit

FXCQ, FXZQ, FXFQ, FXKQ, FXSQ, FXMQ, FXHQ, FXAQ, FXLQ, FXNQ



DU220-602D

R1T : Thermistor for suction air temperature

R2T : Thermistor for liquid line temperature

R3T : Thermistor for gas line temperature

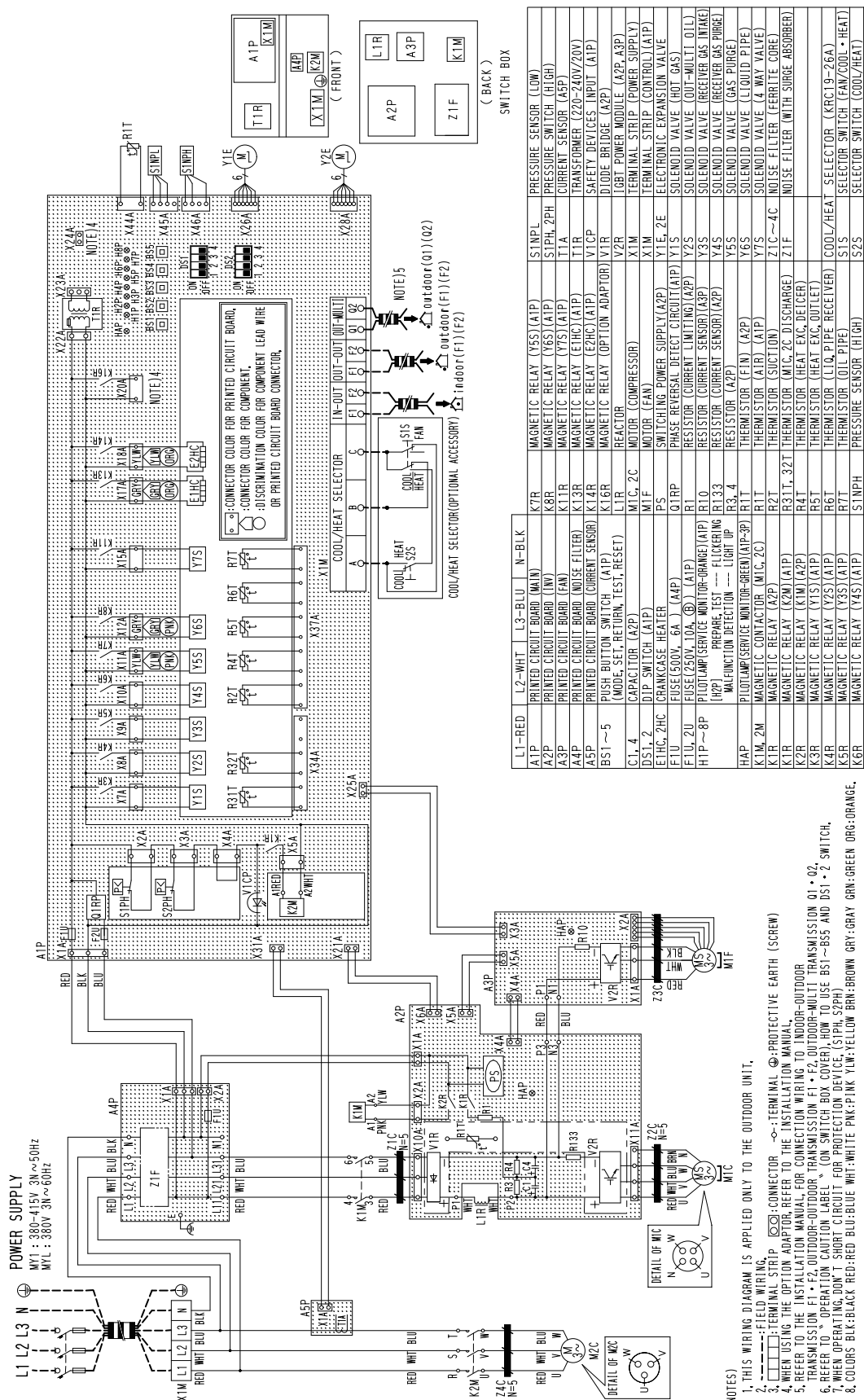
(mm)		
Capacity	GAS	Liquid
20 / 25 / 32 / 40 / 50M	φ12.7	φ6.4
63 / 80 / 100 / 125M	φ15.9	φ9.5
200M	φ19.1	φ9.5
250M	φ22.2	φ9.5

7.11.1 Outdoor Unit

[illegible][illegible]

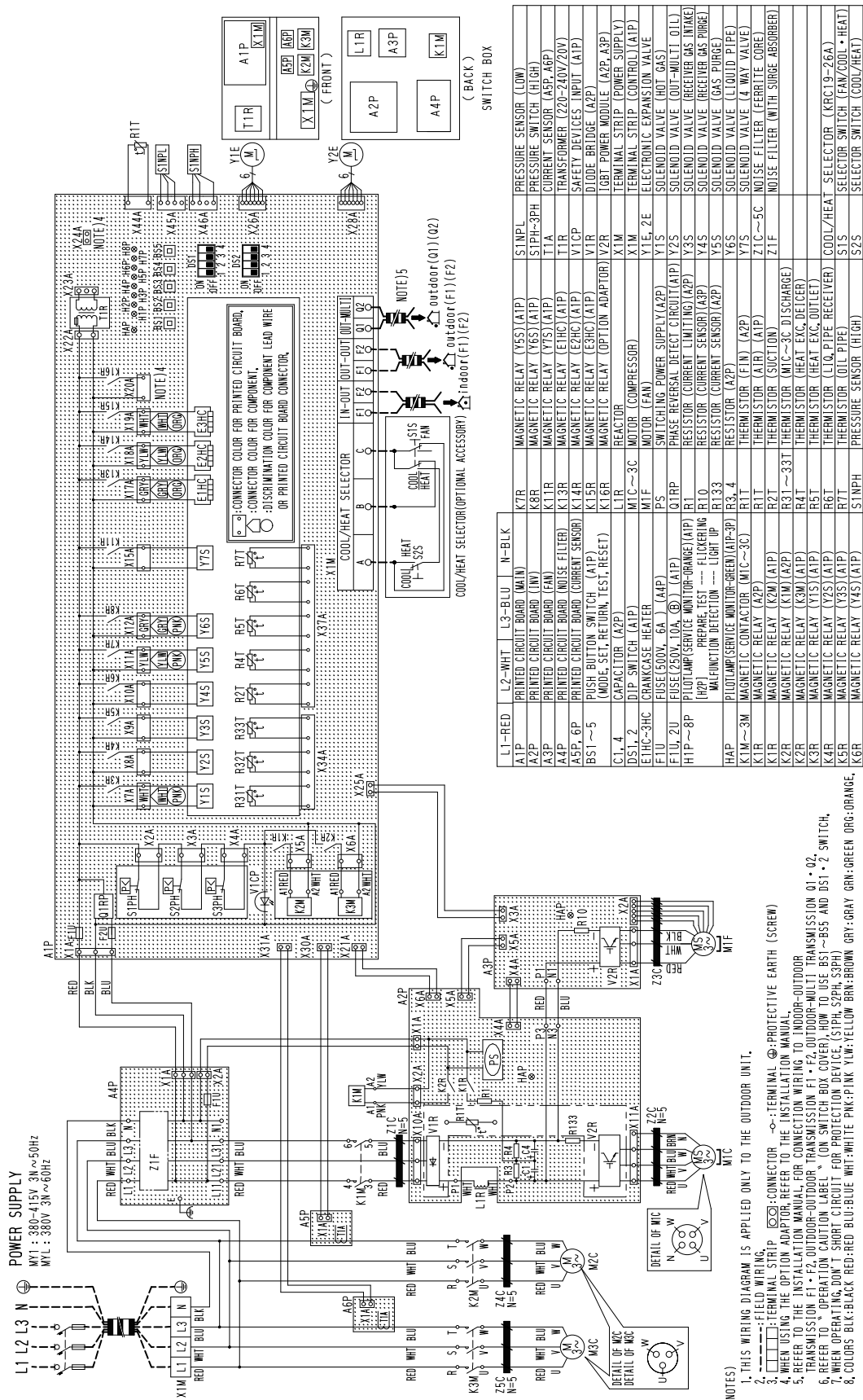
3D038590D

RXYQ8MY1B
RXYQ10MY1B
RXYQ12MY1B



3D038582

RXYQ14MY1B RXYQ16MY1B

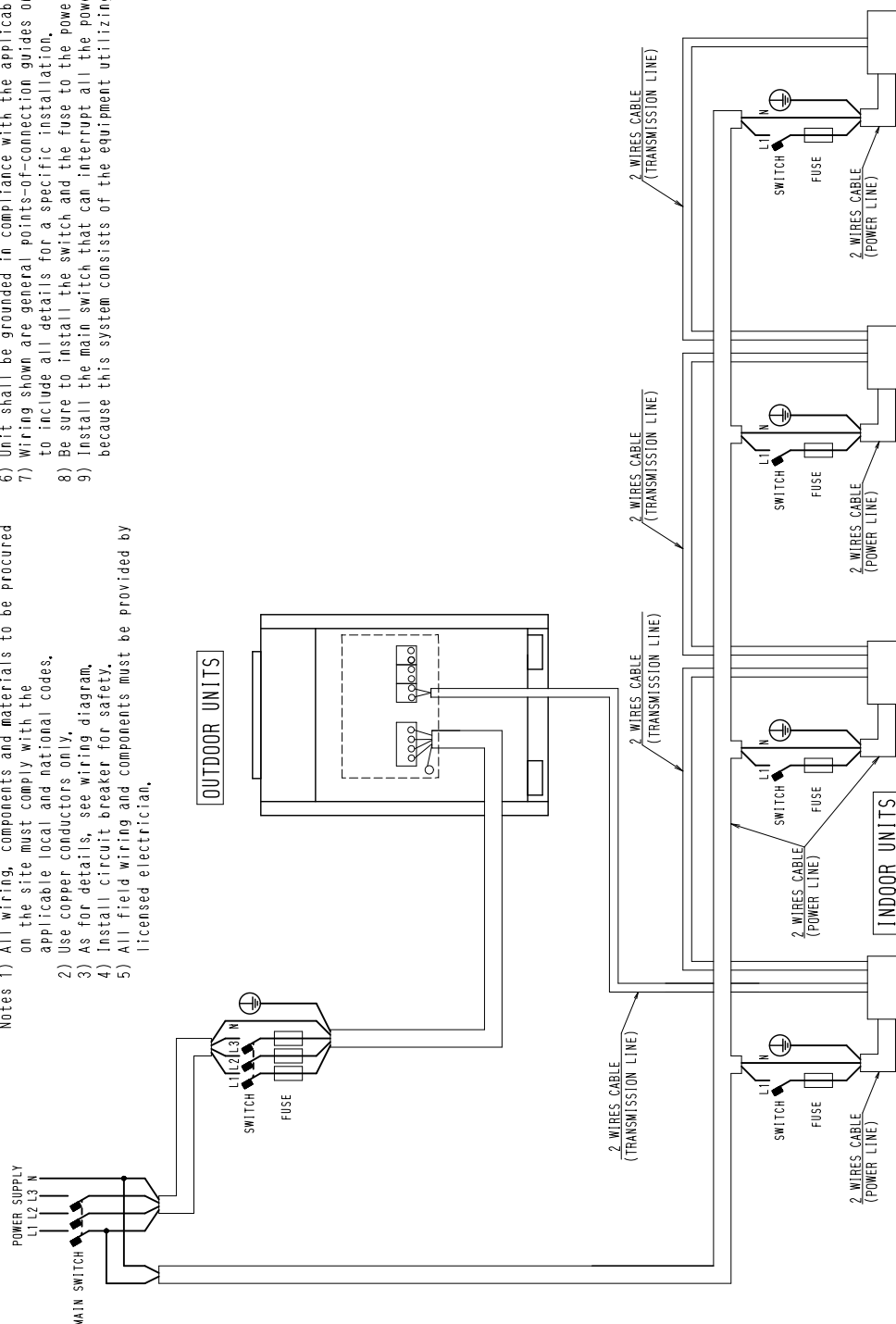


3D038058

7.11.2 Field Wiring

RXYQ5~16MY1B

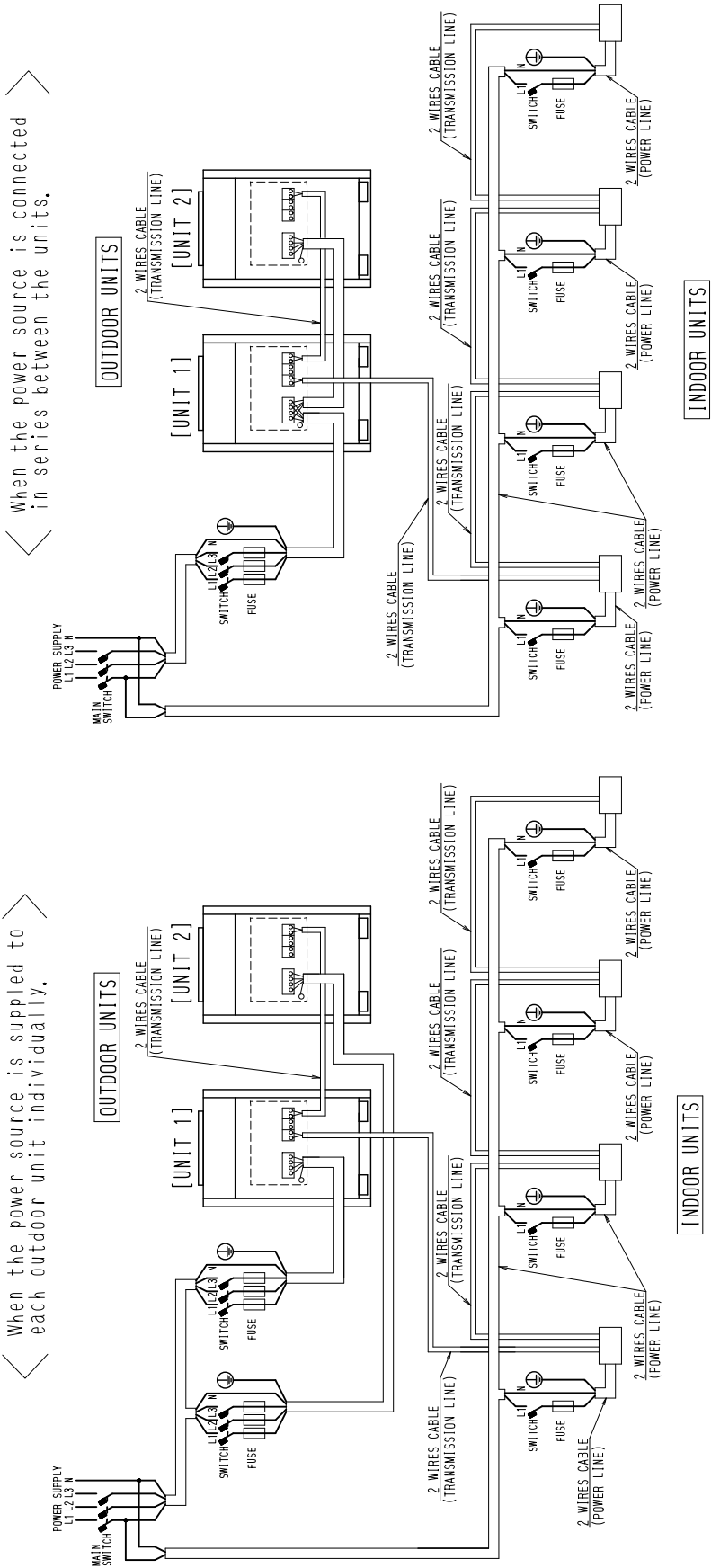
- 6) Unit shall be grounded in compliance with the applicable local and national codes.
- 7) Wiring shown are general points-of-connection guides only and are not intended for or to include all details for a specific installation.
- 8) Be sure to install the switch and the fuse to the power line of each equipment.
- 9) Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.



3D040746

RXYQ18~32MY1B

- Notes 1) All wiring, components and materials to be procured on the site must comply with the applicable local and national codes, to include all details for a specific installation.
- 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 and the fuse to the power line of each equipment.
- 9) Install the main switch that can interrupt all the power sources 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.



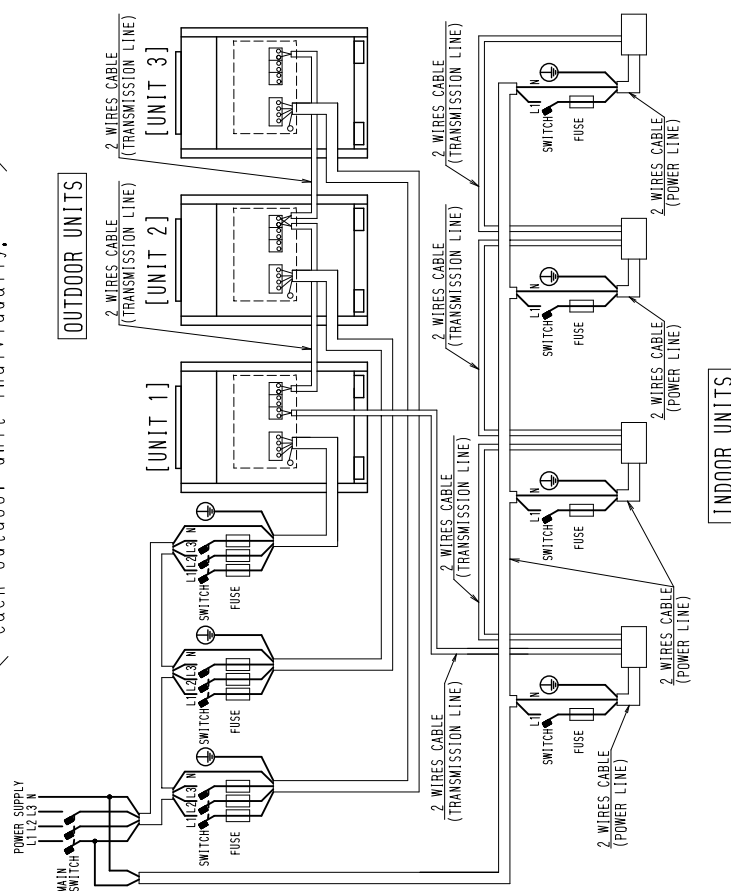
3D040747

RXYQ34~48MY1B

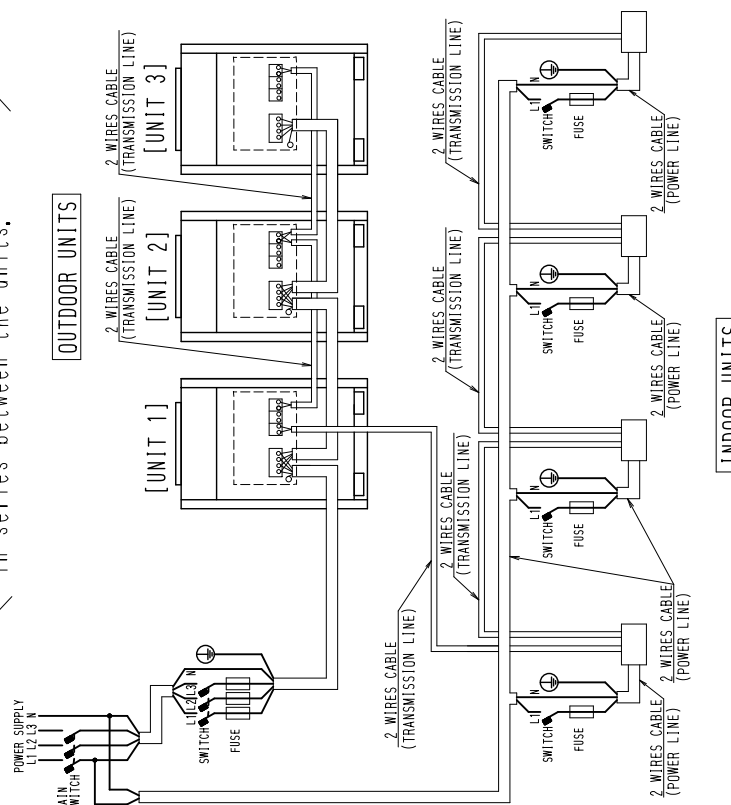
- Notes 1) All wiring, components and materials to be procured on the site must comply with the applicable local and national codes, to include all details for a specific installation.
- 2) Use copper conductors only.
- 3) As for details, see wiring diagram.
- 4) Install circuit breaker for safety.
- 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 and the fuse to the power line of each equipment.
- 9) Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
- 10) UNIT1 must be RXYQ16MY1B when the power source is connected in series between the units.
(In case of RXYQ34MY1B, RXYQ14MY1B,)

When the power source is supplied to each outdoor unit individually.



When the power source is connected in series between the units.



3D040748

7.12 Bad Examples and Good Examples in Installation

7.12.1 Example 1: Signal interference due to use of multiple core cable (all model)

Situation

Although for the purposes of group control there are only 2 units per group there are transmission malfunctions between the indoor units and the remote controller and the remote controller's address display is showing non-existent addresses such as 13 or 15.

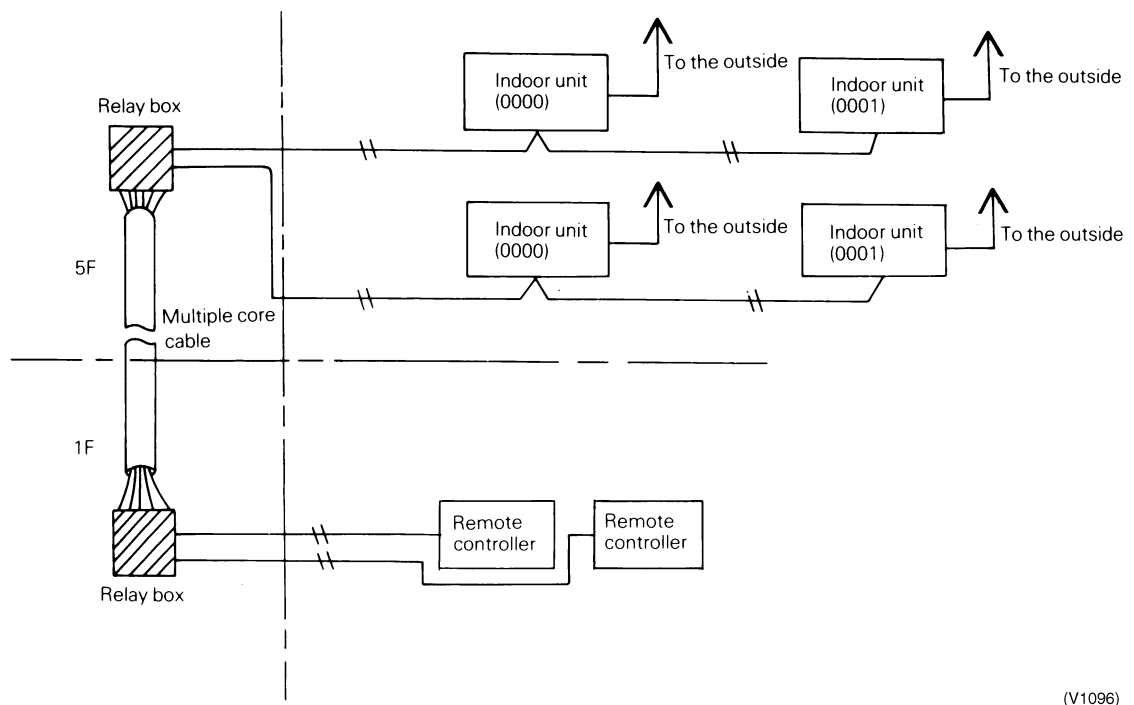
Source of

Problem and

Remedial Action

Multiple core cable has been used for at least part of the interconnecting wiring between the remote controller and the indoor units.

This has resulted in signal interference leading to a transmission malfunction.



(V1096)

The multiple core cable was replaced by twin core cable and the fault disappeared.

Main Points

- Although twin core cable had been run from each unit, multiple core cable was used on the way.
- In schools, etc., because remote controllers are often installed in a single first floor control room, it is easier to use a multi-core cable.
- Signal interference can result in non-existent addresses appearing on the display.

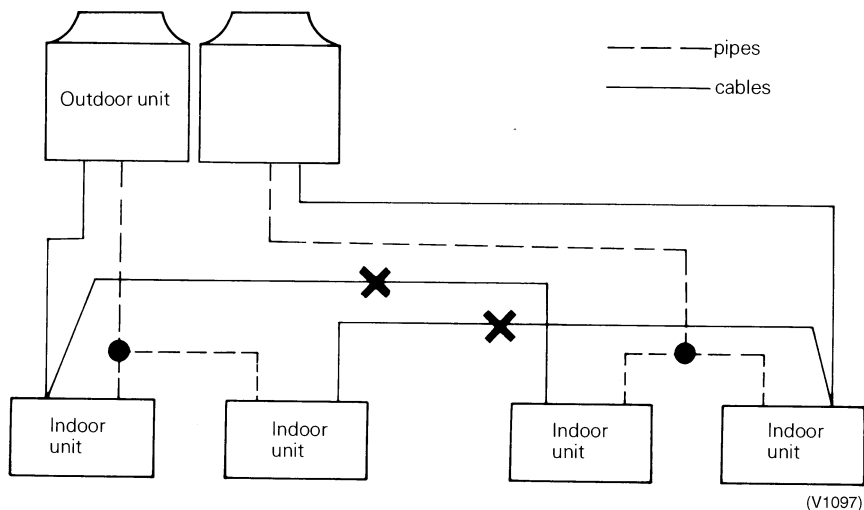
7.12.2 Example 2: Mismatch between cables connecting indoor and outdoor units and corresponding piping. (all model)

Situation

The remote controller is not showing any malfunction and the system is operating but there is no flow of warm air from the indoor unit (in heating mode).

Source of Problem and Remedial Action

The connecting cables and the corresponding piping were not correctly matched.
Recabling was carried out and the fault disappeared.



Main Points

- Special care must be taken when the pipework and cabling are carried out by different people.
- Run each indoor unit in turn to check that the system is correctly matched.

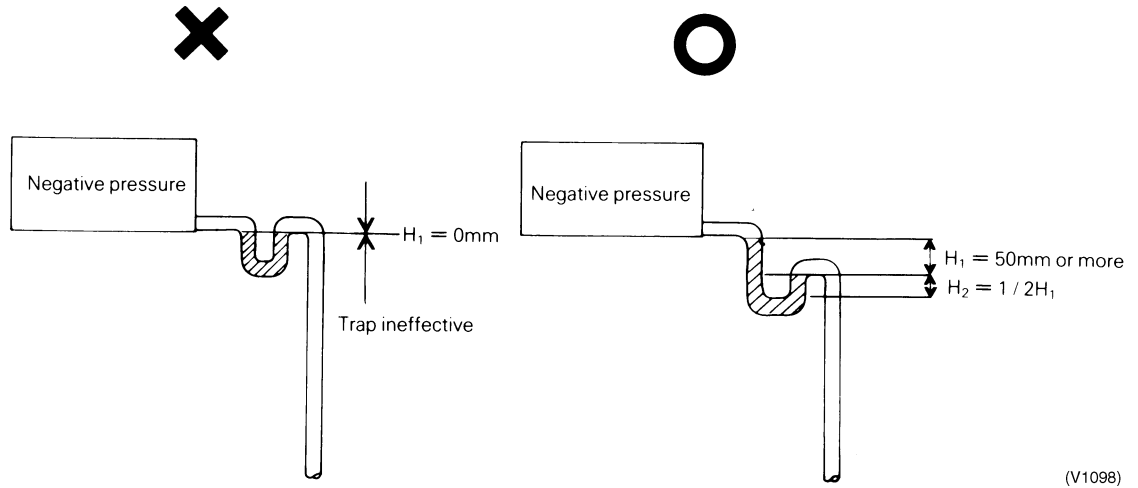
7.12.3 Example 3: Drain pipe trap shape defective

Situation

Indoor unit was fitted with a drain trap but a leak occurred during subsequent operation.

Source of Problem and Remedial Action

The trap was not properly shaped thus preventing it from functioning effectively as a trap and resulting in drain leakage. The trap was reshaped and the fault disappeared.


Main Points

- Duct types (40~125) require a drain trap.

