



Single "A" Air Conditioner SVC MANUAL(General)

MODEL : Single "A"-Inverter Type

CAUTION

Before Servicing the unit, read the safety precautions in General SVC manual. Only for authorized service personnel.

CONTENTS

| Part 1 | General Information 1. Safety Precautions 2. Model Line up 3. Nomenclature | 2 3 6 8 |
|---------|---|------------------|
| Part 2 | Functions & Controls | 10 |
| i ait 2 | 1 List of Functions & Controls | 11 |
| | 2 Air flow | |
| | 3 Air nurifving | |
| | 4 Installation Functions | |
| | 5 Reliability | 10 |
| | 6 Convenience Functions & Controls | 20 |
| | 7 Special Function & KIT | 20 |
| | 8. Synchro Operation | 48 |
| | | |
| Part 3 | Control logic | 51 |
| | 1. Compressor | 52 |
| | 2. Step(frequency) control | 54 |
| | 3. Reversing valve operaton | 57 |
| | 4. Discharge pipe control | 58 |
| | 5. Input Current Control | 59 |
| | 6. Outdoor Fan Control | 60 |
| | 7. Defrost Control | 63 |
| | 8. LEV Control | 64 |
| | 9. Oil restoration operation | 70 |
| | 10. Compressor warm-up control logic | 70 |
| | 11. Heat sink control | 71 |
| | | |
| Part 4 | Test Run | 72 |
| | 1. Check before Test Run | 73 |
| | 2. Test Run Flow chart | 74 |
| | | |
| Part 5 | Trouble Shooting Guide | |
| | | |
| | 2. Pump Down | 80 |
| | 3. Evacuation | |
| | 4. Gas Charging | |
| | 5. Cycle Part | |
| | b. Electronic Parts | |

Part 1 General Information

| 1. Safety Precautions | 3 |
|-----------------------|---|
| 2. Model Line up | 6 |
| 3. Nomenclature | 8 |

1. Safety Precautions

To prevent injury to the user or other people and property damage, the following instructions must be followed.

Incorrect operation due to ignoring instruction will cause harm or damage. The seriousness is classified by the following indications.

| | This symbol indicates the possibility of death or serious injury. | | |
|--------------------|---|--|--|
| | This symbol indicates the possibility of injury or damage to properties only. | | |
| Meanings of symbol | Is used in this manual are as shown below. | | |
| \bigcirc | Be sure not to do. | | |
| 0 | Be sure to follow the instruction. | | |

Dangerous Voltage

1.1 Cautions in Repair

4

| A WARNING | |
|--|------------|
| Be sure to disconnect the power cable plug from the plug socket before disas- sembling the equipment for a repair.Internal components and circuit boards are at main potential when the equipment is connected to the power cables. This volt- age is extremely dangerous and may cause death or severe injury if come in con- tact with it. | |
| Do not touch the discharging refrigerant gas during the repair work. The discharging refrigerant gas. The refrigerant gas can cause frostbite. | \bigcirc |
| Release the refrigerant gas completely at a well-ventilated place first. Otherwise, when the pipe is disconnected, refrigerant gas or refrigerating machine oil discharges and it Can cause injury. | 0 |
| When the refrigerant gas leaks during work, execute ventilation. If the refrigerant gas touches to a fire, poisonous gas generates. A case of leakage of the refrigerant and the closed room full with gas is dangerous because a shortage of oxygen occurs. Be sure to execute ventilation. | 0 |
| When removing the front panel or cabinet, execute short-circuit and discharge between high voltage capacitor terminals. If discharge is not executed, an electric shock is caused by high voltage resulted in a death or injury. | |
| Do not turn the air-conditioner ON or OFF by plugging or unplugging the power plug. There is risk of fire or electrical shock. | \bigcirc |

| Do not use a defective or underrated circuit breaker. Use the correctly rated breaker and fuse. Otherwise there is a risk of fire or electric shock. | |
|---|------------|
| Install the panel and the cover of control box securely. Otherwise there is risk of fire or electric shock due to dust, water etc. | Λ |
| Indoor/outdoor wiring connections must be secured tightly and the cable should be routed properly so that there is no force pulling the cable from the connection terminals. Improper or loose connections can cause heat generation or fire. | 0 |
| Do not touch, operate, or repaire the product with wet hands. Hoding the plug by hand when taking out. Otherwise there is risk of electric shock or fire. | \bigcirc |

| Do not turn on the breaker under condition that front panel and cabinet are removed. | |
|---|------------|
| Be sure to earth the air conditioner with an earthing conductor connected to the earthing terminal. | |
| Conduct repair works after checking that the refrigerating cycle section has cooled down sufficiently. Otherwise, working on the unit, the hot refrigerating cycle section can cause burns. | 0 |
| Do not tilt the unit when removing panels. Otherwise, the water inside the unit can spill and wet floor. | \bigcirc |
| Do not use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency. | \bigcirc |
| Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred. | |

1.2 Inspections after Repair

| A WARNING | |
|--|------------|
| Check to see if the power cable plug is not dirty or loose. If the plug is dust or loose it can cause an electrical shock or fire. | 0 |
| Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances. otherwise, it can cause an electrical shock, excessive heat generation or fire. | \bigcirc |
| Do not insert hands or other objects through the air inlet or outlet while the prod- uct is operating. There are sharp and moving parts that could cause personal injury. | \bigcirc |
| Do not block the inlet or outlet of air flow. It may cause product failure | \bigcirc |

| Check to see if the parts are mounted correctly and wires are connected. Improper installation and connections can cause an electric shock or an injury. | 0 |
|---|---|
| Check the installation platform or frame has corroded. Corroded installation plat- form or frame can cause the unit to fall, resulting in injury. | 0 |
| Be sure to check the earth wire is correctly connected. | |
| After the work has finished, be sure to do an insulation tset to check the resis- tance is 2[Mohm] or more between the charge section and the non-charge metal section (Earth position). If the resistance value is low, a disaster such as a leak or electric shock is caused at user's side. | |
| Check the drainage of the indoor unit after the repair. If drainage is faulty the water to enter the room and wet floor. | 0 |

2. Model line up

2.1 Indoor units

| | | | | Model Name | | | | | | | | | |
|------------------------------|---|--------------|----|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------------------------|--------------------------|
| Category | Type | Chassis | | Capacity, kW(kBth/h) | | | | | | | | | |
| | .,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | 3.52 (12) | 5.28 (18) | 7.03 (24) | 8.79 (30) | 10.6 (36) | 12.3 (42) | 14.1 (48) | 17.6 (60) | | |
| Ceiling cassette | 4way | | | B | TE | ATNH126ELFC [UT12 NEC] | ATNH186ELFC [UT18 NEC] | | | | | | |
| | | | | TP | | | ATNH24GPLED [UT24NPD] | ATNH30GPLED [UT30NPD] | | | | | |
| | | | TN | | | | | ATNH36GNLED [UT36NND] | | | | | |
| | | | | | | тм | | | | | | ATNH42GMLED [UT42NMD] | ATNH48GMLED [UT48NMD] |
| Ceiling concealed duct | High static pressure | B re B | вн | | ABNH186HLAC [UB18 NHC] | ABNH246HLAD [UB24 NHD] | | | | | | | |
| | | | BG | | | | ABNH306GLAD [UB30 NGD] | ABNH366GLAD [UB36 NGD] | | | | | |
| | | | BR | | | | | | ABNH426RLAD [UB42 NRD] | ABNH486RLAD [UB48 NRD] | ABNH606RLAD [UB60 NRD] | | |
| Coiling | 9 flaar | floor | VE | AVNH126ELAC [UV12 NEC] | | | | | | | | | |
| Ceiling | & floor | | VB | | AVNH186BLAC [UV18 NBC] | AVNH246BLAD [UV24 NBD] | AVNH306BLAD [UV30 NBD] | | | | | | |
| Ceiling suspended | | | νк | | | | | AVNH366KLAD [UV36 NKD] | | | | | |
| | | (management) | VL | | | | | | AVNH426LLAD [UV42 NLD] | AVNH486LLAD [UV48 NLD] | AVNH606LLAD [UV60 NLD] | | |

2.2 Outdoor units

Inverter SINGLE A^{-} (1Ø)

| DC Inverter | AUUW126C [UU12W UEC] | AUUW186C [UU18W UEC] | AUUW246D [UU24W UED] | AUUW306D [UU30W UED] | AUUW366D [UU36W UED] | | | |
|-------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|----------|--|--|
| No. of connectable indoor units | | | | Max.1 | | | | |
| Total capacity index of connectable | kW | 3.52 | 5.28 | 7.03 | 8.79 | 10.6 | | |
| indoor units | kBtu/h | 12 | 18 | 24 | 30 | 36 | | |
| Power supply | | 1Ø, 220-240V, 50Hz | | | | | | |
| Chassis | | Inver | ter LQ | (Inver | ter LG | (nverter | | |

| DC Inverter | | AUUW426D [UU42W U3D] | AUUW606D [UU60W U3D] | | | | |
|-------------------------------------|--------------------------------------|-------------------------|-------------------------|------|--|--|--|
| No. of connectable indoor units | | | Max.1 | | | | |
| Total capacity index of connectable | tal capacity index of connectable kW | | 14.0 | 15.0 | | | |
| indoor units kBtu/h | | 42 | 48 | 51 | | | |
| Power supply | | 1Ø, 220-240V, 50Hz | | | | | |
| | | | Inverter | | | | |
| Chassis | | | | | | | |

Inverter SINGLE A. (3Ø)

| 3Phase Inverter | | AUUW368D [UU37W UED] | AUUW428D [UU43W U3D] | AUUW488D [UU49W U3D] | AUUW608D [UU61W U3D] | | |
|-------------------------------------|--------|-------------------------|-------------------------|-------------------------|-------------------------|--|--|
| No. of connectable indoor units | | | Max.1 | | | | |
| Total capacity index of connectable | kW | 10.6 | 12.5 14.0 15.0 | | | | |
| indoor units | kBtu/h | 36 | 42 48 | | 51 | | |
| Power supply | | | 3Ø, 380-41 | 15V, 50Hz | | | |
| Chassis | | Cinverter | | (nverter | ✤ Synchro available | | |

