

INSTALLATION MANUAL MANUAL DE INSTALACIÓN MANUEL D'INSTALLATION MANUALE D'INSTALLZIONE MANUAL DE INSTALAÇÃO INSTALLATIONS-HANDBUCH ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ ИНСТРУКЦИЯ ΠΟ УСТАНОВКЕ UH175GCM UH175GZM

Duct-type Air Conditioner (Cool & Heat) Aire acondicionador Tipo Canal (Enfriamiento & Calefacción) Climatiseur de type Conduit (Refroidissement et Chauffage) Ar Condicionado Tipo Conduto (Refrigeração e Aquecimento) Climatiseur de type Conduit (Refroidissement et Chauffage) Ventiltype Klimaanlage (Kühlen und Wärmen) Kλιματιστικό Τύπου Αεραγωγού (Ψύξης και Θέρμανσης) Воздушный Кондиционер Трубного Типа (Охлаждение и Обогрев)



E-2

# OUTDOOR Unit Installation • Preparation for Outdoor Unit Installation • Deciding on Where to Install the Outdoor Unit • Deciding on Where to Install the Outdoor Unit • Example Unit in Position • Fixing the Unit in Position • Connecting the Refrigerant Pipe • Connecting the Refrigerant Pipe • Connecting Up and Removing Air In the Circuit • Performing Leak Tests

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# Outdoor Unit Installation

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# **Preparation for Outdoor Unit Installation**

# Moving the Outdoor Unit by Wire Rope

Fasten the outdoor unit by two 8m or longer wire ropes as shown at the figure. To protect damage or scratches, insert a piece of cloth between the outdoor unit and rope, then move the unit.



#### How to choose Refnet Joint

If you want to connect several indoor units to one outdoor unit, you should purchase a refnet joint. Select an appropriate refnet joint according to the table below.



	Dimension	Inner D	iameter	Len	gth
Model		Α	В	С	D
	-	-	-	-	-
	-	-	-	-	-

#### Deciding on Where to Install the Outdoor Unit

#### Outdoor Unit

- The outdoor unit must NEVER be placed on its side or upside down, as the compressor lubrication oil will run into the cooling circuit and seriously damage the unit.
- Choose a location that is dry and sunny, but not exposed to direct sunlight or strong winds.
- Do not block any passageways or thoroughfares.
- Choose a location where the noise of the air conditioner when running and the discharged air do not disturb any neighbours.
- Choose a position that enables the pipes and cables to be easily connected to the indoor unit.
- Install the outdoor unit on a flat, stable surface that can support its weight and does not generate any unnecessary noise and vibration.
- Position the outdoor unit so that the air flow is directed towards the open area.
- Maintain sufficient clearance around the outdoor unit, especially from a radio, computer, stereo system, etc.



- If the outdoor unit is installed at a height, ensure that its base is firmly fixed in position.
- Make sure that the water dripping from the drain hose runs away correctly and safely.

#### - CAUTION

- You have just purchased a system air conditioner and it has been installed by your installation specialist.
- This device must be installed according to the national electrical rules.

ENGLISH

#### Space Requirements for Outdoor Unit

If there is no obstacle around the outdoor unit...



\* Max. height of obstacle

- Front side : 1500mm or less

- Air inlet side : 500mm or less

- Right/Left side : No limit

#### If there is an obstacle around the outdoor unit...

- If an obstacle in front of the outdoor unit is higher than 1500mm the half of additional height should be added to the S1.
- If an obstacle behind the outdoor unit is higher than 500mm, the half of additional height should be added to the S2.



# Deciding on Where to Install the Outdoor Unit (cont.)



Respect the clearances and maximum lengths indicated in the diagram below when installing the unit.

#### Connecting the Drain Hose to the Outdoor Unit

When using the air conditioner in the heating mode, ice may accumulate. During de-icing, the condensed water must be drained off safely. Consequently, you must install a drain hose on the outdoor unit, following the instructions below.

- 1 Make space more than 50mm between the bottom of the outdoor unit and the ground for installation of the drain hose, as shown in figure.
- 2 Insert the drain plug into the hole on the underside of the outdoor unit.
- 3 Connect the drain hose to the drain plug.
- 4 Ensure that the drained water runs off correctly and safely.