Reason: There is resistance on the air inlet side caused by the heat exchanger and air filter and this in turn creates negative pressure in relation to the atmospheric pressure on the discharge side. If there is no drain trap then air will be drawn in from the drain pipe and the waste water splashed around giving rise to the risk of water overflowing from the drain pan. To avoid this problem it is therefore necessary to design a trap which takes account of the maximum negative pressure which is likely to be created on the suction side.

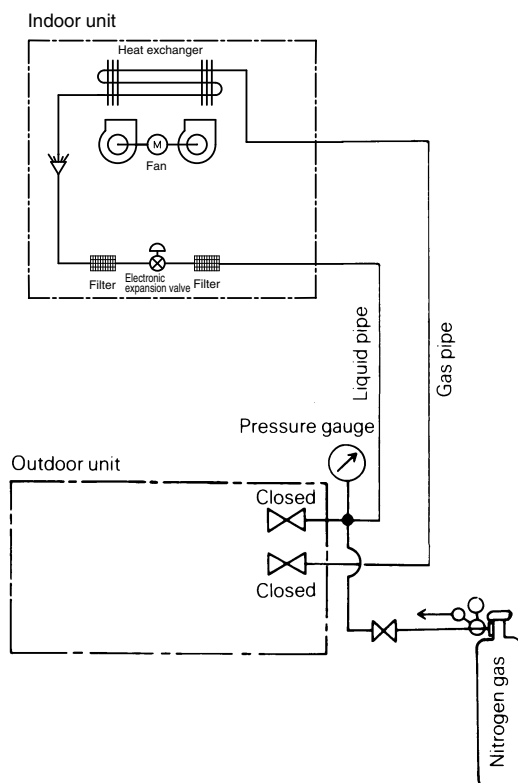
7.12.4 Example 4: Pressure down despite absence of leaks during air tight test (all model)

Situation

In order to carry out local air tight tests on the refrigerant piping the system was pressurized via the liquid pipe service port and after 24 hours the pressure was found to have fallen. The local refrigerant piping alone does not lose any pressure. Maybe the gas leak is supposed to be located in the indoor unit itself.

Source of Problem and Remedial Action

The system was pressurized from the liquid pipe side and the gas pipes were therefore not pressurized. The system was then left under pressure for 24 hours but during that time gas leaked through into the gas pipes due to internal leaks within electronic expansion valves and the gas pressure inside the liquid pipes consequently dropped.



Main Points

When carrying out air tight tests on local pipework it is essential that the system be pressurized via both the liquid pipes and the gas pipes.

7.12.5 Example 5: Excessive noise due to incorrect angling of REFNET joints

Situation

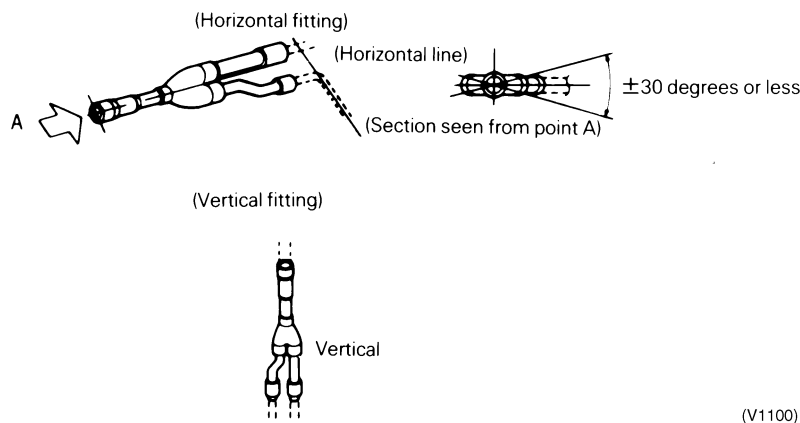
The noise of the refrigerant flow during defrosting is excessive.

Source of Problem and Remedial Action

The angle of the fittings was incorrect and needed to be rectified as shown in the following figure.

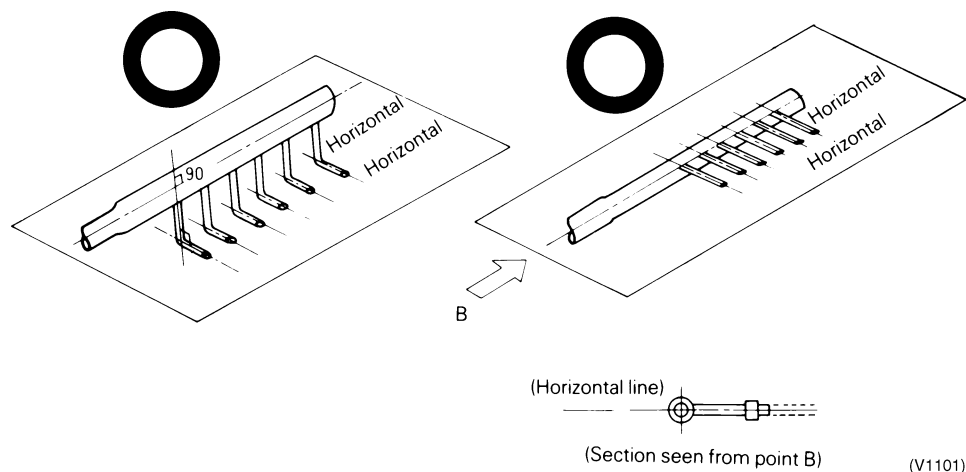
1. REFNET joints

The REFNET joints should be installed such that branches meet the main pipe either horizontally or vertically at an angle of exactly 90 degrees.



2. REFNET header

The REFNET header is a lateral flow pipe and should be fitted so as to allow horizontal branch fittings. (Vertical or sloping fitting is not permissible.)



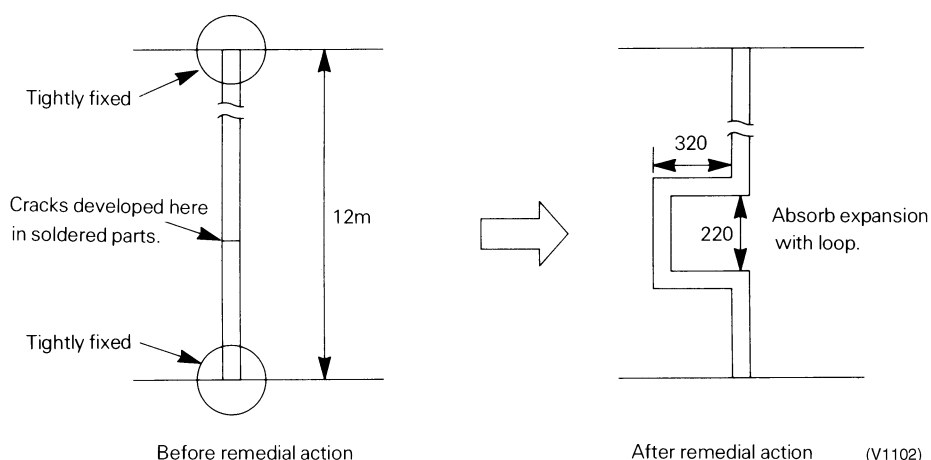
Main Points

- Reasons for using refrigerant branch kit
Fittings of REFNET joints or headers which are not carried out in strict accordance with the principles outlined here may result in complaints relating, for example, to “poor performance” of the system or “noisy refrigerant flow”. (To prevent unbalance flow or oil shortage)

7.12.6 Example 6: Cracks develop in field pipes due to thermal expansion and contraction

Situation	Refrigerant piping has developed cracks in soldered points and is leaking gas.
Cause	<p>Both ends of the pipe have been tightly fixed in place.</p> <p>↓</p> <p>Starting and stopping the compressor has caused temperature to vary, thus the pipes have expanded and contracted which places stress on soldered parts.</p> <p>↓</p> <p>Cracks have formed because of repeated expansion and contraction.</p>

Remedial Action Fit the pipe with a loop as shown in the below drawing.



Main Points ■ Take thermal expansion and contraction along the spline into consideration when installing pipe supports.

For Your Reference Expansion (m) = Full length × Coefficient of thermal expansion × Rise in temperature
Coefficient of thermal expansion for copper: 16.5×10^{-6}

Example For a pipe length of 10 m and a rise in temperature of 50°C, expansion reaches 8.2 mm.

7.12.7 Example 7: Transmission wiring between the cool/heat selector and the outdoor unit is too close to a high voltage wire.

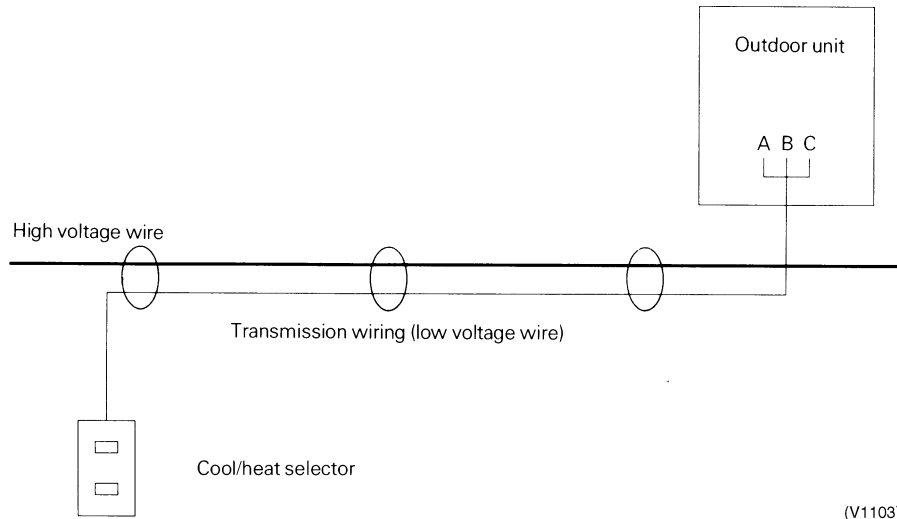
Situation

Heating is indicated despite having selected cooling with the cool/heat selector.

Cause and

Remedial Action

The transmission wiring between the cool/heat selector and the outdoor unit is too close to a high voltage wire. An induced voltage is, therefore, being impressed on the transmission wiring which is causing a heating/cooling malfunction in the outdoor unit PC board.



Bypassing the transmission wiring will allow the unit to function normally.

Main Points

- Keep low and high voltage wiring away from each another.

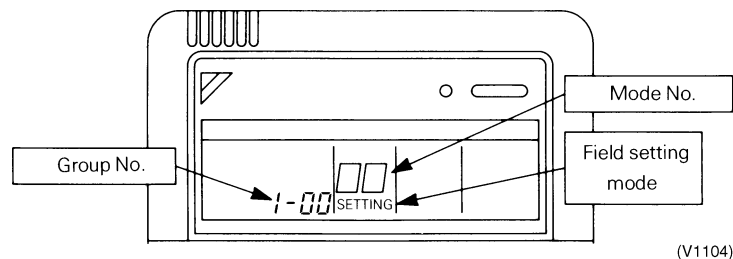
7.12.8 Example 8: The centralized control group number cannot be set (Inverter K Series).

Situation

An attempt was made to set the centralized control group number with the indoor unit remote controller, but "00" cannot be selected in the field setting mode.

Cause

1. The central remote controller or unified ON/OFF controller is OFF.
2. The central remote controller or unified ON/OFF controller, or indoor unit is not wired to the centralized control line (F1 & F2).



Remedial Action

Supply power to either the central remote controller or unified ON/OFF controller.
Wire the central remote controller or unified ON/OFF controller, or indoor unit to the centralized control line.

Main Points

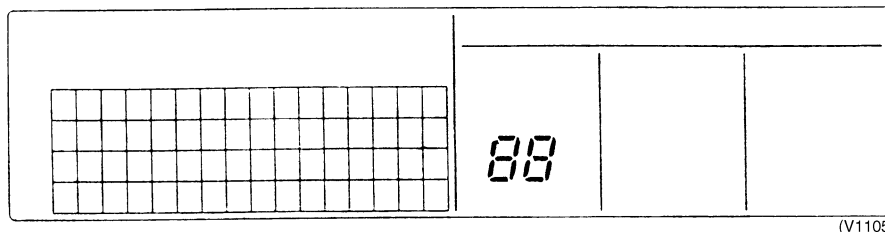
- When communications with the central remote controller are down, "00" cannot be selected in the field setting mode.
- Activate power to the central remote controller, unified ON/OFF controller and indoor unit before setting the centralized control group number.

7.12.9 Example 9: “88” cannot be cleared from the central remote controller.

Situation

The display on the central remote controller does not change from its initial state after turning power ON.

Initial display of the central remote controller



Cause

1. None of the indoor units connected to the central remote controller have been given a group No.
2. The connector for setting the master controller inside the central remote controller is disconnected.

Remedial Action

- Set a centralized control group No. for each indoor unit with the respective remote controllers.
- Connect the connector for setting the master controller in one of the central remote controller.

Main Points

- If the setting for master controller has been changed, reset the power to the unit at the ON/OFF switch or the forced reset switch of the controller.
- Activate power to the central remote controller, unified ON/OFF controller and indoor unit before setting the centralized control group No.
- For details on how to set the centralized control group number, refer to the installation manual.

Part 2

Installation Manual

1. Introduction	155
1.1 Combination	155
1.2 Standard Operation Limit	156
1.3 Standard Supplied Accessories	156
1.4 Option Accessory	157
1.5 Technical Specifications	158
1.6 Electrical Specifications.....	160
2. Main Components	161
3. Selection of Location	162
4. Inspecting and Handling the Unit	164
5. Unpacking and Placing the Unit	165
6. Refrigerant Piping	167
6.1 Selection of Piping Material	167
6.2 Connecting the Refrigerant Piping	168
6.3 Example of Connection	173
6.4 Leak test and Vacuum Drying	175
6.5 Pipe Insulation.....	177
6.6 Additional refrigerant charge	178
7. Field Wiring	180
7.1 Optional Parts Cool / Heat Selector	180
7.2 Power Circuit and Cable Requirements	181
7.3 General.....	182
7.4 Examples.....	183
8. Before Operation.....	191
8.1 Checks Before Initial Start-up.....	191
8.2 Test Run.....	192
9. Caution for Refrigerant Leaks	194
9.1 Caution for Refrigerant Leaks	194

[Applicable models]

RXYQ5MY1B	RXYQ28MY1B
RXYQ8MY1B	RXYQ30MY1B
RXYQ10MY1B	RXYQ32MY1B
RXYQ12MY1B	RXYQ34MY1B
RXYQ14MY1B	RXYQ36MY1B
RXYQ16MY1B	RXYQ38MY1B
RXYQ18MY1B	RXYQ40MY1B
RXYQ20MY1B	RXYQ42MY1B
RXYQ22MY1B	RXYQ44MY1B
RXYQ24MY1B	RXYQ46MY1B
RXYQ26MY1B	RXYQ48MY1B

**Caution**

- Read this manual attentively before starting up the unit. Do not throw it away. Keep it in your files for future reference.

**Caution**

- Improper installation or attachment of equipment or accessories could result in electric shock, short-circuit, leaks, fire or other damage to the equipment. Be sure only to use accessories made by Daikin which are specifically designed for use with the equipment and have them installed by a professional.
If unsure of installation procedures or use, always contact your Daikin dealer for advice and information.

**Caution**

- The refrigerant R410A requires strict cautions for keeping the system clean, dry and tight.
 - A.Clean and dry
Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting mixed into the system.
 - B.Tight
R410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth's protection against harmful ultraviolet radiation.
R410A can contribute slightly to the greenhouse effect if it is released. Therefore we should take special attention to check the tightness of the installation.
- Read the chapter "Refrigerant piping work" carefully and follow these procedures correctly.

**Caution**

- Since design pressure is 3.8MPa or 38bar (for R407C units: 3.3MPa or 33bar), pipes of larger wall thickness may be required.
- Since R410A is a mixed refrigerant, the required additional refrigerant must be charged in its liquid state. (If the refrigerant is charged in a state of gas, its composition changes and the system will not work properly.)
- The indoor unit is for R410A. See the catalog for indoor unit models which can be connected.
(Normal operation is not possible when connected to other units.)

**Caution**

- Do not allow children to mount on the outdoor unit, or avoid placing any object on it. Falling or tumble may result in injury.

1. Introduction

This installation manual concerns VRV inverters of the Daikin RXYQ-M series. These units are designed for outdoor installation and used for cooling and heatpump applications. The units are available in 3 standard sizes with nominal cooling capacities ranging from 14.0 to 133.5kW and nominal heating capacities ranging from 16.0 to 150.0kW.

The RXYQ-M units can be combined with Daikin VRV series indoor units for air conditioning purposes.

The present installation manual describes the procedures for unpacking, installing and connecting the RXYQ-M units. Installation of the indoor units is not described in this manual. Always refer to the installation manual supplied with these units for their installation.

1.1 Combination

The indoor units can be installed in the following range.

■ **Always use appropriate indoor units compatible with R410A.**

To lean which models of indoor units are compatible with R410A, refer to the product catalogs.

■ **Total capacity/quantity of indoor units**

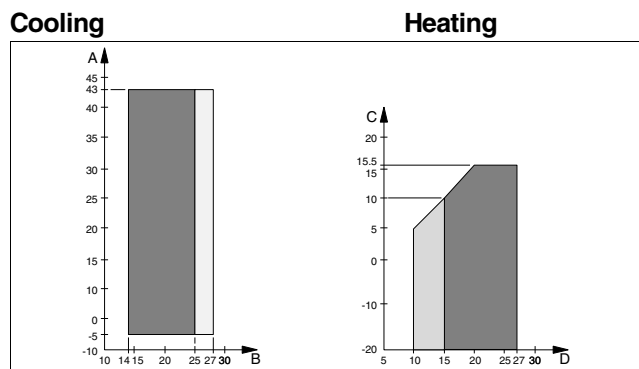
〈Outdoor unit〉	〈Total capacity of indoor units〉	〈Total quantity of indoor units〉
RXYQ5MY1B.....	62.5 ~ 162.5	8 units
RXYQ8MY1B.....	100 ~ 260	13 units
RXYQ10MY1B.....	125 ~ 325	16 units
RXYQ12MY1B.....	150 ~ 390	19 units
RXYQ14MY1B.....	175 ~ 455	20 units
RXYQ16MY1B.....	200 ~ 520	20 units
RXYQ18MY1B.....	225 ~ 585	20 units
RXYQ20MY1B.....	250 ~ 650	20 units
RXYQ22MY1B.....	275 ~ 715	22 units
RXYQ24MY1B.....	300 ~ 780	32 units
RXYQ26MY1B.....	325 ~ 845	32 units
RXYQ28MY1B.....	350 ~ 910	32 units
RXYQ30MY1B.....	375 ~ 975	32 units
RXYQ32MY1B.....	400 ~ 1040	32 units
RXYQ34MY1B.....	425 ~ 1105	34 units
RXYQ36MY1B.....	450 ~ 1170	36 units
RXYQ38MY1B.....	475 ~ 1235	38 units
RXYQ40MY1B.....	500 ~ 1300	40 units
RXYQ42MY1B.....	525 ~ 1365	40 units
RXYQ44MY1B.....	550 ~ 1430	40 units
RXYQ46MY1B.....	575 ~ 1495	40 units
RXYQ48MY1B.....	600 ~ 1560	40 units

1.2 Standard Operation Limit

The figures below assume following operating conditions for indoor and outdoor units:

Equivalent pipe length..... 7.5m

Level difference..... 0m



A Outdoor temperature (°CDB)

B Indoor temperature (°CWB)

C Outdoor temperature (°CWB)




D Indoor temperature (°CDB)





■ Range for continuous operation



■ Range for pull down operation

■ Range for warming up operation

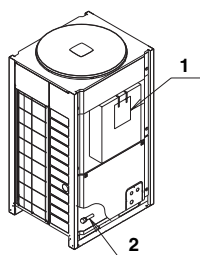
1.3 Standard Supplied Accessories

RXYQ5 type				
Name	Clamp (1)	Clamp (2)	Clamp (3)	Others
Quantity	9 pcs.	2 pcs.	1 pc.	<ul style="list-style-type: none"> ■ Operation manual ■ Installation manual ■ Additional refrigerant charge label
Shape	 Small		 Large	

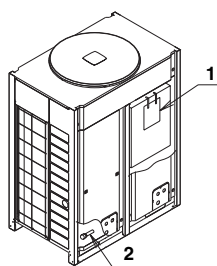
RXYQ8 · 10 · 14 · 16 type				
Name	Clamp (1)	Clamp (2)	Clamp (3)	Gas line piping attached to unit (1)
Quantity	9 pcs.	2 pcs.	1 pc.	1 pc.
Shape	 Small		 Large	

Name	Gas line piping attached to unit (2)	Gas line piping attached to unit (3)	Others
Quantity	1 pc.	1 pc.	<ul style="list-style-type: none"> ■ Operation manual ■ Installation manual ■ Declaration of conformity ■ Additional refrigerant charge label
Shape			

[RXYQ5 · 8 · 10 type]



[RXYQ12 · 14 · 16 type]



1. Operation manual
Installation manual
Clamp
2. Attached pipe

1.4 Option Accessory

To install the above outdoor units, the following optional parts are also required.

- **Refrigerant branching kit (For R410A only: Always use an appropriate kit dedicated for your system.)**

REFNET header	KHRP26M22H	KHRP26M33H	KHRP26M72H	KHRP26M73H
REFNET joint	KHRP26M22T	KHRP26M33T	KHRP26M72T	KHRP26M73T

- **Outdoor unit multi connection piping kit (For R410A only: Always use an appropriate kit dedicated for your system.)**

Number of outdoor units connected	2 units	3 units
Kit name	BHFP22M90	BHFP22M135

- **Pipe size reducer (For R410A only: Always use an appropriate kit dedicated for your system.)**

Kit name	KHRP26M73TP	KHRP26M73HP	BHFP22M90P	BHFP22M135P
Type of outdoor unit used	RXYQ24~48MY1B		RXYQ24~32MY1B	RXYQ34~48MY1B

* To select an optimum refrigerant branching kit, refer to “6. Refrigerant Piping Work”.

1.5 Technical Specifications

General			RXYQ5MY1B	RXYQ8MY1B	RXYQ10MY1B	RXYQ12MY1B	RXYQ14MY1B	RXYQ16MY1B
Nominal cooling capacity		kW	14.0	22.4	28.0	33.5	40.0	44.5
Nominal heating capacity		kW	16.0	25.0	31.5	37.5	45.0	50.0
Nominal input cooling / heating		kW	3.79 / 4.34	6.97 / 6.89	9.00 / 9.31	10.6 / 10.8	14.3 / 12.9	15.6 / 14.0
Dimensions Exhorts		mm	1600×635×765	1600×930×765	1600×930×765	1600×1240×765	1600×1240×765	1600×1240×765
Weight		kg	160	230	230	281	323	325
Connections	Refrigerant gas pipe	inch	5/8	6/8	7/8	1 1/8	1 1/8	1 1/8
		mm	φ 15.9	φ 19.1	φ 22.2	φ 28.6	φ 28.6	φ 28.6
	Refrigerant liquid pipe	inch	3/8	3/8	3/8	1/2	1/2	1/2
		mm	φ 9.5	φ 9.5	φ 9.5	φ 12.7	φ 12.7	φ 12.7
Compressor			RXYQ5MY1B	RXYQ8MY1B	RXYQ10MY1B	RXYQ12MY1B	RXYQ14MY1B	RXYQ16MY1B
Oil type			Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil
Oil charge volume		l	1.2	1.9+1.6	1.9+1.6	1.9+1.6	1.9+1.6+1.6	1.9+1.6+1.6
Crankcase heater		W	33	33+33	33+33	33+33	33+33+33	33+33+33
Refrigerant type			R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge		kg	5.6	8.6	9.6	11.4	12.9	14.4
Nominal air flow		m³ / min.	75	175	180	210	210	210
Fan motor output		W	350	750	750	750	750	750

General			RXYQ18MY1B	RXYQ20MY1B	RXYQ22MY1B	RXYQ24MY1B	RXYQ26MY1B	RXYQ28MY1B
Nominal cooling capacity		kW	50.4	56.0	61.5	68.0	72.5	78.0
Nominal heating capacity		kW	56.5	63.0	69.0	76.5	81.5	87.5
Nominal input cooling / heating		kW	16.0 / 16.2	18.0 / 18.6	19.6 / 20.1	23.3 / 22.2	24.6 / 23.3	26.2 / 24.8
Dimensions	HxWxD	mm	(1600×930×765)+ (1600×930×765)	(1600×930×765)+ (1600×930×765)	(1600×930×765)+ (1600×1240×765)	(1600×930×765)+ (1600×1240×765)	(1600×930×765)+ (1600×1240×765)	(1600×1240×765)+ (1600×1240×765)
Weight		kg	230+230	230+230	230+281	230+323	230+325	281+325
Connections	Refrigerant gas pipe	inch	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8	1 3/8
		mm	φ 28.6	φ 28.6	φ 28.6	φ 34.9	φ 34.9	φ 34.9
	Refrigerant liquid pipe	inch	5/8	5/8	5/8	5/8	6/8	6/8
		mm	φ 15.9	φ 15.9	φ 15.9	φ 15.9	φ 19.1	φ 19.1
	Oil equalizing pipe	inch	1/4	1/4	1/4	1/4	1/4	1/4
		mm	φ 6.4	φ 6.4	φ 6.4	φ 6.4	φ 6.4	φ 6.4
Compressor			RXYQ18MY1B	RXYQ20MY1B	RXYQ22MY1B	RXYQ24MY1B	RXYQ26MY1B	RXYQ28MY1B
Oil type			Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil
Oil charge volume		l	(1.9+1.6)+(1.9+1.6)	(1.9+1.6)+(1.9+1.6)	(1.9+1.6)+(1.9+1.6)	(1.9+1.6)+ (1.9+1.6+1.6)	(1.9+1.6)+ (1.9+1.6+1.6)	(1.9+1.6)+ (1.9+1.6+1.6)
Crankcase heater		W	(33+33)+(33+33)	(33+33)+(33+33)	(33+33)+(33+33)	(33+33)+ (33+33+33)	(33+33)+ (33+33+33)	(33+33)+ (33+33+33)
Refrigerant type			R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge		kg	8.6+9.6	9.6+9.6	9.6+11.4	9.6+12.9	9.6+14.4	11.4+14.4
Nominal air flow		m³ / min	175+180	180+180	180+210	180+210	180+210	210+210
Fan motor output		W	750+750	750+750	750+750	750+750	750+750	750+750

General			RXYQ30MY1B	RXYQ32MY1B	RXYQ34MY1B	RXYQ36MY1B	RXYQ38MY1B	RXYQ40MY1B
Nominal cooling capacity		kW	84.5	89.0	96.0	101.0	106.0	113.0
Nominal heating capacity		kW	95.0	100.0	108.0	113.0	119.0	127.0
Nominal input cooling / heating		kW	29.9 / 26.9	31.2 / 28.1	32.3 / 31.5	33.6 / 32.6	35.2 / 34.1	38.9 / 36.2
Dimensions		HxWxD	mm	(1600×1240×765)+ (1600×1240×765)	(1600×1240×765)+ (1600×1240×765)	(1600×930×765)+ (1600×930×765)+ (1600×1240×765)	(1600×930×765)+ (1600×930×765)+ (1600×1240×765)	(1600×930×765)+ (1600×1240×765)+ (1600×1240×765)
Weight		kg	323+325	325+325	230+230+323	230+230+325	230+281+325	230+323+325
Connections	Refrigerant gas pipe	inch	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1 5/8
		mm	φ 34.9	φ 34.9	φ 34.9	φ 41.3	φ 41.3	φ 41.3
	Refrigerant liquid pipe	inch	6/8	6/8	6/8	6/8	6/8	6/8
		mm	φ 19.1	φ 19.1	φ 19.1	φ 19.1	φ 19.1	φ 19.1
	Oil equalizing pipe	inch	1/4	1/4	1/4	1/4	1/4	1/4
		mm	φ 6.4	φ 6.4	φ 6.4	φ 6.4	φ 6.4	φ 6.4
Compressor			RXYQ30MY1B	RXYQ32MY1B	RXYQ34MY1B	RXYQ36MY1B	RXYQ38MY1B	RXYQ40MY1B
Oil type			Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil
Oil charge volume		l	(1.9+1.6+1.6)+ (1.9+1.6+1.6)	(1.9+1.6+1.6)+ (1.9+1.6+1.6)	(1.9+1.6)+(1.9+1.6)+ (1.9+1.6+1.6)	(1.9+1.6)+(1.9+1.6)+ (1.9+1.6+1.6)	(1.9+1.6)+(1.9+1.6)+ (1.9+1.6+1.6)	(1.9+1.6)+ (1.9+1.6+1.6)+ (1.9+1.6+1.6)
Crankcase heater		W	(33+33+33)+ (33+33+33)	(33+33+33)+ (33+33+33)	(33+33)+(33+33)+ (33+33+33)	(33+33)+(33+33)+ (33+33+33)	(33+33)+(33+33)+ (33+33+33)	(33+33)+ (33+33+33)+ (33+33+33)
Refrigerant type			R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge		kg	12.9+14.4	14.4+14.4	9.6+9.6+12.9	9.6+9.6+14.4	9.6+11.4+14.4	9.6+12.9+14.4
Nominal air flow		m³ / min	210+210	210+210	180+180+210	180+180+210	180+210+210	180+210+210
Fan motor output		W	750+750	750+750	750+750+750	750+750+750	750+750+750	750+750+750