* Synchro available

3. Nomenclature

Global Model Name

3.1 Indoor units



3.2 Decoration panel(For ceiling cassette models)



AVN : Universal Ceiling & Floor Type Indoor Unit

3.3 Outdoor units



• Europe Model Name

3.4 Indoor units







3.5 Outdoor units



Part 2 Functions & Controls

| 1. List of Functions & Controls | 9 |
|---|-----------|
| 2. Air flow | 11 |
| 2.1 Auto swing (left & right) | 11 |
| 2.2 Auto swing (up & down) | 11 |
| 2.3 Chaos swing (up/down) | 11 |
| 2.4 Air flow step | 12 |
| 2.5 Chaos wind (auto wind) | 12 |
| 2.6 Jet Cool Mode Operation | 12 |
| 2.7 Swirl wind Swing | 12 |
| 3. Air purifying | 13 |
| 3.1 PLASMA Air Purifying System | 13 |
| 4. Installation Functions | 14 |
| 4.1 E.S.P. (External Static Pressure) Setting | 14 |
| 4.2 High Ceiling operation | 16 |
| 5. Reliability | 17 |
| 5.1 Hot start | 17 |
| 5.2 Self-diagnosis Function | 17 |
| 5.3 Soft dry operation | 17 |
| 6. Convenience Functions & Controls | 20 |
| 6.1 Auto changeover operation | 21 |
| 6.2 Child Lock Function | 24 |
| 6.3 Forced operation | 24 |
| 6.5 Sloop Timor Operation | 20 27 |
| 6.6 Timer(On/Off) | 27 27 |
| 6.7 Weekly Program | 27 |
| 6.8 Two Thermistor Control | |
| 6.9 Filter Sign clear | 29 |
| 7. Special Function & KIT | 31 |
| 7.1 Wide Wired Remote controller(PQRCUSA0) installation guide | 31 |
| Group control | 31 |
| Installer Setting-How to enter installer setting mode | 32 |
| Installer Setting-Test Run mode | 34 |
| Installer Setting-Setting Address of Central Control | 35 |
| Installer Setting-E.S.P. | 36 |
| Installer Setting-Thermistor | 38 |
| Installer Setting-Celling Height Selection | 39 |
| Installer Setting-Group Setting | 40 //1 |
| Installer Setting-Mode Override Setting | 41 |
| Installer Setting-Dry Contact Mode Setting | |
| Installer Setting-Zone state setting. | 44 |
| Installer Setting-Option Function Setting | 45 |
| 7.2 Zone Controller | 46 |
| 7.3 Auto Elevation Grille | 47 |
| 8. Synchro operation | 48 |

1. List of Functions & Controls

| Category | Function | Description | Remark |
|------------------------------------|--------------------------------|---|----------|
| | Auto swing (left & right) | Horizontal Airflow Direction control | Optional |
| | Auto swing (up & down) | Vertical Airflow Direction control | Optional |
| | Chaos swing (up & down) | Vertical Airflow Direction control | Optional |
| Airflow | Airflow steps (fan/cool/heat) | Indoor Fan speed Control | |
| | Chaos wind (auto wind) | Indoor Fan speed Control by chaos pattern | Optional |
| | Jet cool (Power wind) | Powerful cooling mode | |
| | Swirl wind Swing | Distribute & stir the Air inside. | Optional |
| | Deodorizing filter | Air filtration using Deodorizing filter | |
| Air purifying | Plasma air purifier | Air filtration using plasma filter | Optional |
| · ··· · ···· · ··· · ··· ··· ···· | Pre-filter | Air filtration using pre-filter | |
| | (washable/anti-fungus) | | |
| | Drain pump | Drain water pump | Optional |
| Installation | E.S.P. control | Changeable External Static Pressure | Optional |
| | High ceiling operation | Function to Control the Air Volume by Ceiling Height | Optional |
| | Hot start | To prevent cold wind blow on heating mode start | |
| Reliability | Self diagnosis | Error code displays | |
| | Soft dry operation | Dehumidification | |
| | Auto changeover | Cooling mode is automatically changed to heating mode and | Optional |
| | | VICE VERSE | |
| | Auto clean | After cooling operation, this function makes the evaporator dry | Optional |
| | Auto operation | Air volume & set temp, are automatically selected for comfort | |
| | (artificial intelligence) | on Cooling/Heating mode | Optional |
| | Auto restart operation | When power returns after a power failure, unit restarts in the | |
| | | previous operating mode | |
| Ormanianaa | Child lock | Protect the unit operation without approval | Optional |
| Convenience | Forced operation | Operation without remote controller | |
| | Group control | Where several products are linked, one specific control | Ontional |
| | | device can control a specific number of products. | Optional |
| | Sleep mode | Air volume & set temp. are automatically changed for com- | |
| | | fortable sleep | |
| | Timer (on/off) | Operation by Timer setting | |
| | Timer (weekly) | Operation by weekly reservation | |
| | Two thermistor control | Option to control temperature by referring thermistor in the | Optional |
| | | Indoor unit or the LCD wired remote. | |
| | Standard wired remote | Standard wired remote controller | Optional |
| | Doluvo wirod romoto controllor | | Ontional |
| | Simple wired remote controller | Deluxe wired remote controller | Optional |
| Individual control | Simple wired remote controller | Simple wired remote controller | Optional |
| | (for botel use) | Wired remote controller (for hotel use) | Optional |
| | Wireless remote controller | Wireless remote controller (cimple) | |
| | (simple) | wireless remote controller (simple) | Optional |
| | Wireless LCD remote control | Wireless I CD remote control | Optional |
| | General central controller | General central controller | optional |
| CAC network | (Non LGAP) | | Optional |
| | Dry contact | Dry contact | Optional |

| Category | Function | Description | Remark |
|-------------------------|---------------------------------------|--|----------|
| | Network Solution (LGAP) | Network Solution (LGAP) | Optional |
| CAC network function | PDI (Power Distribution Indicator) | PDI (power distribution indicator) | Optional |
| | PI 485 | Network control using PI 485 (Internet) | Optional |
| Special Function | Zone control | control the operation of the Air conditioning unit where each zone | Optional |
| & KIT | Low ambient operation | For operation at low temp. | |
| <u>u</u> i i i | Space Control | Vanes angle can be controlled by pair. | Optional |
| | Auto Elevation | Grille is automatically down to clean | Optional |
| | Outdoor Normal | Outdoor Control | |
| | Comp. control | Compressor Control | |
| | EEV control | EEV Control | |
| | FAN control | FAN control | |
| | Oil Return Control | Oil Return Control | |
| | Oil equalizing | Oil equalizing Control | |
| | Sump Heating | Sump Heating Control | |
| Other | Protection Control | Protection Control | |
| Other | Inverter protection | Inverter protection | |
| Functions | Defrost / Deicing | Condenser frost prevention | |
| & Controis | High pressure switch | Detect high pressure for safety | Optional |
| | Low pressure switch | Detect low pressure for safety | Optional |
| | Phase protection | Misconnection prevention for three phase | Optional |
| | Restart delay (3-minutes) | For overload prevention | Optional |
| | Self diagnosis | Error code displays | |
| | Soft start | Soft start for compressor | Optional |
| | Test function | Test operation | |

Notes: The Exploded View part has the particular Function table for each model.



* Some Models are different with swing width and swing pattern.

2.1 Auto swing (left & right)

• By the horizontal airflow direction control key input, the left/right louver automatically operates with the auto swing or it is fixed to the desired direction.



2.2 Auto swing (up & down)

• By the auto swing key input, the upper/lower vane automatically operates with the auto swing or it is fixed to the desired direction.



2.3 Chaos swing (up/down)

• By the Chaos swing key input, the upper/lower vane automatically operates with the chaos swing or it is fixed to the desired direction.





2.4 Air flow step

- Indoor fan motor control have 6 steps.
- Air volume is controlled "SH", "H", "Med", Low" by remote controller.
- "LL" step is selected automatically in Hot start operation.

| Step | Discription |
|------|---------------------------|
| LL | Very low, In heating mode |
| L | Low |
| М | Med |
| Н | High |
| SH | Super high |
| Auto | Chaos wind |

2.5 Chaos wind (auto wind)

• When "Auto" step selected and then operated, the high, medium, or low speed of the airflow mode is operated for 2~15 sec. randomly by the Chaos Simulation

2.6 Jet Cool Mode Operation

- While in heating mode or Fuzzy operation, the Jet Cool key cannot be input. When it is input while in the other mode operation (cooling, dehumidification, ventilation), the Jet Cool mode is operated.
- In the Jet Cool mode, the indoor fan is operated at super-high speed for 30 min. at cooling mode operation.
- In the Jet Cool mode operation, the room temperature is controlled to the setting temperature, 18°C.
- When the sleep timer mode is input while in the Jet Cool mode operation, the Jet Cool mode has the priority.
- When the Jet Cool key is input, the upper/lower vanes are reset to those of the initial cooling mode and then operated in order that the air outflow could reach further.

2.7 Swirl wind Swing

- It is the function for comfort cooling/heating operation.
- The diagonal two louvers are opened the more larger than the other louvers. After one minute, it is opposite.



• Comparison of Air Flow Types

4-Open (conventional)

| Vane 1 | Open | | |
|--------|------------------|--|--|
| Vane 2 | Open | | |
| Vane 3 | Open | | |
| Vane 4 | Open | | |
| | → Time | | |

Swirl Swing (New)

| Vane 1 Close | | Open | Close | Open | Close |
|--------------|-------|-------|-------|-------|-------|
| Vane 2 | Open | Close | Open | Close | Open |
| Vana 3 | Close | Onen | Close | Onen | Close |
| valle 5 | - | | 0.000 | | 0.030 |
| Vane 4 | Open | Close | Open | Close | Open |
| | Time | | | | |

3. Air purifying

3.1 PLASMA Air Purifying System

The PLASMA Air Purifying System not only removes microscopic contaminants and dust, but also removes house mites, pollen, and pet fur to help prevent allergic diseases like asthma. This filter that can be used over and over again by simply washing with water.



4. Installation Functions

4.1 E.S.P. (External Static Pressure) Setting

4.1.1 Open the rear cover of the wired remote-controller to set the mode.

4.1.2 Select one of three selectable modes as follows.

■ Without Zone System

1. Position V-H, F-H

• This position sets the maximum E.S.P. as a default set.

- 2. Position V-L
 - This position sets the minimum E.S.P. as a default set.

With Zone System

- 1. Position V-H
 - Maximum E.S.P. setting & Fan speed is varied according to the state of dampers by micom.
- 2. Position F-H
 - Maximum E.S.P. setting & Fan speed doesn't vary according to the opening & closing of dampers.
- 3. Position V-L
 - Minimum E.S.P setting & Fan speed is varied according to the state of dampers by micom.
- * Maximum : 8mmAq Minimum : 0mmAq

4.1.3 Move the slide switch to set position.



4.1.4 Close the rear cover and check if it works normally.

4.1.5 How to Set E.S.P?

Procedure of RPM change:

- Ex) External Static pressure is 4mmAq for Model 36K.
- To protect the unit, compressor is designed to be off during E.S.P. setting.



4.2 High Ceiling operation

Function to Control the Air Volume by Ceiling Height Control of the air intensity has been made possible by employing a height-control algorithm for the interior fan.

According to the height of the installation, it provides variability of indoor fan motor rpm. If the height of installation is low then you can adjust low rpm of indoor fan motor. On the other hand if the height of the installation is high you can adjust high rpm of indoor fan motor. Selection of speed can be done by slide switch at the back of the LCD wired remote.



5. Reliability

5.1 Hot start

- When heating is started, the indoor fan is stopped or very slow to prevent the cold air carry out
- When the temp. of heat exchanger reach 30°C(model by model), indoor fan is started.

5.2 Self-diagnosis Function

- The air conditioner installed can self-diagnosed its error status and then transmits the result to the central control. Therefore, a rapid countermeasure against failure of the air conditioner allows easy management and increases the usage life of air conditioner.
- Refer to trouble shooting guide.

5.3 Soft dry operation

• When the dehumidification operation input by the remote control is received, the intake air temperature is detected and the setting temp is automatically set according to the intake air temperature.

| Intake air Temp. | Setting Temp. |
|--|----------------------|
| $26^{\circ}C \le intake air temp.$ | 25°C |
| $24^{\circ}C \le intake air temp. < 26^{\circ}C$ | intake air temp1°C |
| $22^{\circ}C \le intake air temp. < 24^{\circ}C$ | intake air temp0.5°C |
| 18°C ≤ intake air temp. < 22°C | intake air temp. |
| intake air temp. < 18°C | 18°C |

- While compressor off, the indoor fan repeats low airflow speed and stop.
- While the intake air temp is between compressor on temp. and compressor off temp., 10-min dehumidification operation and 4-min compressor off repeat.