#### **Fixing the Unit in Position**

The outdoor unit must be installed on a rigid and stable base to avoid any increase in the noise level and vibration, particularly if the outdoor unit is to be installed close to a neighbour. If it is to be installed in a location exposed to strong winds or at a height, the unit must be fixed to an appropriate support (wall or ground).

- 1 Position the outdoor unit so that the air flow is directed towards the outside.
- 2 Attach the outdoor unit to the appropriate support using anchor bolts.
- **3** If the outdoor unit is exposed to strong winds, install shield plates around the outdoor unit, so that the fan can operate correctly.



## **Connecting the Cable**

#### Two electronic cables must be connected to the outdoor unit.

- The connection cord between indoor unit and outdoor units
- The power cable between outdoor unit and auxiliary circuit breaker.

#### Example of Air Conditioner System

When using an ELB for 3 phase 4 wires



\* If an outdoor unit is installed in a place in danger of an electric leak or submergence, you must install the ELB.

#### Power Cable Specifications

	Power Supply													
Model	3 Phase			Single Phase				Earth	Commu-					
Woder	Power Supply	Max/Min (V)	МССВ	ELB	Power Cable	Length	Power Supply	Max/Min (∨)	МССВ	ELB	Power Cable	Length	Cable	Cable
UH175GCM	380- 415V~		300	304	H07RN-F, 5G, 3.5mm <sup>2</sup>	10m or less					-	-		
UH175GZM	/50Hz, 3Ø		304	304	H07RN-F, 5G, 4.0mm <sup>2</sup>	10m~ 20m	-				-	-		

\* The power cable is not supplied with air conditioner.

#### When using an ELB for 3 phase 4 wires



#### CAUTION -

- You should connect the power cable into the power cable terminal and fasten it with a clamp.
- The unbalanced power must be maintained within 2% of supply rating.
  - If the power is unbalanced greatly, it may shorten the life of the condenser. If the unbalanced power is exceeded over 4% of supply rating, the indoor unit is protected, stopped and the error mode indicates.
- To protect the product from water and possible shock, you should keep the power cable and the connection cord of the indoor and outdoor units in the iron pipe.
- Connect the power cable to the auxiliary circuit breaker. An all pole disconnection from the power supply must be incorporated in the fixed wiring(≥3mm).

#### Wiring Diagram of Connection Cord



#### **Connecting the Refrigerant Pipe**

#### Refrigerant Piping System (i.e. 2 indoor units)



		Model		
	Refrigerant pip	-	-	
Max. allowable length	Actual pipe length	L0+L1(L1≥L2) or L0+L2(L1≤L2)	-	-
Allowable	Actual pipe	Between outdoor unit and indoor unit (H1)		-
height length	length	Between indoor units (H2)		-
Max. difference in length after branching	Difference in length	IL1-L21		-

\* You had better make piping length from the refnet joint to indoor unit equal with the other ( L1=L2 ).

\* It is recommended there is no height difference between indoor units.



#### Install the oil trap

- Install the oil trap in case that the outdoor unit is situated higher than the indoor unit.
- Install the oil trap only in the gas pipe for cooling operation.
- Install the oil trap only between the outdoor unit and the first refnet joint. In this case, it must be installed every 10m from the outdoor unit.
- The radius of curvature(R) is as followings.

(Unit : mm)

The diameter of the gas pipe(D)	12.70	15.88	19.05	22.23	25.40	28.60	31.75
The radius of	25	32	38	41	51	57	60
curvature(R)	or more						

• The height of the oil trap(H) :  $4R \le H \le 6R$ 

# **Connecting Up and Removing Air In the Circuit**

The air in the indoor unit and in the pipe must be purged. If air remains in the refrigeration pipes, it will affect the compressor, reduce to cooling capacity and could lead to a malfunction. Refrigerant for air purging is not charged in the outdoor unit. Use Vacuum Pump as shown at the figure.

- 1 Connect each assembly pipe to the appropriate valve on the outdoor unit and tighten the flare nut.
- **2** Referring to the illustration opposite, tighten the flare nut on section B first manually and then with a wrench, applying the following torque.