General			RXYQ42MY1B	RXYQ44MY1B	RXYQ46MY1B	RXYQ48/MY1B
Nominal cooling capacity		kW	117.0	123.0	129.0	134.0
Nominal heating capacity		kW	132.0	138.0	145.0	150.0
Nominal input cooling / heating		kW	40.2 / 37.4	41.8 / 38.8	45.5 / 40.9	46.9 / 42.1
Dimensions	HxWxD	mm	(1600×930×765)+ (1600×1240×765)+ (1600×1240×765)	(1600×1240×765)+ (1600×1240×765)+ (1600×1240×765)	(1600×1240×765)+ (1600×1240×765)+ (1600×1240×765)	(1600×1240×765)+ (1600×1240×765)+ (1600×1240×765)
Weight		kg	230+325+325	281+325+325	323+325+325	325+325+325
Connections	refrigerant gas pipe	inch	1 5/8	1 5/8	1 5/8	1 5/8
		mm	φ 41.3	φ 41.3	φ 41.3	φ 41.3
	refrigerant liquid pipe	inch	6/8	6/8	6/8	6/8
		mm	φ 19.1	φ 19.1	φ 19.1	φ 19.1
	Oil equalizing pipe	inch	1/4	1/4	1/4	1/4
		mm	φ 6.4	φ 6.4	φ 6.4	φ 6.4
Compressor			RXYQ42MY1B	RXYQ44MY1B	RXYQ46MY1B	RXYQ48/MY1B
Oil type			Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil	Synthetic(ether)oil
Oil charge volume	l		(1.9+1.6)+ (1.9+1.6+1.6)+ (1.9+1.6+1.6)	(1.9+1.6)+ (1.9+1.6+1.6)+ (1.9+1.6+1.6)	(1.9+1.6+1.6)+ (1.9+1.6+1.6)+ (1.9+1.6+1.6)	(1.9+1.6+1.6)+ (1.9+1.6+1.6)+ (1.9+1.6+1.6)
Crankcase heater	W		(33+33)+ (33+33+33)+ (33+33+33)	(33+33)+ (33+33+33)+ (33+33+33)	(33+33+33)+ (33+33+33)+ (33+33+33)	(33+33+33)+ (33+33+33)+ (33+33+33)
Refrigerant type			R410A	R410A	R410A	R410A
Refrigerant charge	kg		9.6+14.4+14.4	11.4+14.4+14.4	12.9+14.4+14.4	14.4+14.4+14.4
Nominal air flow	m³ / min		180+210+210	210+210+210	210+210+210	210+210+210
Fan motor output	W		750+750+750	750+750+750	750+750+750	750+750+750

1.6 Electrical Specifications

Model				RXYQ5MY1B	RXYQ8MY1B	RXYQ10MY1B	RXYQ12MY1B	RXYQ14MY1B	RXYQ16MY1B
Power supply	Phase			3N~	3N~	3N~	3N~	3N~	3N~
	Frequency	Hz		50	50	50	50	50	50
	Voltage	V		380-415	380-415	380-415	380-415	380-415	380-415
	Voltage tolerance	%		±10	±10	±10	±10	±10	±10
	Recommended fuses	A		20	30	30	30	40	40
Compressor	Phase			3~	3~	3~	3~	3~	3~
	Frequency	Hz		50	50	50	50	50	50
	Voltage	V		380-415	380-415	380-415	380-415	380-415	380-415
	Nominal running current	A		6.1-6.7	(2.8-3.1)+ (7.3-7.9)	(5.8-6.3)+ (7.7-8.4)	(7.7-8.4)+ (7.8-8.5)	(4.4-4.8)+ (8.2-8.9)+ (8.2-8.9)	(5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)
Control and fan motor	Type	Voltage	V	220-240	220-240	220-240	220-240	220-240	220-240
		Nominal running current	A	0.3	0.7	0.7	1.1	1.1	1.1

Model				RXYQ18MY1B	RXYQ20MY1B	RXYQ22MY1B	RXYQ24MY1B	RXYQ26MY1B	RXYQ28MY1B
Power supply	Phase			3N~	3N~	3N~	3N~	3N~	3N~
	Frequency	Hz		50	50	50	50	50	50
	Voltage	V		380-415	380-415	380-415	380-415	380-415	380-415
	Voltage tolerance	%		±10	±10	±10	±10	±10	±10
	Recommended fuses	A		50	50	50	60	60	70
Compressor	Phase			3~	3~	3~	3~	3~	3~
	Frequency	Hz		50	50	50	50	50	50
	Voltage	V		380-415	380-415	380-415	380-415	380-415	380-415
	Nominal running current	A		(2.8-3.1)+ (7.3-7.9)+ (5.8-6.3)+ (7.7-8.4)	(5.8-6.3)+ (7.7-8.4)+ (5.8-6.3)+ (7.7-8.4)	(5.8-6.3)+ (7.7-8.4)+ (7.7-8.4)+ (7.8-8.5)	(5.8-6.3)+ (7.7-8.4)+ (4.4-4.8)+ (8.2-8.9)	(5.8-6.3)+ (7.7-8.4)+ (5.7-6.2)+ (8.4-9.2)	(7.7-8.4)+ (7.8-8.5)+ (5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)
Control and fan motor	Type	Voltage	V	220-240	220-240	220-240	220-240	220-240	220-240
		Nominal running current	A	0.7×2	0.7×2	0.7+1.1	0.7+1.1	0.7+1.1	1.1×2

Model				RXYQ30MY1B	RXYQ32MY1B	RXYQ34MY1B	RXYQ36MY1B	RXYQ38MY1B	RXYQ40MY1B
Power supply	Phase			3N~	3N~	3N~	3N~	3N~	3N~
	Frequency	Hz		50	50	50	50	50	50
	Voltage	V		380-415	380-415	380-415	380-415	380-415	380-415
	Voltage tolerance	%		±10	±10	±10	±10	±10	±10
	Recommended fuses	A		70	70	90	90	90	100
Compressor	Phase			3~	3~	3~	3~	3~	3~
	Frequency	Hz		50	50	50	50	50	50
	Voltage	V		380-415	380-415	380-415	380-415	380-415	380-415
	Nominal running current	A		(4.4-4.8)+ (8.2-8.9)+ (8.2-8.9)+ (5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)	(5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)+ (5.7-6.2)+ (8.4-9.2)	(5.8-6.3)+ (7.7-8.4)+ (5.8-6.3)+ (7.7-8.4)+ (4.4-4.8)+ (8.2-8.9)	(5.8-6.3)+ (7.7-8.4)+ (5.8-6.3)+ (7.7-8.4)+ (5.7-6.2)+ (8.4-9.2)	(5.8-6.3)+ (7.7-8.4)+ (7.7-8.4)+ (7.8-8.5)+ (5.7-6.2)+ (8.4-9.2)	(5.8-6.3)+ (7.7-8.4)+ (4.4-4.8)+ (8.2-8.9)+ (8.2-8.9)+ (5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)
Control and fan motor	Type	Voltage	V	220-240	220-240	220-240	220-240	220-240	220-240
		Nominal running current	A	1.1×2	1.1×2	1.1+0.7×2	1.1+0.7×2	0.7+1.1×2	0.7+1.1×2

Model				RXYQ42MY1B	RXYQ44MY1B	RXYQ46MY1B	RXYQ48MY1B
Power supply	Phase			3N~	3N~	3N~	3N~
	Frequency	Hz		50	50	50	50
	Voltage	V		380-415	380-415	380-415	380-415
	Voltage tolerance	%		±10	±10	±10	±10
	Recommended fuses	A		100	100	110	110
Compressor	Phase			3~	3~	3~	3~
	Frequency	Hz		50	50	50	50
	Voltage	V		380-415	380-415	380-415	380-415
	Nominal running current	A		(5.8-6.3)+ (7.7-8.4)+ (5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)+ (5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)	(7.7-8.4)+ (7.8-8.5)+ (5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)+ (5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)	(4.4-4.8)+ (8.2-8.9)+ (8.2-8.9)+ (5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)+ (5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)	(5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)+ (5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)+ (5.7-6.2)+ (8.4-9.2)+ (8.4-9.2)
Control and fan motor	Type	Voltage	V	220-240	220-240	220-240	220-240
		Nominal running current	A	0.7+1.1×2	1.1×3	1.1×3	1.1×3

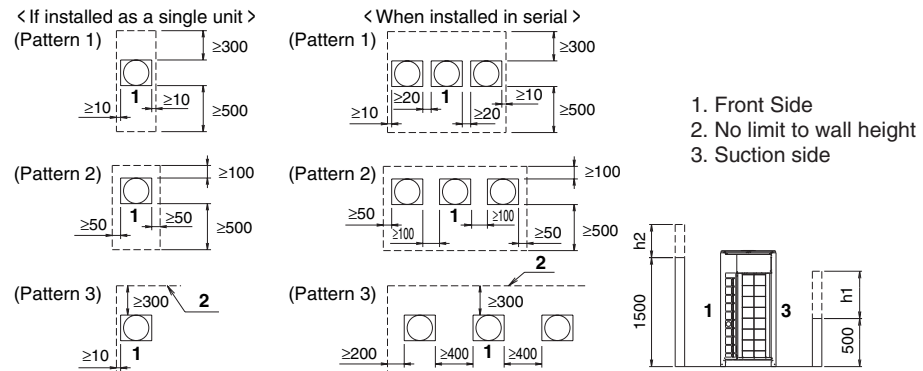
2. Main Components

For main components and function of the main components, refer to the Engineering Data Book and the Service Manual Si39-302.

3. Selection of Location

This unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment. If installed as a household appliance it could cause electromagnetic interference. The VRV OUTDOOR units should be installed in a location that meets the following requirements:

1. The foundation is strong enough to support the weight of the unit and the floor is flat to prevent vibration and noise generation.
2. The space around the unit is adequate for servicing and the minimum space for air inlet and air outlet is available.
(refer to figure below and choose one of both possibilities)

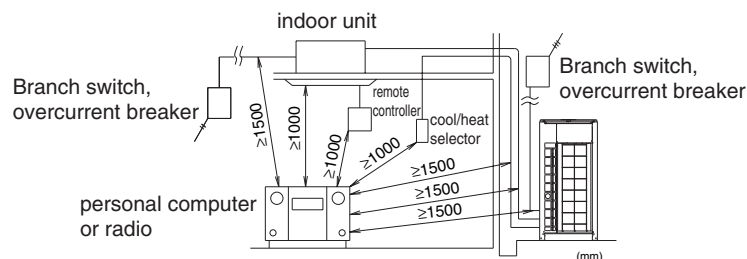


3. There is no danger of fire due to leakage of inflammable gas.
4. Ensure that water cannot cause any damage to the location in case it drips out the unit (e.g. in case of a blocked drain pipe).
5. The piping length between the outdoor unit and the indoor unit may not exceed the allowable piping length. (see "Example of connection")
6. Select the location of the unit in such a way that neither the discharged air nor the sound generated by the unit disturb anyone.
7. Make sure that the air inlet and outlet of the unit are not positioned towards the main wind direction. Frontal wind will disturb the operation of the unit. If necessary, use a windscreen to block the wind.



Caution

1. An inverter air conditioner may cause electronic noise generated from AM broadcasting. Examine where to install the main air conditioner and electric wires, keeping proper distances away from stereo equipment, personal computers, etc.



If the electric wave of AM broadcasting is particularly weak, keep distances of 3m or more and use conduit tubes for power and transmission lines.



2. In heavy snowfall areas, select an installation site where snow will not affect operation of the unit.
3. The refrigerant R410A itself is nontoxic, nonflammable and is safe. If the refrigerant should leak however, its concentration may exceed the allowable limit depending on room size. Due to this it could be necessary to take measures against leakage. Refer to the chapter "Caution for refrigerant leaks".
4. Do not install in the following locations.
 - Locations such as kitchens which contain a lot of mineral oil or steam in the atmosphere or where oil may splatter on the unit.
Resin parts may deteriorate, causing the unit to fall or leak.

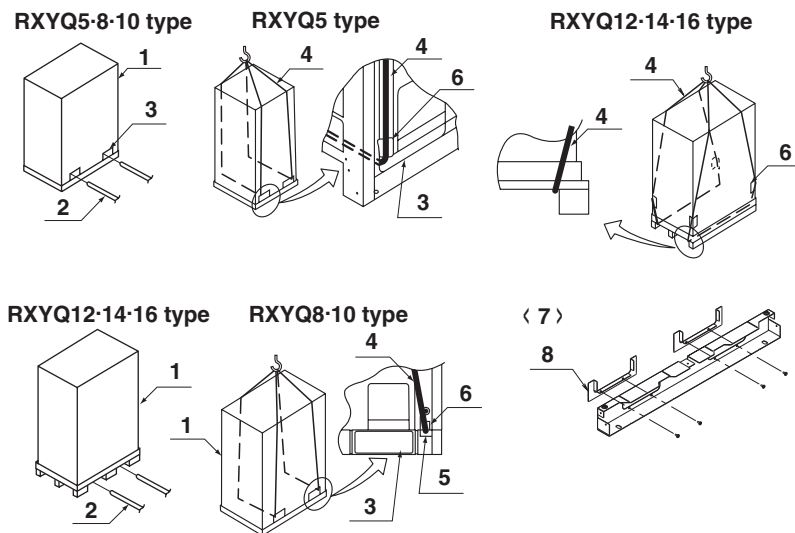
- Locations where sulfurous acids and other corrosive gases may be present in the atmosphere.
Copper piping and soldered joints may corrode, causing refrigerant to leak.
- Locations where equipment that produces electromagnetic waves is found.
The electromagnetic waves may cause the control system to malfunction, preventing normal operation.
- Locations where flammable gases may leak, where thinner, gasoline, and other volatile substances are handled, or where carbon dust and other incendiary substances are found in the atmosphere.
Leaked gas may accumulate around the unit, causing an explosion.

4. Inspecting and Handling the Unit

At delivery, the package should be checked and any damage should be reported immediately to the carrier claims agent.

When handling the unit, take into account the following:

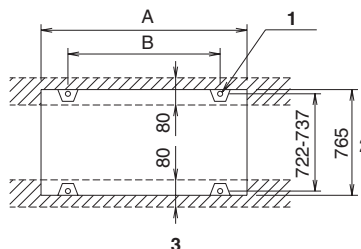
1.  Fragile, handle the unit with care.
-  Keep the unit upright in order to avoid compressor damage.
2. Choose the path along which the unit is to be brought in ahead of time.
3. If a forklift is to be used, pass the forklift arms through the large openings on the bottom of the unit.
4. Lift the unit preferably with a crane and 2 belts of at least 8m long.
5. When lifting the unit with a crane, always use protectors to prevent belt damage and pay attention to the position of the unit's centre of gravity.
6. After installation, remove the transport clasps attached to the large openings.
7. Bring the unit as close to its final installation position in its original package to prevent damage during transport.



1. Packaging material
2. Forklift
3. Opening (Large)
4. Belt sling
5. Opening (Small) (40x30)
6. Wear plate
7. Removal of shipping brackets
8. Shipping bracket (Remove the screws.)

5. Unpacking and Placing the Unit

- Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise.
- Secure the unit to its base using foundation bolts. (Use four commercially available M12-type foundation bolts, nuts, and washers.)
- The foundation bolts should be inserted 20 mm.
- Make sure the base under the unit extended more than 765mm behind the unit.
- The height of the base should be at least 150mm from the floor.
- The unit must be installed on a solid longitudinal foundation (steel beam frame or concrete) as indicated in figure below.



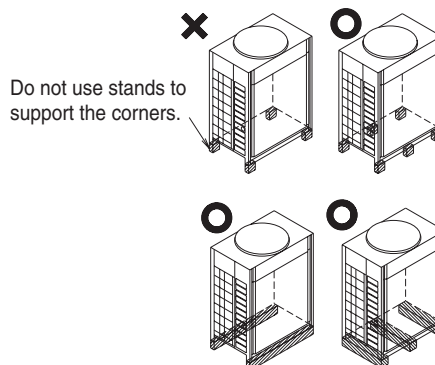
1.Foundation bolt point ($\phi 15$ dia. : 4 positions)

2.Depth of product

3.Shape of indoor unit's support leg and foundation bolt positions

Model	A	B
Q5 type	635	497
Q8 · 10 type	930	792
Q12 · 14 · 16 type	1240	1102

Do not use stands to support the corners



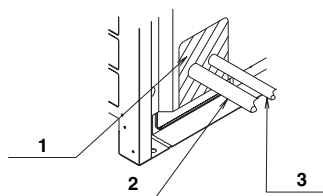
Caution

1. Prepare a water drainage channel around the foundation to drain waste water from around the unit.
2. If the unit is to be installed on a roof, check the strength of the roof and its drainage facilities first.
3. If the unit is to be installed on a frame, install the waterproofing board within a distance of 150mm under the unit in order to prevent infiltration of water coming from under the unit.

[Precaution]

- When installing on a roof, make sure the roof floor is strong enough and be sure to waterproof all work.
- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation.
(Drain water is sometimes discharged from the outdoor unit when it is running.)
- Block all gaps in the holes for passing out piping and wiring using sealing material (locally procured). (Small animals may enter the machine.)

Ex: passing piping out through the front



1. Plug the areas marked with "▨".
(When the piping is routed from the front panel.)
2. Gas side piping
3. Liquid side piping

6. Refrigerant Piping



Caution

After completing installation, be sure to open the valve.

(See 6-6 Additional refrigerant charge for details) (Operating the unit with the valve shut will break the compressor.)

Use R410A to add refrigerant. (The R410A refrigerant cylinder has a pink stripe painted around it.)

All field piping must be installed by a licensed refrigeration technician and must comply with relevant local and national regulations.

Caution to be taken when brazing refrigerant piping

Do not use flux when brazing copper-to copper refrigerant piping. (Particularly for the HFC refrigerant piping) Therefore, use the phosphor copper brazing filler metal (BCuP) which does not require flux.

(Flux has extremely harmful influence on refrigerant piping systems. For instance, if the chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will damage the refrigerant oil.)



Notes:

- Use R410A only when adding refrigerant.

- Installation tools:

Make sure to use installation tools (gauge manifold charge hose, etc.) that are exclusively used for R410A installations to withstand the pressure and to prevent foreign materials (e.g. mineral oils such as SUNISO and moisture) from mixing into the system.

(The screw specifications differ for R410A and R407C.)

Vacuum pump (use a 2-stage vacuum pump with a non-return valve):

1. Make sure the pump oil does not flow oppositely into the system while the pump is not working.

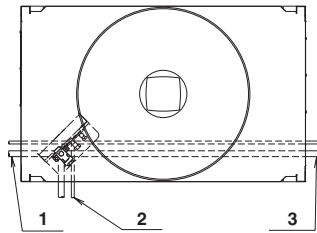
2. Use a vacuum pump which can evacuate to -100.7 kPa (5Torr, -755 mmHg).

6.1 Selection of Piping Material

1. Foreign materials inside pipes (including oils for fabrication) must be 30mg/10m or less.
2. Use the following material specification for refrigerant piping:
 - Construction material: Phosphoric acid deoxidized seamless copper for refrigerant.
 - Size: Determine the proper size referring to chapter "Example of connection".
 - The wall thickness of the refrigerant piping should comply with relevant local and national regulations. For R410A the design pressure is 3.8 MPa.
3. Make sure to use the particular branches of piping that have been selected referring to chapter "Example of connection".

6.2 Connecting the Refrigerant Piping

1. The local branch piping can be connected either forward or to the sides (taken out of the bottom) as shown in the figure.



1. Left-side connection
2. Front connection
3. Right-side connection

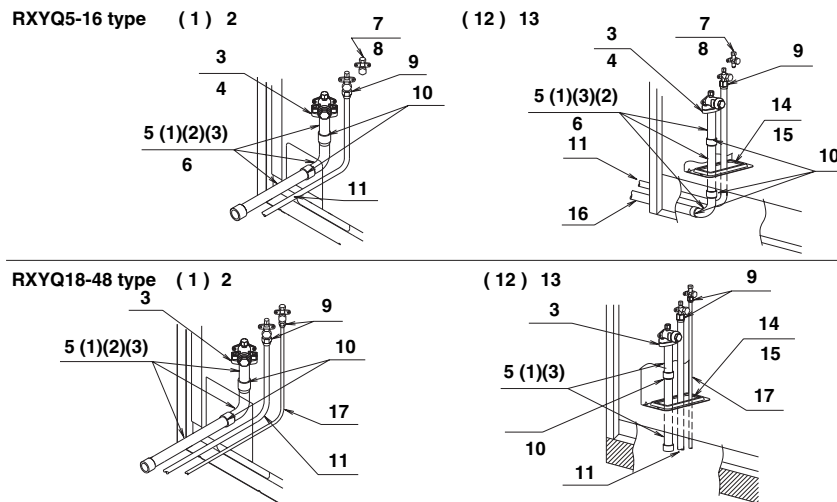
[One outdoor unit installed: In case of RXYQ5-16MY1B]

- Front connection:
Remove the shutoff valve cover to connect.
- Side (bottom) connection:
Remove the knock holes on the bottom frame and route the piping under the bottom frame.

[When multiple outdoor units installed: In case of RXYQ18-48MY1B]

To connect the piping between outdoor units, an optional piping kit (multi connection piping kit) is always required. When installing the piping, follow the instructions in the installation manual that comes with the kit.

- Front connection:
Remove the shutoff valve cover to connect.
- Side (bottom) connection:
Remove the knock holes on the bottom frame and route the piping under the bottom frame.



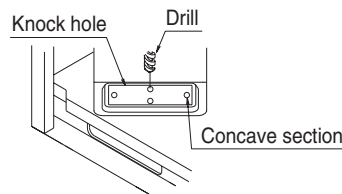
1. Front connection:
2. Remove the shutoff valve cover to connect.
3. Flange:
4. (or flare nut in case of models Q5 type)
5. Gas side accessory pipe (1) (2) (3)
6. (In case of Q5 type, field supply.)
7. Oil-equalizing piping shutoff valve (Except Q5)
8. No piping work is needed.
9. Flare nut
10. Brazing
11. Liquid side piping (field supply)
12. Side (bottom) connection:
13. Remove the knock holes on the bottom frame and route the piping under the bottom frame.
14. Knockout hole
15. Punch the knock holes.
16. Liquid side piping (field supply)
17. Oil-equalizing piping (field supply)

**Caution**

Be sure to use the attached pipe when carrying out piping work in the field.
Be sure that the local piping does not touch other pipes, the bottom panel or side panel.
Especially for the bottom and side connection, be sure to protect the local piping with the provided insulation, to prevent it from coming into contact with the casing.

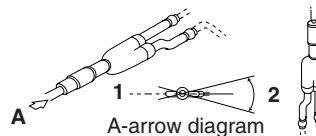
Precautions when knocking out knock holes

- Be sure to avoid damaging the casing
- After knocking out the holes, we recommend you paint the edges and areas around the edges using the repair paint to prevent rusting.
- When passing electrical wiring through the knock holes, wrap the wiring with protective tape to prevent damage.
- Open knock holes around the 4 concave knock holes in the base frame, using a $\phi 6$ mm-bit drill.



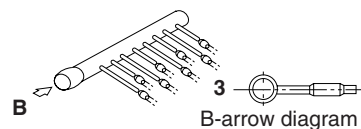
2. Make sure to perform the piping installation within the range of the maximum allowable pipe length, allowable level difference and allowable length after branching as indicated in chapter "Example of connection"
3. For installation of the refrigerant branching kit, refer to the installation manual delivered with the kit.

Mount the REFNET joint so that it branches either horizontally or vertically.



1. Horizontal wires
2. Up to $\pm 30^\circ$ or vertically.

Mount the REFNET header so that it branches horizontally.



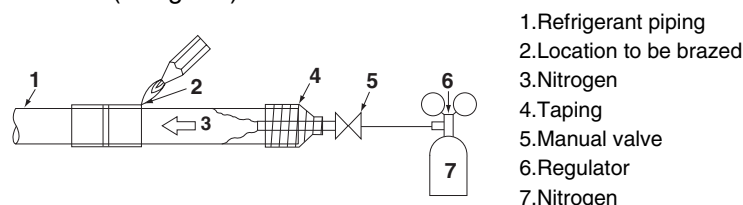
3. Horizontal wires

4. Pipe connection

- Only use the flare nuts included with the unit.
Using different flare nuts may cause the refrigerant to leak.
- Be sure to perform a nitrogen blow when brazing.
(Brazing without performing nitrogen replacement or releasing nitrogen into the piping will create large quantities of oxidized film on the inside of the pipes, adversely affecting valves and compressors in the refrigerating system and preventing normal operation.)
- Do not use a flux when brazing the refrigerant pipe joints.
Use phosphor copper brazing (BCup) which does not require flux.
(Using a chlorine flux may cause the pipes to corrode, and if it contains fluoride it may cause the refrigerant lubricant to deteriorate, adversely affecting the refrigerant piping system.)

**Notes:**

- The pressure regulator for the nitrogen released when doing the brazing should be set to 0.02 MPa(0.2kg/cm²) or less.



5. Protection against contamination when installing pipes

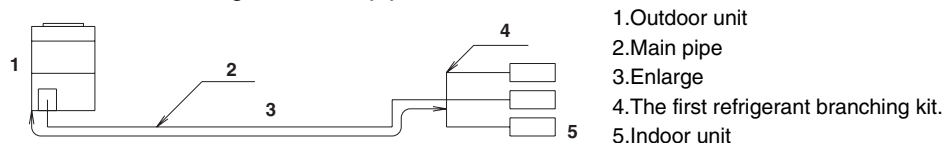
- Take measures to prevent foreign materials like moisture and contamination from mixing into the system.

Place	Installation period	Protection method
Outdoor	More than a month	Pinch the pipe
	Less than a month	Pinch or tape the pipe
Indoor	Regardless of the period	

- Great caution is needed when passing copper tubes through walls.

Precautions when selecting branch piping.

- If the piping between the outdoor units is 90m or longer, be sure to enlarge the main pipe in the liquid-side and gas-side branch piping. (This does not apply to Q5 type)
Depending on the length of the refrigerant piping, the power may drop, but even in such cases it is ok to enlarge the main pipe.