Compressor ON Temp. → Setting Temp+0.5°C Compressor OFF Temp. → Setting Temp-0.5°C

• The indoor fan speed is automatically set to the low, so the shift of the indoor fan speed is impossible because of already being set to the best speed for Dry Operation by Micom Control.

6. Convenience Functions & Controls

6.1 Auto changeover operation

- The air conditioner changes the operation mode automatically to keep indoor temperature.
- When room temperature vary over ±2°C with respect to setting temperature, air conditioner keeps the room temperature in ±2°C with respect to setting temperature by auto change mode.



■ Cooling & heating Opeattions



6.1.1 Cooling Mode

- Operating frequency of compressor depends on the load condition, like the difference between the room temp. and the set temp., frequency restrictions.
- If the compressor operates at some frequency, the operating frequency of compressor cannot be changed within 30 seconds. (not emergency conditions)
- Compressor turned off when
 - intake air temperature is in between ±0.5°C of the setting temp. limit for three minutes continuously.
 - intake air temperature reaches below 1.0°C of the temperature of setting temp..
- Compressors 3 minutes time delay.
 - After compressor off, the compressor can restart minimum 3 minutes later.
- Compressor operating range is form 40% to 110% of rated condition.

6.1.2 Heating Mode



- Operating frequency of compressor depend on the load condition, The difference between the room temp. and set temp., frequency restrictions.
- If compressor operates at some frequency, the operating frequency of compressor cannot be changed within 30 seconds.
- Condition of compressor turned off
 - When intake air temperature reaches +4°C above the setting temperature.
- Condition of compressor turned on - When intake air temperature reaches +2°C above the setting temperature.
- * Condition of indoor fan turned off
- While in compressor on : indoor pipe temp. < 20°C (Option)
- While in compressor off : indoor pipe temp. < 30°C (Option)
- While in defrost control, between the indoor and outdoor fans are turned off.
- Compressor 3 minutes delay
 - After compressor off, the compressor can restart minimum 3 minutes later.

NOTE: Some Models are different by temperature of thermo ON/OFF.

* Some Models are different with temperature of indoor fan ON/OFF

Heating Mode Operation Details

The unit will operate according to the setting by the remote controller and the operation diagram is shown as following.



• Compressor-off interval : - (A) While the indoor Heat-Exchanger temperature is higher than 27°C, fan operates at low speed, when it becomes lower than 26°C fan stops.

- (B) For eleminating latent heat-loss, fan operates at low speed for 10 seconds periodically.



6.2 Child Lock Function

This function prevents children or others from tampering with the control buttons on the unit.

It is then controlled by the remote controller.

- All the buttons on indoor display panel will blocked.
- The unit will be controlled only by remote controller.

The function is used to restrict children to not to use the air conditioner carelessly.(CL is an abbreviated form of Child Lock.)



6.3 Forced operation

- To operate the appliance by force in case when the remote control is lost, the forced operation selection switch is on the main unit of the appliance, and operate the appliance in the standard conditions.
- The operating condition is set according to the outdoor temp. and intake air temperature as follows.

| Indoor temp. | Operating Mode | Setting temp. | Setting speed of indoor fan |
|--------------|--------------------------|---------------|--------------------------------|
| over 24°C | Cooling | 22°C | |
| 21~24°C | Healthy Dehumidification | High speed | |
| below 21°C | Heating | 22°C | |

• The unit select the last operation mode in 3 hours.

- Operating procedures when the remote control can't be used is as follows :
 - The operation will be started if the ON/OFF button is pressed.
 - If you want to stop operation, re-press the button.

6.4 Group Control

6.4.1 Operation Summary

• Where several products are linked, one specific control device can control a specific number of products.

6.4.2 Specific Operation

- Connecting line is linked to each of the indoor equipments for communication. A specific control device is connected to each of them and this control device can control the same function.
- Group control function is enabled by cutting an optional jump wire in the wired remote control. At this time, the main system will not respond in order to prevent data collision.
- While executing group control command, use the random data(0-3minutes) in the main body of indoor equipment for limiting starting current.
- Control device can control up to 16 indoor equipments.





6.4.3 Group Control(Optional Wiring)

- You can use a group control operation after connecting the brown and yellow wire of each air-conditioner.
- It operates maximum 16 Units by only one Wired Remote Controller, and each Unit starts sequentially to prevent overcurrent.



Features

- Use Only One Wired Remote Controller with several air conditioners(max. 16 Units)
- Random starting to prevent overcurrent.

- Be careful not to exchange the color of wires.
- The maximum length of connecting wire should be below 200m(25 Ω) on connecting each units.
- Use a wire more than 0.5mm2

6.5 Sleep Timer Operation

- When the sleep time is reached after <1,2,3,4,5,6,7,0(cancel) hr> is input by the remote control while in appliance operation, the operation of the appliance stops.
- While the appliance is on pause, the sleep timer mode cannot be input.
- While in cooling mode operation, 30 min later since the start of the sleep timer, the setting temperature increases by 1°C. After another 30 min elapse, it increases by 1°C again.
- When the sleep timer mode is input while in cooling cycle mode, the airflow speed of the indoor fan is set to the low.
- When the sleep timer mode is input while in heating cycle mode, the airflow speed of the indoor fan is set to the medium.

6.6 Timer(On/Off)

6.6.1 On-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance starts to operate.
- The timer LED is on when the on-timer is input. It is off when the time set by the timer is reached.
- If the appliance is operating at the time set by the timer, the operation continues. While in Fuzzy operation, the airflow speed of the indoor fan is automatically selected according to the temperature.

6.6.2 Off-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance stops operating.
- The timer LED is on when the off-timer is input. It is off when the time set by the timer is reached.
- If the appliance is on pause at the time set by the timer, the pause continues.

6.7 Weekly Program

- If necessary, an operator can make an On/Off reservation of the product for a period of one week.
- On/Off schedule of operation for a period of One week.
- No need to turn the unit On/Offmanually during working days. On/Off time is scheduled in micom of the wired remote control.

| operation time table (Example) | | | | | | | |
|--------------------------------|-------|-------|-------|-------|-------|-----|-----|
| Setting | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
| Temp. | 25°C | 25°C | 25°C | 25°C | 25°C | | |
| On | 09:00 | 08:00 | 09:00 | 08:00 | 09:00 | 0 | ff |
| Off | 12:00 | 17:00 | 12:00 | 12:00 | 12:00 | | |

Operation Time Table (Example)



6.8 Two Thermistor Control

There may be a significant difference between temperature taken at the installed product indoor temperature. Two thermistor control provides option to control temperature by referring any of the two temperatures.

With help of the slide switch at the back of the wired remote controller, selection of the thermistor for controlling the unit can be One thermistor is in the Indoor unit & the one is in the LCD wired remote.

Two Thermistor System

6.8.1 Open the rear cover of the wired remote-controller to set the mode.

6.8.2 Select one of three selectable modes as follows.

- Position 1:
- The room temperature is controlled by the thermistor of the main body.
- Position 2:

The room themperature is controlled by the thermistor of the wired remote-controller, control the temperature according to the position of wired remote-controller.

• Position 3:

The room temperature is controlled by lower temperature between the temperature of main body and of remote-controller sensor.

6.8.3 Move the slide switch to set position.



6.8.4 Close the rear cover and check if it works normally.

- · Select the position after counselling with a customer.
- In case of cooling mode, room temperature is controlled by the main body sensor.
- To control the room temperature by a wired remote controller, install controller(room temp. sensor) to sense the temperature more accurately.
- Maunfactured in the position 3.

6.9 Filter Sign clear

This function is to clear the indicator of indoor filter cleaning





When the filter is covered by dust, it will reduce cooling / heating efficiency and accumulate more electric power. Therefore, do clean the filter whenever cleaning time is expired.

7. Special Function & KIT

7.1 Wired Remote controller(PQRCUSA0) installation guide

- 7.1.1 When installing more than 2 units of air conditioner to one wired remote controller, please connect as the right figure.
- If it is not event communication indoor unit, set the unit as slave.
- Check for event communication through the product manual.
- Refer to regarding page on how to set the slave.



7.1.2 When installing more than 2 wired remote controllers to one air conditioner, please connect as the right picture.

- When installing more than 2 units of wired remote controller to one air conditioner, set one wired remote controller as master and the others all as slaves, as shown in the right picture.
- Refer to Installer setting section on how to set master/slave.
- You cannot control the group as shown in the right for some products.



<When simultaneously connecting 2 sets of wired remote controller>

<<You cannot use this function when using Synchro operation>>

* Some products do not use 'Group control'. It depends on the product type.

Installer Setting -How to enter installer setting mode

Installer setting mode is to set the detail function of the remote controller.

If the installer setting mode is not set correctly, it can cause problems to the product, user injury or property damage. This must be set by an certificated installer, and any installation or change that is carried out by a non-certificated person should be responsible for the results. In this case, free service cannot be provided.



j Some contents may not be displayed depending on the product function.

<Installer Setting Code Table>

| No. | Function | Code | Value |
|-----|-------------------------|------|--|
| 1 | Test Run | 01 | 01:Set |
| 2 | Address Setting | 02 | 00~FF : Address |
| 3 | E.S.P. Value | 03 | <esp step=""> <esp value=""> 01:VeryLow 0 ~ 255 02:Low I I I 5 5 03:Med I I 5 5 04:High Function Code ESP step 05:Very High Function Code ESP step</esp></esp> |
| 4 | Thermistor | 04 | 01:Remo 02:Indoor 03:2TH |
| 5 | Ceiling Height | 05 | 01:Med 02:Low 03:High 04:Very High |
| 6 | Static Pressure | 06 | 01:V-H 02:F-H 03:V-L 04:F-L |
| 7 | Group Setting | 07 | 00:Slave 01:Master |
| 8 | Override Setting | 08 | 00:Slave 01:Master |
| 9 | Dry Contact | 09 | 00:OFF 01:ON |
| 10 | Release 3 Min. Delay | 10 | 01:Set |
| 11 | Zone State | 11 | 01:Variable 02:Fixed |
| 12 | Plasma | 20 | |
| 13 | Humidifier | 22 | 00: Not Installed |
| 14 | Elevation Grill | 23 | 01: Installed |
| 15 | Ventilation Kit | 24 | |

j Some contents may not be displayed depending on the product function

Installer Setting -Test Run Mode

After installing the product, you must run a Test Run mode.

For details related to this operation, refer to the product manual.



- * After running 18 minutes under test run mode, system will automatically turn OFF.
- ℁ In case of duct type, the Airflow UP/DOWN function is not displayed.
- * During test run mode, receiving signal from wireless remote controller will release this operation. If you press any kind of button, Test Run mode will be released.

Installer Setting - Setting Address of Central Control


Installer Setting -E.S.P.

What is an E.S.P function?

This is the function that decides the strength of the wind for each wind level and because this function is to make the installation easier, please do not use this function when using the remote controller.