 Outer Diameter
 Torque

 9.52 mm (3/8")
 333~407 kgf•cm

 19.05 mm (3/4")
 990~1210 kgf•cm

- **3** Connect the charging hose of low pressure side of manifold gauge to the packed valve having a service port as shown at the figure.
- 4 Open the valve of the low pressure side of manifold gauge counterclockwise.
- 5 Purge the air from the system using vacuum pump for about 10 minutes.
  Close the valve of the low pressure side of manifold gauge clockwise.
  - Make sure that pressure gauge show -0.1MPa(-76cmHg) after about 10 minutes.
  - This procedure is very important in order to avoid gas leak.
  - Turn off the vacuum pump.
  - Remove the hose of the low pressure side of manifold gauge.
- 6 Set valve cork of both liquid side and gas side of packed valve to the open position.
- 7 Mount the valve stem nuts and the service port cap to the valve, and tighten them at the torque of 183kgf•cm with a torque wrench.
- 8 Check for gas leakage.
  - At this time, especially check for gas leakage from the 3-way valve's stem nuts(A port), and from the service port cap.
- **9** If necessary, install the refnet joint horizontally or vertically ; for choice of the refnet joint, refer to page 5.
  - Mote
    Mote
    ◆ The refnet joint should be installed within 15° or less from the horizontal/vertical line.
    - When you install the refnet joint vertically, the inlet of a joint (Part A) should face downwards.

10 Fix the refnet joint insulation to the refnet joint as shown at figure.











# **Cutting/Flaring the Pipes**



Connect the pipe within 50m and cutting pieces will not be gone into the pipe as being clean to pipe section.

- Make sure that you have the required tools available (pipe cutter, reamer, flaring tool and pipe holder).
- 2 If you wish to shorten the pipes, cut it with a pipe cutter, taking care to ensure that the cut edge remains at a 90° angle with the side of the pipe. Refer to the illustrations below for examples of edges cut correctly and incorrectly.



- **3** To prevent any gas from leaking out, remove all burrs at the cut edge of the pipe, using a reamer.
- 4 Slide a flare nut on to the pipe and modify the flare.



Depth (A) 1.8 mm 2.2 mm

5 Check that the flaring is correct, referring to the illustrations below for examples of incorrect flaring.



6 Align the pipes and tighten the flare nuts first manually and then with a wrench, applying the following torque.

Outer Diameter	Torque
9.52 mm (3/8")	333~407 kgf•cm
19.05 mm (3/4")	990~1210 kgf•cm

- CAUTION -

 In case of welding the pipe, you must weld with nitrogen gas blowing.





# **Performing Leak Tests**

Before completing the installation (insulation of the hose and piping), you must check that there are no gas leaks.

To check for gas leaks on the	Then, using a leak detector, check the		
Indoor unit	Flare nuts at the end of sections A and B.		
Outdoor unit	Valves on sections C and D.		





# Insulation

# Once you have checked that there are no leaks in the system, you can insulate the piping and hose.

- 1 To avoid condensation problems, place **heat-resistant polyethylene foam** separately around each refrigerant pipe.
  - Notə

Always make the seam of pipes face upwards.

- 2 Wind insulating tape around the pipes.
- **3** Finish wrapping insulating tape around the rest of the pipes leading to the outdoor unit.





#### **Using Stop Valve**



#### To Open the Stop Valve

- Open the cap and turn the stop valve counterclockwise by using a hexagonal wrench.
- 2 Turn it until the axis is stopped.

 Do not apply excessive force to the stop valve and always use special instruments. Otherwise, the stopping box can be damaged and the back sheet can leaks.

- If the watertight sheet leaks, turn the axis back by half, tighten the stopping box, then check the leakage again. If there is no leakage any more, tighten the axis entirely.
- 3 Tighten the cap securely.

#### To Close the Stop Valve

- 1 Remove the cap.
- 2 Turn the stop valve clockwise by using a hexagonal wrench.
- 3 Tighten the axis until the valve reached the sealing point.
- 4 Tighten the cap securely.
- CAUTION
- When you use the service port, always use a charging hose, too.
- Check the leakage of refrigerant gas after tightening the cap.
- Must use a spanner and wrench when you open/tighten the stop valve.