**[Gas side]**

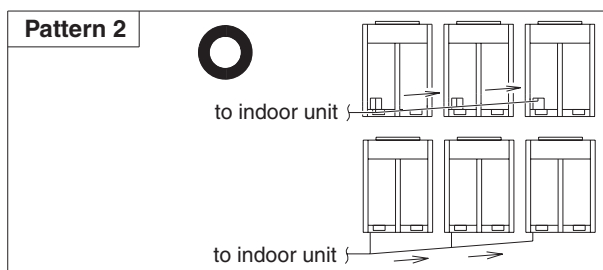
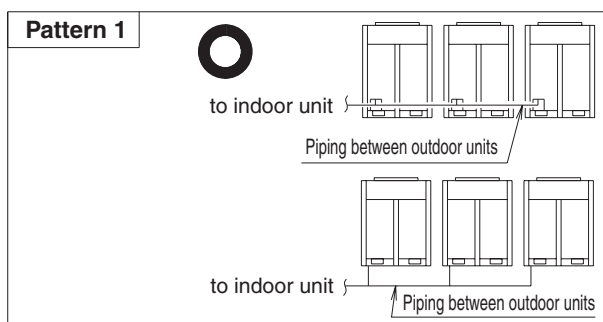
RXYQ5MY1B type: $\phi 15.9 \rightarrow \phi 19.1$ (Minimum thickness $\phi 1.00\text{mm}$)
 RXYQ8MY1B type: $\phi 19.1 \rightarrow \phi 22.2$ (Minimum thickness $\phi 1.00\text{mm}$)
 RXYQ10MY1B type: $\phi 22.2 \rightarrow \phi 25.4$ (Minimum thickness $\phi 1.00\text{mm}$)
 RXYQ12-14MY1B type: ... $\phi 28.6 \rightarrow$ Not Increased
 RXYQ16-22MY1B type: ... $\phi 28.6 \rightarrow \phi 31.8$ (Minimum thickness $\phi 1.10\text{mm}$)
 RXYQ24MY1B type: $\phi 34.9 \rightarrow$ Not Increased
 RXYQ26-34MY1B type: ... $\phi 34.9 \rightarrow \phi 38.1$ (Minimum thickness $\phi 1.10\text{mm}$)
 RXYQ36-48MY1B type: ... $\phi 41.3 \rightarrow$ Not Increased

[Liquid side]

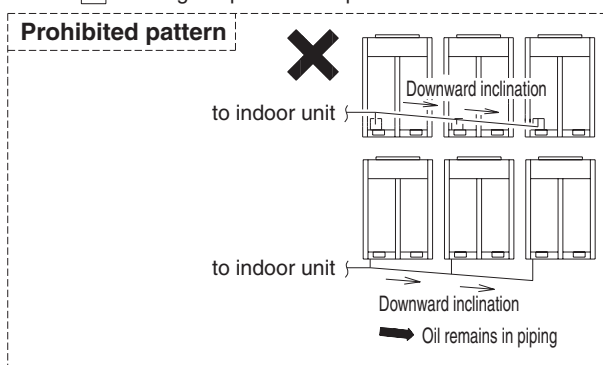
RXYQ5MY1B type: $\phi 9.5 \rightarrow$ Not Increased
 RXYQ8-10MY1B type: $\phi 9.5 \rightarrow \phi 12.7$ (Minimum thickness $\phi 0.80\text{mm}$)
 RXYQ12-16MY1B type: ... $\phi 12.7 \rightarrow \phi 15.9$ (Minimum thickness $\phi 1.00\text{mm}$)
 RXYQ18-24MY1B type: ... $\phi 15.9 \rightarrow \phi 19.1$ (Minimum thickness $\phi 1.00\text{mm}$)
 RXYQ26-48MY1B type: ... $\phi 19.1 \rightarrow \phi 22.2$ (Minimum thickness $\phi 1.00\text{mm}$)

<Cautions for installation of multiple outdoor units>

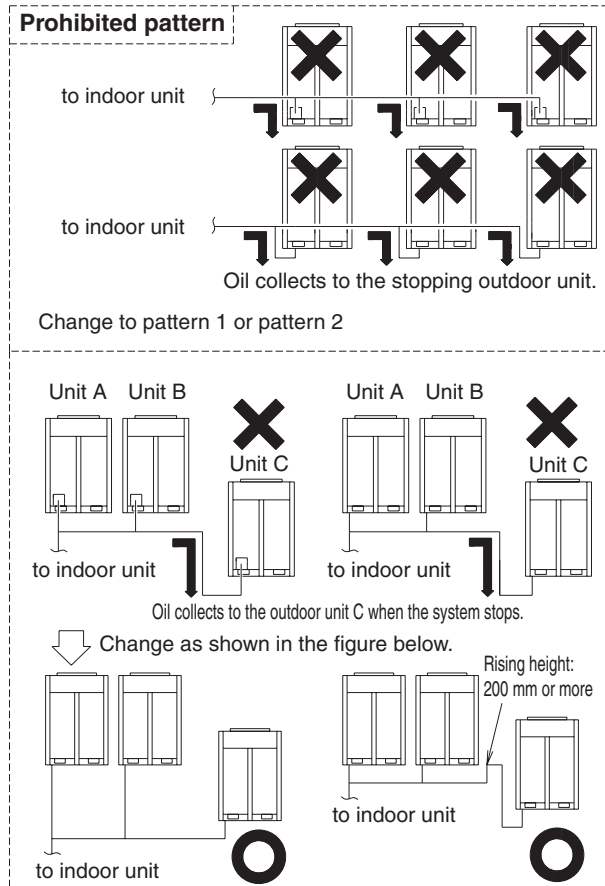
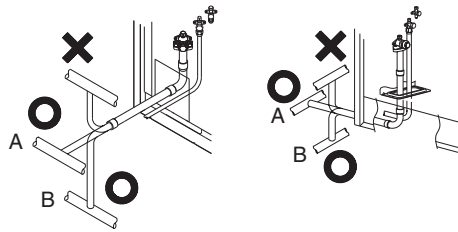
1. The piping between the outdoor units must be routed level or slightly upward to avoid the risk of oil detention to the piping side.



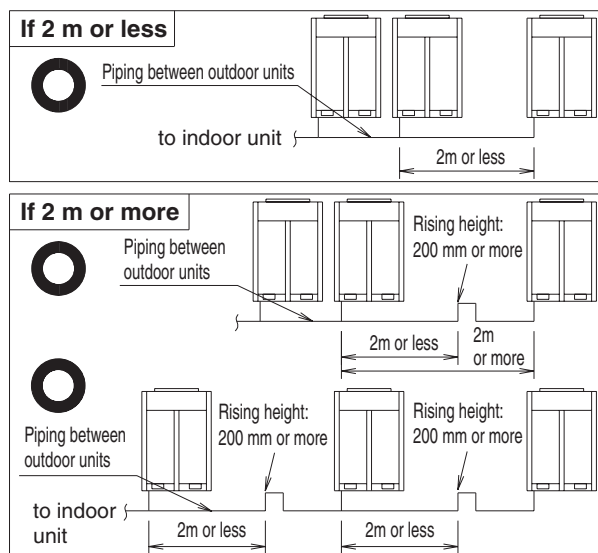
Change to pattern 1 or pattern 2



2. To avoid the risk of oil retention to the stopping unit side, always connect the shutoff valve and the piping between outdoor units as shown in the figure A or figure B.



3. If the piping length between the outdoor unit-connecting pipe kits or between the outdoor units exceeds 2 m, create a rise of 200 mm or more in the gas line within a length of 2 m from the kit.



6.3 Example of Connection

Example of connection (Connection of 8 indoor units Heat pump system)			Branch with refnet joint		Branch with refnet joint and refnet header		Branch with refnet header																																													
One outdoor unit installed (RXYQ5~16)																																																				
When multiple outdoor units installed (RXYQ18~)																																																				
Maximum allowable length	Between outdoor and indoor units	Actual pipe length	Pipe length between outdoor and indoor units ≤ 150m Example unit 8: a + b + c + d + e + f + g + p ≤ 150m		Example unit 6: a + b + h ≤ 150m, unit 8: a + i + k ≤ 150m		Example unit 8: a + i ≤ 150m																																													
		Equivalent length	Equivalent pipe length between outdoor and indoor units ≤ 175m (assume equivalent pipe length of refnet joint to be 0.5m, that of refnet header to be 1m, calculation purposes)																																																	
		Total extension length	Total piping length from outdoor unit* to all indoor units ≤ 300m																																																	
Allowable height length	Between outdoor branch and indoor unit (Only for RXYQ18 or more)	Actual pipe length	Piping length from outdoor branch to outdoor unit ≤ 10m Approximately length: max 13m																																																	
	Between outdoor and indoor units	Difference in height	Difference in height between outdoor and indoor units (H1) ≤ 50m (Max 40m if the outdoor unit is below)																																																	
	Between indoor and indoor units	Difference in height	Difference in height between adjacent indoor units (H2) ≤ 15m																																																	
	Between outdoor and outdoor units	Difference in height	Difference in height between outdoor unit (main) and outdoor unit (sub) (H3) ≤ 5m																																																	
Allowable length after the branch		Actual pipe length	Pipe length from first refrigerant branch kit (either refnet joint or refnet header) to indoor unit ≤ 40m Example unit 8: b + c + d + e + f + g + p ≤ 40m		Example unit 6: b + h ≤ 40m, unit 8: i + k ≤ 40m		Example unit 8: i ≤ 40m																																													
Refrigerant branch kit selection			How to select the refnet joint <ul style="list-style-type: none">When using refnet joints at the first branch counted from the outdoor unit side. Choose from the following table in accordance with the capacity of the outdoor unit. <table><thead><tr><th>Outdoor unit capacity type</th><th>Refrigerant branch kit name</th></tr></thead><tbody><tr><td>RXYQ5 type</td><td>KHRP26M22T</td></tr><tr><td>RXYQ8, 10 type</td><td>KHRP26M33T</td></tr><tr><td>RXYQ12~22 type</td><td>KHRP26M72T</td></tr><tr><td>RXYQ24 type~</td><td>KHRP26M73T + KHRP73TP</td></tr></tbody></table> <ul style="list-style-type: none">For refnet joints other than the first branch, select the proper branch kit model based on the total capacity index. <table><thead><tr><th>indoor capacity index</th><th>Refrigerant branch kit name</th></tr></thead><tbody><tr><td>< 200</td><td>KHRP26M22T</td></tr><tr><td>200 ≤ x< 290</td><td>KHRP26M33T</td></tr><tr><td>290 ≤ x< 640</td><td>KHRP26M72T</td></tr><tr><td>640 <</td><td>KHRP26M73T + KHRP73TP</td></tr></tbody></table>			Outdoor unit capacity type	Refrigerant branch kit name	RXYQ5 type	KHRP26M22T	RXYQ8, 10 type	KHRP26M33T	RXYQ12~22 type	KHRP26M72T	RXYQ24 type~	KHRP26M73T + KHRP73TP	indoor capacity index	Refrigerant branch kit name	< 200	KHRP26M22T	200 ≤ x< 290	KHRP26M33T	290 ≤ x< 640	KHRP26M72T	640 <	KHRP26M73T + KHRP73TP	How to select the refnet header <ul style="list-style-type: none">Choose from the following table in accordance with the total capacity of all the indoor units connected below the REFNET header.Note: 250 type cannot be connected below the REFNET header. <table><thead><tr><th>indoor capacity index</th><th>Refrigerant branch kit name</th></tr></thead><tbody><tr><td>< 200</td><td>KHRP26M22H (Max. 4 kit)</td></tr><tr><td>< 290</td><td>KHRP26M33H (Max. 8 kit)</td></tr><tr><td>290 ≤ x< 640</td><td>KHRP26M72H (Max. 8 kit)</td></tr><tr><td>640 <</td><td>KHRP26M73H (Max. 8 kit) + KHRP26M73HP</td></tr></tbody></table> <p>How to choose an outdoor branch kit (needed if the outdoor unit capacity type is RXYQ18 or more.)</p> <ul style="list-style-type: none">Choose from the following table in accordance with the number of outdoor units. <table><thead><tr><th>Number of outdoor units</th><th>Branch kit name</th></tr></thead><tbody><tr><td>2 unit</td><td>BHFP22M90 + BHFP22M90P</td></tr><tr><td>3 unit</td><td>BHFP22M135 + BHFP22M135P</td></tr></tbody></table>			indoor capacity index	Refrigerant branch kit name	< 200	KHRP26M22H (Max. 4 kit)	< 290	KHRP26M33H (Max. 8 kit)	290 ≤ x< 640	KHRP26M72H (Max. 8 kit)	640 <	KHRP26M73H (Max. 8 kit) + KHRP26M73HP	Number of outdoor units	Branch kit name	2 unit	BHFP22M90 + BHFP22M90P	3 unit	BHFP22M135 + BHFP22M135P								
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2 unit	BHFP22M90 + BHFP22M90P																																																			
3 unit	BHFP22M135 + BHFP22M135P																																																			
Example of downstream indoor units			example in case of refnet joint C; indoor units 3 + 4 + 5 + 6 + 7 + 8		example in case of refnet joint B indoor units 7 + 8, example in case of refnet header; indoor units 1 + 2 + 3 + 4 + 5 + 6		example in the case of refnet header; indoor units 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8																																													
Pipe size selection For an outdoor unit multi installation (RXYQ18~48MY1B), make the settings in accordance with the following figure.			Piping between outdoor unit and refrigerant branch kit (part A) <ul style="list-style-type: none">Match to the size of the connection piping on the outdoor unit. Outdoor unit connection piping size (Unit:mm) <table><thead><tr><th rowspan="2">Outdoor unit capacity type</th><th colspan="2">Piping size (outer diameter x minimum thickness)</th></tr><tr><th>Gas pipe</th><th>Liquid pipe</th></tr></thead><tbody><tr><td>RXYQ5 type</td><td>φ15.9 × 0.99</td><td rowspan="3">φ9.5 × 0.80</td></tr><tr><td>RXYQ8 type</td><td>φ19.1 × 0.80</td></tr><tr><td>RXYQ10 type</td><td>φ22.2 × 0.80</td></tr><tr><td>RXYQ12, 14, 16 type</td><td>φ28.6 × 0.99</td><td>φ12.7 × 0.80</td></tr><tr><td>RXYQ18~22 type</td><td>φ28.6 × 0.99</td><td>φ15.9 × 0.99</td></tr><tr><td>RXYQ24 type</td><td>φ34.9 × 1.21</td><td rowspan="3">φ19.1 × 0.80</td></tr><tr><td>RXYQ26~34 type</td><td>φ41.3 × 1.43</td></tr><tr><td>RXYQ36~48 type</td><td>φ41.3 × 1.43</td></tr></tbody></table>		Outdoor unit capacity type	Piping size (outer diameter x minimum thickness)		Gas pipe	Liquid pipe	RXYQ5 type	φ15.9 × 0.99	φ9.5 × 0.80	RXYQ8 type	φ19.1 × 0.80	RXYQ10 type	φ22.2 × 0.80	RXYQ12, 14, 16 type	φ28.6 × 0.99	φ12.7 × 0.80	RXYQ18~22 type	φ28.6 × 0.99	φ15.9 × 0.99	RXYQ24 type	φ34.9 × 1.21	φ19.1 × 0.80	RXYQ26~34 type	φ41.3 × 1.43	RXYQ36~48 type	φ41.3 × 1.43	Piping between refrigerant branch kits <ul style="list-style-type: none">Choose from the following table in accordance with the total capacity of all the indoor units connected below this.Do not let the connection piping exceed the refrigerant piping size chosen by general system model name. (Unit:mm) <table><thead><tr><th rowspan="2">indoor capacity index</th><th colspan="2">Piping size (outer diameter x minimum thickness)</th></tr><tr><th>Gas pipe</th><th>Liquid pipe</th></tr></thead><tbody><tr><td>< 200</td><td>φ15.9 × 0.99</td><td rowspan="3">φ9.5 × 0.80</td></tr><tr><td>200 ≤ x< 290</td><td>φ22.2 × 0.80</td></tr><tr><td>290 ≤ x< 420</td><td>φ28.6 × 0.99</td></tr><tr><td>420 ≤ x< 640</td><td>φ28.6 × 0.99</td><td>φ12.7 × 0.80</td></tr><tr><td>640 ≤ x< 920</td><td>φ34.9 × 1.21</td><td>φ15.9 × 0.99</td></tr><tr><td>920 <</td><td>φ41.3 × 1.43</td><td>φ19.1 × 0.80</td></tr></tbody></table>		indoor capacity index	Piping size (outer diameter x minimum thickness)		Gas pipe	Liquid pipe	< 200	φ15.9 × 0.99	φ9.5 × 0.80	200 ≤ x< 290	φ22.2 × 0.80	290 ≤ x< 420	φ28.6 × 0.99	420 ≤ x< 640	φ28.6 × 0.99	φ12.7 × 0.80	640 ≤ x< 920	φ34.9 × 1.21	φ15.9 × 0.99	920 <	φ41.3 × 1.43	φ19.1 × 0.80
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920 <	φ41.3 × 1.43	φ19.1 × 0.80																																																		
			Piping between outdoor branches (part B) <ul style="list-style-type: none">Choose from the following table in accordance with the total capacity of all the outdoor units connected above this. (Unit:mm) <table><thead><tr><th rowspan="2">outdoor capacity index</th><th colspan="2">Piping size (outer diameter x minimum thickness)</th></tr><tr><th>Gas pipe</th><th>Liquid pipe</th></tr></thead><tbody><tr><td>< 22HP</td><td>φ28.6 × 0.99</td><td rowspan="3">φ15.9 × 0.99</td></tr><tr><td>24HP</td><td>φ34.9 × 1.21</td></tr><tr><td>26HP <</td><td>φ34.9 × 1.21</td></tr></tbody></table>		outdoor capacity index	Piping size (outer diameter x minimum thickness)		Gas pipe	Liquid pipe	< 22HP	φ28.6 × 0.99	φ15.9 × 0.99	24HP	φ34.9 × 1.21	26HP <	φ34.9 × 1.21	Between refrigerant branch kit and indoor unit <ul style="list-style-type: none">Pipe size for direct connection to indoor unit must be the same as the connection size of indoor unit. (Unit:mm) <table><thead><tr><th rowspan="2">indoor capacity type</th><th colspan="2">Piping size (outer diameter x minimum thickness)</th></tr><tr><th>Gas pipe</th><th>Liquid pipe</th></tr></thead><tbody><tr><td>20, 25, 32, 40, 50 type</td><td>φ12.7 × 0.80</td><td>φ6.4 × 0.80</td></tr><tr><td>63, 80, 100, 125 type</td><td>φ15.9 × 0.99</td><td rowspan="3">φ9.5 × 0.80</td></tr><tr><td>200 type</td><td>φ19.1 × 0.80</td></tr><tr><td>250 type</td><td>φ22.2 × 0.80</td></tr></tbody></table>		indoor capacity type	Piping size (outer diameter x minimum thickness)		Gas pipe	Liquid pipe	20, 25, 32, 40, 50 type	φ12.7 × 0.80	φ6.4 × 0.80	63, 80, 100, 125 type	φ15.9 × 0.99	φ9.5 × 0.80	200 type	φ19.1 × 0.80	250 type	φ22.2 × 0.80																			
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			Piping between outdoor branch and indoor unit (part C) (Unit:mm) <table><thead><tr><th rowspan="2">outdoor capacity type</th><th colspan="2">Piping size (outer diameter x minimum thickness)</th></tr><tr><th>Gas pipe</th><th>Liquid pipe</th></tr></thead><tbody><tr><td>RXYQ8 type</td><td>φ19.1 × 0.80</td><td rowspan="3">φ9.5 × 0.80</td></tr><tr><td>RXYQ10 type</td><td>φ22.2 × 0.80</td></tr><tr><td>RXYQ12, 14, 16 type</td><td>φ28.6 × 0.99</td></tr></tbody></table>		outdoor capacity type	Piping size (outer diameter x minimum thickness)		Gas pipe	Liquid pipe	RXYQ8 type	φ19.1 × 0.80	φ9.5 × 0.80	RXYQ10 type	φ22.2 × 0.80	RXYQ12, 14, 16 type	φ28.6 × 0.99	Oil-equalizing line (Only for RXYQ18 or more) (part D) <table><thead><tr><th colspan="2">Piping size (outer diameter x minimum thickness)</th></tr></thead><tbody><tr><td colspan="2">φ6.4 × 0.80</td></tr></tbody></table> (Unit:mm)		Piping size (outer diameter x minimum thickness)		φ6.4 × 0.80																															
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Piping size (outer diameter x minimum thickness)																																																				
φ6.4 × 0.80																																																				
How to calculate the additional refrigerant to be charged Additional referigerant to be charged R (Kg) R should be rounded off in units of 0.1Kg. NOTE: If a negative result is gotten for R from the formula at right, no refrigerant needs to be added.			R = $\left(\frac{\text{Total length (m) of liquid piping (size at } \phi 22.2)}{\text{Total length (m) of liquid piping (size at } \phi 19.1)} \times 0.35 + \left(\frac{\text{Total length (m) of liquid piping (size at } \phi 15.9)}{\text{Total length (m) of liquid piping (size at } \phi 12.7)} \times 0.25 + \left(\frac{\text{Total length (m) of liquid piping (size at } \phi 9.5)}{\text{Total length (m) of liquid piping (size at } \phi 6.4)} \times 0.054 + \left(\frac{\text{Total length (m) of liquid piping (size at } \phi 6.4)}{\text{Total length (m) of liquid piping (size at } \phi 6.4)} \times 0.022 - \left(\frac{\text{Total length (m) of liquid piping (size at } \phi 15.9)}{\text{Total length (m) of liquid piping (size at } \phi 12.7)} \times 0.11 \right) \right)$ <table><thead><tr><th>Model name</th><th>Amount of refrigerant</th></tr></thead><tbody><tr><td>RXYQ5~16MY1B</td><td>0 kg</td></tr><tr><td>RXYQ18~32MY1B</td><td>3 kg</td></tr><tr><td>RXYQ34~48MY1B</td><td>6 kg</td></tr></tbody></table>		Model name	Amount of refrigerant	RXYQ5~16MY1B	0 kg	RXYQ18~32MY1B	3 kg	RXYQ34~48MY1B	6 kg	Example for refrigerant branch using refnet joint and refnet header for RXYQ34MY1B If the outdoor unit is RXYQ34MY1B and the piping lengths are as at right <table><thead><tr><th>a: φ19.1 × 30m</th><th>d: φ9.5 × 10m</th><th>g: φ6.4 × 10m</th><th>j: φ6.4 × 10m</th></tr><tr><th>b: φ15.9 × 10m</th><th>e: φ9.5 × 10m</th><th>h: φ6.4 × 20m</th><th>k: φ6.4 × 9m</th></tr><tr><th>c: φ9.5 × 10m</th><th>f: φ9.5 × 10m</th><th>i: φ12.7 × 10m</th><th></th></tr></thead></table> $R = \frac{30 \times 0.25}{a} + \frac{10 \times 0.17}{b} + \frac{10 \times 0.11}{c} + \frac{40 \times 0.054}{d+e+f} + \frac{49 \times 0.022}{g+h+j+k} - 6 = 7.538$ <p>7.5</p>		a: φ19.1 × 30m	d: φ9.5 × 10m	g: φ6.4 × 10m	j: φ6.4 × 10m	b: φ15.9 × 10m	e: φ9.5 × 10m	h: φ6.4 × 20m	k: φ6.4 × 9m	c: φ9.5 × 10m	f: φ9.5 × 10m	i: φ12.7 × 10m																											
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c: φ9.5 × 10m	f: φ9.5 × 10m	i: φ12.7 × 10m																																																		

6.4 Leak test and Vacuum Drying

The units were checked for leaks by the manufacturer.

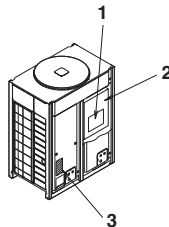
Confirm that the valves are firmly closed before pressure test or vacuuming.

To prevent entry of any impurities and insure sufficient pressure resistance, always use the special tools dedicated for R410A.

Air tight test and vacuum drying

- Air tight test: Make sure to use nitrogen gas.

(For the service port location, refer to the “Caution” label attached on the front panel [right] of the outdoor unit.)



1. [Service precautions]
Label location
2. Electric box lid
3. [Caution]
Label location

Pressurize the liquid and gas pipes to 3.8MPa (38bar) (do not pressurize more than 3.8MPa (38bar)). If the pressure does not drop within 24 hours, the system passes the test. If the pressure drops, check where the nitrogen leaks from.

- Vacuum drying: Use a vacuum pump which can evacuate to -100.7kPa (5Torr, -755mmHg).
 1. Evacuate the system from the liquid and gas pipes by using a vacuum pump for more than 2 hours and bring the system to -100.7kPa . After keeping the system under that condition for more than 1 hour, check if the vacuum gauge rises or not. If it rises, the system may either contain moisture inside or have leaks.
 2. Following should be executed if there is a possibility of moisture remaining inside the pipe (if piping work is carried out during the raining season or over a long period of time rainwater may enter the pipe during work).
After evacuating the system for 2 hours, pressurize the system to 0.05MPa (vacuum break) with nitrogen gas and evacuate the system again using the vacuum pump for 1 hour to -100.7kPa (vacuum drying). If the system cannot be evacuated to -100.7kPa within 2 hours, repeat the operation of vacuum break and vacuum drying.
Then, after leaving the system in vacuum for 1 hour, confirm that the vacuum gauge does not rise.



Notes:

Make sure to perform airtightness test and vacuum drying using the service ports of the shutoff valve shown in the table on the below.

One outdoor unit installed: In case of RXYQ5-16MY1B	Liquid line shutoff valve Gas line shutoff valve
When multiple outdoor units installed: In case of RXYQ18-48MY1B	Liquid line shutoff valve Gas line shutoff valve Oil-equalizing line shutoff valve

Shutoff valve operation procedure

Introduction

Confirm the sizes of the shutoff valves connected to the system referring to the table on the below.

	Q5 type	Q8 type	Q10 type	Q12 type	Q14 type	Q16 type
Liquid line shutoff valve	$\phi 9.5$			$\phi 12.7$		
Gas line shutoff valve	$\phi 15.9$	$\phi 22.2$ (The model Q8 supports onsite piping of $\phi 19.1$ by the accessory pipes)		$\phi 25.4$ (The model Q12-14-16 supports onsite piping of $\phi 28.6$ by the accessory pipes)		

Opening shutoff valve

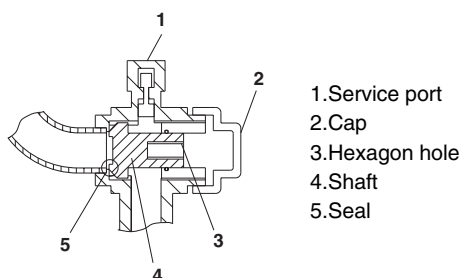
1. Remove the cap and turn the valve counterclockwise with the hexagon wrench (JISB4648).
2. Turn it until the shaft stops.
Do not apply excessive force to the shutoff valve. Doing so may break the valve body, as the valve is not a backseat type. Always use the special tool.
3. Make sure to tighten the cap securely.

Closing shutoff valve

1. Remove the cap and turn the valve clockwise with the hexagon wrench (JISB4648).
2. Securely tighten the valve until the shaft contacts the main body seal.
3. Make sure to tighten the cap securely.
* For the tightening torque, refer to the table on the bellow.

Tightening torque

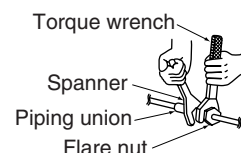
Shutoff valve size	Tightening torque N-m (Turn clockwise to close)					
	Shaft (valve body)		Cap (valve lid)	Service port	Flare nut	Gas line piping attached to unit (1)
φ6.4	5.4-6.6	Hexagonal wrench 4 mm	13.5-16.5	11.5-13.9	14-17	—
φ9.5					33-39	
φ12.7					50-60	
φ15.9	13.5-16.5	Hexagonal wrench 6 mm	23-27		62-75	
φ22.2	27-33	Hexagonal wrench 10 mm	36-44		—	22-28
φ25.4						

**Caution**

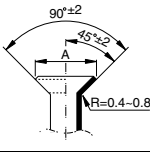
- Always use a charge hose for service port connection.
- After tightening the cap, check that no refrigerant leaks are present.
- When loosening a flare nut, always use two wrenches in combination. When connecting the piping, always use a spanner and torque wrench in combination to tighten the flare nut.
- When connecting a flare nut, coat the flare (inner and outer faces) with etheral oil or ester oil and hand-tighten the nut 3 to 4 turns as the initial tightening.

Flare shape and flare nut tightening torque**<Precautions when connecting pipes>**

- See the following table for flare part machining dimensions.
- φ 12.7 or greater
When loosening a flare nut, always use two wrenches in combination. When connecting the piping, always use a spanner and torque wrench in combination to tighten the flare nut.
- φ 6.4 or φ 9.7
Tighten with one torque wrench within the set torque.
(Do not use two wrenches because this might cause the refrigerant to leak.)
- (Use ester oil or ether oil.)
- See the following table for tightening torque.
(Applying too much torque may cause the flares to crack.)