If you set ESP incorrectly, the air conditioner may malfunction. This setting must be carried out by a certificated-technician. This function is used for only Duct product.





- $\ensuremath{\#}$ Weak and Power setting is not available for some products.
- * Because the ESP value is already appropriately set when manufactured from the factory, it is recommended that you do not change the ESP value.

Installer Setting - Thermistor



j Therefore system will use value that sensed from indoor unit or remote controller

<Thermistor Table>

| Temperature sensor location | | Function |
|-----------------------------|-------------------|--|
| 01 | Remote controller | Operation in remote controller temperature sensor |
| 02 | Indoor unit | Operation in indoor unit temperature sensor |
| 03 | 2-Thermistor(2TH) | Operation in lower temperature after comparing the temperature between the indoor unit And remote controller |

Installer Setting -Ceiling Height Selection

This function is to adjust FAN Airflow rate according to ceilingheight (only cassette model)



<Ceiling Height Selection Table>

| Ceiling Height Level | | Description |
|----------------------|------------|---|
| 01 | Low | Decrease the indoor airflow rate 1 step from standard level |
| 02 | Standard | Set the indoor airflow rate as standard level |
| 03 | High | Increase indoor airflow rate 1 step from standard level |
| 04 | Super high | Increase indoor airflow rate 2 steps from standard level |

* Ceiling height setting is available only for some products.

* Ceiling height of 'Super high' function may not exist depending on the indoor unit.

* Refer to the product manual for more details.

Installer Setting - Static Pressure Setting

This function is applied to only duct type. Setting this in other cases will cause malfunction.



<Static Pressure Setting Table>

| Pressure selection | | Function | | | |
|--------------------|-----|------------|--------------------|--|--|
| | | Zone state | ESP standard value | | |
| 01 | F-L | Fixed | Low | | |
| 02 | F-H | Fixed | High | | |
| 03 | V-L | Variable | Low | | |
| 04 | V-H | Variable | High | | |

Installer Setting-Group Setting

This function is only for group control operation. Please don't set this function in case of non-group control.



Installer Setting -Mode Override Setting

In case of More than 2 indoor units connected to 1 outdoor unit, they are assigned as Master indoor and Slave indoor. Therefore, they can operate together. (the setting code for this function is not displayed with un-equipped unit).



Installer Setting-Dry Contact Mode Setting

This function allows the Dry contact-indoor unit operate under Auto Run mode or Manual mode with remote controller.



* Please refer to dry contact manual for more details.

Installer Setting-Zone State Setting

This function is only available on some products.

It is possible to setup Variable or Fixed option for Zone State of indoor. The initial setting is 'Variable'



Installer Setting -Optional Function Setting

For the optional product such as PLASMA PURIFICATION/dehumidifier/ electric heater and ventilation, elevation grill.

It is possible to set the items are installed or not



7.2 Zone Controller

This feature can be used to control the operation of the Air Conditioning Unit where each zone (maximum of 4 zones) has a separate thermostat and damper motor, your Air Conditioning





ABZCA

7.3 Auto Elevation Grille

• Auto Elevation Grille is automatically down to height of max. 3.1 m. So it enables to install the Indoor unit at high ceiling space. And Auto Elevation Grille makes you cleaning the filter easily.



■ ELEVATION GRILL (REMOTE CONTROLLER_Accessory)



Main Components of Lift Grill

- ① Lift grill front panel assembly
- 2 Bolts for installation (4 EA, P/No. 3A00255K)
- 3 Instruction manual
- ④ Remote Controller for lift grill

• How to Use Remote Controller

As for operation of Remote Controller, use it by directing the transmitter part of Remote Controller to the receiver part of front panel directly under front panel.

- Do not drop it down or into water. Or else there is worry about trouble failure.
- Do not press hard the Remote Controller button with nail (ballpoint pen or other sharp substance). Or else there is worry about trouble failure.
- In case when obstacle such as curtain hides the signal reception part of receiver in between the space interval, Remote Controller operation is infeasible.

8. Synchro operation

8.1 Piping length guide

Install the branch pipe so that pipe length and difference between high and low will not exceedbelow SPEC.



Fig.1 Piping length

8.2 Additional refrigerant charging guide

| Indoor Unit | Refrigerant Additional charging (kg) | Pipe Dia. (mm) | А | |
|---|--|-------------------|------------|--|
| Duo Refrigerant = (L1-a) x B + (L2 + L3) x A Trio Refrigerant = (L1-a) x B + (L2 + L3 + L4) x A | | Ø 0 05 | 0.00 her/m | |
| | | 0 6.35 | 0.03 kg/m | |
| Quartet | Refrigerant = (L1-a) x B + (L2 + L3 + L4 + L5) x A | Ø 9.52 | 0.04 kg/m | |

| Model | а | В |
|----------------|-----|------|
| AUUW42-606(8)D | 7.5 | 0.04 |

8.3 Electric Wiring method



Fig.2 electric wiring

8.4 Main PCB Appearance

 (1) [DIP SW2] for [SETTING No. OF IDU] OR [LONG PIPE].
1 TO 3 PIN SWITCHES RECOGNIZE IDU NORMAL-

LY BEING UP AND DOWN ONE BY ONE.

- (2) [SW01B] for [AUTO-ADDRESSING]
- (3) [LED01G/LED02G] for SIGNALS

Table 1. signals

| RED LED | GREEN LED | MEANS |
|----------------|-----------|------------|
| ON | ON/OFF | UNDERGOING |
| ON/OFF | ON | SUCCEEDED |
| ON/OFF | ON/OFF | FAILED |
| SLOW ON/OFF | ON/OFF | CKECKING |

* ON / OFF : CONTINUOUS ON AND OFF. SLOW ON / OFF : AT A PERIOD OF 1.5s

8.5 Auto addressing guide

Addressing work assigns address to each indoor unit. When firstly installing product of roplacing the indoor unit PCB.

It needs Auto Addressing for Synchro operation

- * Work procedure
- 1) DIP SW2 correctly.(A)
- 2) Turn on main power.
- 3) Press the SW01B for about 3 seconds within 3minutes After main power on.([®])
- 4) After step 3), the LED01H(green LED) rapidly flickers.When Addressing work is done, green LED is off, else LED stops flickering and lights continuously.
- 5) If you fail to perform the Addressing work, repeat step 2),3).



Table2.a DIP SW2 Setting

| DIP SW2 | Indoor Unit No. |
|--------------------------------|-----------------|
| ON 1 2 3 4 5 0 0 0 0 0 0 | 1(Single) |
| ON 1 2 3 4 5 1 0 0 0 0 | 2(Duo) |
| ON 1 2 3 4 5 1 1 0 0 0 | 3(Trio) |
| ON 1 2 3 4 5 1 1 1 0 0 | 4(Quartet) |
| ON 1 2 3 4 5 0 0 0 1 0 | Long Pipe |

SYNCHRO COMBINATION TABLE

| | | Possible combination of indoor units | | | | | | | | |
|--|-------------------------------|--------------------------------------|-----------|-------------|-----------|-----------|-------------|-----------|------|-------------|
| Synchro | | | | | | | | | | |
| | | Duo | | | Trio | | Quartet | | | |
| IDU:INDOORUNIT ODU:OUTDOORINUT BD:BRANCHDISTRIBUTORUNIT REMO: WIREDREMOTECONTROLLER | | | | | | | | | | |
| N | lodel | Cassette | Duct | Convertible | Cassette | Duct | Convertible | Cassette | Duct | Convertible |
| UU42\ | N/UU43W | UT24NPD*2 | UB24NHD*2 | UV24NBD*2 | UT18NEC*3 | UB18NHC*3 | UV18NBC*3 | UT12NEC*4 | - | - |
| UU48\ | W/UU49W | UT24NPD*2 | UB24NHD*2 | UV24NBD*2 | UT18NEC*3 | UB18NHC*3 | UV18NBC*3 | UT12NEC*4 | - | - |
| UU60\ | W/UU61W | UT30NPD*2 | UB30NGD*2 | UV30NBD*2 | UT18NEC*3 | UB18NHC*3 | UV18NBC*3 | UT12NEC*4 | - | - |
| | Wiredremote controller* | | | PVRCUSZO | | | PVRCUSZO | | | |
| Applied | BDunit | PMUB11A | | | PMUB111A | | | PMUB1111A | | |
| Accessiries | Simplecentral controller** | PQCSB101S0 | | | | | | | | |
| | Function controller** | PQCSC101S0 | | | | | | | | |

NOTICE

- * When install ceiling and floor type synchro combinations, You must use wired remote controller"PVRCUSZ0"
- * In case of cassette or duct type synchro combinations, You can use only one wired remote controller included in the indoor units.
- ** When using synchro operation,
 - Do not use wireless remote controller.
 - Use only one wired remote controller in the indoor units.
 - Use central controller and function controller "PQCSB101S0 & PQCSC101S0" only.

3. Control logic

| I. Compressor5 | 2 |
|---------------------------------------|---|
| 2. Step(frequency) control | 4 |
| 3. Reversing valve operaton | 8 |
| 1. Discharge pipe control5 | 9 |
| 5. Input Current Control | 0 |
| 6. Outdoor Fan Control6 | 1 |
| 7. Defrost Control6 | 3 |
| 3. LEV Control | 4 |
| 9. Oil restoration operation7 | 0 |
| 10. Compressor warm-up control logic7 | 0 |
| 1. Heat sink control7 | 0 |



1.1 Basic principle

Basic principle is to control the rpm of the motor by changing the working frequency of the compressor. Three phase voltage is supplied to the motor and the time for which the voltage will supplied is controlled by IPM (intelligent power module).

Switching speed of IPM defines the variable frequency input to the motor.

$$RPM = \frac{120 \text{ f}}{P} \qquad \begin{array}{c} RPM \rightarrow \text{Revolutions/Minute} \\ F \rightarrow \text{Frequency} \\ P \rightarrow \text{Number of poles} \end{array}$$



BLDC Motor

1.2 Inverter compressor starting

- : Target Step calculation method
- Step A = Step 1 Frequency (Min. frequency : 20~25Hz)
- Step B = (Step A + Target STEP) / 2
- Step C = (Step B + Target STEP) / 2
- Step D = (Step C + Target STEP) / 2
- Step E = (Step D + Target STEP) / 2



2. Step(frequency) control

2.1 Frequency control

Frequency that corresponds to each rooms capacity will be determined according to the difference in the temperature of each room and the temperature set by the remote controller.

There are various factors determining the frequency.

- 1. Indoor unit capacity value.
- 2. Temperature compensation factor
- 3. Initial frequency setting



2.2 Primary step setting

: Capacity steps of compressor are decided by ∑Qj (Summation of capacity code), TA0(Outdoor temp.), TAI(Indoor temp.), DTAI (Step Compensation of temperature difference Indoor Temp. and Setting Temp.

Comp Step = (Step base+Long piping compensation) x \(\Delta Step TAO x \(\Delta Step TAI x \(\Delta Step DTAI \)

| Step base | Standard frequency step by ΣQj (Summation of capacity code) |
|-------------|--|
| Long piping | Comp. Step compensation by setting long piping |
| ∆Step TAO | step compensation by TAO (Outdoor temp.) |
| ∆Step TAI | step compensation by TAI (Indoor temp.) |
| ∆Step DTAI | Step Compensation of temperature difference Indoor Temp. and Setting Temp. |

* Target frequency step (Step base) exceeds maximum step, the Step base value follows the maximum step value.