# **Adding Refrigerant**

The outdoor unit is loaded with sufficient refrigerant for the standard piping. Thus, refrigerant must be added if the piping is lengthened. This operation can only be performed by a qualified refrigeration specialist. For quantity of adding refrigerant, refer to page 18.

1 Check that the stop valve is closed entirely.

2 Charge the refrigerant through the service port of liquid stop valve.



- **3** If you cannot charge the refrigerant according to the upper steps, following these:
  - 3-1 Open both liquid stop valve and gas stop valve.
  - **3-2** Operate the air conditioner by pressing the K2 key on the outdoor unit PCB.
  - **3-3** About 30 minutes later, charge the refrigerant through the service port of gas stop valve.
  - Mote
    ♦ If necessary, refer to the pressure table classified by outdoor temperature.



#### How to Calculate the Quantity of Adding Refrigerant

If you have used more than 5m, add "A" of refrigerant for extra meter. (For maximum piping length and height, refer to page 12) The quantity of additional refrigerant is variable according to the installation situation. Thus, make sure the outdoor unit situation before adding refrigerant. This operation can only be performed by a qualified refrigeration specialist.

Model	"A"	Refrigerant
UH175GCM	55g/m	R407C
UH175GZM	45g/m	R22

#### i.e. 1 indoor unit



Piping length	Additional charging amount			
"a"	UH175GCM	UH175GZM		
5m	0	0		
7m	110g={(7-5) x 55g}	90g={(7-5) x 45g}		

#### i.e. 2 indoor units



Piping length				Additional cha	arging amount
а	b	С	a+b+c	UH175GCM	UH175GZM
3m	1m	1m	5m	0	0
3m	2m	4m	9m	220g={(9-5) x 55g}	180g={(9-5) x 45g}

# **Checking Correct Grounding**

If the power distribution circuit does not have an earth or the ground does not comply with specifications, an grounding electrode must be installed. The corresponding accessories are not supplied with the air conditioner.

- 1 Select an grounding electrode that complies with the specifications given in the illustration.
- 2 Determine a suitable location for the grounding electrode:
  - In damp hard soil rather than loose sandy or gravel soil that has a higher grounding resistance
  - Away from underground structures or facilities, such as gas pipes, water pipes, telephone lines and underground cables
  - At least two metres away from a lightening conductor grounding electrode and its cable
  - Mote
    ★ The grounding wire for the telephone line cannot be used to ground the air conditioner.
- **3** Finish wrapping insulating tape around the rest of the pipes leading to the outdoor unit.
- 4 Install a green/yellow coloured grounding wire:
  - If the grounding wire is too short, connect an extension lead, in a mechanical way and wrapping it with insulating tape (do not bury the connection)
  - Secure the grounding wire in position with staples
  - Mote
    ♦ If the grounding electrode is installed in an area of heavy traffic, its wire must be connected securely.
- **5** Carefully check the installation, by measuring the grounding resistance with a ground resistance tester. If the resistance is above required level, drive the electrode deeper into the ground or increase the number of grounding electrodes.
- 6 Connect the grounding wire to the electrical component box inside of the outdoor unit.





# **Setting Up Option Switches**



#### Rotary Switch

You should display that how many indoor units are connected to the outdoor unit. Refer to the table below, then turn the arrow to appropriate position.

Switch No.	Number of indoor unit(s)	Switch No.	Number of indoor unit(s)
0 or 1	One	9	Nine
2	Two	А	Ten
3	Three	В	Eleven
4	Four	С	Twelve
5	Five	D	Thirteen
6	Six	E	Fourteen
7	Seven	F	Fifteen
8	Eight	-	-







#### Summary of KEY functions

Number of Function press times	K1 (Displayed on SEG 3, 4)	K2 (Displayed on SEG 3, 4)	K3 (Displayed on SEG 3, 4)	K4 (Displayed on SEG 3, 4)
1	Adding refrigerant at heating mode	Adding refrigerant at cooling mode	Reset	Displays data
2	Test operation at heating mode	Test operation at cooling mode	-	-
3	End	Pump Down for recovery of refrigerant	-	-
4	-	End	-	-

\* Use the K1 only for heat pump models.