- After all the piping has been connected, use nitrogen to perform a gas leak check.

pipe size	tightening torque (Ncm)	A (mm)	flare shape
φ9.5	3270 - 3990	12.8 - 13.2	
φ12.7	4950 - 6030	16.2 - 16.6	
φ15.9	6180 - 7540	19.3 - 19.7	

Not recommendable but in case of emergency

You must use a torque wrench but if you are obliged to install the unit without a torque wrench, you may follow the installation method mentioned below.

After the work is finished, make sure to check that there is no gas leak.

When you keep on tightening the flare nut with a spanner, there is a point where the tightening torque suddenly increases. From that position, further tighten the flare nut the angle shown below:

Pipe size	Further tightening angle	Recommended arm length of tool
9.5 (3/8")	60 to 90 degrees	Approx. 200 mm
12.7 (1/2")	30 to 60 degrees	Approx. 250 mm
19.1 (5/8")	30 to 60 degrees	Approx. 300 mm

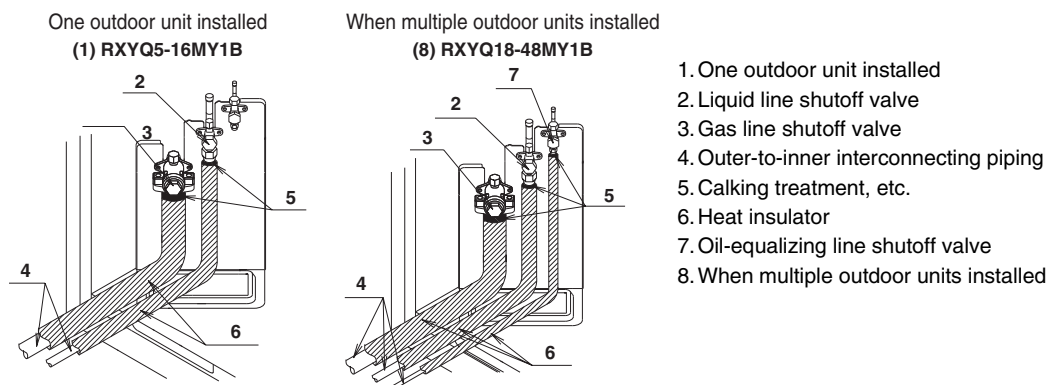
Disposal requirements

Dismantling of the unit, treatment of the refrigerant, oil and eventual other parts, should be done in accordance with the relevant local and national regulations.

6.5 Pipe Insulation

After finishing the leak test and vacuum drying, the piping must be insulated. Take into account the following points:

- Make sure to insulate the connection piping and refrigerant branch kits entirely.
- Be sure to insulate the liquid-side and gas-side piping for the inter-unit piping and the refrigerant branch kits and always use Q18-type or better insulation for the oil pressure equalizer.
- Not insulating them may cause leaking. (The gas piping can reach temperatures of 120°C. Be sure the insulation used can withstand such temperatures.)
- If you think the humidity around the cooling piping might exceed 30°C and RH80%, reinforce the insulation on the cooling piping (at least 20mm thick). Condensation might form on the surface of the insulation.
- If there is a possibility that condensation on the shut-off valve might drip down into the indoor unit through gaps in the insulation and piping because the outdoor unit is located higher than the indoor unit, etc., this must be prevented by corking the connections, etc.



Caution

Be sure to insulate local pipes, as touching them can cause burns.

6.6 Additional refrigerant charge



Caution

Refrigerant cannot be charged until field wiring has been completed.

Refrigerant may only be charged after performing the leak test and the vacuum drying (see above).

When charging a system, care shall be taken that its maximum permissible charge is never exceeded, in view of the danger of liquid hammer.

Charging with an unsuitable substance may cause explosions and accidents, so always ensure that the appropriate refrigerant (R410A) is charged.

Refrigerant containers shall be opened slowly.

Always use protective gloves and protect your eyes when charging refrigerant.

To avoid compressor breakdown. Do not charge the refrigerant more than the specified amount to raise the condensing pressure.

- This outdoor unit is factory charged with refrigerant and depending on pipe sizes and pipe lengths some systems require additional charging of refrigerant.
- Charge the refrigerant to the liquid pipe in its liquid state. Since R410A is a mixed refrigerant, its composition changes if charged in a state of gas and normal system operation would no longer be assured.
- Before filling, check whether the tank has a siphon attached or not.

How to fill a tank with a siphon attached.

Fill with the tank upright.

(There is a siphon tube inside, so there is no need to turn the tank upside-down.)



Other ways of filling the tank

Fill with the tank upside-down.



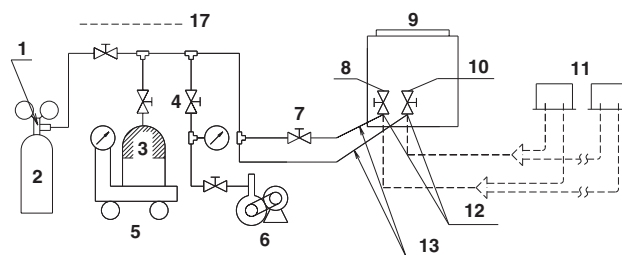
- Determine the amount of refrigerant to be added by referring to the table, write it down on the included "Added Refrigerant" plate and attach it to the rear side of the front cover.
Note: refer to the example of connection for the amount to be added.
- After the vacuum drying is finished, charge the additional refrigerant in its liquid state through the liquid stop valve service port. Taking into account following instructions:
 1. Check that gas and liquid stop valves are closed.
 2. Stop the compressor and charge the specified weight of refrigerant.
- If the outdoor unit is not in operation and the total amount cannot be charged, follow the procedures for additional refrigerant charge shown below.
- Make sure to use installation tools you exclusively use on R410A installations to withstand the pressure and to prevent foreign materials from mixing into the system.



Notes:

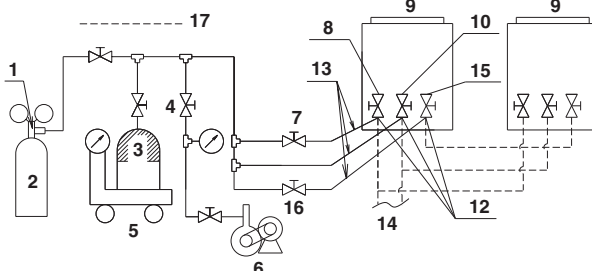
- Procedures for charging additional refrigerant.

One outdoor unit installed: In case of RXYQ5-16MY1B



1. Pressure reducing valve
2. Nitrogen
3. Tank
4. Siphon system
5. Measuring instrument
6. Vacuum pump
7. Valve A
8. Gas side
9. Outdoor unit
10. Liquid side
11. Indoor unit
12. Shutoff valve service port
13. Charge hose
14. To indoor unit
15. Oil-equalizing line
16. Valve B
17. Dotted lines represent onsite piping

When multiple outdoor units installed: In case of RXYQ18-48MY1B



17. Dotted lines represent onsite piping

[Additional refrigerant charge procedure]

To learn the system settings for additional refrigerant charging, refer to the [Service Precaution] label attached on the back of the electric box lid in the outdoor unit.

1. Fully open the gas line shutoff valve (liquid line shutoff valve and valve A above must be left fully closed) and start the additional refrigerant charge operation.
2. After the system is charged with a specified amount of refrigerant, press the confirmation button (BS3) on the P-board (A1P) in the outdoor unit to stop the additional refrigerant charge operation.
3. Immediately restore the shutoff valve to the following status. (Otherwise, the piping may burst due to liquid seal.)

Liquid line shutoff valve	Gas line shutoff valve	Oil-equalizing line shutoff valve
Open	Open	Close (Default status before delivery)

[Additional refrigerant charge procedure]

To learn the system settings for additional refrigerant charging, refer to the [Service Precaution] label attached on the back of the electric box lid in the outdoor unit.

1. Fully open the gas line shutoff valve/oil-equalizing line shutoff valve (liquid line shutoff valve and valves A and B above must be left fully closed), start the additional refrigerant charge operation.
2. After the system is charged with a specified amount of refrigerant, press the confirmation button (BS3) on the P-board (A1P) in the outdoor unit to stop the additional refrigerant charge operation.
3. Immediately restore the shutoff valve to the following status. (Otherwise, the piping may burst due to liquid seal.)

Liquid line shutoff valve	Gas line shutoff valve	Oil-equalizing line shutoff valve
Open	Open	Open



Caution If the refrigerant cylinder is siphonal, set it upright while charging additional refrigerant.

7. Field Wiring

**Caution**

All field wiring and components must be installed by a licensed electrician and must comply with relevant local and national regulations.

The field wiring must be carried out in accordance with the wiring diagrams and the instructions given below.

Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.

This product's reversed phase protection detector only works when the product started up.

The reversed phase protection detector is designed to stop the product in the event of an abnormalities when the product is started up.

Replace two of the three phases (L1, L2, and L3) during reverse-phase protection circuit operation.

Reversed phase detection is not performed while the product is operating.

If there exists the possibility of reversed phase after an momentary black out and the power goes on and off while the product is operating, attach a reversed phase protection circuit locally.

Running the product in reversed phase can break the compressor and other parts.

7.1 Optional Parts Cool / Heat Selector

S1S..... Selector switch (fan, cool/heat)

S2S..... Selector switch (cool/heat)

**Notes:**

- Use copper conductors only.
- When using the adaptor for sequential start, refer to chapter "Examples".
- For connection wiring to outdoor-outdoor transmission F1-F2, outdoor-indoor transmission F1-F2, outdoor-multi transmission Q1-Q2, refer to chapter "Examples".
- For connection wiring to the central remote controller, refer to the installation manual of the central remote controller.
- Use insulated wire for the power cord.

7.2 Power Circuit and Cable Requirements

A power circuit (see table below) must be provided for connection of the unit. This circuit must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and an earth leak detector.

	Phase and frequency	Voltage	Recommended fuses	Transmission line selection
RXYQ5MY1B	φ 3, 50Hz	380-415V	20A	0.75-1.25mm ²
RXYQ8MY1B	φ 3, 50Hz	380-415V	30A	0.75-1.25mm ²
RXYQ10MY1B	φ 3, 50Hz	380-415V	30A	0.75-1.25mm ²
RXYQ12MY1B	φ 3, 50Hz	380-415V	30A	0.75-1.25mm ²
RXYQ14MY1B	φ 3, 50Hz	380-415V	40A	0.75-1.25mm ²
RXYQ16MY1B	φ 3, 50Hz	380-415V	40A	0.75-1.25mm ²
RXYQ18MY1B	φ 3, 50Hz	380-415V	50A	0.75-1.25mm ²
RXYQ20MY1B	φ 3, 50Hz	380-415V	50A	0.75-1.25mm ²
RXYQ22MY1B	φ 3, 50Hz	380-415V	50A	0.75-1.25mm ²
RXYQ24MY1B	φ 3, 50Hz	380-415V	60A	0.75-1.25mm ²
RXYQ26MY1B	φ 3, 50Hz	380-415V	60A	0.75-1.25mm ²
RXYQ28MY1B	φ 3, 50Hz	380-415V	70A	0.75-1.25mm ²
RXYQ30MY1B	φ 3, 50Hz	380-415V	70A	0.75-1.25mm ²
RXYQ32MY1B	φ 3, 50Hz	380-415V	70A	0.75-1.25mm ²
RXYQ34MY1B	φ 3, 50Hz	380-415V	90A	0.75-1.25mm ²
RXYQ36MY1B	φ 3, 50Hz	380-415V	90A	0.75-1.25mm ²
RXYQ38MY1B	φ 3, 50Hz	380-415V	90A	0.75-1.25mm ²
RXYQ40MY1B	φ 3, 50Hz	380-415V	100A	0.75-1.25mm ²
RXYQ42MY1B	φ 3, 50Hz	380-415V	100A	0.75-1.25mm ²
RXYQ44MY1B	φ 3, 50Hz	380-415V	100A	0.75-1.25mm ²
RXYQ46MY1B	φ 3, 50Hz	380-415V	110A	0.75-1.25mm ²
RXYQ48MY1B	φ 3, 50Hz	380-415V	110A	0.75-1.25mm ²

When using residual current operated circuit breakers, be sure to use a high-speed type 200mA rated residual operating current.



Notes:

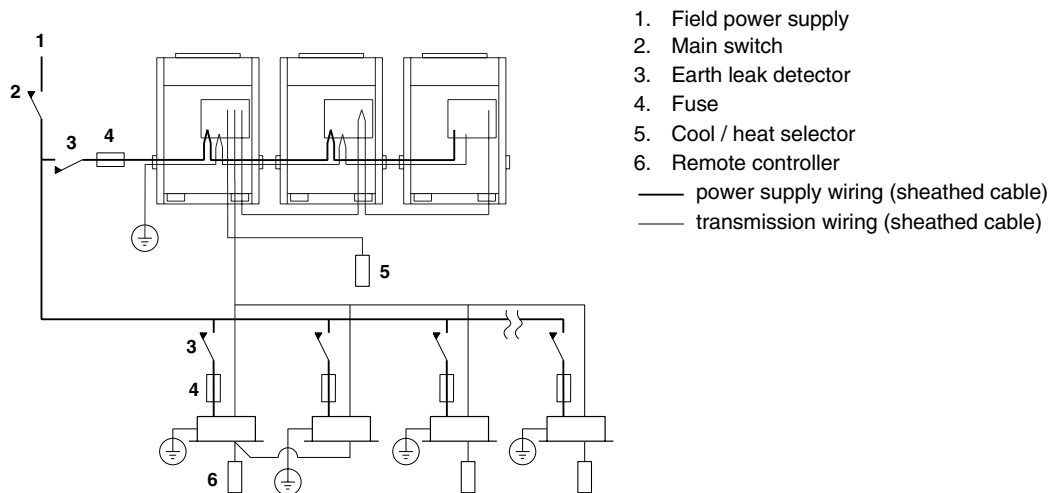
- Select the power supply cable in accordance with relevant local and national regulations.
- Wire size must comply with the applicable local and national code.
- Specifications for local wiring power cord and branch wiring are in compliance with IEC60245.
- WIRE TYPE H05VV(*)
*Only in protected pipes, use H07RN-F when protected pipes are not used.

7.3 General

- Up to 3 units can be connected by crossover power source wiring between outdoor units. However, units of smaller capacity must be connected downstream. For details, refer to the equipment design data and technical data.
- Make sure to connect the power source wire to the power source terminal block and to clamp it as shown in figure 14, chapter “Field line connection”.
- As this unit is equipped with an inverter, installing a phase advancing capacitor not only will deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high-frequency waves. Therefore, never install a phase advancing capacitor.
- Keep power imbalance within 2% of the supply rating.
 1. Large imbalance will shorten the life of the smoothing capacitor.
 2. As a protective measure, the product will stop operating and an error indication will be made, when power imbalance exceeds 4% of the supply rating.
- Follow the “electrical wiring diagram” when carrying out any electrical wiring.
- Only proceed with wiring work after blocking off all power.
- Always ground wires. (In accordance with national regulations of the pertinent country.)
- Do not connect the ground wire to gas pipes, sewage pipes, lightning rods, or telephone ground wires.
 - Gas pipes: can explode or catch fire if there is a gas leak.
 - Sewage pipes: no grounding effect is possible if hard plastic piping is used.
 - Telephone ground wires and lightning rods: dangerous when struck by lightning due to abnormal rise in electrical potential in the grounding.
- This unit uses an inverter, and therefore generates noise, which will have to be reduced to avoid interfering with other devices. The outer casing of the product may take on an electrical charge due to leaked electrical current, which will have to be discharged with the grounding.
- Be sure to install an earth leak detector. (One that can handle higher harmonics.)
(This unit uses an inverter, which means that an earth leak detector capable handling high harmonics in order to prevent malfunctioning of the earth leak detector itself.)
- Earth leak detector which are especially for protecting ground-faults should be used in conjunction with main switch or fuse for use with wiring.
- This unit has a negative phase protection circuit. (If it operates, only operate the unit after correcting the wiring.)

7.4 Examples

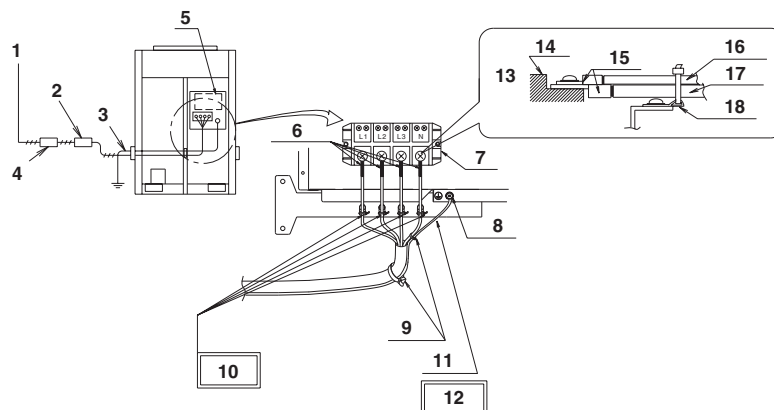
System example



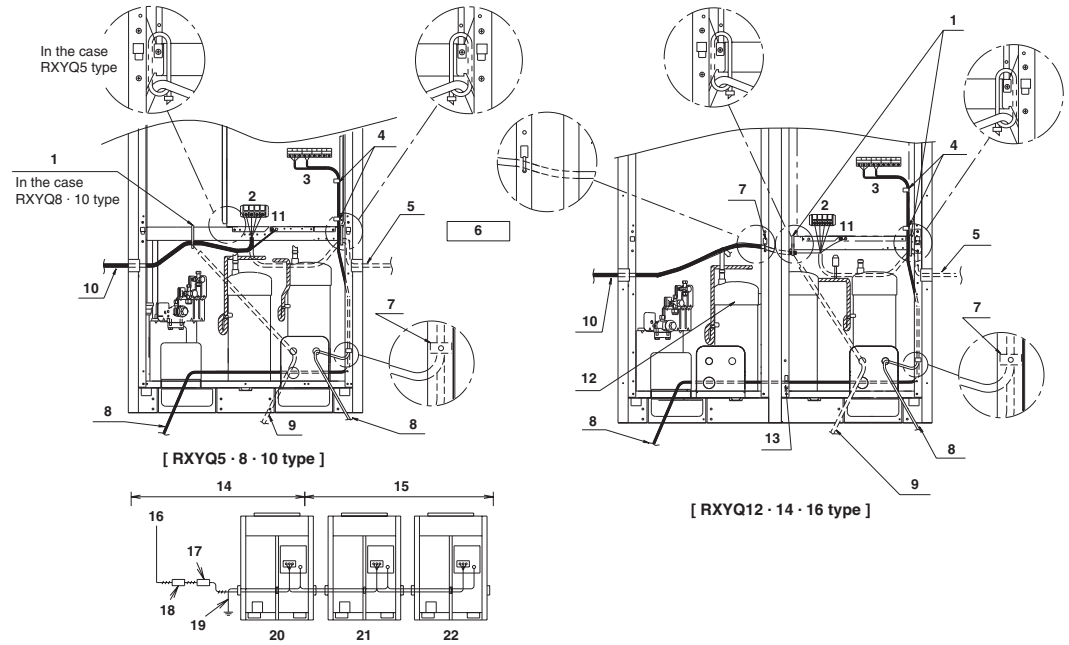
Field line connection


L1, L2, L3, N-phase of the power cord should be clamped to the safety catch using the included clamp material.

The green and yellow striped wrapped wires should be used for grounding.



1. Power supply
(200 V, Three-phase)
2. Branch switch, overcurrent breaker
3. Grounding wire
4. Earth leakage breaker
5. Section A
6. Attach insulation sleeves.
7. Power supply terminal block
8. Grounding wire
9. Retain the ground wires along with the power wires using the accessory clamps (1).
10. Retain the respective power wires - L1, L2, L3 and N phases - to the bracket individually using the accessory clamps (1).
11. Grounding wire
12. When wiring, do not allow the ground wires to contact the compressor lead wires. If the wires contact each other, adverse effects may occur to other units.
13. When connecting two wires to one terminal, ensure that the crimp-style terminals face with each other back to back.
 Moreover, make sure that the wire of the smaller gauge is located above.
 At the same time, retain the power wires to the plastic bracket using the accessory clamps (1).
14. Terminal block
15. Crimp-style terminal
16. Wire gauge: Small
17. Wire gauge: Large
18. Plastic bracket

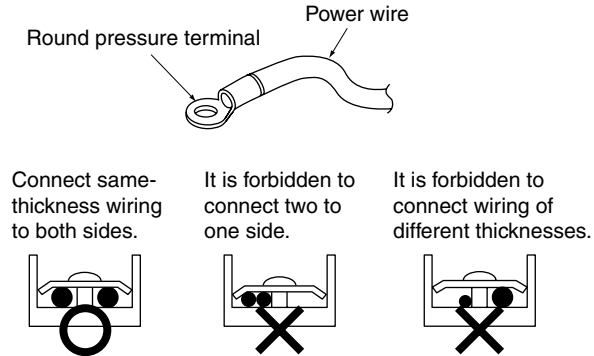


1. Retain with accessory clamps (3).
2. Electric wiring
3. Wiring between units
4. Retain to the electric box with the accessory clamps (1).
5. When routing out the power/ground wires from the right side:
6. When routing the remote control cord and inter-unit wiring, secure clearance of 50 mm or more from the power wiring. Ensure that the power wiring does not contact any heated sections ().
7. Retain to the back of the column support with the accessory clamps (2).
8. When routing out the inter-unit wirings from the opening for piping:
9. When routing out the power/ground wires from the front:
10. When routing out the ground wires from the left side:
11. Grounding wire
12. When wiring, exercise sufficient caution not to detach the acoustic insulators from the compressor.
13. Retain to the back of the column support with the accessory clamps (2).
14. Section A
15. Section B
16. Power supply
17. Branch switch, overcurrent breaker
18. Earth leakage breaker
19. Ground wire
20. Unit A
21. Unit B
22. Unit C

**Caution****<Precautions when laying power wiring>**

Use round pressure terminals for connections to the power terminal block. When none are available, follow the instructions below.

- Do not connect wiring of different thicknesses to the power terminal block. (Slack in the power wiring may cause abnormal heat.)
- When connecting wiring which is the same thickness, do as shown in the figure below.

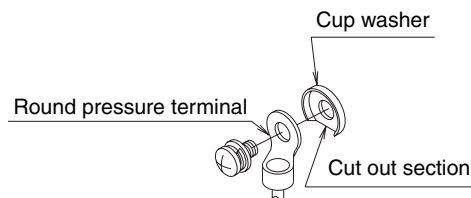


- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will strip the head and make proper tightening impossible.
- Over-tightening the terminal screws may break them.
- See the table below for tightening torque for the terminal screws.

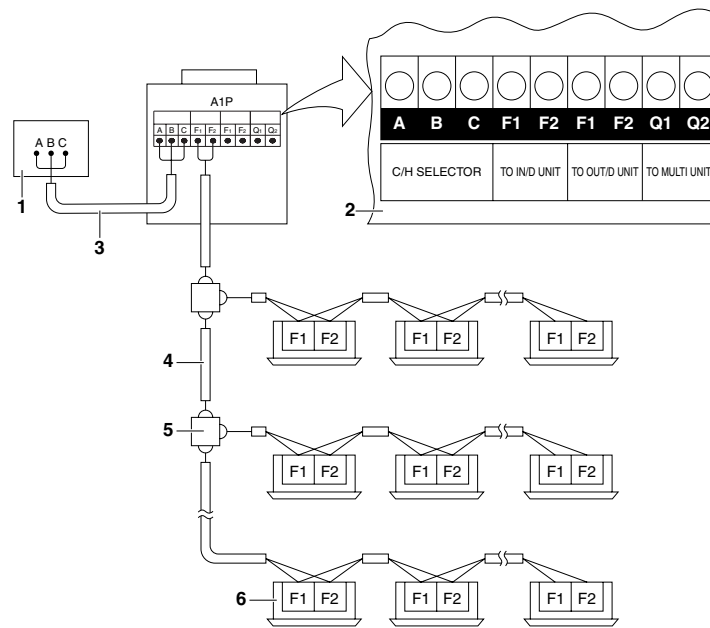
Tightening torque (N · m)	
M8 (Power terminal block)	5.5-7.3
M8 (Ground)	
M3 (Inter-unit wiring terminal block)	0.8-0.97

<Precautions when connecting the ground>

When pulling the ground wire out, wire it so that it comes through the cut out section of the cup washer. (An improper ground connection may prevent a good ground from being achieved.)

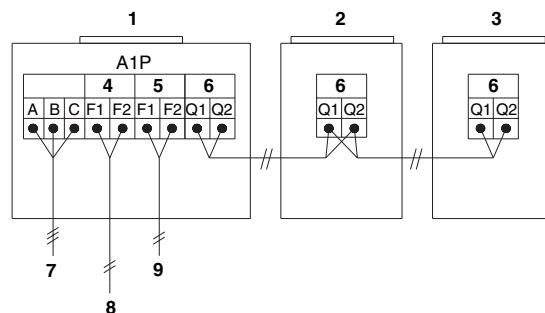


Field line connection: transmission wiring and cool/heat selection
[In case of RXYQ5-16MY1B]

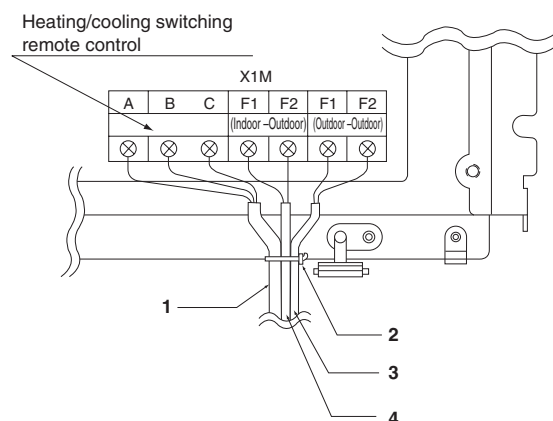


1. Cool/heat selector
2. Outdoor unit P.C. board (A1P)
3. Take care of the polarity
4. Use the conductor of sheathed wire (2 wire) (nopolarity)
5. Terminal board (field supply)
6. Indoor unit

[In case of RXYQ18-48MY1B]



1. Unit A (Base unit)
2. Unit B
3. Unit C
4. TO IN/D UNIT
5. TO OUT/D UNIT
6. TO MULTI UNIT
7. To cooler/heater selector
8. To indoor unit
9. To other systems



1. Heating/cooling switching remote control cord (when a heating/cooling switch remote control (sold separately) is connected)
2. Secure to the lock plate using the included clamping material.
3. Wiring between the units (Outdoor - outdoor)
4. Wiring between the units (Indoor - outdoor)

**Caution**

Be sure to follow the limits below. If the unit-to-unit cables are beyond these limits, it may result in malfunction of transmission.

Maximum wiring length: 1000m

Total wiring length: 2000m

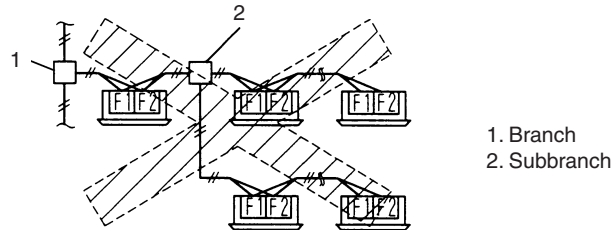
Max branches No. of branches: 16

Max. number of outdoor units connectable: 10 or less

Up to 16 branches are possible for unit-to unit cabling. No branching is allowed after branching.

Max. number of outdoor units connectable: 10 or less

Never connect the power supply to unit-to-unit cabling terminal block. Otherwise the entire system may break down.

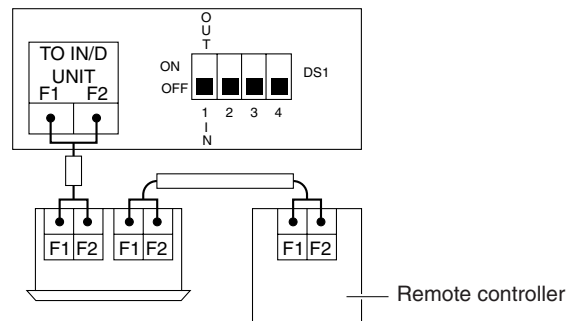
**Sequential start**

Make the outdoor unit cable connections shown below.

