SPLIT TYPE AIR CONDITIONER

Duct Type

INSTALLATION INSTRUCTION SHEET

(PART NO. 9362590013)

For authorized service personnel only.

⚠ WARNING

(1) **For the air conditioner to operate satisfactorily, install it as outlined in this installation manual.**

(2) **Installation work must be performed in accordance with national wiring standards by authorized personnel only.**

(3) **Do not turn on the power until all installation work is complete.**

- **Be careful not to scratch the air conditioner when handling it.**
- **After installation, explain correct operation to the customer, using the operating manual.**
- **Let the customer keep this installation manual because it is used when the air conditioner is serviced or moved.**
- **The maximum length of the piping is shown in Table 1. If the units are further apart than this, correct operation cannot be guaranteed.**

STANDARD PARTS

The following installation parts are furnished. Use them as required.

INDOOR UNIT ACCESSORIES

Name and Shape	Q'ty	Application
Installation template	1	For positioning the indoor unit
Special nut A (large flange)	4	For suspending the indoor unit from ceiling
Special nut B (small flange)	4	
Coupler heat insulation (large)	2	For indoor side pipe joint (large pipe)
Coupler heat insulation (small)	1	For indoor side pipe joint (small pipe)
Nylon fastener	1	For fixing the drain hose
Remote controller	1	
Remote controller cord clamp	10	For installing the remote controller cord
Tapping screw (flush heads)	10	For installing the remote controller cord clamp
Auxiliary pipe assembly	1	For wiring conduit (gas side) connection
Drain hose insulation	1	Insulates the drain pipe and drain hose connection
Drain pipe insulation	1	For insulating the drain pipe

OUTDOOR UNIT ACCESSORIES

Power cap	1	For power supply cord installation
Auxiliary pipe assembly	1	For wiring conduit (gas side) connection (May not be supplied, depending on the model)
Edge cover	1	For wiring conduit installation hole edge protection
Tapping screw	2	• For cabinet A and cabinet D mounting (1) • Spare (1)
Binder	1	For power supply cord binding
Putty	1	For sealing
Coupler heat insulation	1	For outdoor side pipe joint
Pipe (drain)	2	For outdoor unit drain piping work (May not be supplied, depending on the model.)
Flexible tube	2	
Cap (drain)	2	

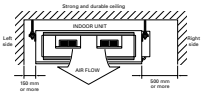
SELECTING THE MOUNTING POSITION

Decide the mounting position together with the customer as follows:

INDOOR UNIT

(1) Install the indoor unit on a place having a sufficient strength so that it withstand against the weight of the indoor unit.
(2) The inlet and outlet parts should not be obstructed; the air should be able to blow all over the room.
(3) Leave the space required to service the air conditioner (Fig. 1).

Fig. 1



(4) Install the unit where the drain pipe can be easily installed.
(5) Providing as much space as possible between the indoor unit and the ceiling will make work much easier.

OUTDOOR UNIT

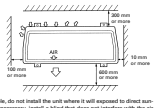
⚠ WARNING

(1) Install the unit where it will not be tilted by more than 5°.

(2) When installing the outdoor unit where it may exposed to strong wind, fasten it securely.

(1) Leave the space indicated for good air flow. (Fig. 2)

Fig. 2



(2) If possible, do not install the unit where it will exposed to direct sunlight. (If necessary, install a blind that does not interfere with the air flow.)
(3) Do not install the unit near a source of heat, steam, of flammable gas.
(4) During heating operation, drain water flows from the outdoor unit. Therefore, install the outdoor unit in a place where the drain water flow will not be obstructed. (Reverse cycle model only)
(5) Do not install the unit where a strong wind blows or where it is very dusty.
(6) Do not install the unit where people pass.
(7) Install the outdoor unit in a place where it will be free from being dirty or getting water rain as much as possible.
(8) Install the unit when connection to the indoor unit is easy.

CONNECTION PIPE REQUIREMENT

Table 1

Diameter		Maximum length	Maximum height (between indoor and outdoor)
Small	Large		
9.53 mm	19.05 mm	50 m	30 m

- Use 0.7 mm to 1.2 mm thick pipe.
- Use pipe with water-resistant heat insulation.

ELECTRICAL REQUIREMENT

- Electric wire size and fuse capacity:

Table 2

Power supply cord (cord)	MAX	3.5
	MIN	2.5
Connection cord (cord)	MAX	2.5
	MIN	1.0
Fuse capacity (A)		20

- Install all electrical works in accordance to local regulation.
- Use H07RN-F or equivalent as the connection cord. (Europe area only)
- Install the disconnect device with a contact gap of at least 3 mm nearby the units. (Both indoor unit and outdoor unit)

INSTALLATION PROCEDURE

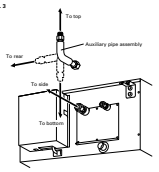
Install the air conditioner as follows:

1 INDOOR UNIT INSTALLATION

1. PIPING CONNECTION DIRECTION AND PREPARATION

- Select piping directions.(Fig. 3)

Fig. 3

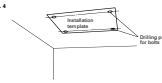


- When bending the piping is difficult, use the auxiliary pipe assembly.

2. DRILLING HOLES FOR BOLTS AND INSTALLING THE BOLTS

- Using the installation template, drill holes for bolts (four holes). (Fig. 4)

Fig. 4

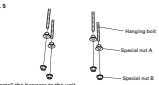


3. INSTALLING THE HANGERS

Installation method

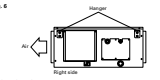
- Fasten the hanging bolts to the ceiling and install special nuts A and B.

Fig. 5



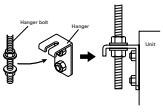
- Install the hangers to the unit.

Fig. 6



- Hang the unit.
Pass the hanging bolts through the hangers. (Four places)

Fig. 7

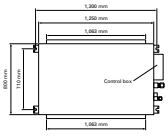


⚠ CAUTION

Fasten the unit securely with special nuts A and B.

Hanging bolt installation diagram

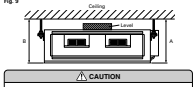
Fig. 8



4. LEVELING

Base horizontal direction leveling on top of the unit.

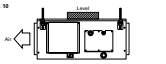
Fig. 9



⚠ CAUTION

The side of the unit that holds the drain port (A) should be slightly lower than the opposite side of the unit (B). The slant should allow from 0 to 20 mm of difference between (A) and (B).

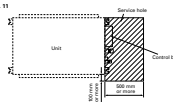
Fig. 10



5. SERVICE HOLE DIMENSIONS

Open a service hole with the dimensions shown below.

Fig. 11

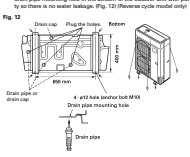


2 OUTDOOR UNIT INSTALLATION

1. OUTDOOR UNIT PROCESSING

(1) When the outdoor unit will be exposed to strong wind, fasten it with bolts or wire at the four places indicated by the arrows. (Fig. 12)
(2) Since the drain water flows out of the outdoor unit during heating operation, install the drain pipe and connect it to an commercial 16 mm hose. (When heating when the outdoor temperature is 0°C or less, construct so that the drain water drained from the outdoor unit will not freeze in the drain pipe.) (Reverse cycle model only)
(3) When installing the drain pipe, plug all the holes other than the drain pipe mounting hole in the bottom of the outdoor unit with putty so there is no water leakage. (Fig. 12) (Reverse cycle model only)

Fig. 12

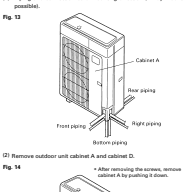


(4) Always use a drain pipe at two places.

2. OUTDOOR UNIT CONNECTION CORD AND PIPE CONNECTION PREPARATIONS

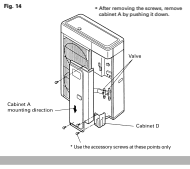
(1) Piping and connection cord mounting direction (4-way mounting possible).

Fig. 13



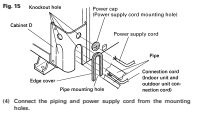
(2) Remove outdoor unit cabinet A and cabinet D.

Fig. 14



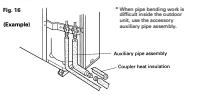
(3) Open the piping and connection cord knockout holes of the desired direction with nippers, etc. After opening the knockout holes, install the accessory edge cover and power cap to protect the opened places.

Fig. 15 Knockout hole



(4) Connect the piping and power supply cord from the mounting holes.

Fig. 16



3 CONNECTING THE PIPING

1. FLARE PROCESSING

(1) Cut the connection pipe with pipe cutters so that the pipe is not deformed.
(2) Holding the pipe downward so that cuttings cannot enter the pipe, remove the burrs.
(3) Remove the flare nut from the indoor unit pipe and outdoor unit and assemble as shown in (Table 3) and insert the flare nut onto the pipe, and flare with a flaring tool.
(4) Check if the flared part "L" (Fig. 17) is spread uniformly and that there are no cracks.

Table 3

Pipe	Flare nut
Small pipe	Small (width across flats 22 mm)
Large pipe	Large (width across flats 36 mm)

Fig. 17

2. BENDING PIPES

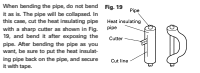
The pipes are shaped by your hands. Be careful not to collapse them.

Fig. 18

Do not bend the pipes in an angle less than 90°.
When the pipes are bent and stretched repeatedly, the material will be hardened, causing the pipes no longer be sent or stretched. Be sure to limit number of bending and stretchings to three times.

When bending the pipe, do not bend it as is. The pipe will be collapsed. In this case, cut the heat insulating pipe with a sharp cutter as shown in Fig. 19, and bend it after exposing the pipe. After bending the pipe as you want, be sure to put the heat insulating pipe back on the pipe, and secure it with tape.

Fig. 19



3. CONNECTION PIPES

Indoor unit side

Detach the caps and plugs from the pipes.

⚠ CAUTION

Be sure to apply the pipe against the port on the indoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.

Centering the pipe against port on the indoor unit, turn the flare nut with your hand.

⚠ CAUTION

Hold the torque wrench at its grip, keeping it in the right angle with the pipe as shown in Fig. 21, in order to tighten the flare nut correctly.

Fig. 20

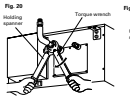


Fig. 21

When the flare nut is tightened properly by your hand, use a torque wrench to finally tighten it.

Table 4 : Flare nut tightening torque

Pipe	Tightening torque
Small pipe	310 to 350 kgf-cm (30.4 to 34.3 N·m)
Large pipe	800 to 1,000 kgf-cm (78.4 to 98 N·m)

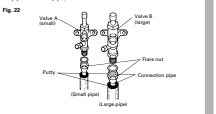
⚠ CAUTION

Be sure to connect the large pipe after connecting the small pipe completely.

Outdoor unit side

(1) Tighten the flare nut of the connection pipe at the outdoor unit valve connector. The tightening method is the same as that as at the indoor side.
(2) Seal with the accessory putty so that water does not enter at the top of the pipe insulation installed to the connection pipe (large pipe and small pipe).

Fig. 22



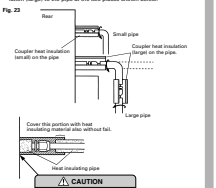
4. CHECKING THE PIPE CONNECTIONS FOR GAS LEAKING

For both the indoor and outdoor unit sides, check the joints for gas leaking by the use of a gas leakage detector without fail when the pipes are connected.

5. HEAT INSULATION ON THE PIPE JOINTS (INDOOR SIDE ONLY)

- Stick coupler heat insulation (large and small) to the place where connecting pipes.
- When using auxiliary piping with large pipe, stick coupler heat insulation (large) to the pipe at the two places shown below.

Fig. 23



⚠ CAUTION

No gap should remain.

4 VACUUMING AND ADDITIONAL CHARGE

1. VACUUM

(1) Vacuum inside the indoor unit and the piping to a pressure of 1.5 mmHg abs or less from the charging valve with a vacuum pump.
(2) After vacuuming inside the indoor unit and the piping, remove the cap of the two valves.
(3) Open the spindle(handle) of the two valves from the closed state. (Table 6)
(4) Tighten the cap of the two valves to the specified torque.

Table 5

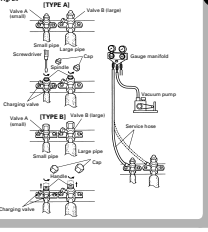
	Tightening torque	
	Large valve	Small valve
Spindle (TYPE A)	25 kgf-cm (2.45 N·m) or less	
Handle (TYPE B)	15 kgf-cm (1.47 N·m) or less	
Cap	150 to 200 kgf-cm (14.7 to 19.6 N·m)	

Table 6

Valve	Open valve state	Closed valve state
TYPE A		
TYPE B		

* If the spindle (handle) is not fully open, performance will drop and an abnormal sound will be generated.

Fig. 24



2. ADDITIONAL CHARGE

Refrigerant suitable for a piping length of 5 m (36/45 TYPE), 20 m (60 TYPE) is charged in the outdoor unit at the factory.
When the piping is longer than 5 m (36/45 TYPE), 20 m (60 TYPE) additional charging is necessary.
For the additional amount, see the table below.

Table 7

Pipe length / Unit model	5 m	10 m	20 m	30 m	40 m	50 m	g/m
36/45 TYPE (Cooling model)	None	175 g	525 g	875 g	1225 g	1575 g	35 g/m
36/45 TYPE (Reverse cycle model)	None	200 g	600 g	1000 g	1400 g	1800 g	40 g/m
60 TYPE	None			600 g	1200 g	1800 g	60 g/m

⚠ CAUTION

(1) When charging the refrigerant, always use a measuring cylinder.

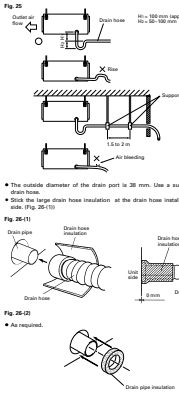
(2) Add refrigerant from the charging valve after the completion of the work.

5 INSTALLING DRAIN HOSE

NOTE : INSTALL THE DRAIN HOSE

- Install the drain hose so that there is a trap. The position of the installed drain hose should have a downward gradient of (1/50 to 1/100). Make sure that the drain hose is installed without rises.
- Make the trap near to the indoor unit.
- Use general hard polyvinyl chloride pipe (VP25) (outside diameter 38 mm) and connect it with adhesive (polyvinyl chloride) so that there is no leakage.
- When the hose is long, install supporters.
- Do not perform air bleeding.
- Always heat insulate the indoor side of the drain hose.

Fig. 25



- The outside diameter of the drain port is 38 mm. Use a suitable drain hose.
- Stick the large drain hose insulation at the drain hose installation side. (Fig. 26-(1))

Fig. 26-(1)

Fig. 26-(2)

- As required.

6 ELECTRICAL WIRING

HOW TO CONNECT WIRING TO THE TERMINALS

A. For solid core wiring (or F-cable)

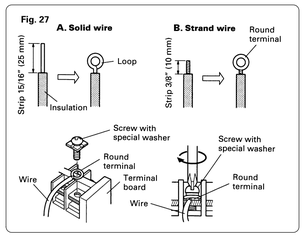
(1) Cut the wire and with a wire cutter or wire-cutting pliers, then strip the insulation to about 15/16" (25 mm) of expose the solid wire.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
(4) Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.

B. For strand wiring

(1) Cut the wire and with a wire cutter or wire-cutting pliers, then strip the insulation to about 3/8" (10 mm) of expose the strand wiring.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
(4) Position the round terminal wire, and replace and tighten the terminal screw with a screwdriver.

- Continued on back -

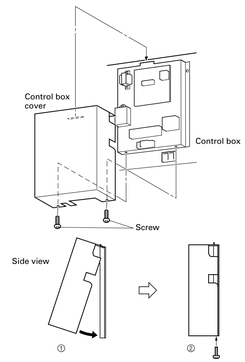
Fig. 27



1. INDOOR UNIT SIDE

(1) Attaching and removing the control box cover.

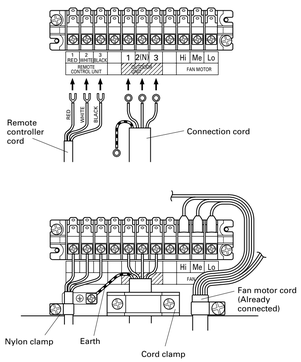
Fig. 28



(2) Connection cord and remote controller cord connections.

- Clamp the connection cord with the cord clamp and the remote controller cord with the nylon clamp. (Fig. 29)

Fig. 29



⚠ CAUTION
(1) Tighten the indoor unit connection cord (to the outdoor unit) and power supply indoor and outdoor unit terminal board connections firmly with the terminal board screws. Faulty connection may cause a fire.
(2) If the indoor unit connection cord (to the outdoor unit) and power supply are wired incorrectly, the air conditioner may be damaged.
(3) Wire the indoor unit connection cord (to the outdoor unit) by matching the numbers of the outdoor and indoor units terminal board numbers as shown in (Fig. 29).
(4) Ground both the indoor and outdoor units by attaching a ground wire.
(5) Unit shall be grounded in compliance with the applicable local and national codes.

2. OUTDOOR UNIT SIDE

(1) Remove outdoor unit cabinet A and connect the power supply cord and the outdoor unit connection cord wired at the indoor unit.
(2) Fasten the power supply cord and connection cord with cable clips and binders as shown in (Fig. 31).

Fig. 30

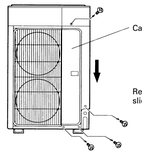


Fig. 31

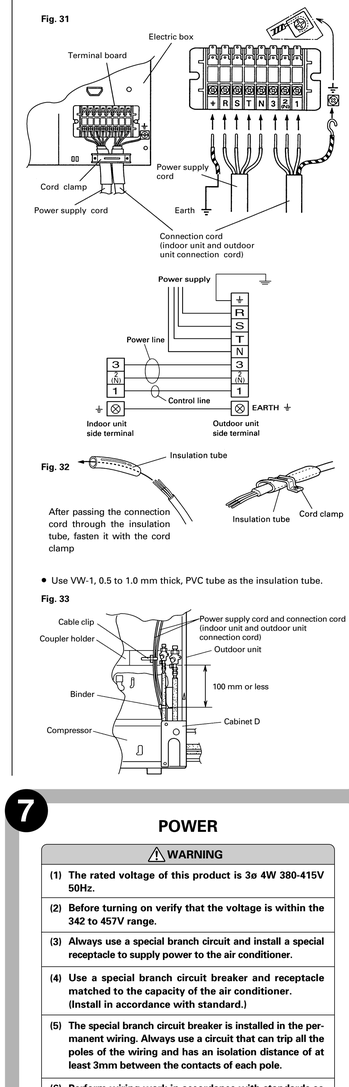


Fig. 32

- Use VW-1, 0.5 to 1.0 mm thick, PVC tube as the insulation tube.

Fig. 33

7 POWER

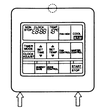
⚠ WARNING
(1) The rated voltage of this product is 3ø 4W 380-415V 50Hz.
(2) Before turning on verify that the voltage is within the 342 to 457V range.
(3) Always use a special branch circuit and install a special receptacle to supply power to the air conditioner.
(4) Use a special branch circuit breaker and receptacle matched to the capacity of the air conditioner. (Install in accordance with standard.)
(5) The special branch circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3mm between the contacts of each pole.
(6) Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.
(7) Install a leakage special branch circuit breaker in accordance with the related laws and regulations and electric company standards.

⚠ CAUTION
When the voltage is low and the air conditioner is difficult to start, contact the power company the voltage raised.

8 REMOTE CONTROLLER INSTALLATION

- Insert the end of a flat blade screwdriver at the arrow parts of the groove at the side of the remote controller case and remove the remote controller case top by turning the screwdriver.
- Disconnect the remote controller cord from the remote controller terminal board.

Fig. 34



(1) When remote controller exposed
1) Make a notch in the thin part (part of Fig. 34) at the remote controller case top and bottom with nippers, file, etc.
2) Connect the remote controller cord to the remote controller terminal board specified in (Fig. 35)
3) Clamp the remote controller cord sheath with the binder (small) as shown in Fig. 35.
4) Cut off the excess binder.
5) Clamp the remote controller cord to a wall, etc. with the remote controller cord clamp furnished. (Fig. 36)

Fig. 35

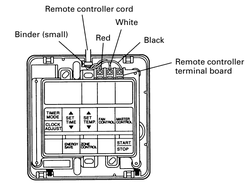
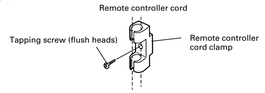
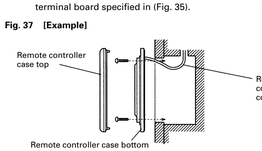


Fig. 36



(2) When remote controller cord embedded
1) Embed the remote controller cord and box.
2) Pass the remote controller cord through the hole at the remote controller case bottom and install the cord to the box. (Fig. 37)
3) Connect the remote controller cord to the remote controller terminal board specified in (Fig. 35).

Fig. 37 [Example]



- After wiring work is complete, return the remote controller case top to its original state.

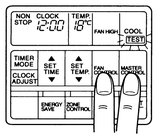
⚠ CAUTION
(1) Do not bundle the remote controller cord, or wire the remote controller cord in parallel, with the indoor unit connection wire (to the outdoor unit) and the power supply cord. It may cause erroneous operation.
(2) When installing the remote controller and cord near a source of electromagnetic waves, separate the remote controller from the source of the electromagnetic waves and use shielded cord.
(3) Do not touch the remote controller PC board and PC board parts directly with your hands.

9 TEST RUNNING

1. REMOTE CONTROLLER

- Supply power to the crankcase heater 12 hours before the start of operation in the winter.
- For test running, when the remote controller FAN CONTROL button and MASTER CONTROL button are pressed simultaneously for more than three seconds when the air conditioner is not running, the air conditioner starts and TEST is displayed on the remote controller display.
  However, the SET TEMP. setting button does not function, but all other buttons, displays, and protection functions operate. (Fig. 38)

Fig. 38



- When EE: EE blinks at the current time display, there is an error inside the air conditioner. If the ZONE CONTROL button and ENERGY SAVE button are pressed simultaneously for more than three seconds, the self diagnosis check will start and the error contents will be displayed at the current time display. (Fig. 39) When the operation lamp lights, press the START/STOP button and after operation lamp goes off, perform the same operation. (Fig. 39) Process the error contents by referring to (Table 8).

Fig. 39

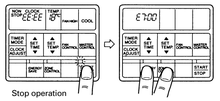


Table 8

Error cord	Error contents
E0:00	Communication error (indoor unit ←→ remote controller)
E1:00	Communication error (indoor unit ←→ outdoor unit)
E2:00	Room temperature sensor open
E3:00	Room temperature sensor shorted
E4:00	Indoor heat exchanger temperature sensor open
E5:00	Indoor heat exchanger temperature sensor shorted
E6:00	Outdoor heat exchanger temperature sensor open
E7:00	Outdoor heat exchanger temperature sensor shorted
EA:00	Outdoor temperature sensor open
Eb:00	Outdoor temperature sensor shorted
EC:00	Discharge pipe temperature sensor open
Ed:00	Discharge pipe temperature sensor shorted
EF:00	Discharge pipe temperature abnormal

- To stop test running, press the START/STOP button.
- For the operation method, refer to the operating manual and perform operation check.
- Check that there are no abnormal sounds or vibration sounds during test running.

2. OUTDOOR UNIT

When the outdoor temperature drops, the outdoor unit's fans may switch to low speed, or one of the fans may stop intermittently.

ERROR

The LED lamps operate as follows (Table 9) according to the error contents.
The LED lamps are on the outdoor unit board.

Table 9

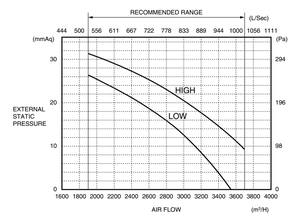
	Error display	Error contents
LED No. 1 Lamp	ON / OFF — Lighting continued	Discharge pipe temperature abnomal
	ON / OFF — 0.5 sec, 5 sec — Single quick flashes repeated	Outdoor heat exchanger temperature sensor abnormal
	ON / OFF — 0.5 sec, 0.5 sec, 5 sec — Two quick flashes repeated	Outdoor temperature sensor abnormal
	ON / OFF — 0.5 sec, 0.5 sec, 5 sec — Three quick flashes repeated	Discharge pipe temperature sensor abnormal
LED No. 2 Lamp	ON / OFF — Lighting continued	High pressure abnormal

When the fault is cleared, the LED lamp goes off.
However, for discharge pipe temperature abnormal and high pressure abnormal, the LED lamp lights continuously for 24 hours, as long as the power is not turned off.

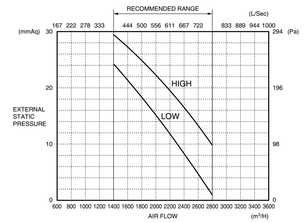
10 STATIC PRESSURE CHARACTERISTIC

Fig. 40 FAN PERFORMANCE AND AIR FLOW
EXTERNAL STATIC PRESSURE

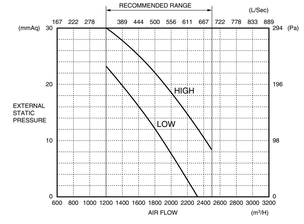
60 TYPE



45 TYPE



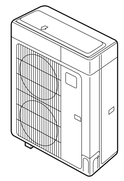
36 TYPE



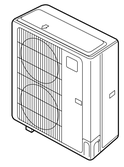
11 APPEARANCE OF OUTDOOR UNIT

Fig. 41

60 TYPE



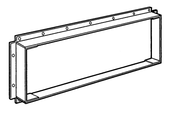
36/45 TYPE



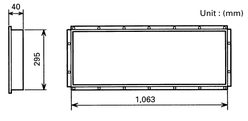
12 CONNECTION FLANGE DIMENSIONS (INTAKE AND OUTLET)

Fig. 42

Rectangular flange



- Rectangular flange dimensions



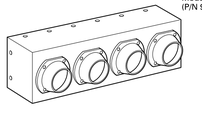
OPTIONAL PARTS

When connecting the square duct and round duct, use the optional square flange or round flange and flexible duct.

Fig. 43

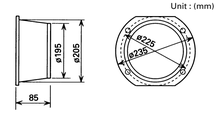
Outlet chamber

Model name : UTD-BC200
(P/N 9085835002)



- Round flange dimensions

Unit : (mm)



Flexible duct

Model name : UTD-RD202
(P/N 9074165004)

ø200 mm L 2 m