* The compressor get the minimum step in case Step base value is lower than the minimum step of operating capacity.

2.3 Setting value / Cooling



 Δ Step TAO : step compensation by Outdoor temp.

$\Delta Step TAI:$ step compensation by Indoor temp.



△Step DTAI : Step Compensation of temperature difference between indoor temp. and setting temp. (40-110%)

2.4 Setting value / Heating

 $\Delta \text{Step TAO}$: step compensation by Outdoor temp.



 $\Delta Step TAI:$ step compensation by Indoor temp.



△Step DTAI : Step Compensation of temperature difference between indoor temp. and setting temp (40-110%).

3. Reversing valve operation

- 1. At the starting (outdoor is powered on, indoor is not) reversing valve continues OFF(cooling).
- 2. For the cooling and defrosting operation :valve OFF, for the heating operation :valve ON
- 3. Method of changing mode from heating to defrosting : As defrosting starts Inverter compressor Hz is lowered to 30Hz for 5 sec and the valve is OFF for the defrost mode. (refer "working process of each component in defrosting and returning to heating mode ")
- 4 . Method of changing mode from defrosting to heating : As the defrosting is finished inverter compressor frequency is lowered to 30Hz for 10 sec. And the valve is ON for the heating mode.
- 5. If the operating mode is changed to heating from cooling, "3 min. restarting rule" is applied, and reversing valve position is changed within 30 sec. after compressor turns OFF.
- 6. If the compressor is stopped during heating mode by remote controller operation or error mode, reversing valve position is changed to OFF in 30 sec. after compressor turns OFF.
- 7. If the compressor is stopped during heating mode by Thermistor signal, reversing valve will remain in heating position.

4. Discharge pipe control

- 1) There can be two situations
 - a) Sensor is failed (error code for sensor failure will be generated)
 - b) Abnormal high temperature discharge temperature (error code for high discharge will be generated) Both cases unit will stop.

Compressor working

- 1. If discharge pipe temperature \mathfrak{L}° T1 No limitation on compressor frequency
- T2 ≤ discharge pipe temperature £º Toff (Hysteresis control) Compressor frequency down by 5 pulse & Expansion valve up by 10 pulse in every 1 min. If LEV is in the starting control it will follow starting control first.
- 3. discharge pipe temperature ≥ Toff then compressor will be OFF System will stop if this situation occurs 5 times in 1 hour and error code will be generated also self diagnosis will start.



5. Input Current Control

5.1 Function

Controlling total current to protect power semiconductor devices from burn-out by the low current (including connecting mistake) and over current.

Operating process

- 1. Detection : check the output DC voltage of Current Transformer(CT).
- 2. Current Transformer Sensing Error
- In initial power input, if the CT output is over 4.0V (25A) it shows Self-Diagnosis Error Mode 40 (defect in CT1 or CT2 detection)

5.2 Operating process

CT 1 detection :

- 1) If total current exceeds CT1 value, reduce inverter operation by 1 step.
 - Step down 10Hz from current step.
 - If new Hz is below minimum Hz of operation (cooling & heating), then turn off the compressor.
- 2) After step down, still if the total current exceed CT1 for more than 5 sec. then step down inverter operation by 1 more step.
- 3) If the current continue below CT1 for more than 1 min., return the to setting step Hz.

CT 2 detection :

- 1) If total current exceeds CT2 turn off compressor. And after 3 min turn on the compressor and check the current again.
- 2) If CT2 occurs 5 times in 1 hour, stop the operation and shows Self-Diagnosis Error Mode 22

| Model | | Cooling | | Heating | |
|---------|----------|---------|-----|---------|-----|
| | | CT1 | CT2 | CT1 | CT2 |
| 1 Phase | AUUW126C | 7 | 10 | 8 | 10 |
| | AUUW186C | 9 | 12 | 10 | 12 |
| | AUUW246D | 16 | 19 | 17 | 19 |
| | AUUW306D | 16 | 19 | 17 | 19 |
| | AUUW366D | 16 | 19 | 17 | 19 |
| | AUUW426D | 26 | 29 | 27 | 29 |
| | AUUW486D | 26 | 29 | 27 | 29 |
| | AUUW606D | 26 | 29 | 27 | 29 |
| 3 Phase | AUUW428D | 10 | 13 | 11 | 13 |
| | AUUW488D | 10 | 13 | 11 | 13 |
| | AUUW608D | 10 | 13 | 11 | 13 |



6. Outdoor Fan Control

6.1 Function

Working of outdoor fan are different in different models. Some models are single fan some are two fan type.

6.2 Operating process

Control logic of outdoor fan depends on outdoor temperature

1. AC motor fan control

| Model | | RPM | | | | |
|---------|----------|-----------|----------|----------|--|--|
| | | Base Step | Max Step | Min Step | | |
| 1 Pahse | AUUW126C | 880 | 880 | 720 | | |
| | AUUW186C | 880 | 880 | 720 | | |

| Outdoor Temperature | Cooling Step | Outdoor Temperature | Heating Step |
|---------------------|--------------|---------------------|--------------|
| 38~46°C | Base Step+1 | 10~24°C | Base Step-1 |
| 28~38°C | Base Step | 4~10°C | Base Step |
| 10~38°C | Base Step-1 | -15~-4°C | Base Step |

2. DC motor fan control

| Model | | RPM | | |
|---------|----------|-----------|----------|----------|
| | | Base Step | Max Step | Min Step |
| 1 Pahse | AUUW246D | 670 | 700 | 200 |
| | AUUW306D | 670 | 700 | 200 |
| | AUUW366D | 950 | 1000 | 200 |
| | AUUW426D | 670 | 700 | 200 |
| | AUUW486D | 670 | 700 | 200 |
| | AUUW606D | 670 | 700 | 200 |
| 3 Phase | AUUW368D | 950 | 1000 | 200 |
| | AUUW428D | 670 | 700 | 200 |
| | AUUW488D | 670 | 700 | 200 |
| | AUUW608D | 670 | 700 | 200 |

| Outdoor Temperature | Cooling Step | Outdoor Temperature | Heating Step |
|---------------------|--------------|---------------------|--------------|
| 41~46°C | Base Step+2 | 22~26°C | Base Step-4 |
| 38~41°C | Base Step+1 | 18~22°C | Base Step-3 |
| 28~38°C | Base Step | 14~18°C | Base Step-2 |
| 24~28°C | Base Step-1 | 10~14°C | Base Step-1 |
| 18~24°C | Base Step-2 | 4~10°C | Base Step |
| 14~18°C | Base Step-3 | 0~4°C | Base Step+1 |
| 9~14°C | Base Step-4 | -4~0°C | Base Step+2 |
| 2~9°C | Base Step-5 | -8~-4°C | Base Step+2 |
| -3~2°C | Base Step-6 | -15~-8°C | Base Step+2 |

Low ambient cooling: In this situation outdoor fan works in ON/OFF control.

If the pipe temperature is $0\sim10$ ∞ C and it is falling rapidly in that case compressor will run for 5 min & then it will go in low ambient control.

After the system is stopped by CT cut or heat sink cut-off, cycle will return to the normal operating control.



7. Defrost Control

7.1 Function

:These are about the control of compressor, fan of outdoor unit, reversing valve, LEV.

7.2 Starting to the defrosting operation

- A) Defrost operation will be start when all the conditions below are matched simultaneously Accumulation time of operation and the period after completion of defrost = 35min (Outdoor air temperature -3°C)
- B) Outdoor piping temperature is below than -6 (Option)°C for starting defrosting operation.

7.3 Completion of defrost operation

Send signal of defrost completion in case of meeting one of the condition as below.

- 1. Defrosting time £æ 7 minutes
- 2. Piping temperature maintain 10 seconds (Option) in condition of more than 15°C (Option).

7.4 Defrosting Control Algorithm



8. LEV Control

8.1 Control of LEV opening

- 1. LEV openings have a controllable ranges 70 (option) to 460 (option) pulse in both condition of cooling and heating.
- 2. Products do not be operated before initializing of LEV when starting.
- 3. Time constant control period of LEV is every 2 minutes except below conditions.
- Control LEV every 1 minutes for 10 minutes after starting.
- When indoor capacity changed, Control LEV every 1 minutes for 10 minutes after starting
- Control LEV every 1 minutes for 10 minutes after starting in case of the special situation such as defrost completion, oil recovery, oil equalizing control, oil supplying, current transformer limitation, limitation of discharge temperature, low ambient operation control.



---- Cooling

8.2 Starting control (210 sec)

- 1) Only 1 LEV will be operate as below and others are closed fully.
- 2) Starting control does not use the time when the system operate with partial load after (example) after finishing starting control for 1 indoor unit, another indoor unit is ON additionally is operated with target opening of LEV.
- 3) The indoor units which are in the middle of starting control are continuing starting control with the opening of its opening.
- 4) Urgent control by indoor piping temperature
 - 1. LEV open 4 pulse with every 10 sec when the indoor piping temperature is below 2°C
 - 2. When the temperature reaches $4^{\circ}C$, system return to the starting control pulse value.



8.3 Steady state control

Cycle diagram



• P-h diagram



| | Cooling mode | Heating mode |
|--------|----------------------|----------------------|
| T out | Evaporator outlet | Condenser inlet |
| T in | Evaporator inlet | Condenser outlet |
| T pipe | Condenser out | Evaporator inlet |
| T suc | Compressor suction | Compressor suction |
| T disp | Compressor discharge | Compressor discharge |

Copyright ©2008 LG Electronics. Inc. All right reserved. Only for training and service purposes

Cooling Mode

- 1) Superheating control (Main control)
- Superheating : T superheating = Tout Tin = $2^{\circ}C(Option)$
- LEV pulse up : T superheating > 2°C
- LEV pulse down : T superheating < 2°C
- 2) Discharge Superheating Control (Reliability control)
- Dis Superheating : T dis_superheating = T dis T pipe > 20°C(Option)
- LEV pulse down : T dis_superheating < 20 (Option)°C
 - T dis_superheating > 24(Option) $^{\circ}C \rightarrow$ Back to main control

• Heating Mode

- 1) Superheating control (Main control)
- Superheating : T superheating = Tsuc Tpipe = 1°C(Option)
- LEV pulse up : T superheating > 1°C
- LEV pulse down : T superheating < $1^{\circ}C$
- 2) Discharge Superheating Control (Reliability control)
- Dis_Superheating : T dis_superheating = T dis -((Tin+Tout)/2)> 15°C(Option)
- LEV pulse down : T dis_superheating < 15°C
 - T dis_superheating > 20°C \rightarrow Back to main control

8.4 Flow Chart

• Cooling





9. Oil restoration operation

- 1) When the accumulated compressor running time is over 3 hr.(option), oil restoring operation is made for 3 minutes. If it's on the way of compressor starting, it's made after the starting.
- 2) Accumulated running time is cleared after the defrosting and oil restoring operation.

Operating process :

- 1) Fully open all the indoor's LEV.
- 2) After the LEV opening, change the compressor step to 70 Hz(option)
- 3) Reversing valve will be same as in defrosting process.
- 4) Outdoor fan operates in low speed.
- 5) During this operation, if operating frequency should be changed by safety control. then follow safety control first. If compressor should be OFF by that, stop operation.
- 6) The LEV openings after this operation is 120% of the opening at the point of starting.

10. Compressor warm-up control logic (at low temperatures)

A function protecting inverter compressor from damages, by increasing oil viscosity in low outdoor temperature. For the control,compressor operates in low frequencies.

Operating condition :in case of the following 3 conditions are fulfilled at the same time

- Outdoor temperature ,D-pipe temperature, Heat sink temperature: below 0°C



11. Heat sink control

11.1 Function

: Power module failure protection by checking the temperature of heat sink. There is a temperature sensor for checking the heat sink temperature.

11.2 Heat sink sensor failure error

Short Check : if temperature ≥130°C Open Check : if temperature < - 30°C System will go in self diagnosis (error 65) is displayed and product stops.

11.3 Heat sink temperature control

- a) Heat sink temperature < T2 : No limitation on compressor frequency
- b) T2 \leq heat sink temperature < Toff : Compressor frequency down by 5 Hz
- c) Heat sink temperature \geq Toff : Compressor will be off.

System will stop if this situation occurs 5 times in 1 hour and error code will be generated also self diagnosis will start. If high temperature situation occurs 5 times in 1 hr system counts 1 error and after that 4 times if this situation occurs system stops and give error code.

If the temperature reached Toff condition system will count 5 times after that and system will stop with error code.


4. Test Run

| 1. Check before Test Run | |
|--------------------------|--|
| 2. Test Run Flow chart | |

1. Check before Test Run

| 1 | Check to see whether there is any refrigerant leakage, and check whether the power or transmission cable is connected properly. |
|---|--|
| 2 | Check liquid pipe and gas pipe valves are fully opened. |
| | NOTE: Be sure to tighten caps. |
| | Confirm that 500 V megger shows 2.0 M Ω or more between power supply terminal block and ground. Do not operate in the case of 2.0 M Ω or less. |
| 3 | NOTE : Never carry out mega ohm check over terminal control board. Otherwise the control board may break. |
| | Immediately after mounting the unit or after leaving it turned off for an extended length of time, the resistance of the insulation between the power supply terminal board and the ground maydecrease to approx. 2.0 M Ω as a result of refrigerant accumulation in the internal compressor. |
| | If the insulation resistance is less than 2.0 $M\Omega,$ turn on the main power supply. |



• Each indoor unit should be tested.

• If the unit has accessory, it should be tested.

2.1 CVT Type

2.1.1 Connection of power supply

- 1) Connect the power supply cord to the independent power supply.
 - Circuit breaker is required.
- 2) Prepare the remote control.
 - Insert two batteries provided. Remove the battery cover from the remote controller.
 - Slide the cover according to the arrow direction. Insert the two batteries. (Two "R03" or "AAA" dry-cell batteries or equivalent.)
 - \bullet Be sure that the (+) and (-) directions are correct.
 - Be sure that both batteries are new. Re-attach the cover.
 - Slide it back into position.
- 3) Operate the unit for fifteen minutes or more.



2.1.2 Evaluation of the performance

- 1) Measure the temperature of the intake and discharge air.
- 2) Ensure the difference between the intake temperature and the discharge one is more than 8°C (Cooling) or reversely (Heating).

2.1.3 Selection of the slide switch according to installation method

- 1) In case the indoor unit is installed on the floor, please change the side switch which is on the Main PCB Assembly to the 'BOTTOM' state.
- 2) In case the indoor unit is installed under the ceiling, please change the slide switch which is on the Main PCB Assembly to the 'CEILING' state.
- * The initial state of the slide switch is set for the bottom installation.





2.2 Ceiling Cassette Type

2.2.1 PRECAUTIONS IN TEST RUN

• The initial power supply must provide at least 90% of the rated voltage. Otherwise, the air conditioner should not be operated.

CAUTION:

- ① For test run, carry out the cooling operation first even during winter season. If heating operation is carried out first, it leads to the trouble of compressor.
- ② Carry out the test run more than 5 minutes without stopping. (Test run will be cancelled 18 minutes later automatically)
- The test run is started by pressing the room temperature checking button and down timer button for 3 seconds at the same time.
- To cancel the test run, press any button.

2.2.2 CHECK THE FOLLOWING ITEMS WHEN INSTALLATION IS COMPLETE

- After completing work, be sure to measure and record trial run properties, and store measured data, etc.
- Measuring data are room temperature, outside temperature, suction temperature, blow out temperature, air velocity, air volume, voltage, current, presence of abnormal vibration and noise, operating pressure, piping temperature.
 - As to the structure and appearance, check following items.
 - □ Is the circulation of air adequate?
 - □ Is the drainage OK?
 - Is the heat insulation complete (refrigerant and drain piping)?
 - $\hfill\square$ Is there any leakage of refrigerant?

- Does the romote controller works properly?
- □ Is there any error on wiring?
- □ Aren't terminal screws loosened?

M4.....118N.cm{12kgf.cm} M5.....196N.cm{20kgf.cm} M6.....245N.cm{25kgf.cm} M8.....588N.cm{60kgf.cm}

5. Trouble Shooting

| 1. Self-diagnosis Function | 78 |
|----------------------------|----|
| 2. Pump Down | 80 |
| 3. Evacuation | 81 |
| 4. Gas Charging | 82 |
| 5. Cycle Part | 83 |
| 6. Electronic Parts | 84 |

1. Self-diagnosis Function

1.1 Error Indicator (Indoor)

- The function is to self-diagnosis air conditioner and express the troubles if there is any trouble.
- Error mark is displayed on display window of indoor units and wired-remote controller, and LED of outdoor unit control board.
- If more than two troubles occur simultaneously, lower number of error code is first displayed.
- After error occurs, if error is released, error LED is also released simultaneously.



Ex) Error 21 (DC Peak)



1.2 Indoor Error

| Error code | Description | INV TPS | LED 1 (Red) | LED 2 (Green) | Indoor Status |
|------------|--|---------|----------------|------------------|------------------|
| 00 | No Error | • | | | ON |
| 01 | Indoor Room themistor error | • | | 1time 🕕 | OFF |
| 02 | Indoor in-piping sensor error | • | | 2times 🕦 | OFF |
| 03 | Remote controller error | • | | 3times 🕕 | OFF |
| 04 | Drain Pump error | • | | 4times 🕦 | OFF |
| 05 | 05 Communcation error between in and out | | | 5times 🕕 | OFF |
| 06 | Indoor Out-Piping sensor error | • | | 6times 🕕 | OFF |
| 07 | Differnt mode operation | • | | 7times 🕕 | OFF |
| 09 | Checksum error | • | | 9times 🕦 | OFF |
| 10 | BLDC motor fan lock (indoor) | • | | 10times 🕕 | OFF |

1.3 Error Indicator (Outdoor)

Outdoor Error Ex) Error 21 (DC Peack)





Outdoor Error

| Error Code | Description | INV TPS | LED 1 (Red) | LED 2 (Green) | Indoor Status |
|------------|---------------------------------------|---------|----------------|------------------|------------------|
| 21 | DC Peak (IPM Fault) | • | 2times () | 1time 🕕 | OFF |
| 22 | CT 2(Max CT) | • | 2times 🕕 | 2times 🕕 | OFF |
| 23 | DC Link Low Volt. | • | 2times 🕕 | 3times 🕕 | OFF |
| 24 | L_P/Heater Sink | • | 2times 🕕 | 4times 🕕 | OFF |
| 25 | Low voltage / Over voltage | • | 2times 🕕 | 5times 🕕 | OFF |
| 26 | DC Comp Position Error | • | 2times 🕕 | 6times 🕕 | OFF |
| 27 | PFC/PSC Fault Error | • | 2times 🕕 | 7times 🕕 | OFF |
| 28 | DC Link High Volt | • | 2times 🕕 | 8times 🕕 | OFF |
| 29 | COMP Over Current | - | 2times 🕕 | 9times 🕕 | OFF |
| 32 | D-Pipe High (INV) | • | 3times 🕕 | 2times 🕕 | OFF |
| 33 | D-Pipe High (Normal) | • | 3times 🕕 | 3times 🕕 | OFF |
| 39 | Communication Error | - | 3times 🕕 | 9times 🕕 | OFF |
| 40 | CT Sensor (Open/Short) | • | 4times 🕕 | 0 | OFF |
| 41 | INV. D-PipeTh Error(Open/Short) | • | 4times 🕕 | 1time 🕕 | OFF |
| 44 | Outdoor air Th Error(Open/Short) | • | 4times 🕕 | 4times 🕕 | OFF |
| 45 | Cond. Pipe Th Error(Open/Short) | • | 4times 🕕 | 5times 🕕 | OFF |
| 46 | Suction Pipe Error(Open/Short) | • | 4times 🕕 | 6times 🕕 | OFF |
| 47 | Const D-pipe Th Error(Open/Short) | • | 4times 🕕 | 7times 🕕 | OFF |
| 51 | Capacity over | • | 5times 🕕 | 1time 🕕 | OFF |
| 52 | Signal Error (DSP Board ↔ Main Board) | • | 5times 🕕 | 2time 🕕 | OFF |
| 53 | Signal error (Indoor ↔ Outdoor) | • | 5times 🕕 | 3times 🕕 | OFF |
| 60 | EEPROM Check Sum Error | • | 6times 🕕 | 0 | OFF |
| 61 | Cond. Pipe High | • | 6times 🕕 | 1time 🕕 | OFF |
| 62 | Heatsink High | • | 6times 🕕 | 2times 🕕 | OFF |
| 63 | Cond. Pipe Low | • | 6times 🕕 | 3times 🕕 | OFF |
| 65 | Heatsoml Th error (Open/Short) | • | 6times 🕕 | 5times 🕕 | OFF |
| 67 | BLDC motor fan lock (outdoor) | • | 6times 🕕 | 7times 🕕 | OFF |
| 73 | PFC Fault Error (S/W) | - | 7times 🕕 | 3times 🕕 | OFF |

Precaution in Service or Check

Even after stopping the operation of product, it takes some time to discharge the remaining electricity of the electrolytic capacitor that was charged early.

Before conducting a checking or repairing job, pull out the plug out of the outlet and make sure that the lamp on the control board outdoor unit is off.

5. Trouble Shooting

2. Pumping Down



• Procedure

- (1) Confirm that both the 2-way and 3-way valves are set to the open position.
 - Remove the valve stem caps and confirm that the valve stems are in the raised position.
 - Be sure to use a hexagonal wrench to operate the valve stems.
- (2) Operate the unit for 10 to 15 minutes.
- (3) Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valve.
 - Connect the charge hose with the push pin to the service port.

(4) Air purging of the charge hose.

- Open the low-pressure valve on the charge set slightly to air purge from the charge hose.
- (5) Set the 2-way valve to the closed position.

- (6) Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 1kg/cm²g.
- (7) Immediately set the 3-way valve to the closed position.
 - Do this quickly so that the gauge ends up indicating 3 to 5kg/cm²g.
- (8) Disconnect the charge set, and mount the 2way and 3-way valve's stem nuts and the service port nut.
 - Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
 - Be sure to check for gas leakage.

3. Evacuation (All amount of refrigerant leaked)



Procedure

- (1) Connect the vacuum pump to the center hose of charge set center hose
- (2) Evacuation for approximately one hour.
 - Confirm that the gauge needle has moved toward 0.8Torr.
- (3) Close the valve (Lo side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- (4) Disconnect the charge hose from the vacuum pump.

 Vacuum pump oil.
 If the vacuum pump oil becomes dirty or depleted, replenish as needed.

5. Trouble Shooting

4. Gas Charging (After Evacuation)



• Procedure

(1) Connect the charge hose to the charging cylinder.

- Connect the charge hose which you dis-connected from the vacuum pump to the valve at the bottom of the cylinder.
- If you are using a gas cylinder, also use a scale and reverse the cylinder so that the system can be charged with liquid.

(2) Purge the air from the charge hose.

 Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air. (Be careful of the liquid refrigerant). The procedure is the same if using a gas cylinder.

(3) Open the valve (Lo side on the charge set and charge the system with liquid refrigerant.

 If the system can not be charged with the specified amount of refrigerant, it can be charged with a little at a time (approximately 150g each time) while operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure (pumping down-pin). This is different from previous procedures. Because you are charging with liquid refrigerant from the gas side, absolutely do not attempt to charge with larger amounts of liquid refrigerant while operating the air conditioner.

(4) Immediately disconnect the charge hose from the 3-way valve's service port.

- Stopping partway will allow the gas to be discharged.
- If the system has been charged with liquid refrigerant while operating the air conditioner turn off the air conditioner before disconnecting the hose.

(5) Mount the valve stem nuts and the service port nut.

- Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
- Be sure to check for gas leakage.

5. Cycle Part

Trouble analysis

1. Check temperature difference between intake and discharge air, and check for the operating current too.

| Case | Symptom | Supposed Caused |
|--------|--|---|
| Case 1 | Temp. difference : approx. 0°C Current : less than 80% of rated current | All amount of refrigerant leaked out. Check refrigeration cycle. |
| Case 2 | Temp. difference : approx. 8°C Current : less than 80% of rated current | Refrigerant leakage Clog of refrigeration cycle Defective Compressor. |
| Case 3 | Temp. difference : less than 8°C Current : over the rated current | Excessive amount of refrigerant |
| Case 4 | Temp. difference : over 8°C | Normal |

NOTICE

Temperature difference between intake and discharge air depends on room air humidity. When the room air humidity is relativery higher, temperature difference is smaller. When the room air humidity is relatively lower temperature difference is larger.

2. Check temperature and pressure of refrigeration cycle in cooling mode.

| Suction pressure (Compared with the normal value) | Temperature of Discharge Air (Compared with the normal valve) | Cause of Trouble | Description |
|---|---|---|--|
| | High | Defective compressor Defective 4-way reverse valve | Current is low. |
| Higher | Normal | Excessive amount of refrigerant | High pressure does not quickly rise at the beginning of operation. |
| Lower | Higher | Insufficient amount of refrigerant (Leakage) Clogging | Current is low. |

NOTICE

- 1. The suction pressure is usually 8.5~9.5kg/cm2G(Cooling) at normal condition.(R410A)
- 2. The temperature can be measured by attaching the thermometer to the low pressure tubing and wrap it with putty.

| | Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Internal components and circuit boards are at main potential when the equipment is connected to the power cables. This voltage is extremely dangerous and may cause death or severe injury if come in contact with it. |
|-------------|---|
| \bigwedge | Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred. |



6.1 The Product doesn't operate at all



| The operation check of the Indoor P.C.B. Ass'y | | |
|--|--|----------------------------|
| Procedure | Specification | Remedy |
| 1) The input voltage of power mod- ule. | 1) AC230V ± 30V : Check the rated voltage | 1) Check the power outlet. |
| 2) The output voltage of power mod- ule. | 2) 12V ± 3V | 2) Replace P.C.B Ass'y |

6.2 The Product doesn't operate with the remote controller



- If problem still persists, Replace display PCB

Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Internal components and circuit boards are at main potential when the equipment is connected to the power cables. This voltage is extremely dangerous and may cause death or severe injury if come in contact with it.

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

6.3 The Compressor/Outdoor Fan are don't operate



- Check the related circuit of R02H(12.1K), R01H(1K), R04H(6.2K), R03H(1K), C01H(102), C02H(102), Micom(pin No. ①, ②).
- Check the Indoor temperature sensor is disconnected or not (about 10K at 25°C).

Check the Relay(RY-PWR, RY-START) for driving Compressor.

- Check the voltage between brown and blue cable of terminal to connect the Outdoor (About AC220V / 240V).
- Check the related circuit of relay in Outdoor PCB Ass'y.

| Check Point | Comp. ON | Comp. OFF |
|-------------------------------|----------|-----------|
| Between Micom(No. 19) and GND | DC 5V | DC 0V |
| Between IC01M(No. 10) and GND | DC 1V↓ | DC 12V |

Turn off main power.

Check the electrical wiring diagram of Outdoor side. Check the open or short of connecting wires between Indoor and Outdoor.



Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Internal components and circuit boards are at main potential when the equipment is connected to the power cables. This voltage is extremely dangerous and may cause death or severe injury if come in contact with it.

 \bigwedge

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

6.4 When indoor Fan does not operate.



| Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Internal components and circuit boards are at main potential when the equipment is connected to the power cables. This voltage is extremely dangerous and may cause death or severe injury if come in contact with it. |
|---|
| Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred. |

6.5 When the louver does not operate.



| \bigwedge | Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Internal components and circuit boards are at main potential when the equipment is connected to the power cables. This voltage is extremely dangerous and may cause death or severe injury if come in contact with it. |
|-------------|---|
| \land | Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred. |

6.6 Check code Trouble shooting CH01, CH02, CH06

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|---------------------------|--|--|
| 01 | Indoor air sensor | Connector connection error Faulty PCB Faulty sensor (Open / Short) | Normal resistor : $10K\Omega$ / at 25°C (Unplugged) Normal voltage : 2.5Vdc / at 25°C(Plugged) Refer to sensor resistance table. |
| 02 | Indoor inlet pipe sensor | Connector connection error Faulty PCB Faulty sensor (Open / Short) | Normal resistor : $5K\Omega$ / at 25°C(Unplugged) Normal voltage : 2.5Vdc / at 25°C(Plugged) Refer to sensor resistance table. |
| 06 | Indoor outlet pipe sensor | Connector connection error Faulty PCB Faulty sensor (Open / Short) | Normal resistor : $5K\Omega$ / at $25^{\circ}C(Unplugged)$ Normal voltage : 2.5Vdc / at $25^{\circ}C(Plugged)$ Refer to sensor resistance table. |

Check Flow Chart



6.7 Check code Trouble shooting CH03

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|--|---|--|
| 03 | Communication Error (Wired remote controller) | Connector connection error Faulty PCB / Remote controller Connection wire break | Connection of wire Main PCB Volt. DC12V Noise interference |



6.8 Check code Trouble shooting CH04

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|------------------------------|--|--|
| 04 | Drain pump / Float switch | Float switch open. (Normal : short) Water over flow | The connection of wire (Drain pump/ Float switch) Drain pump power input. (220V) Drain tube installation. Indoor unit installation. (Inclination) |



6.9 Check code Trouble shooting CH09, CH10

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|---------------------------------|--|--|
| 09 | EEPROM Check sum (Indoor) | Check sum error | Check the poor soldering.Change PCB |
| 10 | BLDC motor fan lock (Indoor) | Fan motor break down Fan motor & PCB poor contact Obstruction to the fan | Check the indoor fan motor.Check the connection status betweenPCB and fan motor. |



6.10 Check code Trouble shooting CH05, CH53

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|-----------------------------------|--|--|
| 05 / 53 | Communication (Indoor↔Outdoor) | The connector for transmission is disconnected. The connecting wires are misconnected. The communication line is break Outdoor PCB is abnormal. Indoor PCB is abnormal. Synchro # of IDU is abnormal. | Check power input AC 230V. (Outdoor, Indoor) Check connector for transmission Check wires are misconnecting. Check transmission circuit of outdoor PCB Check transmission circuit of indoor PCB Check # of IDU setting DIP SW |



6.11 Check code Trouble shooting CH21

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|---------|--|--|
| 21 | DC Peak | Instant over current Over Rated current Poor insulation of IPM | An instant over current in the U,V,W phase Comp lock The abnormal connection of U,V,W Over load condition Overcharging of refrigerant Pipe length. Poor insulation of compressor |



6.12 Check code Trouble shooting CH22

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|----------|----------------|--|
| 22 | Max. C/T | • Over current | Malfunction of compressor Blocking of pipe Low voltage input Refrigerant, pipe length, blocked, |



6.13 Check code Trouble shooting CH23, CH28

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|-------------------------|--|---|
| 23 | DC Link Low voltage. | 1ph : DC link volt. is 140Vdc ↓ 3ph : DC link volt. is 250Vdc ↓ | Check the power source.Check the components. |
| 28 | DC Link High voltage | 1ph : DC link volt. is 140Vdc ↑ 3ph : DC link volt. is 250Vdc ↑ | Check the power source.Check the components. |



* Check DC link voltage





* Dc link voltage table

| Madal | | DC Link Voltage | | |
|---------|----------|-----------------|---------------|--------------|
| | wodei | | Non operating | Operating |
| 1 Phase | AUUW126C | PSC | DC300V ± 10% | DC280V ± 10% |
| | AUUW186C | PSC | DC300V ± 10% | DC280V ± 10% |
| | AUUW246D | PFC | DC300V ± 10% | DC380V ± 10% |
| | AUUW306D | PFC | DC300V ± 10% | DC380V ± 10% |
| | AUUW366D | PFC | DC300V ± 10% | DC380V ± 10% |
| | AUUW426D | PFC | DC300V ± 10% | DC380V ± 10% |
| | AUUW486D | PFC | DC300V ± 10% | DC380V ± 10% |
| | AUUW606D | PFC | DC300V ± 10% | DC380V ± 10% |
| 3 Phase | AUUW368D | PSC | DC540V ± 10% | DC500V ± 10% |
| | AUUW428D | PFC | DC540V ± 10% | DC680V ± 10% |
| | AUUW488D | PFC | DC540V ± 10% | DC680V ± 10% |
| | AUUW608D | PFC | DC540V ± 10% | DC680V ± 10% |

6.14 Check code Trouble shooting CH24

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|----------------|---------------------------------|--|
| 24 | Press S/W Open | • Low / High press S/W open. | Check the connection of "CN_PRESS" Check the SVC V/V open. Check the leakage of refrigerant. |



* Pressure switch table

| Switch | Low pressure switch | High pressure switch |
|--------|---------------------|----------------------|
| Spec | 0.03 Mpa | 4.3 Mpa |
| Model | AUUW126C | AUUW246D |
| | AUUW186C | AUUW306D |
| | | AUUW366D |
| | | AUUW426D |
| | | AUUW486D |
| | | AUUW606D |
| | | AUUW368D |
| | | AUUW428D |
| | | AUUW488D |
| | | AUUW608D |



6.15 Check code Trouble shooting CH26, CH27

| Display code | Title | Cause of error | Check point & Normal condition | |
|-----------------|---------------------------|--------------------------------------|--|--|
| 26 | DC Compressor Position | Compressor position detect error | Check the connection of comp wire "U,V,W" Malfunction of compressor Check the component of "IPM", detection parts. | |
| 27 | PSC Fault PFC Fault | Over current at "IGBT"/PFC module | Check the component of "IGBT" /PFC module. Check the components. | |



6.16 Check code Trouble shooting CH29

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|-------------------------------------|--|--|
| 29 | Inverter compressor over current | Inverter compressor input current is over 30A | Overload operation (Pipe clogging/Covering/EEV defect/Ref. over- charge) Compressor damage(Insulation damage/Motor damage) Input voltage low ODU inverter PCB assembly damage |

Check Flow Chart



6.17 Check code Trouble shooting CH39

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|--|--|--|
| 39 | Transmission Error Between (PFC Micom → INV Micom) | Communication Error Between PFC Micom and INV Micom. | Micom defect/Circuit defect Different Micom S/W Version ODU inverter PCB assembly damage |



6.18 Check code Trouble shooting CH40

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|-------------------------|---|--|
| 40 | C/T Internal circuit | Initial current error | Malfunction of current detection circuit. (Open / Short) The voltage of "C01N" Is 4.0Vdc (25A) ↑. |



6.19 Check code Trouble shooting CH32, CH33

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|---|---|--|
| 32 | D-pipe (Inverter) temp. high (105°C↑) | Discharge sensor (Inverter) temp. high | Check the discharge pipe sensor for INV. Check the install condition for over load. Check the leakage of refrigerant. Check the SVC V/V open. Refer to sensor resistance table. |
| 33 | D-pipe (Constant) temp. high (105°C↑) | Discharge sensor (Cons.) temp. high | Check the discharge pipe sensor for Cons. Check the install condition for over load. Check the leakage of refrigerant. Check the SVC V/V open. Refer to sensor resistance table. |



6.20 Check code Trouble shooting CH41, CH44, CH45, CH46, CH47, CH65

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|--|--|--|
| 41 47 | D-pipe sensor(Inv) D-pipe sensor(Cons) | Connector connection error Faulty PCB Faulty sensor (Open / Short) | Normal resistor : 200KΩ/ at 25°C (Unplugged) Normal voltage : 4.5Vdc / at 25°C (plugged) Refer to sensor resistance table. |
| 44 | Air sensor | Connector connection error Faulty PCB Faulty sensor (Open / Short) | Normal resistor : 10KΩ/ at 25°C (Unplugged) Normal voltage : 2.5Vdc / at 25°C (plugged) Refer to sensor resistance table. |
| 45 46 | Condenser Pipe sensor Suction Pipe sensor | Connector connection error Faulty PCB Faulty sensor (Open / Short) | Normal resistor : 5KΩ/ at 25°C (Unplugged) Normal voltage : 2.5Vdc / at 25°C (plugged) Refer to sensor resistance table. |
| 65 | Heat sink sensor | Connector connection error Faulty PCB Faulty sensor (Open / Short) | Normal resistor : 5KΩ/ at 25°C (Unplugged) Normal voltage : 2.5Vdc / at 25°C (plugged) Refer to sensor resistance table. |

Check Flow Chart



6.21 Check code Trouble shooting CH51, CH60

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|---------------------|-------------------------------|--|
| 51 | Over capacity | Over capacity Combination | Check the indoor unit capacity.Check the combination table. |
| 60 | EEPROM Check sum | Check sum error | Check the connection port.Check the poor soldering. |





6.22 Check code Trouble shooting CH52

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|--|--|---|
| 52 | Transmission error between (Inverter PCB → Main PCB) | Main controller of Master unit of Master unit can't receive signal from inverter controller | Power cable or transmission cable is not connected Defect of outdoor Main fuse/Noise Filter Defect of outdoor Main / inverter PCB |

Error diagnosis and countermeasure flow chart



Check Point

- Check the Transmission connector and LED (Main & Inverter)
- ▶ 42/48/60k





<Inverter PCB>





<MAIN PCB>

6.23 Check code Trouble shooting CH61, CH62

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|--|--|--|
| 61 | Condenser pipe sensor temp. high | condenser pipe sensordetected high temp.(65°C) | Check the load condition. Check the sensor of Condenser pipe sensor. Normal resistor : 5KΩ/ at 25°C (Unplugged) Normal voltage : 2.5Vdc / at 25°C (Plugged) |
| 62 | Heat sink sensor temp. high | heat sink sensor detected high temp. (85°C) | Check the load condition. Check the sensor of heat sink. Normal resistor : 10KΩ/ at 25°C (Unplugged) Normal voltage : 2.5Vdc / at 25°C (Plugged) |



6.24 Check code Trouble shooting CH67

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|----------------------------------|--|--|
| 67 | BLDC motor fan lock (Outdoor) | Fan motor break down Fan motor & PCB poor contact Obstruction to the fan | Check the indoor fan motor. Check the connection status between PCB and fan motor. |


6.25 Check code Trouble shooting CH73

| Display code | Title | Cause of error | Check point & Normal condition |
|-----------------|--|--|---|
| 73 | AC input instant over cur- rent error (Matter of software) | Inverter PCB input power current is over 48A(peak) for 2ms | Overload operation (Pipe clogging/Covering/EEV defect/Ref.overcharge) Compressor damage (Insulation damage/Motor damage) Input voltage abnormal (L, N) Power line assemble condition abnormal Inverter PCB assembly damage (input current sensing part) |



Sensor resistance table

Pipe Temp

| B Constant | 3977 | | B Constant | 3977 | |
|------------|------------|-------|------------|------------|-------|
| Std Temp | 25 | | Std Temp | 25 | |
| Resistance | 5 | | Resistance | 10 | |
| Temp | Resistance | Volt | Temp | Resistance | Volt |
| -30 | 102.17 | 4.714 | -30 | 204.35 | 4.72 |
| -25 | 73.49 | 4.611 | -25 | 146.97 | 4.62 |
| -20 | 53.55 | 4.481 | -20 | 107.09 | 4.492 |
| -15 | 39.5 | 4.322 | -15 | 79 | 4.336 |
| -10 | 29.48 | 4.131 | -10 | 58.95 | 4.149 |
| -5 | 22.24 | 3.91 | -5 | 44.47 | 3.931 |
| 0 | 16.95 | 3.661 | 0 | 33.9 | 3.685 |
| 5 | 13.05 | 3.389 | 5 | 26.09 | 3.416 |
| 10 | 10.14 | 3.102 | 10 | 20.27 | 3.131 |
| 15 | 7.94 | 2.808 | 15 | 15.89 | 2.838 |
| 20 | 6.28 | 2.515 | 20 | 12.55 | 2.546 |
| 25 | 5 | 2.232 | 25 | 10 | 2.262 |
| 30 | 4.01 | 1.965 | 30 | 8.03 | 1.994 |
| 35 | 3.24 | 1.717 | 35 | 6.49 | 1.745 |
| 40 | 2.64 | 1.493 | 40 | 5.28 | 1.519 |
| 45 | 2.16 | 1.293 | 45 | 4.32 | 1.316 |
| 50 | 1.78 | 1.116 | 50 | 3.56 | 1.137 |
| 55 | 1.48 | 0.962 | 55 | 2.95 | 0.981 |
| 60 | 1.23 | 0.828 | 60 | 2.46 | 0.846 |
| 65 | 1.03 | 0.714 | 65 | 2.06 | 0.729 |
| 70 | 0.87 | 0.615 | 70 | 1.74 | 0.628 |
| 75 | 0.74 | 0.531 | 75 | 1.47 | 0.542 |
| 80 | 0.63 | 0.459 | 80 | 1.25 | 0.469 |
| 85 | 0.54 | 0.397 | 85 | 1.07 | 0.406 |
| 90 | 0.46 | 0.345 | 90 | 0.92 | 0.353 |
| 95 | 0.4 | 0.3 | 95 | 0.79 | 0.307 |
| 100 | 0.34 | 0.262 | 100 | 0.68 | 0.268 |

Air Temp

Copyright ©2008 LG Electronics. Inc. All right reserved. Only for training and service purposes

Heatsink Temp

B Constant 3970 Std Temp 25 Resistance 10 Resistance Volt Temp -30 102.17 4.71 -25 73.49 4.61 -20 53.55 4.48 -15 39.5 4.32 -10 29.48 4.13 -5 22.24 3.91 0 16.95 3.66 5 26.05 4.73 10 20.25 4.66 15 15.87 4.57 20 4.47 12.55 10 4.35 25 30 8.03 4.21 35 6.49 4.06 40 5.28 3.89 45 4.33 3.71 50 3.57 3.52 55 3.32 2.96 60 2.47 3.11 65 2.07 2.9 70 1.74 2.69 75 1.48 2.48 80 1.26 2.28 1.07 2.09 85 90 0.92 1.9 95 0.8 1.73 100 0.69 1.57

D-Pipe Temp

| B Constant | 3500 | |
|------------|------------|-------|
| Std Temp | 25 | |
| Resistance | 200 | |
| Temp | Resistance | Volt |
| -30 | 2845.99 | 4.969 |
| 0 | 585.66 | 4.851 |
| 5 | 465.17 | 4.814 |
| 10 | 372.49 | 4.77 |
| 15 | 300.58 | 4.717 |
| 20 | 244.33 | 4.657 |
| 25 | 200 | 4.587 |
| 30 | 164.79 | 4.508 |
| 35 | 136.64 | 4.418 |
| 40 | 113.98 | 4.318 |
| 45 | 95.62 | 4.208 |
| 50 | 80.65 | 4.088 |
| 55 | 68.38 | 3.958 |
| 60 | 58.27 | 3.82 |
| 65 | 49.88 | 3.674 |
| 70 | 42.9 | 3.522 |
| 75 | 37.05 | 3.365 |
| 80 | 32.14 | 3.205 |
| 85 | 27.99 | 3.043 |
| 90 | 24.46 | 2.88 |
| 95 | 21.46 | 2.719 |
| 100 | 18.89 | 2.561 |
| 110 | 14.79 | 2.255 |
| 120 | 11.72 | 1.972 |
| 130 | 9.4 | 1.716 |
| 140 | 7.62 | 1.487 |
| 150 | 6.24 | 1.287 |

Check of compressor

Check resistance of the compressor



 \blacksquare Check Insulation resistance of the compressor



| Model | | Resistance(Ω at 20) | | |
|---------|----------|------------------------------|------|------|
| | | U | V | W |
| 1 Phase | AUUW126C | 0.65 | 0.65 | 0.65 |
| | AUUW186C | 0.65 | 0.65 | 0.65 |
| | AUUW246D | 0.75 | 0.75 | 0.75 |
| | AUUW306D | 0.75 | 0.75 | 0.75 |
| | AUUW366D | 0.44 | 0.44 | 0.44 |
| | AUUW426D | 0.44 | 0.44 | 0.44 |
| | AUUW486D | 0.44 | 0.44 | 0.44 |
| | AUUW606D | 0.44 | 0.44 | 0.44 |
| 3 Phase | AUUW368D | 1.84 | 1.84 | 1.84 |
| | AUUW428D | 1.08 | 1.08 | 1.08 |
| | AUUW488D | 1.08 | 1.08 | 1.08 |
| | AUUW608D | 1.08 | 1.08 | 1.08 |

| Resistance(Ω) at 20°C | | |
|-----------------------|----------------------|--|
| Terminal | All models | |
| U-GND | More than $2M\Omega$ | |
| V-GND | More than $2M\Omega$ | |
| W-GND | More than $2M\Omega$ | |



P/NO : MFL47149001

July. 2008