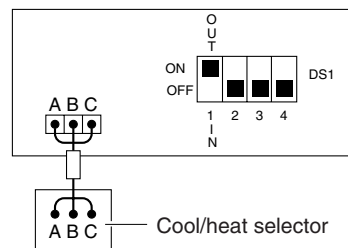
The outdoor unit PC board (A1P) is factory set at "Sequential start available".

Setting the cool/heat operation (heat pump unit only)

1. Performing cool/heat setting with the remote controller connected to the indoor unit.
Keep the cool/heat selector switch (DS1) on the outdoor unit PC board (A1P) at the factory setting position IN/D UNIT.



2. Performing cool/heat setting with the cool/heat selector.
Connect the cool/heat selector remote controller (optional) to the A/B/C terminals and set the cool/heat selector switch (DS1) on the outdoor unit PC board (A1P) to OUT/D UNIT.



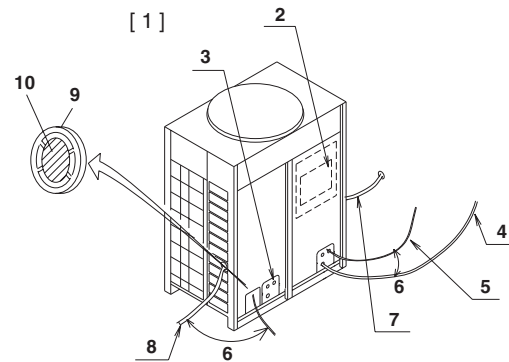
**Caution**

For low-noise operation, it is necessary to get the optional “External control adaptor for outdoor unit”.

For details, see the installation manual attached to the adaptor.

Picking power line and transmission line

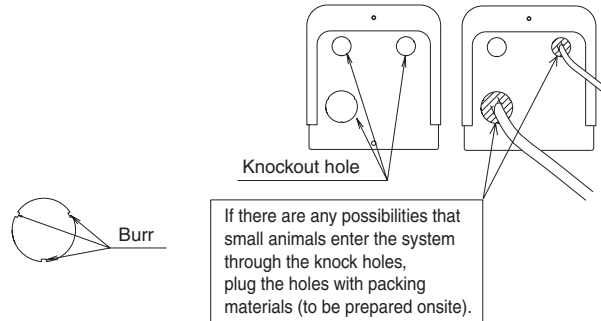
- Be sure to let the power line and the transmission line pass through a conduit hole.
- Pick the power line from the upper hole on the left side plate, from the front position of the main unit (through the conduit hole of the wiring mounting plate - optional parts) or from a knock out hole to be made in the unit's bottom plate.

Electric wiring diagram printed on the back of the electric box lid

1. Electric wiring diagram printed on the back of the electric box lid
2. Section A
3. Knockout hole
4. Power wiring between outdoor units
(When the wiring is routed out through the front panel.)
5. Power wiring between outdoor units
6. Set apart
7. Power wiring between outdoor units
(When the wiring is routed out through the lateral panel.)
8. Electric wiring
9. Through cover
10. Cut off the shaded zones before use.

Precautions when knocking out knock holes

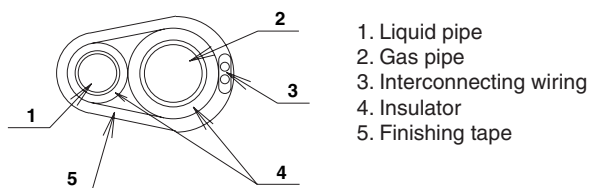
- To punch a knock hole, hit on it with a hammer.
- After knocking out the holes, we recommend you paint the edges and areas around the edges using the repair paint to prevent rusting.
- When passing electrical wiring through the knock holes, remove any burrs from the knock holes and wrap the wiring with protective tape to prevent damage.

**Caution**

- Use a power wire pipe for the power wiring.
- Outside the unit, make sure the weak electric wiring (i.e. for the remote control, between units, etc.) and the strong electric wiring do not pass near each other, keeping them at least 50 mm apart. Proximity may cause electrical interference, malfunctions, and breakage.
- Be sure to connect the power wiring to the power wiring terminal block and secure it as described in 7-4 Field line connection.
- Inter-unit wiring should be secured as described in 7-4 Field line connection.
 - Secure the wiring with the accessory clamps so that it does not touch the piping.
 - Make sure the wiring and the electric box lid do not stick up above the structure, and close the cover firmly.

Never connect 200V to the terminal block of the interconnecting wiring. Doing so will break the entire system.

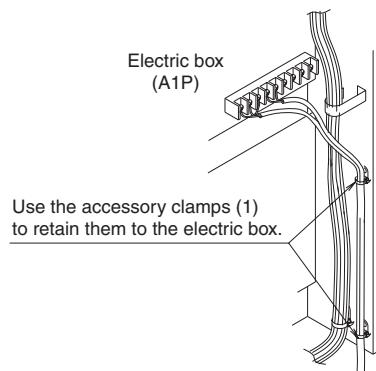
- The wiring from the indoor units must be connected to the F1/F2 (In-Out) terminals on the PC board in the outdoor unit.
- After installing the interconnecting wires inside the unit, wrap them along with the onsite refrigerant pipes using finishing tape, as shown below.



For the above wiring, always use vinyl cords with 0.75 to 1.25 mm² sheath or cables (2 core wires). (3 core wire cables are allowable for the cooler/heater changeover remote controller only.)

[In case of RXYQ18-48MY1B]

- The interconnecting wiring between the outdoor units in the same pipe line must be connected to the Q1/Q2 (Out Multi) terminals. Connecting the wires to the (Out-Out) terminals results in system malfunction.
- The wiring for the other lines must be connected to the F1/F2 (Out-Out) terminals of the P-board in the outdoor unit to which the interconnecting wiring for the indoor units is connected.
- The base unit is the outdoor unit to which the interconnecting wiring for the indoor units is connected.
- The interconnecting wiring between the outdoor units must be 30 m in length at maximum.

**Caution**

Be sure to keep the power line and transmission line apart from each other.

Be careful about polarity of the transmission line.

Make sure that the transmission line is clamped as shown in the figure in chapter "Field line connection".

Check that wiring lines do not make contact with refrigerant piping.

Firmly close the lid and arrange the electrical wires so as to prevent the lid or other parts from coming loose.

When you don't use a wire conduit, be sure to protect the wires with vinyl tubes etc., to prevent the edge of the knock-out hole from cutting the wires.

8. Before Operation

8.1 Checks Before Initial Start-up

**Caution**

Make sure that the circuit breaker on the power supply panel of the installation is switched off. Attach the power wire securely. Introducing power with a missing N-phase or with a mistaken N-phase will break the equipment.

After the installation, check the following before switching on the circuit breaker:

1. The position of the switches that require an initial setting
Make sure that switches are set according to your application needs before turning the power supply on.
2. Power supply wiring and transmission wiring
Use a designated power supply and transmission wiring and make sure that it has been carried out according to the instructions described in this manual, according to the wiring diagrams and according to local and national regulations.
3. Pipe sizes and pipe insulation
Make sure that correct pipe sizes are installed and that the insulation work is properly executed.
4. Additional refrigerant charge
The amount of refrigerant to be added to the unit should be written on the included "Added Refrigerant" plate and attached to the rear side of the front cover.
5. Insulation test of the main power circuit
Using a megatester for 500V, check that the insulation resistance of 2M Ω or more is attained by applying a voltage of 500V DC between power terminals and earth. Never use the megatester for the transmission wiring.
6. Installation date
Be sure to keep record of the installation date on the sticker on the electric box lid according to EN60335-2-40.

8.2 Test Run



Caution After completing installation, be sure to open the valve. (Operating the unit with the valve shut will break the compressor.)

Power supply connection

When running the unit for the first time after installation, be sure to perform a test run following these steps for test run. (Not performing a test run when the unit is first installed may prevent the unit from operating properly.)

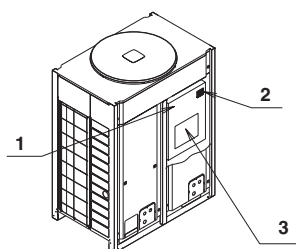
- During the operation, monitor the outdoor unit operation status and check for any incorrect wiring.

1. Turn ON the power to the outdoor units and indoor units.		Make sure to turn ON the power 6 hours before starting the operation. This is necessary to warm the crankcase preliminarily by the electric heater.							
2. Check the LED on the P-board (A1P) in the outdoor unit to see if the data transmission is performed normally.									
LED display (Default status before delivery)	Microcomputer operation monitor	Page	Ready/ Error	Cooler/heater changeover			Low noise	Demand	Multi
				Individual	Bulk (parent)	Bulk (child)			
	HAP	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
One outdoor unit installed	●	●	●	○	●	●	●	●	●
When multiple outdoor unit installed (*):	Master station	●	●	○	●	●	●	●	○
	Sub station 1	●	●	●	●	●	●	●	●
	Sub station 2	●	●	●	●	●	●	●	●

LED display: ● OFF ○ ON ● Blinking

(*) The base (parent) unit is the outdoor unit to which the interconnecting wiring for the indoor units is connected. The other outdoor units are child units.

3. As necessary, configure the system settings onsite by using the dipswitch (DS1) on the outdoor unit P-board (A1P) and push button switches (BS1 to 5). When the system is in the multiple-outdoor unit configuration (Out Multi), perform the configuration on the parent unit. (Any settings made on a child unit will be ignored.)		Always perform configuration after turning ON the power. To learn the setting method, refer to the [Service Precautions] label attached at the position shown in the figure on the right (Electric box lid in outdoor unit). (Remember, the actual settings you have made must be recorded on the [Service Precautions] label.)							
4. Check if the shutoff valves are in appropriate status and correct any wrong status. (Refer to the table in "6-6 Additional Refrigerant Charge".)		<div>Caution</div> Do not leave any shutoff valve closed. Otherwise the compressor will fail.							
5. Perform the check operation following the instructions printed on the [Service Precaution] label.		The system operates for about 15 minutes (30 minutes at maximum) and automatically stops the test operation. The system can start a normal operation about 15 minutes after the test operation, only if the remote controller displays no error codes.							



1. Electric box lid
2. Service lid
3. [Service precautions] Label location

<Cautions for check operation>

- If the system is started within about 12 minutes after the outdoor/indoor units are turned ON, the compressor will not run and H2P lights up. Before starting an operation, always verify that the LED display shows the contents of the table in "8-2 Test run 2."
- The system may require up to 10 minutes until it can start the compressor after an operation start. This is a normal operation to equalize the refrigerant distribution.
- The check operation does not provide any means of checking the indoor units individually. For that purpose, perform normal operation using the remote controller after the check operation.

Remote controller displays an error:

Installation error	Malfunction code	Remedial action
The shutoff valve of an indoor unit is left closed.	E3 E4 F3 UF	Check referring to the table in “ 6-6 Additional Refrigerant Charge ”.
The phases of the power to the outdoor units are reversed.	U1	Exchange two of the three phases (L1, L2, L3) to make a positive phase connection.
No power is supplied to an outdoor or indoor unit (including phase interruption).	U1 U4	Check if the power wiring for the outdoor units are connected correctly. (If the power wire is not connected to L2 phase, no malfunction display will appear and the compressor will not work.)
Incorrect interconnections between units	UF	Check if the refrigerant line piping and the unit wiring are consistent with each other.
Refrigerant overcharge	E3 F6 UF	Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
Insufficient refrigerant	E4 F3	Check if the additional refrigerant charge has been finished correctly. Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant.

Temperature adjustment operation confirmation

- After the test run is over, operate the unit normally. (Heating is not possible if the outdoor temperature is 24°C or higher.)
 - Make sure the indoor and outdoor units are operating normally (If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the heater for a sufficient length of time before restarting the operation.)
 - Run each indoor unit one at a time and make sure the corresponding outdoor unit is also running.
 - Check to see if cold (or hot) air is coming out of the indoor unit.
 - Press the fan direction and fan strength buttons on the indoor unit to see if they operate properly.

**Caution****<Cautions for normal operation check>**

- Once stopping, the compressor will not restart in about 5 minutes even if the Run/Stop button of an indoor unit in the same system is pressed.
- When the system operation is stopped by the remote controller, the outdoor units may continue operating for further 5 minutes at maximum.
- If the system has not undergone any check operation by the test operation button since it was first installed, an error code “U3” is displayed. In this case, perform check operation referring to “8-2 Test run”.
- After the test run, when handing the unit over to the customer, make sure the electric box lid, the service lid, and the unit casing are all attached.

9. Caution for Refrigerant Leaks

9.1 Caution for Refrigerant Leaks

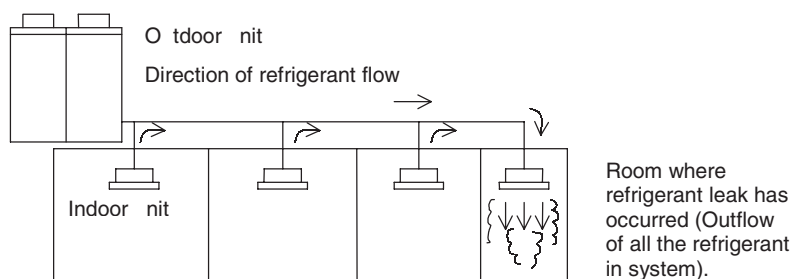
9.1.1 Introduction

Points to note in connection with refrigerant leaks

The installer and system specialist shall secure safety against leakage according to local regulations or standards. The following standards may be applicable if local regulations are not available.

9.1.2 Maximum Concentration Level

The maximum charge of refrigerant and the calculation of the maximum concentration of refrigerant is directly related to the humanly occupied space in to which it could leak. The unit of measurement of the concentration is kg/m^3 (the weight in kg of the refrigerant gas in 1m^3 volume of the occupied space). Compliance to the local applicable regulations and standards of the maximum allowable concentration level is required. In Australia the maximum allowed concentration level of refrigerant to a humanly space is limited to 0.35kg/m^3 for R407C and 0.44kg/m^3 for R410A.



Pay special attention to the place, such as a basement, etc., where refrigerant can stay, since refrigerant is heavier than air.

9.1.3 Procedure for Checking Dangerous Concentration

Check the Dangerous concentration in accordance with steps (1)-(4) below and take whatever action is necessary.

Step1:

Calculate the amount of refrigerant (kg) charged to each system separately.

(Amount of refrigerant in a single indoor unit system)	+	(Additional charging amount)	=	Total amount of refrigerant (kg) in the system
				Amount of refrigerant with which the system is charged before leaving the factory
				Amount of refrigerant added locally in accordance with the length or diameter of the refrigerant piping



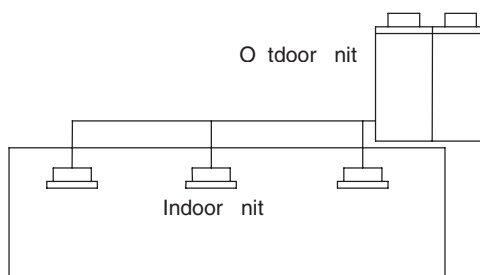
Notes:

Where a single refrigerant facility is divided onto 2 entirely independent refrigerant systems then use the amounts of refrigerant with which each separate system of charged.

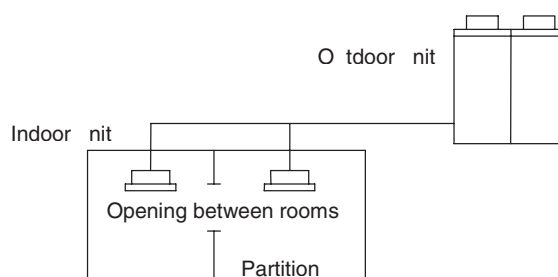
Step 2:**Calculate the smallest room volume (m³).**

In a case like the following calculate the volume of (a), (b) as a single room or as the smallest room.

(a) Where there are no smaller room divisions

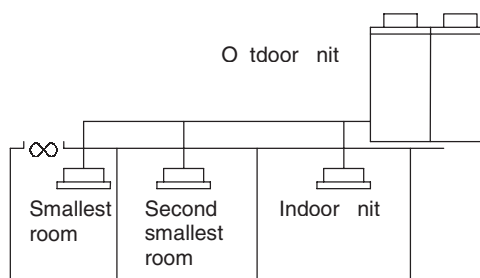


(b) Where there is a room division but there is an opening between the rooms sufficiently large to permit a free flow of air back and forth.



(Where there is an opening without a door or where there are openings above and below the door which are each equivalent in size to 0.15% or more of the floor area.)

(c) Where there is a gas leak detection alarm device linked to a mechanical ventilator in the smallest room then the next smallest room will become the measurement target.

**Step 3:****Calculate the refrigerant density using the results of the calculations in Step (1) and (2) above.**

$$\frac{\text{Total volume of refrigerant in the refrigerant system}}{\text{Size (m}^3\text{) of the smallest room in which there is an indoor unit installed}} \leq \text{Dangerous concentration (kg/m}^3\text{)}$$

in the case of: R407C = 0.35kg/m³, R410A = 0.44kg/m³

If the result of the above calculation exceeds the dangerous concentration level then make similar calculations for the second then third smallest room and so on until the result falls short of the concentration level.

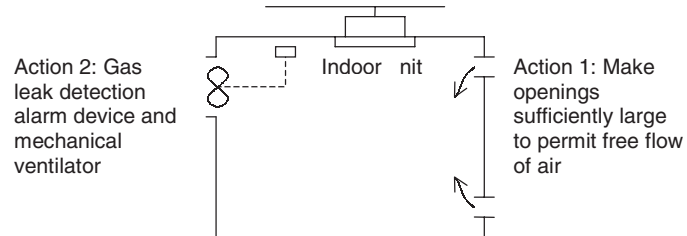
Step 4:**Dealing with situations where the result exceeds the dangerous concentration level.**

Where the installation of a facility results in a concentration in excess of the dangerous concentration level then it may be necessary to revise the system design to some extent or else take one of the following courses of action.

Action 1: Making openings which will allow the air to flow freely into the room.

Make openings above and below the door which are each equivalent in size to 0.15% or more of the floor area or make a doorless opening.

Action 2: Fit a mechanical ventilator linked to a gas leak detection alarm device.

**Notes:**

This precaution shows the requirement of EN.

The precaution should be followed in accordance of local code.

Part 3

Operation Manual

1. Safety Cautions	199
2. What to Do Before Operation	202
3. Remote Controller and Changeover Switch: Name and Function of Each Switch and Display	203
4. Warning	205
4.1 Never Do the Following	205
5. Operation Range	206
6. Operation Procedure	207
6.1 Cooling, Heating and Fan Only Operation	207
6.2 Program Dry Operation	209
6.3 Adjusting the Air Flow Direction (Only for Double-flow, Multi-flow, Corner, Ceiling-suspended and Wall-mounted)	210
6.4 Programming Start and Stop of the System with Timer	211
6.5 Setting the Master Remote Controller	212
6.6 Precautions for group control system or two remote controller control system	213
7. Optimum Operation	214
8. Following Symptoms are not Air Conditioner Troubles	215
8.1 The System does not operate	215
8.2 Cool/Heat cannot be Changed Over	215
8.3 Fan Operation is Possible, but Cooling and Heating do not Work	215
8.4 The Fan Strength does not Correspond to the Setting	215
8.5 The Fan Direction does not Correspond to the Setting	215
8.6 White Mist comes out of a Unit	216
8.7 Noise of Air Conditioners	216
8.8 Dust comes out of the Unit	216
8.9 The Units can Give off Odours	216
8.10 The Outdoor Unit Fan does not Spin	216
8.11 The Display Shows "88"	217
8.12 The Compressor in the Outdoor Unit does not Stop after a Short Heating Operation	217
8.13 The Inside of an Outdoor Unit is Warm even when the Unit has stopped	217
9. Troubleshooting	218

Thank you for purchasing this Daikin air conditioner. Carefully read this operation manual before using the air conditioner. It will tell you how to use the unit properly and help you if any trouble occurs. After reading the manual, file it away for future reference.

[Applicable model]

RXYQ5MY1B	REYQ8MY1B
RXYQ8MY1B	REYQ10MY1B
RXYQ10MY1B	REYQ12MY1B
RXYQ12MY1B	REYQ14MY1B
RXYQ14MY1B	REYQ16MY1B
RXYQ16MY1B	REYQ18MY1B
RXYQ18MY1B	REYQ20MY1B
RXYQ20MY1B	REYQ22MY1B
RXYQ22MY1B	REYQ24MY1B
RXYQ24MY1B	REYQ26MY1B
RXYQ26MY1B	REYQ28MY1B
RXYQ28MY1B	REYQ30MY1B
RXYQ30MY1B	REYQ32MY1B
RXYQ32MY1B	REYQ34MY1B
RXYQ34MY1B	REYQ36MY1B
RXYQ36MY1B	REYQ38MY1B
RXYQ38MY1B	REYQ40MY1B
RXYQ40MY1B	REYQ42MY1B
RXYQ42MY1B	REYQ44MY1B
RXYQ44MY1B	REYQ46MY1B
RXYQ46MY1B	REYQ48MY1B
RXYQ48MY1B	

1. Safety Cautions

Read the following cautions carefully and use your equipment properly.
There are three kinds of safety cautions and tips listed here as follows:



WARNING ...Improper handling can lead to such serious consequences as death or severe injury.



CAUTION.....Improper handling can lead to injury or damage. It could also have serious consequences under certain conditions.



Notes:

- These instructions will ensure proper use of the equipment.
Be sure to follow these important safety cautions.

Keep these warning sheets handy so that you can refer to them if needed.

Also, if this equipment is transferred to a new user, make sure to hand over this user's manual to the new user.



Warning

- **It is not good for your health to expose your body to the air flow for a long time.**
- **In order to avoid electric shock, fire or injury, or if you detect any abnormality such as smell of fire, turn off power and call your dealer for instructions.**
- **Ask your dealer for installation of the air conditioner.**
Incomplete installation performed by yourself may result in a water leakage, electric shock, and fire.
- **Ask your dealer for improvement, repair, and maintenance.**
Incomplete improvement, repair, and maintenance may result in a water leakage, electric shock, and fire.
- **Do not put a finger, a rod or other objects into the air inlet or outlet. As the fan is rotating at high speed, it will cause injury.**
- **The refrigerant in the air conditioner is safe and normally does not leak. If the refrigerant leaks inside the room, the contact with a fire of a burner, a heater or a cooker may result in a harmful gas.**
Do not use the air conditioner until when a service person confirms to finish repairing the portion where the refrigerant leaks.
- **For refrigerant leakage, consult your dealer.**
When the air conditioner is to be installed in a small room, it is necessary to take proper measures so that the amount of any leaked refrigerant does not exceed the limiting concentration even when it leaks. If the refrigerant leaks exceeding the level of limiting concentration, an oxygen deficiency accident may happen.
- **Improper installation or attachment of equipment or accessories could result in electric shock, short-circuit, leaks, fire or other damage to the equipment. Be sure only to use accessories made by Daikin which are specifically designed for use with the equipment and have them installed by a professional.**
- **Ask your dealer to move and reinstall the air conditioner.**
Incomplete installation may result in a water leakage, electric shock, and fire.



Caution

- **Do not use the air conditioner for other purposes.**
In order to avoid any quality deterioration, do not use the unit for cooling precision instruments, food, plants, animals or works of art.
- **In order to avoid injury, do not remove the fan guard.**
- **To avoid oxygen deficiency, ventilate the room sufficiently if equipment with burner is used together with the air conditioner.**

- **After a long use, check the unit stand and fitting for damage.**
If they are left in a damaged condition, the unit may fall and result in injury.
- **Neither place a flammable spray bottle near the air conditioner nor perform spraying.**
Doing so may result in a fire.
- **Before cleaning, be sure to stop the operation, turn the breaker off or pull out the supply cord.**
Otherwise, an electric shock and injury may result.
- **Do not operate the air conditioner with a wet hand.**
An electric shock may result.
- **In order to avoid electric shock, fire, injury or damaging the unit, do not use improper ampere fuses or do not use copper nor steel wires instead.**
- **Do not place appliances which produce open fire in places exposed to the air flow from the unit or under the indoor unit. It may cause incomplete combustion or deformation of the unit due to the heat.**
- **Do not allow a child to mount on the outdoor unit or avoid placing any object on it.**
Falling or tumbling may result in injury.
- **Never expose little children, plants or animals directly to the air flow.**
Adverse influence to little children, animals and plants may result.
- **Do not wash the air conditioner with excessive water.**
Electric shock or fire may result.
- **Do not install the air conditioner at any place where flammable gas may leak out.**
If the gas leaks out and stays around the air conditioner, a fire may break out.
- **In order to avoid electric shock or fire, make sure that an earth leakage breaker is installed.**
- **Be sure the air conditioner is electrically earthed.**
In order to avoid electric shock, make sure that the unit is grounded and that the earth wire is not connected to gas or water pipe, lightning conductor or telephone earth wire.
- **Arrange the drain hose to ensure smooth drainage. Incomplete drainage may cause wetting of the building, furniture etc.**
- **Do not let children play on and around the outdoor unit.**
If they touch the unit carelessly, it may result in injury.
- **Do not place a flower vase and anything containing water.**
Water may enter the unit, causing an electric shock or fire.
- **Do not place the controller exposed to direct sunlight.**
The LCD display may get discolored, failing to display the data.
- **Do not wipe the controller operation panel with benzine, thinner, chemical dust cloth, etc.**
The panel may get discolored or the coating peeled off. If it is heavily dirty, soak a cloth in water-diluted neutral detergent, squeeze it well and wipe the panel clean. And wipe it with another dry cloth.
- **Never touch the internal parts of the controller.**
Do not remove the front panel. Some parts inside are dangerous to touch, and a machine trouble may happen. For checking and adjusting the internal parts, contact your dealer.
- **Avoid placing the controller in a spot splashed with water.**
Water coming inside the machine may cause an electric leak or may damage the internal electronic parts.

- **Never press the button of the remote controller with a hard, pointed object.**
The remote controller may be damaged.
- **Never pull or twist the electric wire of a remote controller.**
It may cause the unit to malfunction.
- **Do not operate the air conditioner when using a room fumigation - type insecticide.**
Failure to observe could cause the chemicals to become deposited in the unit, which could endanger the health of those who are hypersensitive to chemicals.

2. What to Do Before Operation

This operation manual is for the following systems with standard control. Before initiating operation, contact your Daikin dealer for the operation that corresponds to your system type and mark.

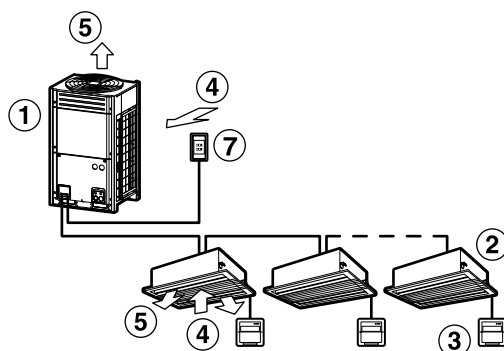
If your installation has a customized control system, ask your Daikin dealer for the operation that corresponds to your system.

Outdoor units

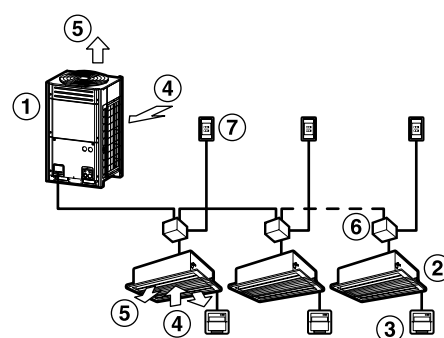
	Cool/heat changeover remote control switch	Operation modes
Inverter series		
heat pumps RXYQ series	<input type="checkbox"/> yes <input type="checkbox"/> no	❄️ 🔥 🌀
Heat recovery series		
heat pumps REYQ series	<input type="checkbox"/> yes <input type="checkbox"/> no	❄️ 🔥 🔄 🌀

■ Names and functions of parts

RXYQ series



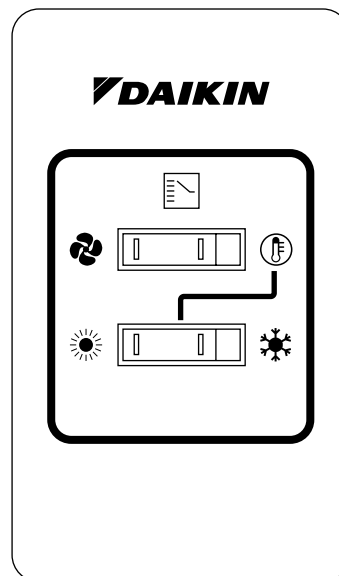
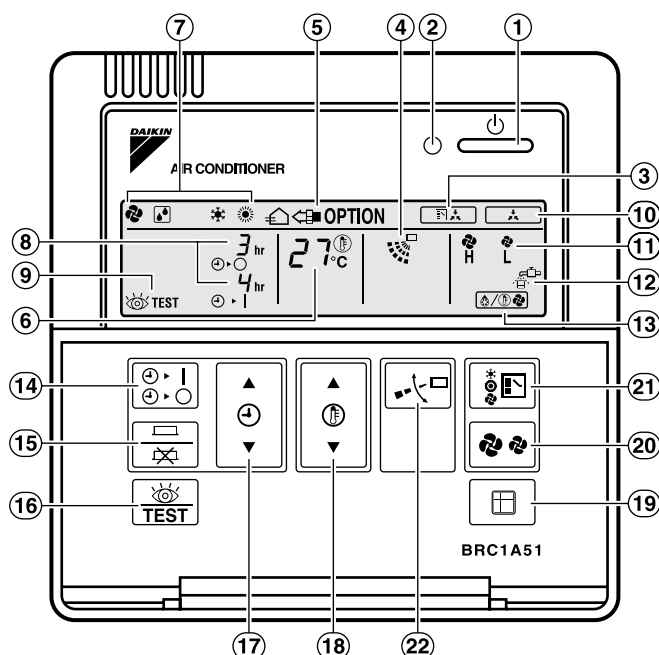
REYQ series



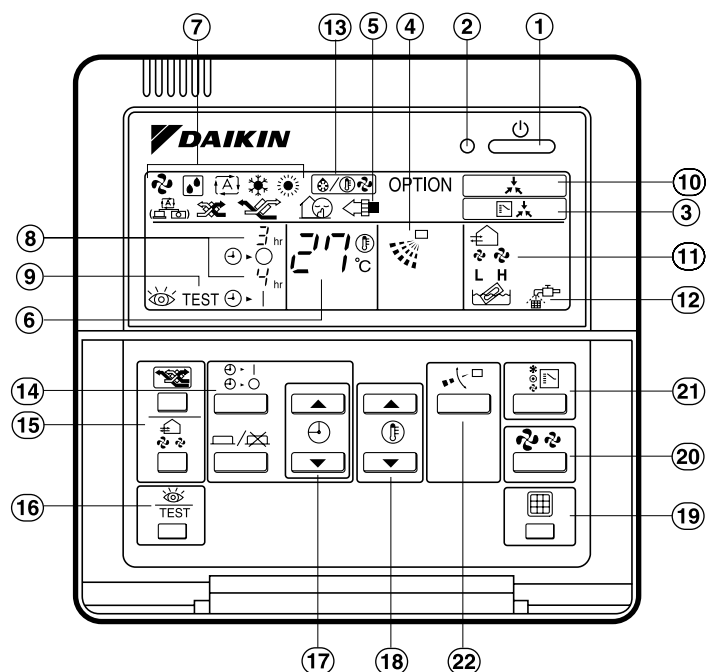
- 1. Outdoor unit
- 2. Indoor unit
- 3. Remote controller
- 4. Inlet air
- 5. Outlet air
- 6. BS (Branch selection) unit
- 7. Cool/heat changeover remote control switch
(Left figure shows systems with changeover remote control switches)

3. Remote Controller and Changeover Switch: Name and Function of Each Switch and Display

RXYQ series



REYQ series



1. On/off button

Press the button and the system will start. Press the button again and the system will stop.

2. Operation lamp (red)


















The lamp lights up during operation.

3. Display “” (changeover under control)

It is impossible to changeover heat/cool with the remote controller when this icon is displayed.

4. Display “” (air flow flap)

Refer to the chapter “Operation procedure - Adjusting the air flow direction”.

5. **Display “ OPTION ” (ventilation/air cleaning)**
This display shows that the total heat exchange and the air cleaning unit are in operation.
(These are optional accessories)
6. **Display “ ” (set temperature)**
This display shows the temperature you have set.
7. **Display “ ” “ ” “ ” “ ” “ ” (operation mode)**
This display shows the current operation mode.
8. **Display “ ” (programmed time)**
This display shows the programmed time of the system start or stop.
9. **Display “ TEST ” (inspection/test operation)**
When the inspection/test operation button is pressed, the display shows the mode in which the system actually is.
10. **Display “ ” (under centralized control)**
When this display shows, the system is under centralized control. (This is not a standard specification.)
11. **Display “ ” (fan speed)**
This display shows the fan speed you have selected.
12. **Display “ ” (time to clean air filter)**
Refer to the indoor unit manual.
13. **Display “ ” (defrost/hot start)**
Refer to the chapter “Operation procedure - Explanation of heating operation.”
14. **Timer mode start/stop button**
Refer to the chapter “Operation procedure - Programming start and stop of the system with timer.”
15. **Timer on/off button**
Refer to the chapter “Operation procedure - Programming start and stop of the system with timer.”
16. **Inspection/test operation button**
This button is only used by qualified service persons for maintenance purposes.
17. **Programming time button**
Use this button for programming start and/or stop time.
18. **Temperature setting button**
Use this button for setting the desired temperature.
19. **Filter sign reset button**
Refer to the indoor unit manual.
20. **Fan speed control button**
Press this button to select the fan speed of your preference.
21. **Operation mode selector button**
Press this button to select the operation mode of your preference.
22. **Air flow direction adjust button**
Refer to the chapter “Operation procedure - Adjusting the air flow direction”.
23. **Fan only/air conditioning selector switch**
Set the switch to “ ” for fan only operation or to “ ” for heating or cooling operation.
24. **Cool/heat changeover switch**
Set the switch to “ ” for cooling or to “ ” for heating operation.

**Notes:**

- In contradistinction to actual operating situations, the display on figure 1 shows all possible indications.
- If the filter sign lamp lights up, clean the air filter as explained in the indoor unit manual. After cleaning and reinstalling the air filter: press the filter sign reset button on the remote controller. The filter sign lamp on the display will go out.
- The remote controller BRC1A52 (for FXS, FXM, FXL, FXN) does not have the display air flow flap (4) nor the air flow direction adjust button (22).

4. Warning

4.1 Never Do the Following

- **Never let the indoor unit or the remote controller get wet.**
Do not wash the outdoor unit with water.
It may cause an electric shock or a fire.
- **Never use flammable spray such as hair spray, lacquer or paint near the unit.**
It may cause a fire.
- **Never touch the air outlet or the horizontal blades while the swing flap is in operation.**
Fingers may become caught or the unit may break down.
- **Never replace a fuse with that of wrong ampere ratings or other wires when a fuse blows out.**
Use of wire or copper wire may cause the unit to break down or cause a fire.
- **Never put any objects into the air inlet or outlet.**
Objects touching the fan at high operating speed can be dangerous.
- **Never remove the fan guard of the outdoor unit.**
A fan rotating at high speed without the fan guard is very dangerous.
- **Never press the button of the remote controller with a hard, pointed object.**
The remote controller may be damaged.
- **Never pull or twist the electric wire of the remote controller.**
It may cause the unit to malfunction.
- **Never inspect or service the unit by yourself.**
Ask a qualified service person to perform this work.
- **To prevent refrigerant leak, contact your Daikin dealer.**
When the system is installed and run in a small room, it is required to keep the concentration of the refrigerant, if by and chance coming out, below the limit. Otherwise, oxygen in the room may be affected, resulting in a serious accident.
- **Cut off all electric waves before servicing.**

5. Operation Range

Use the system in the following temperature and humidity ranges for safe and effective operation.

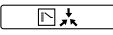
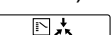
	COOLING	HEATING
Outdoor temperature	-5°~43°CDB	-20°~21°CDB — 20°~15.5°CWB
Indoor temperature	21°~32°CDB 14°~25°CWB	15°~27°CDB
Indoor humidity	≤ 80%*	

- * To avoid condensation and water dripping out the unit.
If the temperature or the humidity is beyond these conditions, safety devices may work and the air conditioner may not operate.

6. Operation Procedure

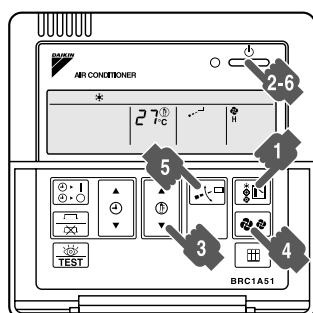
- Operation procedure varies according to the combination of outdoor unit and remote controller. Read the chapter “What to do before operation”.
- To protect the unit, turn on the main power switch 6 hours before operation.
- If the main power supply is turned off during operation, operation will restart automatically after the power turns back on again.

6.1 Cooling, Heating and Fan Only Operation

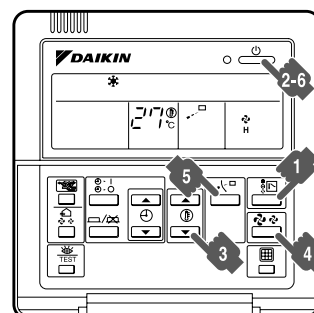
- Changeover cannot be made with a remote controller whose display shows “” (changeover under control).
- When the display “” (changeover under control) flashes, refer to the chapter “Operation procedure - Setting the master remote controller”.
- Automatic operation can be selected only by REYQ series.
- The fan may keep on running for about 1 minute after the heating operation stops.
- The air flow rate may adjust itself depending on the room temperature or the fan may stop immediately. This is not a malfunction.





For systems without cool/heat changeover remote control switch

RXYQ series



REYQ series





- 1 Press the operation mode selector button several times and select the operation mode of your choice;
 - “” Cooling operation
 - “” Heating operation
 - “” Automatic operation
 - “” Fan only operation



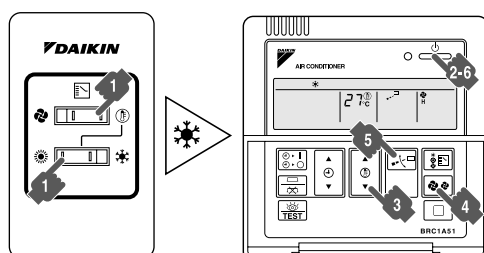
Notes:

- Automatic operation (REYQ only)
In this operation mode, cool/heat changeover is automatically conducted.
- 2 Press the on/off button.
The operation lamp lights up and the system starts operation.

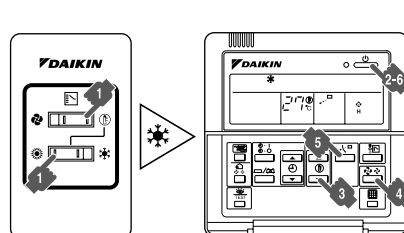
For systems with cool/heat changeover remote control switch

- 1 Select operation mode with the cool/heat changeover remote control switch as follows:
 - “” “” Cooling operation

RXYQ series

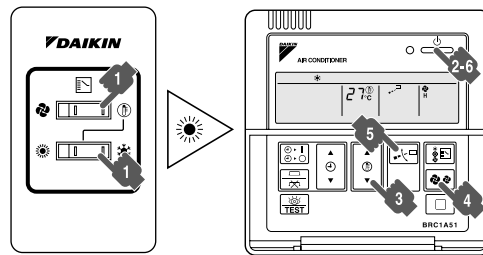


REYQ series

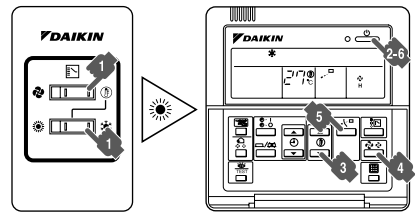


“☀” “🌀” Heating operation

RXYQ series

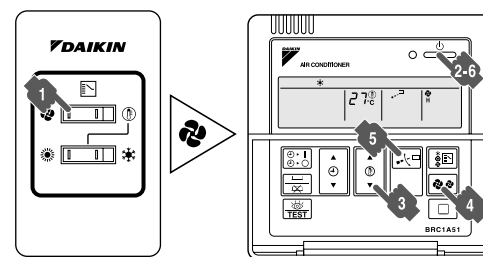


REYQ series

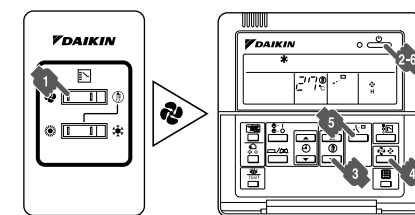


“🌀” Fan only operation

RXYQ series



REYQ series

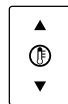


- 2** Press the on/off button.
The operation lamp lights up and the system starts operation.

Adjustment

For programming temperature, fan speed and air flow direction (only for the remote controller BRC1A51: FXC, FXF, FXH, FXK, FXA), follow the procedure shown below.

- 3** Press the temperature setting button and program the desired temperature.
Each time this button is pressed, the temperature setting rises or lowers 1°C.



Notes:

- Set the temperature within the operation range.
- The temperature setting is impossible for fan only operation.
- 4** Press the fan speed control button and select the fan speed of your preference.
- 5** Press air flow direction adjust button.
Refer to the chapter “Adjusting the air flow direction” for details.

Stopping the system

- 6** Press the on/off button once again.
The operation lamp goes off and the system stops operation.



Notes:

- Do not turn off power immediately after the unit stops, but wait for at least 5 minutes.

Explanation of heating operation

Defrost operation

- In heating operation, freezing of the outdoor unit coil increases. Heating capability decreases and the system goes into defrost operation.
- The indoor unit fan stops and the remote controller displays “🌀/🌀/🌀”.
- After maximum 10 minutes of defrost operation, the system returns to heating operation again.

Hot start

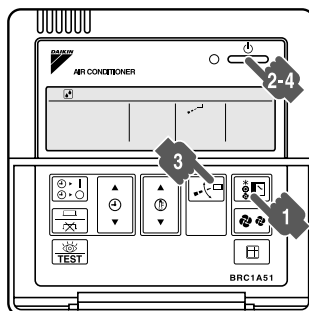
- In order to prevent cold air from blowing out of an indoor unit at the start of heating operation, the indoor fan is automatically stopped. The display of the remote controller shows “🌀/🌀/🌀”.

6.2 Program Dry Operation

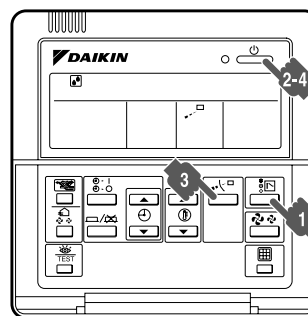
- The function of this program is to decrease the humidity in your room with a minimum temperature decrease.
- The micro computer automatically determines temperature and fan speed.
- The system does not go into operation if the room temperature is low.

For systems without cool/heat changeover remote control switch

RXYQ series



REYQ series



- 1 Press the operation mode selector button several times and select “” (program dry operation).
- 2 Press the on/off button
The operation lamp lights up and the system starts operation.
- 3 Press the air flow direction adjust button (only for FXC, FXF, FXH, FXK, FXA). Refer to the chapter “Adjusting the air flow direction” for details.

Stopping the system

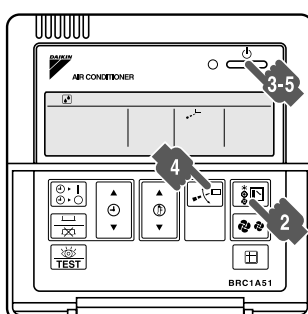
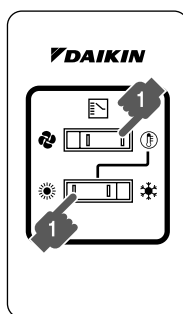
- 4 Press the on/off button once again.
The operation lamp goes off and the system stops operation.



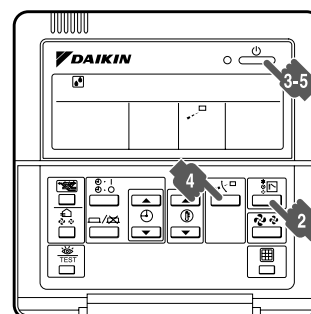
Notes: ■ Do not turn off power immediately after the unit stops, but wait for at least 5 minutes.

For systems with cool/heat changeover remote control switch

RXYQ series



REYQ series



- 1 Select cooling operation mode with the cool/heat changeover remote control switch.
- 2 Press the operation mode selector button several times and select program dry “”.
- 3 Press the on/off button
The operation lamp lights up and the system starts operation.
- 4 Press the air flow direction adjust button (only for FXC, FXF, FXH, FXK, FXA). Refer to the chapter “Adjusting the air flow direction” for details.

Stopping the system

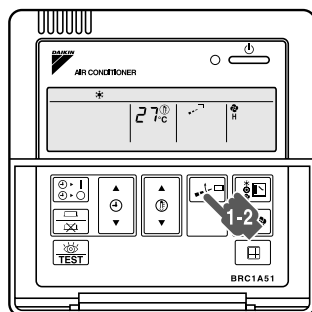
- 5 Press the on/off button once again.
The operation lamp goes off and the system stops operation.



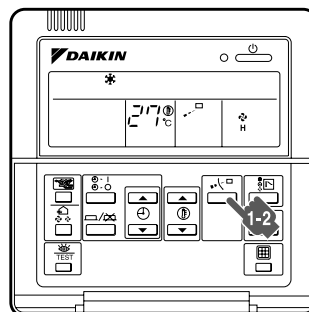
Notes: ■ Do not turn off power immediately after the unit stops, but wait for at least 5 minutes.

6.3 Adjusting the Air Flow Direction (Only for Double-flow, Multi-flow, Corner, Ceiling-suspended and Wall-mounted)

RXYQ series



REYQ series

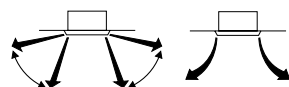


- 1 Press the air flow direction button to select the air direction.
The air flow flap display swings as shown below and the air flow direction continuously varies. (Automatic swing setting)
- 2 Press the air flow direction adjust button to select the air direction of your choice.
The air flow flap display stops swinging and the air flow direction is fixed. (Fixed air flow direction setting)

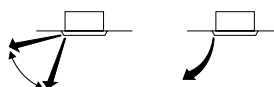


Movement of the air flow flap

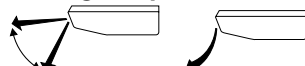
Double-flow + Multi-flow



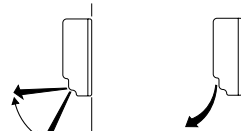
Corner



Ceiling Suspended



Wall Mounted



For the following conditions, a micro computer controls the air flow direction which may be different from the display.

COOLING	HEATING
	<ul style="list-style-type: none"> • When starting operation. • When the room temperature is higher than the set temperature. • At defrost operation.
<ul style="list-style-type: none"> • When operating continuously at horizontal air flow direction. • When continuous operation with downward air flow is performed at the time of cooling with a ceiling-suspended or a wall-mounted unit, the microcomputer may control the flow direction, and then the remote control indication also will change. 	

The air flow direction can be adjusted in one of the following ways.

- The air flow flap itself adjusts its position.
- The air flow direction can be fixed by the user.
- Automatic “” and desired position “”.



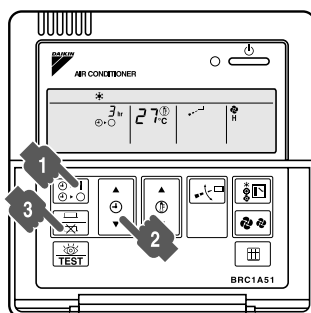
Notes:

- The movable limit of the flap is changeable. Contact your Daikin dealer for details. (Only for Double-flow, Multi-flow, Corner, Ceiling-suspended and Wall-mounted.)
- Avoid operating in the horizontal direction “”. It may cause dew or dust to settle on the ceiling.

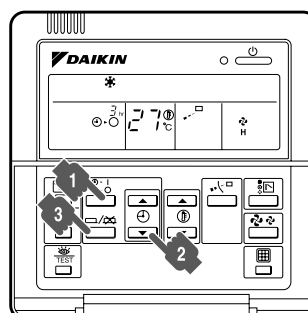
6.4 Programming Start and Stop of the System with Timer

- The timer is operated in the following two ways.
 Programming the stop time “⏸ ▶ ○”. The system stops operating after the set time has elapsed.
 Programming the start time “⏸ ▶ |”. The system starts operating after the set time has elapsed.
- The timer can be programmed for a maximum of 72 hours.
- The start and the stop time can be simultaneously programmed.

RXYQ series



REYQ series



- ➊ Press the timer mode start/stop button several times and select the mode on the display. The display flashes.
 - For setting the timer stop “⏸ ▶ ○”
 - For setting the timer start “⏸ ▶ |”
- ➋ Press the programming time button and set the time for stopping or starting the system. Each time this button is pressed, the time advances or goes backward by 1 hour.
- ➌ Press the timer on/off button. The timer setting procedure ends. The display “⏸ ▶ ○” or “⏸ ▶ |” changes from flashing light to constant light.



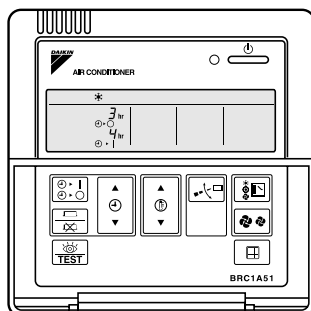
Notes:

- When setting the timer off and on at the same time, repeat the above procedure (from “➊” to “➌”) once again.
- After the timer is programmed, the display shows the remaining time.
- Press the timer on/off button once again to cancel programming. The display vanishes.

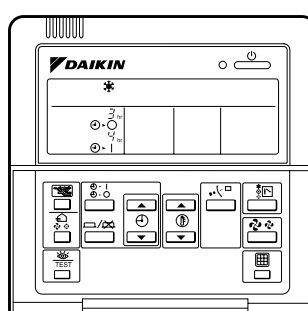
For example:

When the timer is programmed to stop the system after 3 hours and start the system after 4 hours, the system will stop after 3 hours and start 1 hour later.

RXYQ series



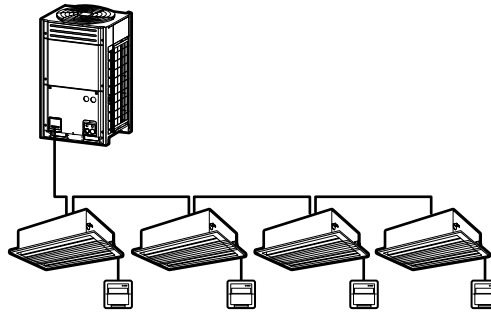
REYQ series



6.5 Setting the Master Remote Controller

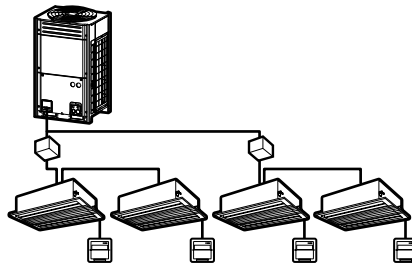
- When the system is installed, it is necessary to designate one of the remote controllers as the master remote controller.


For RXYQ series



When one outdoor unit is connected with several indoor units.

For REYQ series

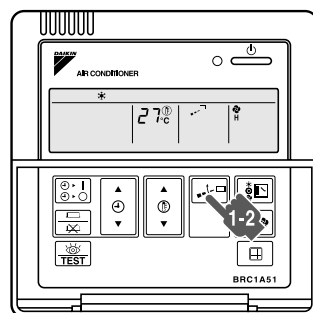


- Only the master remote controller can select heating and cooling or automatic (only REYQ series) operation.
- The displays of slave remote controllers show “” (changeover under control) and they automatically follow the operation mode directed by the master remote controller.

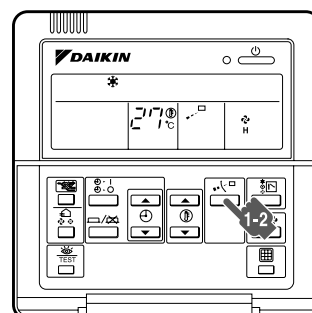
However, it is possible to changeover to program dry with slave remote controllers if the system is in cooling operation set by the master remote controller.

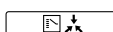
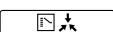

How to designate the master remote controller

RXYQ series



REYQ series



- 1 Press the operation mode selector button of the current master remote controller for 4 seconds.
The display showing “” (changeover under control) of all slave remote controllers connected to the same outdoor unit or BS unit flashes.
- 2 Press the operation mode selector button of the controller that you wish to designate as the master remote controller. Then designation is completed. This remote controller is designated as the master remote controller and the display showing “” (changeover under control) vanishes.
The displays of other remote controllers show “” (changeover under control).

6.6 Precautions for group control system or two remote controller control system

This system provides two other control systems beside individual control (one remote controller controls one indoor unit) system. Confirm the following if your unit is of the following control system type.

- **Group control system**

One remote controller controls up to 16 indoor units. All indoor units are equally set.

- **Two remote controller control system**

Two remote controllers control one indoor unit (in case of group control system, one group of indoor units). The unit is individually operated.




Notes:

- Contact your Daikin dealer in case of changing the combination or setting of group control and two remote controller control systems.

7. Optimum Operation

Observe the following precautions to ensure the system operates properly.

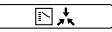
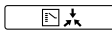
- Adjust the air outlet properly and avoid direct air flow to room inhabitants.
- Adjust the room temperature properly for a comfortable environment. Avoid excessive heating or cooling.
- Prevent direct sunlight from entering a room during cooling operation by using curtains or blinds.
- Ventilate often.
Extended use requires special attention to ventilation.
- Keep doors and windows closed. If the doors and windows remain open, air will flow out of your room causing a decrease in the cooling or heating effect.
- Never place objects near the air inlet or the air outlet of the unit. It may cause deterioration in the effect or stop the operation.
- Turn off the main power supply switch to the unit when the unit is not used for longer periods of time. If the switch is on, it uses electricity. Before restarting the unit, turn on the main power supply switch 6 hours before operation to ensure smooth running. (Refer to the chapter "Maintenance" in the indoor unit manual.)
- When the display shows " " (time to clean the air filter), ask a qualified service person to clean the filters. (Refer to the chapter "Maintenance" in the indoor unit manual.)
- Keep the indoor unit and remote control at least 1 m away from televisions, radios, stereos, and other similar equipment.
Failing to do so may cause static or distorted pictures.
- Do not place items under the indoor unit which may be damaged by water.
Condensation may form if the humidity is above 80% or if the drain outlet gets blocked.

8. Following Symptoms are not Air Conditioner Troubles

8.1 The System does not operate

- **The air conditioner does not start immediately after the ON/OFF button on the remote controller is pushed.**
If the operation lamp lights, the system is in normal condition.
To prevent overloading of the compressor motor, the air conditioner starts 5 minutes after it is turned ON again in case it was turned OFF just before. The same starting delay occurs after the operation mode selector button was used.
- **If “Centralized Control” is displayed on the remote control and pressing the operation button causes the display to blink for a few seconds.**
This indicates that the central device is controlling the unit.
The blinking display indicates that the remote control cannot be used.
- **The system does not start immediately after the power supply is turned on.**
Wait one minute until the micro computer is prepared for operation.

8.2 Cool/Heat cannot be Changed Over

- **When the display shows “” (changeover under control), it shows that this is a slave remote controller.**
- **When the cool/heat changeover remote control switch is installed and the display shows “” (changeover under control).**
This is because cool/heat changeover is controlled by the cool/heat changeover remote control switch. Ask your Daikin dealer where the remote control switch is installed.

8.3 Fan Operation is Possible, but Cooling and Heating do not Work

- **Immediately after the power is turned on.**
The micro computer is getting ready to operate. Wait 10 minutes.

8.4 The Fan Strength does not Correspond to the Setting

- **The fan strength does no change even if the fan strength adjustment button in pressed.**
During heating operation, when the room temperature reaches the set temperature, the outdoor unit goes off and the indoor unit changes to whisper fan strength.
This is to prevent cold air blowing directly on occupants of the room.
The fan strength will not change even if the button is changed, when another indoor unit is in heating operation.

8.5 The Fan Direction does not Correspond to the Setting

- **The fan direction does not correspond to the remote control display.**
The fan direction does not swing.
This is because the unit is being controlled by the micro computer.

8.6 White Mist comes out of a Unit

Indoor unit

- **When humidity is high during cooling operation.**

If the interior of an indoor unit is extremely contaminated, the temperature distribution inside a room becomes uneven. It is necessary to clean the interior of the indoor unit. Ask your Daikin dealer for details on cleaning the unit. This operation requires a qualified service person.

- **Immediately after the cooling operation stops and if the room temperature and humidity are low.**

This is because warm refrigerant gas flows back into the indoor unit and generates steam.

Indoor unit, outdoor unit

- **When the system is changed over to heating operation after defrost operation.**

Moisture generated by defrost becomes steam and is exhausted.

8.7 Noise of Air Conditioners

Indoor unit

- **A “zeen” sound is heard immediately after the power supply is turned on.**

The electronic expansion valve inside an indoor unit starts working and makes the noise. Its volume will reduce in about one minute.

- **A continuous low “shah” sound is heard when the system is in cooling operation or at a stop.**

When the drain pump (optional accessories) is in operation, this noise is heard.

- **A “pishi-pishi” squeaking sound is heard when the system stops after heating operation.**

Expansion and contraction of plastic parts caused by temperature change make this noise.

- **A low “sah”, “choro-choro” sound is heard while the indoor unit is stopped.**

When the other indoor unit is in operation, this noise is heard. In order to prevent oil and refrigerant from remaining in the system, a small amount of refrigerant is kept flowing.

Indoor unit, outdoor unit

- **A continuous low hissing sound is heard when the system is in cooling or defrost operation.**

This is the sound of refrigerant gas flowing through both indoor and outdoor units.

- **A hissing sound which is heard at the start or immediately after stopping operation or defrost operation.**

This is the noise of refrigerant caused by flow stop or flow change.

8.8 Dust comes out of the Unit

- **When the unit is used for the first time in a long time.**

This is because dust has gotten into the unit.

Outdoor unit

- **When the tone of operating noise changes.**

This noise is caused by the change of frequency.

8.9 The Units can Give off Odours

- **The unit can absorb the smell of rooms, furniture, cigarettes, etc., and then emit it again.**

8.10 The Outdoor Unit Fan does not Spin

- **During operation.**

The speed of the fan is controlled in order to optimize product operation.

8.11 The Display Shows "88"

- This is the case immediately after the main power supply switch is turned on and means that the remote controller is in normal condition. This continues for one minute.

8.12 The Compressor in the Outdoor Unit does not Stop after a Short Heating Operation

- This is to prevent oil and refrigerant from remaining in the compressor. The unit will stop after 5 to 10 minutes.


8.13 The Inside of an Outdoor Unit is Warm even when the Unit has stopped

- This is because the crankcase heater is warming the compressor so that the compressor can start smoothly.

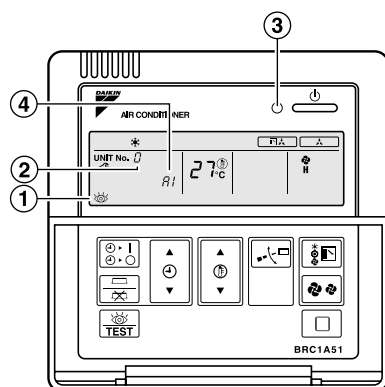
9. Troubleshooting

If one of the following malfunctions occur, take the measures shown below and contact your Daikin dealer.

The system must be repaired by a qualified service person.

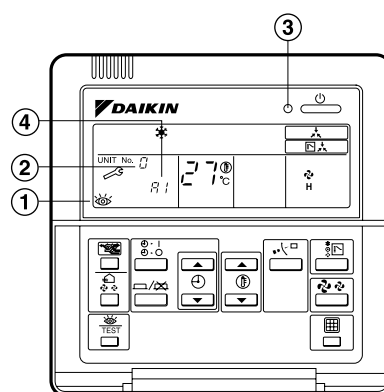
- If a safety device such as a fuse, a breaker or an earth leakage breaker frequently actuates, or the ON/OFF switch does not properly work;
Measure: Turn off the main power switch.
- If water leaks from unit;
Measure: Stop the operation.
- If the display “ TEST ”, the unit number and the operation lamp flash and the malfunction code appears;

RXYQ series




1. Inspection display
2. Indoor unit number in which a malfunction occurs
3. Operation lamp
4. Malfunction code

REYQ series



Measure: Notify your Daikin dealer and report the malfunction code.

If the system does not properly operate except for the above mentioned cases and none of the above mentioned malfunctions is evident, investigate the system according to the following procedures.

1. If the system does not operate at all;
 - Check if there is no power failure.
Wait until power is restored. If power failure occurs during operation, the system automatically restarts immediately after the power supply is recovered.
 - Check if no fuse has blown or breaker has worked. Change the fuse or reset the breaker if necessary.
2. If the system goes into fan only operation, but as soon as it goes into heating or cooling operation, the system stops;
 - Check if air inlet or outlet of outdoor or indoor unit is not blocked by obstacles.
Remove any obstacle and make it well-ventilated.
 - Check if the remote controller display shows “ ” (time to clean the air filter). (Refer to the chapter “Maintenance” in the indoor unit manual.)
3. The system operates but cooling or heating is insufficient;
 - Check if air inlet or outlet of outdoor or indoor unit is not blocked by obstacles.
Remove any obstacle and make it well-ventilated.
 - Check if the air filter is not clogged. (Refer to the chapter “Maintenance” in the indoor unit manual.)
 - Check the temperature setting.
 - Check the fan speed setting on your remote controller.
 - Check for open doors or windows. Shut doors and windows to prevent wind from coming in.
 - Check if there are too many occupants in the room during cooling operation.

- Check if the heat source of the room is excessive.
- Check if direct sunlight enters the room.
Use curtains or blinds.
- Check if the air flow angle is not proper.

Part 4

Precautions for New Refrigerant (R410A)

1. Precautions for New Refrigerant (R410A).....	222
1.1 Outline	222
1.2 Refrigerant Cylinders.....	224
1.3 Service Tools.....	225

1. Precautions for New Refrigerant (R410A)

1.1 Outline

1.1.1 About Refrigerant R410A

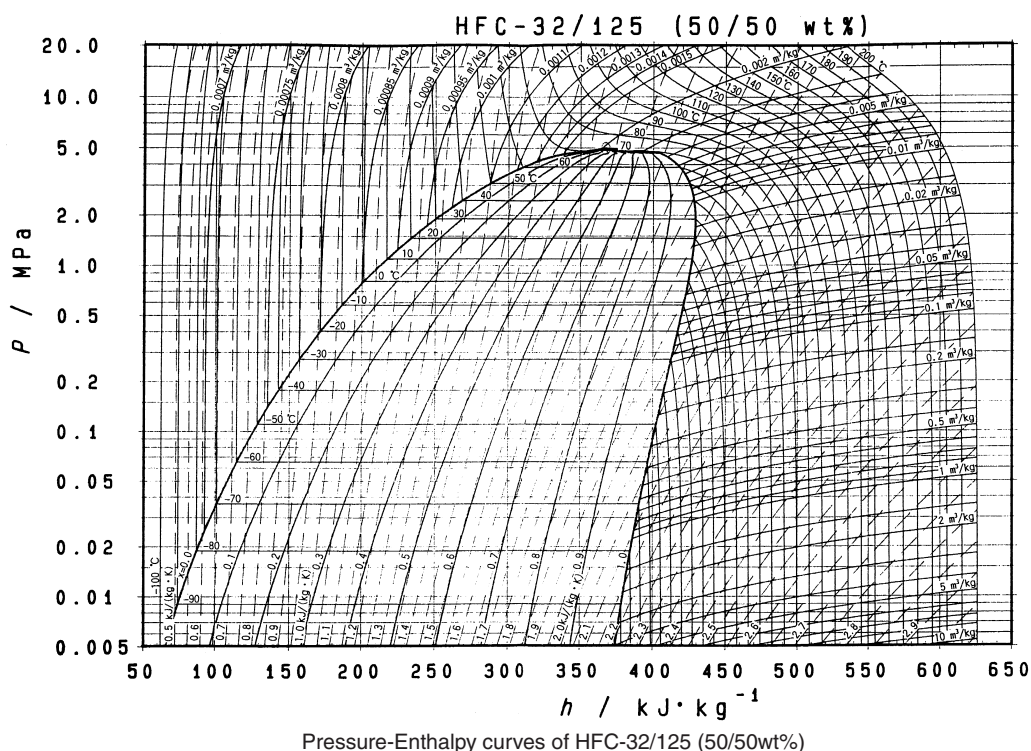
■ Characteristics of new refrigerant, R410A

1. Performance
Almost the same performance as R22 and R407C
2. Pressure
Working pressure is approx. 1.4 times more than R22 and R407C.
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	R407C	R410A	R22
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	3.80 MPa (gauge pressure) = 38.7 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 \doteq 10.19716 kgf / cm²



■ Thermodynamic characteristic of R410A

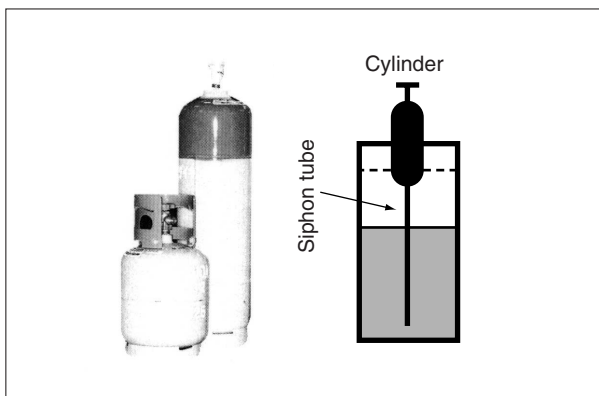
DAIREP ver2.0

Temperature (°C)	Steam pressure (kPa)		Density (kg/m ³)		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

R410A 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) Handling of vessels

Since R410A 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 R410A 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

R410A is used under higher working pressure, compared to previous refrigerants (R22,R407C). 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 (R22,R407C) 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	
	R410A	R407C	R22	
Gauge manifold Charge hose	×			<ul style="list-style-type: none"> Do not use the same tools for R22 and R410A. Thread specification differs for R410A and R407C.
Charging cylinder	×		○	<ul style="list-style-type: none"> Weighting instrument used for HFCs.
Gas detector	○		×	<ul style="list-style-type: none"> The same tool can be used for HFCs.
Vacuum pump (pump with reverse flow preventive function)	○			<ul style="list-style-type: none"> To use existing pump for HFCs, vacuum pump adaptor must be installed.
Weighting instrument	○			
Charge mouthpiece	×			<ul style="list-style-type: none"> Seal material is different between R22 and HFCs. Thread specification is different between R410A and others.
Flaring tool (Clutch type)	○			<ul style="list-style-type: none"> For R410A, flare gauge is necessary.
Torque wrench	○			<ul style="list-style-type: none"> Torque-up for 1/2 and 5/8
Pipe cutter	○			
Pipe expander	○			
Pipe bender	○			
Pipe assembling oil	×			<ul style="list-style-type: none"> 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.			<ul style="list-style-type: none"> 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

Outside Diameter (mm)	Material
φ6.4	○
φ9.5	○
φ12.7	○
φ15.9	○
φ19.1	1/2H
φ22.2	1/2H
φ25.4	1/2H
φ28.6	1/2H
φ31.8	1/2H
φ34.9	1/2H
φ38.1	1/2H
φ41.3	1/2H

* O: Soft (Annealed)

H: Hard (Drawn)

1. Flaring tool



■ Specifications

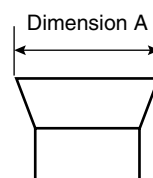
- Dimension A

Unit:mm

Nominal size	Tube O.D. Do	$A \begin{smallmatrix} +0 \\ -0.4 \end{smallmatrix}$	
		Class-2 (R410A)	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: R407C
For class-2: R410A

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 R410A 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

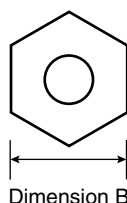
Nominal size	Class-1	Class-2	Previous
1/2	24	26	24
5/8	27	29	27

No change in tightening torque

No change in pipes of other sizes

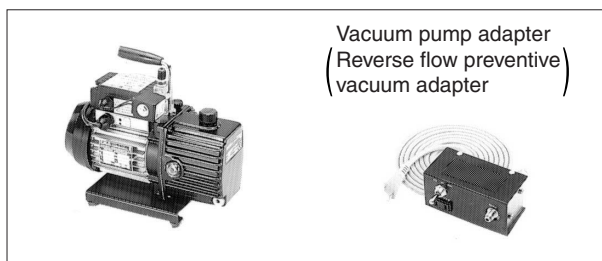
■ Differences

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



For class-1: R407C
For class-2: R410A

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
-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
R410A, R407C, R404A, R507A, R134a, etc.

■ Differences

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

5. Refrigerant oil (Air compal)



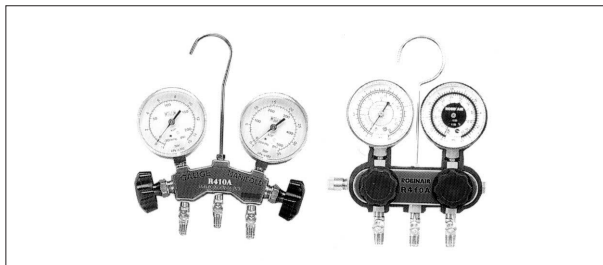
■ Specifications

- 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 R410A and R22 units.

6. Gauge manifold for R410A



■ Specifications

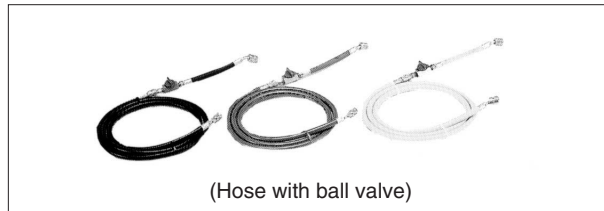
- High pressure gauge
- 0.1 to 5.3 MPa (-76 cmHg to 53 kg/cm²)
- Low pressure gauge
- 0.1 to 3.8 MPa (-76 cmHg to 38 kg/cm²)
- 1/4" → 5/16" (2min → 2.5min)
- No oil is used in pressure test of gauges.
→ For prevention of contamination

- 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 R410A



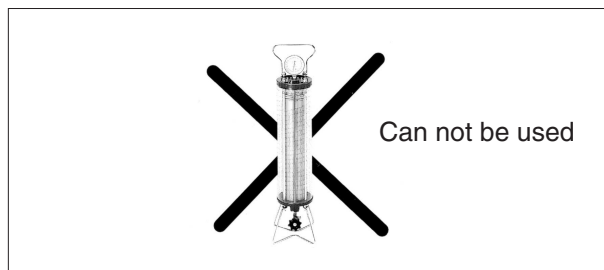
■ **Specifications**

- Working pressure 5.08 MPa (51.8 kg/cm²)
- Rupture pressure 25.4 MPa (259 kg/cm²)
- 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



■ **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 R410A 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) = $\pm 2\text{g}$
TA101B (for 20-kg cylinder) = $\pm 5\text{g}$
- 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 R410A, 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 R410A use)
- Change of sealer material for the HFCs use.

Index

Symbols

“88” cannot be cleared from the central remote controller 151

A

Additional Charge of Refrigerant 36
 Additional refrigerant charge 178
 Air Tight Test 29
 Allowable Piping Length 110
 Applicable range of Field setting 71
 Auto restart after power failure reset 72

B

Brazing 23

C

Centralized Control Group No. Setting 75
 Checks Before Initial Start-up 191
 Combination 155
 Connecting the Refrigerant Piping 168
 Contents of Control Modes 77
 Control Wiring 52
 cool/heat operation 187
 Cooling, Heating and Fan Only Operation 207
 Cracks develop in field pipes due to thermal expansion and contraction 149
 Cylinder specifications 224

D

Detailed Explanation of Setting Modes 72
 Drain Pipe Gradient and Support 38
 Drain pipe trap shape defective 146
 Drain Pipe Work (Indoor) 38
 Drain Piping for Each Model
 Ceiling Mounted Built-in Type (FXSQ-M) 47
 Ceiling Mounted Cassette Corner Type (FXKQ-M) 45
 Ceiling Mounted Cassette Type (FXCQ-M Double flow) 40
 Ceiling Mounted Cassette Type (FXFQ-M Multi-flow) 43
 Ceiling Mounted Duct Type (FXMQ-M) 49
 Ceiling Suspended Type (FXHQ-M) 50
 Floor Standing/Concealed Floor Standing Type (FXLQ-M, FXNQ-M) 52
 Wall Mounted Type (FXAQ-M) 51
 Drain Trap 38

E

Electrical Specifications 160
 Electrical Work 52
 Excessive noise due to incorrect angling of REFNET joints 148
 External Appearance 3

F

Field line connection 183
 Field Setting 67
 Field Setting from Outdoor Unit 79
 Field Wiring 180
 Filter Sign Setting 72
 Flange Connection 27
 Flare Connection 24
 Flaring Procedure 25

G

Grouped Drain Piping 39

H

Hand Over to Customer 105
 Handling of cylinders 224

I

Installation 14
 Installation of Indoor Unit 16
 Installation of Outdoor Unit 59

L

Leak test 175

M

Main Components 161
 Mismatch between cables connecting indoor and outdoor units and corresponding piping 145
 Monitor mode 86

O

Operating Noise of Indoor Units 106
 Operation Mode 78
 Operation Range 206
 Operation When Power is Turned On 65
 Option Accessory 157
 Optional Parts Cool / Heat Selector 180
 Outdoor Unit PC Board Layout 66

P

Picking power line and transmission line 188
 Pipe Insulation 177
 Pipe size selection 115
 Piping Diameter for Grouped Drain Pipes 40
 Piping Installation Point 108
 The Example of A Wrong Pattern 109
 Piping System Diagrams
 Indoor Unit 137
 Piping System Diagrams Outdoor Unit 134
 Power Circuit and Cable Requirements 181
 Power Supply 53
 Power supply connection 192
 Precautions for New Refrigerant (R410) 222
 Pressure down despite absence of leaks during air tight test 147

Program Dry Operation	209
Programming Start and Stop of the System with Timer	211

R

REFNET Header	127
REFNET header.....	128, 148
REFNET Joint	126
REFNET joint	128
REFNET joints	148
Refrigerant Cylinders	224
Refrigerant Leaks.....	102, 194
Refrigerant Pipe Work.....	17

S

Selection of Location.....	56, 162
Selection of Piping Material.....	167
Sequential start	187
Service Space	57
Service Tools	225
Setting by dip switches.....	79
Setting by pushbutton switches.....	79
Setting Contents and Code No.	70
Setting mode 1	81
Setting mode 2.....	82
Setting of Low Noise Operation and Demand Operation	93
Setting of Refrigerant Additional Charging Operation.....	99
Setting the Master Remote Controller	212
Signal interference due to use of multiple core cable	144
Simplified Remote Controller BRC2A51	69
Sleeve and Insert Work.....	15
Standard Operation Limit	156
Standard Supplied Accessories	156
Step by Step Installation Procedure.....	14

T

Technical Specifications.....	158
Test Operation	62
Procedure and Outline.....	62
Test Run.....	192
The centralized control group number cannot be set	150
Thermal Insulation Work	28
Transmission wiring between the cool/heat selector and the outdoor unit is too close to a high voltage wire	150

V

Vacuum Drying.....	31, 175
VRV Inspection Sheet.....	129

W

Wired Remote Controller.....	67
Wireless Remote Controller - Indoor Unit BRC7C type	68
Wiring Diagram	138

Drawings & Flow Charts

Symbols

“88” cannot be cleared from the central remote controller151

A

Additional Charge of Refrigerant	
Operational steps	36
Refrigerant Charging Instructions	36
Siphon tube	36
Additional refrigerant charge	178
Additional refrigerant charge procedure	179
Additional refrigerant charge total flow	99
Address setting for ③ and ④	92
Adjusting the Air Flow Direction	210
After connection piping	124
Air Tight Test	
Checking for Leaks	30
Compensating adjustment value	29
Operational steps	29
Allowable Piping Length	110

B

Branch with refnet header	112
Branch with refnet joint and refnet header	111
Brazing	23

C

Calculate the additional refrigerant to be charged	117
Calculating Operating Noise	107
Calibration method	33
Caution for Refrigerant Leaks	102
Ceiling Mounted Built-in Type (FXSQ-M)	
drain hose	47
Drain Piping	47
DRAIN RAISING PIPING	47
drainage flow	48
Electric wiring work	48
multiple drain pipes	47
Ceiling Mounted Cassette Corner Type (FXKQ-M)	
multiple drain pipes	45
Ceiling Mounted Cassette Type (FXCQ-M Double flow)	
DRAIN RAISING PIPING	41
drainage flows	41
ELECTRIC WIRING WORK	42
Insulate the drain hose inside the building	41
multiple drain pipes	41
Rig drain piping	40
water level of the drain pan	42
Ceiling Mounted Cassette Type (FXFQ-M Multi-flow)	
Drain Piping	45
Drain raising piping	43
Drainage flow	45
Drain-up piping work	45
Electric wiring work	46

Indoor drain piping	43
multiple drain pipes	43
Rig drain piping	43
Terminal box lid	44
Ceiling Mounted Duct Type (FXMQ-M)	49
Ceiling Suspended Type (FXHQ-M)	
Drain hose	50
drainage	51
Rig drain piping	50
Centralized Control Group No. Setting	
BRC1A Type	75
BRC7C Type	75
Group No. Setting Example	76
Charge hose for R410A	229
Charge mouthpiece	230
Charging cylinder	229
CHECK OPERATION FUNCTION	101
Check points	11
Check work prior to turn power supply on	62
Choice of Materials for Refrigerant Piping	21
Coat the flange sheet surface with refrigeration oil	27
Coat the inner and outer surface of the flare with refrigerator oil	24
connect the shutoff valve and the piping	172
Connecting the Refrigerant Piping	168
Contents of Control Modes	
How to Select Operation Mode	78
Contract Drawing	11
Control circuit diagram	13
Cool / Heat Mode Switching	88
Cool/Heat Switching Remote Controller	89
Cooling, Heating and Fan Only Operation	207
Correlation of nozzle tip and size of refrigeration piping	22
Covering of Refrigerant Pipes	
Particular care	19
Pinching method	19
Taping method	19
Cracks develop in field pipes due to thermal expansion and contraction	149

D

Dealing with situations where the result exceeds the dangerous concentration level	104
Degree of vacuum	32
Drain pipe trap shape defective	146
Drain Pipe Work (Indoor)	
Drain Pipe Gradient and Support	38
Drain Trap	38
Grouped Drain Piping	39
Operational steps	38
Use of an Auxiliary Drain Hose (Flexible)	39
Duct Work (Indoor)	
Operational steps	55
Taking Account of Noise and Vibration	55

E		L	
Electrical Work		laying power wiring.....	185
a PCB for remote control, multiple core cable		Leak test.....	175
must not be used	53	Leak tester	228
Choosing a circuit breaker	53		
Earthing	54	M	
When cable more than 1.25 mm ² is used	52	Mismatch between cables connecting indoor and	
Example of Connection	173	outdoor units and corresponding piping	145
Excessive noise due to incorrect angling of		Movement of the air flow flap	210
REFNET joints	148		
F		N	
Field line connection	183	Names and functions of parts	202
.....	186		
Field Setting From Outdoor Unit		O	
Mode changing procedure	80	Outdoor Unit Multi Connection Piping Kit.....	119
Field Wiring		Outdoor Unit PC Board Layout	66
RXYQ18~32MY1B.....	142		
RXYQ34~48MY1B.....	143	P	
RXYQ5~16MY1B.....	141	Picking power line and transmission line.....	188
Flare Gauge	24	Pipe Insulation.....	177
Flaring Procedure.....	25	Pipe size.....	115
Flaring tool	226	Piping Installation Point.....	108
Floor Standing/Concealed Floor Standing Type		Piping System Diagrams	
(FXLQ-M, FXNQ-M).....	52	Indoor Unit	137
Front Piping		RXYQ10MY1B.....	135
BHFP22M135	121	RXYQ12MY1B.....	135
BHFP22M90	121	RXYQ14MY1B.....	136
		RXYQ16MY1B.....	136
G		RXYQ5MY1B.....	134
Gauge manifold for R410A.....	228	RXYQ8MY1B.....	135
		Positioning of indoor unit.....	8
H		Positioning of outdoor unit.....	8
Hand Over to Customer		Pressure down despite absence of leaks during air	
Important Points	105	tight test.....	147
Make the service contact address clear	105	Procedure for Checking Dangerous	
Operational Steps.....	105	Concentration.....	102
How these installation problems affect		Program Dry Operation	209
an equipment	9	Programming Start and Stop of the System	
How to select the refnet header	114	with Timer.....	211
How to select the refnet joint.....	113	proper distances away from stereo equipment,	
		personal computers, etc.....	56, 162
I		R	
Indoor Unit Remote Controller	90	REFNET Header	127
Inspecting and Handling the Unit	58, 164	REFNET header	128
Installation of Gas Side Pipes	122	REFNET Joint	126
Installation of Indoor Unit		REFNET joint	128
Ceiling mounted cassette type (FXCQ63M)	16	Refrigerant Cylinders	224
Operational steps	16	Refrigerant Leaks.....	194
Positioning	16	Refrigerant oil (Air compal).....	228
Installation of liquid side pipes and oil pipe	123	Refrigerant Pipe Flushing	
installation of multiple outdoor units	171	Fit blanking plugs.....	20
Installation of Outdoor Unit		Flushing	20
Bolt pitch	59	Open the main valve on the nitrogen cylinder and	
Operational steps	59	set the pressure regulator to	
Unpacking and Placing the Unit	60	0.5MPa	20
interconnecting wiring	190	Set pressure regulator on nitrogen cylinder.....	20
		Refrigerant Pipe Work	
K		Air tight.....	17
knocking out knock holes	189	Clean	17
		Dry	17

Operational steps	17
The 3 Principles of Refrigerant Piping	17
Refrigerant R410A	222
Remote Controller and Changeover Switch.....	203

S

selecting branch piping	170
Selection of Location.....	56, 162
Sequential start	187
Service Space	57
Set the flaring tool	24
Setting of Air Flow Direction Adjustment Range	74
Setting of Demand Operation	
Image of operation in the case of A	96
Image of operation in the case of A and B	96
Image of operation in the case of B	96
Setting of Low Noise Operation	
Image of operation in the case of A	94
Image of operation in the case of A, B	94
Image of operation in the case of B	94
Setting the Master Remote Controller	212
Signal interference due to use of multiple	
core cable	144
Simplified Remote Controller	
BRC2A51	69
Sleeve and Insert Work	
Operational steps	15
Steel insert.....	15
Through holes in a reinforced	
concrete beam	15
Sound pressure rise due to room reverberation....	106
Special vacuum drying	35
Standard Operation Limit	156
Standard Supplied Accessories	156
standard work practice for all brazing work.....	18
Step by Step Installation Procedure.....	14
Striking a Balance between System Installation and	
General Construction Work.....	10
Supplementation on ③ and ④	91
System example.....	183

T

Test Run.....	192
The analysis of major installation problems	
experienced during the year of 1988	9
The centralized control group number	
cannot be set	150
The Example of A Wrong Pattern	
Piping Installation Point	109
The use of “hard solder” is essential	22
Thermal Insulation Work (Refrigerant Piping)	
Essential Points of Thermal Insulation.....	28
Operational steps	28
Tighten the bolts in opposite corners first to ensure	
that the connection is true	27
Tightening torque	176
Torque wrench	227
Transmission wiring between the cool/heat selector	
and the outdoor unit is too close to a high voltage	
wire	150
Troubleshooting	218

Turn power on	62
---------------------	----

U

Underside Piping	125
Unpacking and Placing the Unit	165

V

Vacuum Drying.....	31
Vacuum Drying Procedure	34
Vacuum pump with check valve	227
VRV Inspection Sheet	129

W

Wall Mounted Type (FXAQ-M)	
Connecting a hard vinyl chloride pipe joint	51
drain hose	51
drain piping	51
Weigher for refrigerant charge	230
Wired Remote Controller.....	67
Wireless Remote Controller - Indoor Unit	
BRC7C type	68
Wiring Diagrams	
RXYQ10MY1B.....	139
RXYQ12MY1B.....	139
RXYQ14MY1B.....	140
RXYQ16MY1B.....	140
RXYQ5MY1B.....	138
RXYQ8MY1B.....	139

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