KEV	Number of	ltom	Exa	mple
NE I	press	liem	Display	Meaning
K1	1	Adding refrigerant for heat pump models	8888	
	2	Test operation for heat pump models	8888	
	3	End	8888	
K2	1	Adding refrigerant for cooling only models	8883	
	2	Test operation for cooling only models	8888	
	3	Pump Down for recovery of refrigerant	8885	
	4	End	8888	
K3		Reset	8888	
K4	1		8888	
	2		8888	
	3	Discharge temperature of compressor	88 88	110 °C
	4	Temperature of outdoor heat exchanger	<i>88 38</i>	38 ℃
	5	Outdoor temperature	58 88	34 °C
	6	Step of electronic expansion valve (0 step : all closed, 480 step : all open)	6882	120STEP (12 x 10)
	7	Temperature of evaporator	7888	-2 °C
			<i>98 82</i>	12 °C
	8	Indoor temperature	8822	22 °C
	9		<b>8</b> 888	
	10	Stopping view mode & display communication data	8888	

#### Reading data indicated on the display

#### **Testing Operations**

- 1 Check the power supply between the outdoor unit and the auxiliary circuit breaker.
  - Single phase power supply: L1, L2
  - Three phase power supply: L1, L2, L3
- 2 Check the indoor unit.
  - 2-1 Check that you have connected the power and communication cables correctly. (If the power cable and communication cables one mixed up or connected incorrectly, the PCB will be damaged.)
  - 2-2 Check the thermistor sensor, drain pump/hose, and display are connected correctly.
- **3** Connect the outdoor unit to your computer where the provided software is installed, then supply power to the outdoor unit.
- 4 If the outdoor unit is powered on, it will start tracking to check user's option(s) and number of indoor unit.
  - At this time, the SEG 1 and SEG 2 on outdoor unit PCB display the number of indoor unit registered and the SEG 3 and SEG 4 display the number of indoor units which responded.
  - If an error mode is displayed, fix the error according to the service manual.
- **5** Check the thermistor sensor, electronic expansion valve by using the computer.
- 6 Press K2 on the outdoor unit PCB.
  - If you press K2, the compressor starts operation. Operate the compressor for 20 minutes, then add refrigerant according to the graph shown on page 23.
  - If you press K2 again, test operation is started.
  - If you don't stop the operation of adding refrigerant, it will be stopped automatically after 1 hour.
  - If you don't stop test operation, it will be stopped automatically after 1 hour.
  - If K2 is pressed during the operation of adding refrigerant, test operation is started without compressor stopping. Therefore, start test operation after the operation of adding refrigerant.
  - The compressor can be operated after completely 3-minute preparation and tracking.
- 7 Check that indoor and outdoor temperatures, step of electronic expansion valve and operation of compressor by using the computer.
- 8 Check that there is any error mode in the outdoor unit PCB during the test.
  - You should test operations for more than 30 minutes.
  - Check that the water dripping from the drain hose runs away correctly and safely.
- 9 To complete the test, press the test operation KEY(K2) again.

#### Graph of low/high pressure depending on outdoor temperature



#### UH175GCM(Heat Pump Mode)

4.42

f 4.29



# Troubleshooting

# Outdoor unit

If an error occurs during the operation, it is displayed on the outdoor unit PCB.

Display	Explanation	Remark
Er↔P[]	High temperature of Discharge (Protection control)	Error about protection
Er↔P1	High temperature of outdoor heat exchanger (Protection control)	control of outdoor unit
Er⇔P5	COMP DOWN to protect being frozen	
Er↔P5	Error of momentary power failure (disappears when the unit is Off/On)	
Er⇔£ 1	Error of OUT TEMP sensor (OPEN/SHORT)	Errors about outdoor unit sensor (OPEN/SHORT)
Er⇔ŁZ	Error of temperature sensor in outdoor heat exchanger (OPEN/SHORT)	Detection during the operation of indoor unit
Er⇔£∃	Error of Discharge TEMP sensor (OPEN/SHORT)	into the communication data)
Er⇔E 1	System Down caused by communication error after completion of tracking	Communication and indoor unit errors
Er⇔EZ	Mismatching of the indoor unit numbers set with those communicated after completion of tracking	
Er⇔E3	Error of float switch in indoor unit	Self-diagnosis of indoor
<i>Er⇔E5</i>	Error of setting option switches for optional accessories	and outdoor unit (x:indoor
Er⇔qx	OPEN/SHORT error of room sensor in indoor unit	unit address)
Er↔r x	OPEN/SHORT error of eva in sensor in indoor unit	
Er⇔Ľx	EEPROM option error	Displays of operating status
Er⇔u x	Error of fan starting	
Er⇔ű4	Open error of electronic expansion valve in outdoor unit (Detected once or more times)	
<i>Er⇔55</i>	Close error of electronic expansion valve in outdoor unit (Detected once or more times)	
<b>L</b> <sup>U</sup> Flicker	Below -5°C when cooling	
<b>E G</b> Flicker	Over 30°C when heating	
K1, K2, K3, K4,		
K5 Flicker		

The order of priority : E1  $\rightarrow$  E2  $\rightarrow$  E4  $\rightarrow$  E5  $\rightarrow$  P0  $\rightarrow$  P1  $\rightarrow$  P5  $\rightarrow$  P9  $\rightarrow$  P6  $\rightarrow$  t1  $\rightarrow$  t2  $\rightarrow$  t3  $\rightarrow$  tu  $\rightarrow$ 

to  $\rightarrow$  G4  $\rightarrow$  G5  $\rightarrow$  E3  $\rightarrow$  qx  $\rightarrow$  rx  $\rightarrow$  vx  $\rightarrow$  K1, K2, K3, K4, K5

- In case that the same error displays from multi-indoor units, the one having the faster address has the priority.



### Receiver & Display Unit Accessories

#### Concealed type

Receiver & display unit	STS 2S-2x10 tapped screw	2S-4x12 tapped screw	Wire kit (length 10m)	Owner's instructions	Installation manual
1	4	2	1	1	1
		()		$\Box$	$\Box$

#### Standard type

Receiver & display unit	M4x16 tapped screw	Cable-tie	Cable clamp	Wire kit (length 10m)	Owner's instructions	Installation manual
1	7	2	5	1	1	1
	()))))))»>	e	Q		$\square$	$\square$

#### Wireless Remote Controller Accessories

Wireless remote controller	Battery	Remote control holder	STS 2S-2x10 tapped screw	Owner's instructions	Installation manual
1	2	1	2	1	1
0000000				$\square$	$\square$

# Wired Remote Controller Accessories

Wired remote controller	Cable-tie	Cable clamp	M4x16 tapped screw	Indoor unit power drawing cable	Owner's instructions	Installation manual
1	2	2	7	1	1	1
	er		€) <b>))))))&gt;</b>	$\bigcirc$	$\Box$	$\square$

# Centralized Controller Accessories

Centralized controller	Cable-tie	Cable clamp	M4x16 tapped screw	Owner's instructions	Installation manual
1	2	5	7	1	1
	¢		()).»>	$\Box$	$\Box$

# Function Controller Accessories

Function controller	Cable-tie	Cable clamp	M4x16 tapped screw	Owner's instructions	Installation manual
1	2	6	7	1	1
\$\$.9	۹		≪(}	$\Box$	$\Box$

#### Transmitter Accessories

Transmitter	Transmitter power cable	Transmitter com- munication cable	Installation manual
1	1	1	1
		$\bigcirc$	$\Box$

Mote
♦ If you would like to install the centralized controller, you must install the transmitter in the outdoor unit.

THIS AIR CONDITIONER IS MANUFACTURED BY: ESTE AIRE ACONDICIONADO HA SIDO FABRICADO POR: CE CLIMATISEUR EST FABRIQUE PAR: QUESTO CONDIZIONATORE D'ARIA È PRODOTTO DA: ESTE APARELHO DE AR CONDICIONADO É FABRICADO POR: DIESE KLIMAANLAGE IST FABRIZIERT VON: AYTH Η ΣΥΣΚΕΥΗ ΚΑΤΑΣΚΕΥΑΣΤΗΚΕ ΑΠΟ: ЭТΟТ КОНДИЦИОНЕР ИЗГОТОВЛЕН ФИРМОЙ:

