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User manual TOSHIBA RAV-SM802KRT-E
User guide TOSHIBA RAV-SM802KRT-E
Operating instructions TOSHIBA RAV-SM802KRT-E
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Manual abstract:

@@4 3. @@5 4. WIRING DIAGRAM

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

..... 6 5. SPECIFICATIONS OF ELECTRICAL PARTS ...

.....
.....
.....
.....
.....
.....

7 6. REFRIGERANT R410A

.....
.....
.....
.....
.....
.....
.....
.....
.....

..... 8 7. INDOOR UNIT CONTROL .

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

16 8. @@27 9. HOW TO REPLACEMENT OF SERVICE INDOOR P.C. BOARD

.....
.....

.. 50 10. @@54 11. @@71 12.

@@76 NOTE : This Service Manual describes explanation for the Under Ceiling type indoor unit. For the combined outdoor unit, refer to the following Service Manual. Outdoor unit Model name SVM to be referred RAV-SMXXOAT-E A03-007 RAV-SPXXXAT-E A03-014 RAV-SMXXIAT-E A05-001 1 1. SPECIFICATIONS 1-1. High-Wall Type (Indoor Unit) Model name Cooling Standard capacity (Note 1) (kW) 5.1 (1.5 5.6) RAV-SM562KRT-E Heating 5.6 (1.5 6.

3) 4.9 2.93 [D] 3.29 [C] 3.11 2.46 [E] Avera ge Cooling 6.7 (2.2 8.0) RAV-SM802KRT-E Heating 8 (2.29.

0) 5.8 3.00 [D] 3.24 Average Heating low temp. capacity (Note 1) (kW) Energy consumption effect ratio (Cooling) Power supply Running current Electrical

characteristics Power consumption (Low temp.

) Power factor Main unit Appearance Ceiling Panel (Sold separately) Model Panel color Height Main unit Outer dimension Ceiling panel (Sold separately) Width Depth Height Width Depth Main unit Total weight Ceiling panel Heat exchanger Soundproof/Heat-insulating material Fan Fan unit Standard air flow High (Mid./Low) Motor Air filter Controller (Sold separately) Gas side Connecting pipe Liquid side Drain port Sound level High (Mid./Low) (Note 2) (mm) (mm) (Nominal dia.) (dB-A) 45 (m³/h) (W) (mm) (mm) (mm) (mm) (mm) (mm) (kg) (A) (kW) (kW) (%) 95 8.337. 63 1.74 1.95 1 phase 230V (220 240V) 50Hz 8.1387.46 1.7 13.1512.05 12.9111.84 2.

72 2.21 95 Pure white ---- 298 998 221 ---- 12 ---- Finned tubu Inflammable polyethylene foam Turbo fan 840 30 Attached main unit Wired remote controller RBC-AMT21E Ø12.7 (1/2") Ø6.4 (1/4") Ø15.9 (5/8") Ø9.5 (3/8") 1110 Foamed polyethylen 94 94 2.67 25 (Polyvinyl chloride tube) 41 36 45 41 36 Note 1 : The cooling capacities and electrical characteristics are measured under the conditions speciied by JIS B 8616 based on the reference piping. The reference piping consists of 3 m of main piping and 2 m of branch piping connected with 0 meter height. Note 2 : The sound level is measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB 2 Operation characteristic curve <Cooling> 14 <Heating> 16 14 12 RAV-SM802KRT-E 12 10 RAV-SM802KRT-E 10 Current (A) 8 Current (A) RAV-SM562KRT-E 8 6 4 RAV-SM562KRT-E · Conditions Indoor : DB20°C Outdoor : DB7 C/WB6°C Air flow : High Pipe length : 7.5m 230V 15 20 6 4 2 0 0 · Conditions Indoor : DB27 C/WB19°C Outdoor : DB35°C Air flow : High Pipe length : 7.5m 230V 15 20 2 0 0 40 60 70 80 100 40 60 80 90 100 Compressor speed (rps) Compressor speed (rps) · Capacity variation ratio according to temperature <Cooling> 105 100 95 90 <Heating> 120 110 100 90 Capacity ratio (%) 85 80 75 70 65 60 55 · Conditions Indoor : DB27 C/WB19°C Indoor air flow : High Pipe length : 7.5m Capacity ratio (%) 80 70 60 50 40 30 20 10 0 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 · Conditions Indoor : DB20°C Indoor air flow : High Pipe length : 7.5m 32 33 34 35 36 37 38 39 40 41 42 43 Outdoor temp.

(°C) Outdoor temp. (°C) 3 2. CONSTRUCTION VIEWS (EXTERNAL VIEWS) High-Wall Type RAV-SM562KRT-E/RAV-SM802KRT-E Back body Front panel Grille inlet Air inlet 998 220 75 298 51 Air outlet 50 7 Knock out system Knock out system 75 56 50 8 75 Connection pipe (0.39 m) (For SM802 : Flare (For SM562 : Flare 15.88) 12.

7) 998 763.5 450 20 48 10 Drain hose (0.54 m) Connection pipe (0.49 m) (Flare 6.35) 57 18 Wireless remote control 55 or more Minimum distance to ceiling (For stud bolt 6) 20 (For stud bolt 8 -10) 29 55 55 55 41 298 100 Installation Plate outline 65 100 4 40 48 Outline of indoor unit 160 65 3. SYSTEMATIC REFRIGERATING CYCLE DIAGRAM 3-1. Hi Wall type RAV-SM562KRT-E/SM802KRT-E Indoor unit TCJ sensor Air heat exchanger Model RAV-SM 562KRT-E 802KRT-E Outer diameter of refrigerant pipe TC sensor Gas side ØA 12.7 mm 15.9 mm Liquid side ØB 6.4 mm 9.

5 mm Refrigerant pipe at gas side Outer dia. ØA Refrigerant pipe at liquid side Outer dia. ØB Pd Packed valve Outer dia. ØA Packed valve Outer dia. ØB Ps Outdoor unit NOTE : The refrigerating cycle differs according to the combined outdoor units. For the cycle diagram, cycle pressure, etc., refer to the following Service Manual. RAV-SMXXX0AT-E : A03-007 RAV-SPXXXXAT-E : A03-014 RAV-SMXXX1AT-E : A05-001 Cooling Heating 5 4. WIRING

DIAGRAM 4-1. Hi Wall type (Indoor unit) RAV-SM562KRT-E/SM802KRT-E ,k,n,t,u,d,q,l,n,s,n,q BLK S ,b,m,Q,Q ,s,d,q,l,h,m ,k ,a,k,n,b,j FA N M TO OR , T ,S ,R ,Q ,P ,a,k,t ,o,m,j ,x,d,k ,n,q,m ,q,d,c ,a,q,v ,a,k,t ,x,d,k ,v,g,h ,a,k,j ,q,d,c U3 U4 ,a,k,t ,a,k,t F ,U ,T ,S ,R ,Q ,P ,U ,T ,S ,R ,Q ,P ,a,t,r ,P ,Q ,P ,Q ,U ,T ,S ,R ,U ,T ,S ,R ,P ,P ,d,l,f ,P ,Q ,P ,Q ,R ,S ,T ,P ,P ,R ,R ,T ,T ,e,R,O,P ,@ ,e,t,r,d ,s,R-D,P,T , @ ,Q,T,O,u ,b,m,R,R -i,v,g,h,j ,b,m,Q,P,O -i,v,g,h,j ,b,m,S,O -i,a,k,t,j ,b,m,S,S (a,q,v) ,b,m,T,O -i,v,g,h,j ,b,m,S,P -i,a,k,t,j ,R ,a,k,j ,Q ,Q ,P ,P ,a,k,j ,c,b,P,T,u ,a , ,s,d,q,l,h,m ,k ,a,k,n,b,j ,b,m,U,V -i,a,k,j,j ,b,m,Q,P,R-i,v,g,h,j ,P ,Q ,R ,S ,T ,U ,V ,W 9 10 ,P ,Q ,R ,S ,T ,U ,V ,W 9 10 ,a,k,t ,a,k,t ,a,k,t ,a,k,t ,a,k,t ,a,k,t ,a,k,t ,a,k,t ,v,g,h ,P ,Q ,R ,S ,T ,U ,V ,W 9 10 ,P ,Q ,R ,S ,T ,U ,V ,W 9 10 ,h,m,e,q ,q,d,c @ ,q ,x,r @ ,q,d,b,d,h,u,d ,m,c @ ,h,m,c,h,b ,s,h,n,m @ ,o ,q,s,r -i,l,b,b,l,W,P,Xj ,o,n,v,d,q ,r,t,o,o,k,x ,b,h,q,b,t,h,s ,P ,c,b @ ,O,u ,b,m,P,O,O ,Q ,c,b,P,Q,u WI H BLK -i,a,q,v,j ,R ,c,b,V,u ,a,k,j ,b,m,P,O,P ,P ,P ,a,k,j -i,a,k,t,j ,Q ,Q ,g,d ,s ,d,w,b,g ,m,f,d,q ,r,d,m,r,n,q -i,s,b,j 12 12 ,b,m,P (WI) H -i,l,b,b,l,P,T,P,O-j C r o l P .

C board ont for indoor unit ,b,m,W,O -i,f,q,m,j ,P ,Q ,R ,b,m,P,O,R -i,f,q,m,j ,b,m,P,O,Q ,P ,P ,a,k,j -i,x,d,k,j ,Q ,Q ,a,k,j ,b,m,U,O -i,v,g,h,j ,b,m,P,O,S ,P ,P ,a,k,j -i,v,g,h,j ,Q ,Q ,a,k,j ,P ,Q W E R R O I D E M T E C N O O T R L L E R ,g,d ,s ,d,w,b,g ,m,f,d,q ,r,d,m,r,n,q -i,s,b,i,j ,s,g,d,q,l,n ,r,d,m,r,n,q -i,s ,j ,b,m,W,Q -i,a,k,t,j ,P ,Q ,R ,S ,T ,U ,b,m,W,P -i,a,k,j,j ,P ,Q ,R ,S ,T ,b,m,U,P -i,x,d,k,j ,P ,Q ,R ,S ,T ,U ,P ,Q ,R ,S ,T ,U ,P ,Q ,R ,S ,T ,U ,o,m,k / ,d,l,f ,n,o,s,h,n,m ,P ,Q ,R ,S HA RED WHI BLK 123 NOTE FM TA TC TCJ LM : Fan motor : Indoor temp.



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sensor : Temp. sensor : Temp. sensor : Louver motor Indoor unit earth screw Color Identification BLK BLU RED GRY PNK GRN WHI BRW ORN YEL : : : : : : : : : : BLACK BLUE RED GRAY PINK GREEN WHITE BROWN ORANGE YELLOW 123 Outdoor unit earth screw Serial signal Single phase 220V, 50Hz
LN 6 5. SPECIFICATIONS OF ELECTRICAL PARTS 5-1.

Indoor Unit High-Wall Type RAV-SM562KRT-E/RAV-SM802KRT-E No. 1 2 3 4 5 Parts name Fan motor (for indoor) Grille motor Thermo. sensor (TA-sensor) Heat exchanger sensor (TC-sensor) Heat exchanger sensor (TCJ-sensor) Type ICF340-30-X MF-340-30-X MP35EA12 268 mm Ø6 mm, 400 mm Ø6 mm, 400 mm 10 kW at 25°C 10 kW at 25°C Specifications Output (Rated) 30 W, 220240 V 7 6. REFRIGERANT R410A This air conditioner adopts the new refrigerant HFC (R410A) which does not damage the ozone layer. The working pressure of the new refrigerant R410A is 1.6 times higher than conventional refrigerant (R22). The refrigerating oil is also changed in accordance with change of refrigerant, so be careful that water, dust, and existing refrigerant or refrigerating oil are not entered in the refrigerant cycle of the air conditioner using the new refrigerant during installation work or servicing time. The next section describes the precautions for air conditioner using the new refrigerant. Conforming to contents of the next section together with the general cautions included in this manual, perform the correct and safe work. (6) When an air conditioning system charged with a large volume of refrigerant is installed in a small room, it is necessary to exercise care so that, even when refrigerant leaks, its concentration does not exceed the marginal level. If the refrigerant gas leakage occurs and its concentration exceeds the marginal level, an oxygen starvation accident may result. (7) Be sure to carry out installation or removal according to the installation manual. Improper installation may cause refrigeration trouble, water leakage, electric shock, fire, etc. (8) Unauthorized modifications to the air conditioner may be dangerous. If a breakdown occurs please call a qualified air conditioner technician or electrician.

Improper repair may result in water leakage, electric shock and fire, etc. 6-1. Safety During Installation/Servicing As R410A's pressure is about 1.6 times higher than that of R22, improper installation/servicing may cause a serious trouble. By using tools and materials exclusive for R410A, it is necessary to carry out installation/servicing safely while taking the following precautions into consideration. (1) Never use refrigerant other than R410A in an air conditioner which is designed to operate with R410A. If other refrigerant than R410A is mixed, pressure in the refrigeration cycle becomes abnormally high, and it may cause personal injury, etc. by a rupture. (2) Confirm the used refrigerant name, and use tools and materials exclusive for the refrigerant R410A. The refrigerant name R410A is indicated on the visible place of the outdoor unit of the air conditioner using R410A as refrigerant. To prevent mischarging, the diameter of the service port differs from that of R22. (3) If a refrigeration gas leakage occurs during installation/servicing, be sure to ventilate fully. If the refrigerant gas comes into contact with fire, a poisonous gas may occur. (4) When installing or removing an air conditioner, do not allow air or moisture to remain in the refrigeration cycle. Otherwise, pressure in the refrigeration cycle may become abnormally high so that a rupture or personal injury may be caused.

(5) After completion of installation work, check to make sure that there is no refrigeration gas leakage. If the refrigerant gas leaks into the room, coming into contact with fire in the fan-driven heater, space heater, etc., a poisonous gas may occur. 6-2. Refrigerant Piping Installation 6-2-1.

Piping Materials and Joints Used For the refrigerant piping installation, copper pipes and joints are mainly used. Copper pipes and joints suitable for the refrigerant must be chosen and installed. Fur 3/8 1/2 5/8 Outer diameter (mm) 6.35 9.52 12.70 15,88 Thickness (mm) 0.8 0.8 0.8 1.0 Dimension (mm) A 9.

1 13.2 16.6 19.7 B 9.2 13.5 16.0 19.0 C 6.5 9.7 12.

9 16.0 D 13 20 23 25 Flare nut width (mm) 17 22 26 29 10 Table 6-2-6 Flare and flare nut dimensions for R22 Nominal diameter 1/4 3/8 1/2 5/8 3/4 Outer diameter (mm) 6.35 9.52 12.70 15.88 19.05 Thickness (mm) 0.8 0.8 0.8 1.

0 1.0 Dimensiopposite side 4mm (6) Level vial (2) Torque wrench (11) Tape measure (7) Screwdriver (+, -) (3) Pipe cutter (12) Metal saw (8) Spanner or Monkey wrench Also prepare the following equipments for other installation method and run check. (3) Insulation resistance tester (1) Clamp meter (4) Electroscope (2) Thermometer 12 6-4. Recharging of Refrigerant When it is necessary to recharge refrigerant, charge the specified amount of new refrigerant according to the following steps. Recover the refrigerant, and check no refrigerant remains in the equipment. Connect the charge hose to packed valve service port at the outdoor unit's gas side. When the compound gauge's pointer has indicated - 0.1 Mpa (- 76 cmHg), place the handle Low in the fully closed position, and turn off the vacuum pump's power switch. Connect the charge hose of the vacuum pump adapter. Keep the status as it is for 1 to 2 minutes, and ensure that the compound gauge's pointer does not return.

Open fully both packed valves at liquid and gas sides. Set the refrigerant cylinder to the electronic balance, connect the connecting hose to the cylinder and the connecting port of the electronic balance, and charge liquid refrigerant. (For refrigerant charging, see the figure below.) Place the handle of the gauge manifold Low in the fully opened position, and turn on the vacuum pump's power switch. Then, evacuating the refrigerant in the cycle. 1. Never charge refrigerant exceeding the specified amount. 2. If the specified amount of refrigerant cannot be charged, charge refrigerant bit by bit in COOL mode. 3. Do not carry out additional charging. When additional charging is carried out if refrigerant leaks, the refrigerant composition changes in the refrigeration cycle, that is characteristics of the air conditioner changes, refrigerant exceeding the specified amount is charged, and working pressure in the refrigeration cycle becomes abnormally high pressure, and may cause a rupture or personal injury. (INDOOR unit) (Liquid side) (OUTDOOR unit) Opened (Gas side) Refrigerant cylinder (With siphon pipe) Check valve Closed Open/Close valve for charging Service port Electronic balance for refrigerant charging Fig. 6-4-1 Configuration of refrigerant charging 13 Be sure to make setting so that liquid can be charged. When using a cylinder equipped with a siphon, liquid can be charged without turning it upside down.

It is necessary for charging refrigerant under condition of liquid because R410A is mixed type of refrigerant.



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Accordingly, when charging refrigerant from the refrigerant cylinder to the equipment, charge it turning the cylinder upside down if cylinder is not equipped with siphon. [Cylinder with siphon] Gauge manifold OUTDOOR unit [Cylinder without siphon] Gauge manifold OUTDOOR unit Refrigerant cylinder Electronic balance R410A refrigerant is HFC mixed refrigerant. Therefore, if it is charged with gas, the composition of the charged refrigerant changes and the characteristics of the equipment varies. Fig.

6-4-2 6-5. Brazing of Pipes 6-5-1. Materials for Brazing (1) Silver brazing filler Silver brazing filler is an alloy mainly composed of silver and copper. It is used to join iron, copper or copper alloy, and is relatively expensive though it excels in solderability. (2) Phosphor bronze brazing filler Phosphor bronze brazing filler is generally used to join copper or copper alloy. (3) Low temperature brazing filler Low temperature brazing filler is generally called solder, and is an alloy of tin and lead. Since it is weak in adhesive strength, do not use it for refrigerant pipes. 1. Phosphor bronze brazing filler tends to react with sulfur and produce a fragile compound water solution, which may cause a gas leakage. Therefore, use any other type of brazing filler at a hot spring resort, etc.

, and coat the surface with a paint. 2. When performing brazing again at time of servicing, use the same type of brazing filler. 6-5-2. Flux (1) Reason why flux is necessary 1.By removing the oxide film and any foreign matter on the metal surface, it assists the flow of brazing filler. 2.In the brazing process, it prevents the metal surface from being oxidized. 3.By reducing the brazing filler's surface tension, the brazing filler adheres better to the treated metal.

14 Refrigerant cylinder Electronic balance Siphon (2) Characteristics required for flux 1.Activated temperature of flux coincides with the brazing temperature. 2.Due to a wide effective temperature range, flux is hard to carbonize. 3.

It is easy to remove slag after brazing. 4.The corrosive action to the treated metal and brazing filler is minimum. 5.It excels in coating performance and is harmless to the human body.

As the flux works in a complicated manner as described above, it is necessary to select an adequate type of flux according to the type and shape of treated metal, type of brazing filler and brazing method, etc. (3) Types of flux Noncorrosive flux Generally, it is a compound of borax and boric acid. It is effective in case where the brazing temperature is higher than 800°C. Activated flux Most of fluxes generally used for silver brazing are this type. It features an increased oxide film removing capability due to the addition of compounds such as potassium fluoride, potassium chloride and sodium fluoride to the borax-boric acid compound. (4) Piping materials for brazing and used brazing filler/flux 6-5-3. Brazing As brazing work requires sophisticated techniques, experiences based upon a theoretical knowledge, it must be performed by a person qualified. In order to prevent the oxide film from occurring in the pipe interior during brazing, it is effective to proceed with brazing while letting dry Nitrogen gas (N₂) flow. Never use gas other than Nitrogen gas. (1) Brazing method to prevent oxidation 1.

Attach a reducing valve and a flow-meter to the Nitrogen gas cylinder. 2. Use a copper pipe to direct the piping material, and attach a flow-meter to the cylinder. 3. Apply a seal onto the clearance between the piping material and inserted copper pipe for Nitrogen in order to prevent backflow of the Nitrogen gas. 4. When the Nitrogen gas is flowing, be sure to keep the piping end open. 5. Adjust the flow rate of Nitrogen gas so that it is lower than 0.05 m³/Hr or 0.02 MPa (0.2kgf/cm²) by means of the reducing valve. 6. After performing the steps above, keep the Nitrogen gas flowing until the pipe cools down to a certain extent (temperature at which pipes are touchable with hands). 7.

Remove the flux completely after brazing. Piping material Used brazing filler Used flux Do not use M Flow meter Paste flux Vapor flux Nitrogen gas cylinder From Nitrogen cylinder Stop valve Copper - Copper Phosphor copper Copper - Iron Iron - Iron Silver Silver 1. Do not enter flux into the refrigeration cycle.

2. When chlorine contained in the flux remains within the pipe, the lubricating oil deteriorates.

Therefore, use a flux which does not contain chlorine. 3. When adding water to the flux, use water which does not contain chlorine (e.g. distilled water or ion-exchange water). 4. Remove the flux after brazing. Pipe Nitrogen gas Rubber plug Fig. 6-5-1 Prevention of oxidation during brazing 15 7. INDOOR UNIT CONTROL 7-1.

Indoor Control Circuit Main (Sub) master remote controller (Wired) Display LCD Display LED CPU Function setup CPU Key switch CN2 CN1 Key switch Weekly timer Display LCD LCD driver Function setup Max. 8 units are connectable.*1 *1 When group and twin combination. main remote controller shall be connected follower indoor unit *2 Weekly timer is not connectable to the sub remote controller. *2 Remote controller communication circuit DC5V Power circuit Power circuit DC5V Secondary battery Sold separately Sold separately Indoor unit #1 Header unit Indoor control P board (MCC-1510) .C. Central control remote controller (Sold separately) U3 U4 Central control communication circuit DC20V DC12V Receiver and Display P.C board (MCC-819) Receiver unit Display LED DC5V Buzzer Driver Driver A B Follower unit #2 A B #3 A B Remote controller communication circuit EEPROM TA sensor CPU H8/3039 TC sensor TCJ sensor Same as the left Same as the left HA Louver motor Outside output Run Warning Ready Thermo. ON Cool Heat Fan AC synchronous signal input circuit Serial send/ receive circuit Indoor fan motor DC280V Fan motor control Power circuit circuit DC15V Wireless remote signal Setting (A/B) 123 123 Outdoor unit Outdoor unit 123 123 Outdoor unit 16 INDOOR UNIT CONTROL CIRCUIT (Continued) 7-2. Control Specifications Overview of specifications (1) Identification of outdoor unit Identifies outdoor unit at power-on reset, and switches control according to the identification result.

(2) Setting of indoor unit fan speed and adjustment of air flow direction Switches indoor unit fan speed, setting of air flow direction adjustment, etc. based on EEPROM data. (1) Switches operation mode according to mode select instruction from remote controller. R/C instructions Outline of control Turns OFF air conditioner OFF FAN COOL DRY HEAT AUTO "Fan only" operation Cooling operation Dehumidifying operation Heating operation · Selects COOL or HEAT mode automatically according to Ta, Ts, and To. · The first operation is as follows according to Ta.

(COOL thermo sensor continues OFF (FAN mode with set fan speed) within the range of Ts +-1<Ta< Ts ++1.



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) COOL operation NO. Item 1 Control at power-on reset Remarks The "PREPARING" lamp lights during initial setting (model recognition) after power-on reset. Fan speed, adjustment of air flow direction 2 Operation mode switching Ta : Room temperature Ts : Set temperature To : Outside air temperature +1.0 Ta Ts+ () -1.

0 FAN mode with set fan speed HEAT operation · is corrected according to outside air temperature. Outside air temp. Corrected value () No To 0K To>24°C -1 K = 24>To>18°C 0K = To<18°C Abnormal To +1 K 0K k=deg (2) Operation instruction permission mode HEAT and AUTO modes are not available for COOL only models. When instruction is issued from wireless remote controller in the HEAT or AUTO mode, it is indicated by a reception sound "pi, pi" and by alternate blinking of "TIMER" and "PREPARING" lamps. To cancel this alternate blinking, issue an instruction of mode other than HEAT or AUTO. 3 Room temperature (1) Adjustment range Remote controller set temperature (°C) control COOL/DRY HEAT AUTO Wired type 18 - 29 18 - 29 18 - 29 Wireless type 17 - 30 17 - 30 17 - 30 * When use of remote controller sensor is set (with DN32), even when sensor value is within the above range in HEAT or AUTO mode, the thermo sensor turns OFF when Ta sensor value exceeds 35 °C. 17 NO. Item Overview of specifications Room temperature (2) The set temperature for HEAT operation can be corrected by code 3 control No. 06. Set data 0 2 4 6 Correction of set temp.

+0°C +2°C +4°C +6°C Factory setting Set data 2 Remarks Heat intake temperature shift (When unit's temperature sensor is used) * When use of remote controller sensor is set (with DN32), no correction is performed. 4 Capacity auto control (GA control) (1) Issues instruction of operating frequency to outdoor unit according to the difference between Ta and Ts. (2) COOL operation Calculates room temp. difference between Ta and Ts as well as room temp. variation every 90 seconds to find correction value of specified operating frequency and to correct the current operating frequency. Ta(n)Ts(n) : Room temp. difference n : Number of detection times Ta(n-1)Ta(n) : Room temp. variation n1 : Number of detection times (90 seconds before) (3) HEAT operation Calculates room temp. difference between Ta and Ts as well as room temp. variation every 60 seconds to find correction value of specified operating frequency and to correct the current operating frequency.

Ts(n)Ts(n) : Room temp. difference n : Number of detection times Ta(n)Ta(n_1) : Room temp. variation n1 : Number of detection times (60 seconds before) (4) DRY operation The frequency correction control is the same as that for COOL operation. However, the maximum frequency is limited to S6 or so. Note) When LOW fan speed is set, the maximum frequency is limited to SB or so.

5 COOL/HEAT/AUTO control (1) Switching between COOL and HEAT is determined based on the following control. Ta (°C) +1.5 Tsc or Tsh -1.5 COOL After 10 minutes pass from thermo sensor OFF, operation mode changes (COOL ON) from HEAT (thermo sensor OFF) to COOL if Ta exceeds (COOL OFF) Tsh +1.5.

HEAT () shows an example of COOL ON/OFF. After 10 minutes pass from thermo sensor OFF, operation mode changes from COOL (thermo sensor OFF) to HEAT if Ta lowers below Tsc -1.5. Tsc : COOL set temp. Tshc : HEAT set temp. + room temp. control/ correction (2) The GA control after determination of operation mode follows the description in No. 4. (3) The room temperature control and temperature correction follow the descriptions in No. 3 and No.

15. 18 INDOOR UNIT CONTROL CIRCUIT (Continued) NO. Item 6 Fan speed control Overview of specifications (1) A fan speed HH (quick high), H (high), L (low) or AUTO is selected according to the instruction from remote controller for FAN mode operation. (2) Fan speed is switched according to the difference between Ta and Ts in the AUTO mode. [Cooling] Ta (°C) +3.0 +2.5 +2.0 +1.5 +1.0 +0.

5 Tsc -0.5 A HH (HH) H+(HH) H(HH) L+(H+) L(H) L(L+) F G E B C D Remarks HH>H+>H> L+>L>UL Wireless type allows HH, H+, H, L+, L, and AUTO. HH H+ H L+ L · The fan speed control is the same for temperature setting by remote controller or the unit. · Once fan speed is changed, it remains unchanged for 3 minutes unless different fan speed is selected by instruction. · At the beginning of cooling, a falling gradient (higher fan speed) is selected.

· When the temperature difference between Ta and Ts is on a threshold line, fan speed does not change. · () : Auto cooling [Heating] Ta (°C) (-0.5) (0) (+0.5) -1.0 Tsh +1.

0 H+ (HH) (+1.0) (+1.5) (+2.0) +2.0 +3.0 +4.0 HH (HH) L(L+) L+(H) H(H+) D E C B A () : Temperature setting by remote controller Other than () : Temperature setting by unit · Once fan speed is changed, it remains unchanged for one minute unless different fan speed is selected by instruction. · At the beginning of heating, a rising gradient (higher fan speed) is selected. · When the temperature difference between Ta and Ts is on a threshold line, fan speed does not change. · () : Auto heating · Fan speed is switched to a higher level when Tc reaches 60 °C.

Tc : Indoor unit heat exchange sensor temp. 19 NO. Item 6 Fan speed control Overview of specifications COOL HH H+ H L+ L UL L+ L UL HEAT HH H+ H AP40-56 1220 1180 1140 1120 1060 1060 990 940 500 AP63 1360 1300 1240 1200 1120 1120 1020 970 500 AP71-80 1480 1340 1320 1300 1200 1200 1100 1040 500 Remarks (3) When thermo sensor turns OFF during heating, the fan speed mode becomes UL (weak). (4) When Ta is 25 °C or above at the beginning of HEAT operation or when canceling defrost mode, H or HH mode continues for one minute from the time when Tc enters zone E shown in the figure in No.7 below. (5) The HH fan speed for auto cooling/heating is set to a speed higher than that for normal cooling/heating. However, it varies depending on the temperature difference of Tc during auto heating. Tc (°C) 47 HH+ 42 HH "HEAT PREPARING" indication 7 Cool air prevention (1) Performs indoor unit fan control in the HEAT mode according to control the Tc (or Tcj) sensor detect temperature. The maximum speed is limited as shown below. Shifts Tc control value by +6 °C Tc (°C) during defrosting.

However, zone Tcj HH B is regarded as zone C after 6 36 minutes pass from the startup of H compressor. 34 L 32 30 OFF 24 20 Fan speed select setting by remote controller takes precedence in zones D and E. "HEAT PREPARING" is indicated in zones A and B. Zone E Zone D Zone C Zone B Zone A UL 20 INDOOR UNIT CONTROL CIRCUIT (Continued) NO. Item 8 Freezing prevention control (low-temp.

release) Overview of specifications (1) Performs the following operation control in the COOL or DRY mode according to the Tc (or Tcj) sensor detect temperature.



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When zone J in the figure below is detected for 6 minutes, the specified operating frequency is decreased from the actual operating frequency, and the specified operating frequency is changed every 30 seconds in zone J. Timer count stops and is maintained in zone K. Timer count is cleared to restore normal operation when zone I is detected. If the specified operating frequency becomes SO due to continuation of zone J, return temperature A is raised from 5 to 12 °C, and operation with L fan speed continues until zone I is detected.

Tc(°C) 5 I K 2 J A Remarks Tcj : Indoor unit heat exchange sensor temp. If 4-way valve cannot be switched during heating and the following conditions become true, freezing prevention control is performed. (However, zone J entering control temperature is changed from 2 to -5 °C.) [Conditions] The following A or B becomes true after 5 minutes pass from operation start. $A T_{cn} < T_c(n-1)5 = B T_{cn} < T_c(n-1)1$ and $T_{cn} < T_a < 5^{\circ}C = 9$ High-temp. release (1) Performs the following operation control in the HEAT mode control according to the Tc (or Tcj) sensor detect temperature. · When zone M is detected, the specified operating frequency is decreased from the actual operating frequency, and the specified operating frequency is changed every 30 seconds in zone M. · The specified operating frequency is maintained in zone N. · When zone L is detected, the specified operating frequency is returned by approx. 6 Hz every 60 seconds.

Tc (°C) Factory setting Control temp. (°C) Tcj M N B L Tcn : Tc after 5 minutes from operation start Tc (n-1): Tc at operation start This control is disabled for twin follower indoor units. A 56 (54) B 52 (52) A Note) At the beginning of operation or when Tc (or Tcj) lowers below Even when the thermo is 30 °C after operation start, values (54) and (52) in the table are set to OFF, the control is implemented in the same used as control temperature. way. 10 Residual heat removal Runs indoor unit fan in L (low) mode for about 30 seconds after HEAT operation stops to remove residual heat. 21 NO. Item 11 Flap control

Overview of specifications (1) During the first operation after power on, flap position is controlled automatically according to operation mode (COOL/HEAT). Cooling Heating Remarks Louver angle: 0 °C (full close) Full close 45° 103° 0° (2) When louver position is controlled by remote controller, the unit's microcomputer memorizes the position for use in the next operation. * The memorized louver position is cleared when power is turned off, and returns to the state of (1) above. (3) Flap position setting · Flap position can be set within the range below.

COOL/DRY HEAT/FAN Alarm : A code number (except F08 and L31) appears on the remote controller and the indoor unit stops. · Flap position can be set collectively or individually in the group twin or triple operation mode. (Wireless remote controller allows individual setting only.) (4) Swing setting · Flap moves within the range below. All operation modes · Flap swing range can be set collectively or individually in the group twin or triple operation mode.

(Setting by wireless remote controller is disabled when the main remote controller is used.) (5) When air conditioner operation stops, flap closes automatically. It keeps its position in the event of an alarm. (6) Flap tilts upward automatically during preparation for heating. (7) In the twin or triple operation mode selected by wireless remote controller, swing setting interlocks with the header indoor unit.

If this setting is transmitted from a follower indoor unit, operation does not change with a reception sound "pi, pi, pi" if operation mode differs between header unit and follower unit. 22 INDOOR UNIT CONTROL CIRCUIT (Continued) Item NO. 12 HA control Overview of specifications (1) When connected to a remote control system (tele-control or remote on/off interface), operation ON/OFF can be controlled by the HA signal input. (2) Outputs operation

ON/OFF status to the HA output terminal. (3) HA signal input/output specifications conform to the JEMA standard. Remarks A connector (separately available) is required when using the HA terminal CH61 for remote ON/OFF control. When group operation is in use, connect the connector to either header or follower indoor unit. 13 Filter sign indication (unavailable for wireless type) (1) Transmits filter replacement signal to remote controller for indication on the LCD when accumulated operation hours of indoor unit fan exceeds the specified time (150 hours). (2) Clears accumulation timer upon receiving the filter reset signal from remote controller. At this time, when the specified time has already passed, the accumulated time is reset and the filter sign disappears from the LCD.

"FILTER" lamp ON 23 NO. Item 14 Central control mode switching Overview of specifications (1) The scope of operation by remote controller on the indoor unit side can be switched by the setting of remote controller. (2) Scope of operation by remote controller on the indoor unit side [Individual] : All settings and ON/OFF operations are available. [Central 1] : ON/OFF operations are disabled. [Central 2] : ON/OFF operations, operation mode selection, and temperature setting are disabled. [Central 3] : Operation mode selection and temperature setting are disabled. [Central 4] : Operation mode selection is disabled. Remarks No indication "CENTRAL CONTROL" lamp ON "CENTRAL CONTROL" lamp ON "CENTRAL CONTROL" lamp ON "CENTRAL CONTROL" lamp ON When wired remote controller is not used, operation range is the same as above though lamp indication remains unchanged. If an unavailable operation mode is transmitted from wireless remote controller, it is indicated with a reception sound "pi, pi, pi, pi, pi". 15 Power-saving control

(1) Power-saving operation is available in the AUTO mode. (2) The set temperature is corrected using various sensor data within the range where comfort is maintained. (3) By using various sensor data including room temp. Ta, outside air temp. To, fan speed, and indoor unit heat exchange sensor temp. Tc, 20-minute data is averaged to calculate a set temperature correction value.

(4) The set temperature is corrected every 20 minutes with the following shift range. Cooling : +1.5 to -1.0K Heating : -1.5 to +1.

OK (1) This control is performed when AUTO mode is selected. (2) COOL mode: When To is under 28 °C, the control is as follows. Ta(°C) Normal control +4 +3 Tsc 16 Maximum frequency limit control Maximum frequency is limited to the rating of cooling. (3) HEAT mode: When To is over 15 °C, the control is as follows. Ta(°C) Tsh -3 -4 Maximum frequency is limited to the rating of heating. Normal control 24 INDOOR UNIT CONTROL CIRCUIT (Continued) 7-3.



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P C. Board of Indoor Unit . MCC-1510 TC sensor CN101, DC5V TCJ sensor CN102, DC5V Microcomputer run LED D02 EEPROM IC10 Indoor unit - outdoor unit wire CN67, AC200V HA (T10) CN61, DC12V Option output CN60, DC12V CHK CN71, DC5V DISP CN72, DC5V Optional power supply CN309, AC200V Central control CN40, DC 5V External alarm input CN80, DC12V EXCT CN73, DC5V R/C power LED D203 TA sensor CN104, DC5V Remote controller CN41, DC20V FAN DRIVE CN32, DC12V Louver CN33, DC12V DC fan input/output CN210 Indication output/wireless reception CN213, DC5V Terminating resistor provided/not provided Remote controller A/B selection SW01 25 Function Pin No. Bit 1 Factory setting OFF: No terminating resistor ON for one unit when performing central control by custom air conditioner only.

Bit 2 A B DC12V Output ON/OFF input OV (COM) R/C prohibition input Operation ON output DC12V (COM) Alarm output DC12V (COM) Defrost output Thermo sensor ON output COOL output HEAT output FAN output DC12V (COM) DC12V (COM) Filter/option/external alarm input ON while outdoor unit is defrosting ON when thermo sensor is ON (compressor ON) ON in cooling mode (COOL/DRY/auto cooling) ON in heating mode (HEAT/auto heating) ON while indoor unit fan is ON Factory setting: External alarm input setting (DN: 2A=2) Indicates alarm code "L30" when an alarm continues for one minute and performs forcible operation OFF. (DN: 2A=1) Performs option alarm input control (indication of unit protection attached externally). * Remote control performs setting of option alarm input controller. ON during alarm Enables/disables operation OFF by remote controller using the R/C prohibition input. ON during operation (answerback of HA) A B C D E F A B C D E F A B C Specification OFF: No terminating resistor ON: Terminating resistor provided OFF: R/C A, ON: R/C B Connector No. Description Terminating resistor Remote controller A/B SW01 Ventilation output CN32 Factory setting OFF: Remote controller A Factory setting: Interlocking with indoor unit operation ON/OFF * Single operation setting is performed with VENT button on the remote controller (DN=31). HA ON/OFF input (J01: input/no input=pulse (factory setting) / static input changeover) HA CN61 Option output CN60 7-4. Optional Onboard Connector Specifications 26 A Check mode input OV Display mode input OV Demand input OV B A B A B External alarm input CN80 CHK Operation check CN71 Used for checking indoor unit operation. (Outputs specified operations such as indoor unit fan speed H, without communication with outdoor unit or remote controller.) DISP mode enables communication only between indoor unit and remote controller.

(at power on) Timer short-circuited (always) Turns OFF indoor unit thermo sensor forcibly. DISP DISP mode CN72 EXCT Demand CN73 9 8.

Troubleshooting 1. Guide to Troubleshooting [Wired Remote Controller Type] (1) Before starting troubleshooting (a) Necessary tools/measuring equipment · Phillips screwdrivers, flat-blade screwdrivers, wrenches, pliers, nipper, etc. · Multimeter, thermometer, pressure gauge, etc.

(b) Precheck A The following operations are normal. 1) Compressor does not work. · Is 3-minute delay operation functioning? (for 3 minutes after compressor OFF) · Is thermo sensor OFF? · Is FAN mode or TIMER mode operation going? · Is water overflow alarm detected? · Is high outside air temperature operation control working during heating? 2) Indoor unit fan does not work. · Is cool air prevention control working during heating? 3) Outdoor unit fan does not work or its fan speed changes. · Is high-temp. release operation control working during heating? · Is low outside air temperature operation control working during cooling? · Is defrosting operation going? 4) Operation ON/OFF by remote controller is disabled. · Is any remote controller or external control working? · Is auto address setting in progress? (At the first power on or when indoor unit address is changed, operation control is disabled for about 5 minutes after power on.) B Are all cables/wiring set in the initial state? C Are indoor unit and remote controller connected correctly? (2) Troubleshooting procedure When an error occurs, check the unit in the following procedure. Error Check indication of check code Check faulty location and parts (Note) Other than the check items in the table, malfunction or wrong diagnosis of microcomputer due to effect of power or external noise is considered. If there is any source of noise, shield the remote controller wiring.

[Wireless Remote Controller Type] (1) Before starting troubleshooting (a) Necessary tools/measuring equipment · Phillips screwdrivers, flat-blade screwdrivers, wrenches, pliers, nipper, etc. · Multimeter, thermometer, pressure gauge, etc. (b) Precheck A The following operations are normal. 1) Compressor does not work. · Is 3-minute delay operation functioning? (for 3 minutes after compressor OFF) · Is thermo sensor OFF? · Is FAN mode or TIMER mode operation going? · Is high outside air temperature operation control working during heating? 2) Indoor unit fan does not work. · Is cool air prevention control working during heating? 27 Outdoor unit fan does not work or its fan speed changes. Is high-temp. release operation control working during heating? Is low outside air temperature operation control working during cooling? Is defrosting operation going? Operation ON/OFF by remote controller is disabled. Is forcible operation OFF mode set? Is any remote controller or external control working? Is auto address setting in progress? (At the first power on or when indoor unit address is changed, operation control is disabled for about 5 minutes after power on.) B Are all cables/wiring set in the initial state? C Are indoor unit and receiver unit connected correctly? 3) · · · 4) · · · (2) Troubleshooting procedure When an error occurs, check the unit in the following procedure. Error Check indication of lamps Check faulty location and parts (Note) Other than the check items in the table, malfunction or wrong diagnosis of microcomputer due to effect of power or external noise is considered. If there is any source of noise, shield the signal lines. (a) Outline of judgment The following describes the primary judgment of locating faulty unit (indoor unit or outdoor unit). (In the case of group control operation, the header unit also indicates errors of follower unit by lamp.) Judging from lamp status of indoor unit The indoor unit monitors the operating status of air conditioner.

When the protection circuit is activated, the indoor unit indicates the following self-diagnosis contents. : OFF Lamp indication OPERATION TIMER PREPARING : ON : Blinking (0).



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5 seconds interval) Possible causes Check code Power OFF Poor connection/contact between receiver/indication unit and indoor unit control board Reception error Wired remote Transmission error controller Communication error Duplication of indoor unit No. Duplication of remote controller header Wrong connection or poor contact between wired remote controller and indoor unit Invalid setting All OFF E01 E02 OPERATION TIMER PREPARING Blinking E03 E08 E09 E18 Poor connection/contact between indoor units or indoor unit power OFF (Communication error between header and follower indoor units or between twin header and follower indoor units) Wrong connection or poor contact between indoor unit and outdoor unit (Communication error between indoor and outdoor units) OPERATION TIMER PREPARING E04 Blinking P12 OPERATION TIMER PREPARING Failure of indoor unit DC fan (Protection device of indoor unit is activated.) Alternate blinking 28 Troubleshooting (Continued) Outline of judgment (Continued) Lamp indication Check code P03 P04 OPERATION TIMER PREPARING Possible causes (*) Protection device Abnormal outdoor unit discharge of outdoor unit is temperature activated.

Outdoor unit high-pressure system error Four-way valve system error (judged by indoor unit) Outdoor unit: Malfunction of fan Outdoor unit: Inverter Idc activated Protection device of Outdoor unit: Position detect error outdoor unit is activated. Header and follower indoor units in the group are not running due to the following alarm. (Alarm code: E03, L03, L07, L08) Heat exchange sensor (TCJ) error Indoor unit sensor error Heat exchange sensor (TC) error Room temperature sensor (TA) error P19 P22 Alternate blinking P26 P29 P31 OPERATION TIMER PREPARING F01 F02 F10 Alternate blinking OPERATION TIMER PREPARING F04 F06 F08 Discharge temperature sensor (TD) error Temperature sensor (TE, TS) error Outside air temperature sensor (TO) error (*) Outdoor unit sensor error Alternate blinking OPERATION TIMER PREPARING F29 Failure of indoor unit EEPROM Simultaneous blinking OPERATION TIMER PREPARING H01 H02 H03 Blinking OPERATION TIMER PREPARING Compressor breakdown Compressor locking Current detect circuit error Outdoor unit low-pressure system error Duplication of header indoor unit Group connection indoor unit for individual indoor unit Group address not set No setting (indoor unit capacity) (*) Outdoor unit compressor system error H06 L03 L07 L08 L09 Auto address *If group configuration or address at power on is invalid, the unit enters address setting mode automatically. Others Simultaneous blinking OPERATION TIMER PREPARING L20 L29 L30 L31 Duplication of indoor unit collective address Other errors of outdoor unit (*) External interlock error Phase sequence error Simultaneous blinking (*) Check code detected by outdoor unit is a typical example. It varies with outdoor unit of combination.

For details, see the Service Guide of applicable outdoor unit. 29 Others (Excluding check code) Lamp indication OPERATION TIMER PREPARING Check code Possible causes Trial operation in progress Simultaneous blinking OPERATION TIMER PREPARING Invalid setting (Auto cooling/heating setting for auto cooling/heating unavailable unit or heating setting for cool only unit) Alternate blinking Error mode detected by remote controller or central controller Check code No indication (remote controller disabled) Diagnosis function Possible causes Air conditioner status No communication with OFF header indoor unit Remote controller is not connected correctly. Indoor unit is not powered on. Auto address setting is not completed. No communication with header indoor unit Disconnection between remote controller and header indoor unit (detected by R/C) Signal transmission error to indoor unit (detected by R/C) OFF (auto reset) *Operation continues under central control Conditions Judgment and action Failure of remote controller power supply or indoor unit EEPROM 1. Check remote controller wires. 2. Check remote controller. 3. Check indoor unit power wiring.

4. Check indoor unit P. C. board. 5. Check indoor unit EEPROM and insertion into socket. ... Auto address repetition occurs. Remote controller signal reception error 1. Check remote controller wires. 2. Check remote controller. 3. Check indoor unit power wiring. 4. Check indoor unit P. C. board.

Remote controller transmission error 1. Check remote controller transmitter. ... Replace remote controller. 1. Check for multiple remote controller headers. ..

. One header only, others are follower R/C. 1. Check central control network address setting. E01 *2 Indicated when an error is detected E02 E09 OFF (auto reset) *Operation continues under central control Multiple remote controller OFF (Follower R/C headers (detected by R/C) continues operation) Duplication of indoor unit collective address during communication of central control system (detected by indoor unit/ central controller) Failure of central control communication circuit (detected by central controller) OFF (auto reset) Indicated when an error is detected Indicated when an error is detected L20 Central controller L20 *3 Central controller (Transmission) C05 (Reception) C06 Central controller P30/b7 Indicated when an error is detected Operation Indicated when an continues (following error is detected R/C) 1. Check communication line, wrong connection, and indoor unit power supply. 2. Check communication circuit (U3, U4, XY terminals). 3. Check central controller (including central control R/C).

4. Check terminating resistors (TCC-LINK). Check the unit's check code with remote controller Failure of indoor unit group Continue/OFF (depending on follower unit. @@@@ @@@@ Indoor unit capacity is not set. @@@@ @@@@ Group follower unit is abnormal.

(R/C indicates unit No. @@@@ @@@@ This table does not include check codes detected by outdoor unit or thermal storage unit. ON, Blinking, OFF, Alternate:

Two LEDs blink alternately, Simultaneous: Two LEDs blink simultaneously (Main errors detected by outdoor unit) A/C operation Main faulty location Blinking Simultaneous Alternate Alternate Alternate Compressor breakdown Compressor locking Current detect circuit error Low-pressure system error Simultaneous Simultaneous Alternate Alternate Alternate Alternate Alternate Position detect error Inverter Idc activated Outdoor unit fan alarm High-pressure system error Abnormal outdoor unit discharge temperature Phase sequence error or others Other outdoor unit errors When compressor locking is detected When abnormal current is detected by AC-CT or when phase loss is detected Ps pressure sensor error. Low-pressure protection circuit is activated.

Other outdoor unit errors 1) MCU communication error between PDU and CDB, 2) IGBT heatsink temp. @@@@ Outdoor unit outside air temp. @@@@ @@@@ Check remote controller wiring.



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@@@· Check outdoor unit boards and wiring. 2. @@@@I. Set indoor unit capacity (DN=11) 1. Check external devices. 2. Check indoor unit boards. 1.

Position detect error 2. Overcurrent protection circuit operation of indoor unit fan driver 3. Indoor unit fan lock 4. Check indoor unit boards. 1. Check 4-way valve. 2. Check 2-way valve/check valve. 3. Check indoor unit heat exchanger (TC/TCJ).
4. Check indoor unit boards. 1. Judging follower unit when header unit is E03, L03, L07 or L08 2. Check indoor unit boards.
1. Check TCJ. 2. Check indoor unit boards. 1.

Check TC. 2. Check indoor unit boards. 1. Check TA. 2. Check indoor unit boards. 1. Check indoor unit EEPROM and insertion into socket. 2.

Check indoor unit boards. 1. Check remote controller wiring. 2. Check indoor unit power wiring. 3. @@@@OFF Compressor does not work.
@@@Check power voltages (200±20 VAC). 2. Freezing cycle overload operation 3.
Check current detect circuit on the AC side. 1. Failure of compressor (lock, etc.) ..
. Replace the compressor. 2. Improper compressor wiring (phase loss) 3. Lost-phase operation of power supply (3-phase models) 1.
Operation stops soon when restarted. ... Check IPDU. 2. @@I. Check freezing cycle (gas leakage). 2. Check low-pressure switch circuit.

3. Check outdoor unit CDB board. 1. Check CDB/IPDU wiring. 2. @@Check phase sequence, reverse phase, and phase loss. 2. Check outdoor unit boards.
3. Check high-pressure switch.
4. Check high-pressure switch circuit wiring. 1. Check freezing cycle (gas leakage). 2.
Failure of electronic expansion valve 3. Check piping sensor (Td). 1. Freezing cycle overload operation 2. Check outdoor unit TE sensor.

3. Check outdoor unit CDB board. 4. Check high-pressure switch and circuit. 1. Position detect error 2. @@Outdoor unit fan lock 4. Check outdoor unit CDB board. 1. Operation stops soon when restarted.

... Compressor partial short-circuit 2. Check IPDU for improper wiring. 1. @@...Replace IPDU.
1. Check TD. 2. Check outdoor unit CDB board. 1.
Check TE, TS. 2. Check outdoor unit CDB board. 1. Check TO.

2. @@@sensor TE, TS Improper mounting, disconnection or short-circuit of outdoor unit outside air temp. sensor TO Operation continued Indicated when an error is detected Indicated when an error is detected Indicated when an error is detected Indicated when an error is detected Indicated when an error is detected
F04 F06 F08 *1 ROA-P*** is not detected by IHS models. Fan continues rotating in a failure mode detected by outdoor unit because there is no communication between outdoor unit and follower indoor unit in twin group. 34 Troubleshooting (Continued) 2. Troubleshooting by Remote Controller
Check Indication Main Remote Controller (RBC-AMT31E) (1) Checking When an error occurs in the air conditioner, a check code and an indoor unit number appear on the LCD of remote controller. Check code is displayed only during operation. If indication disappears, check errors following "Checking Error Log" below. Check code Faulty indoor unit No. (2) Checking Error Log When an error occurs in the air conditioner, error log can be checked following the steps below.

Up to 4 errors are memorized. Error log can be checked in both operation ON and OFF states. Step Operation Press [SET] and [TEST] at the same time for 4 seconds or more. The LCD indication changes as shown below. Indication of "SERVICE CHECK" shows that the unit is in the error log mode. · Code No. "01" (order of error log) is displayed. · A check code is displayed. · The address of faulty indoor unit is displayed in the UNIT No. area.
Each pressing of TEMP. / buttons displays stored error log sequentially. Check code "01" shows the latest error, and "04" shows the oldest. Note Do not press [CL] as this button clears entire error log of indoor unit. After checking the error log, press [TEST] to return to the normal indication.
A B C Numbers appearing on the LCD <Seven-segment display> Hexadecimal number 35 TCC-LINK Central Control Remote Controller (TCB-SC642TLE)
(1) Checking When an error occurs in the air conditioner, a Indication of unit number check code and an indoor unit number appear on UNIT No. the LCD of remote controller. Check code is displayed only during operation. Alternate blinking R.C.
No. If indication disappears, check errors following "Checking Error Log" below. Indication of alarm CHECK (2) Checking Error Log When an error occurs in the air conditioner, error log can be checked following the steps below. Up to 4 errors are memorized. Error log can be checked in both operation ON and OFF states. A Press [SET] and [TEST] at the same time for 4 seconds or more. B Indication of "SERVICE CHECK" and UNIT No. "01" appear. C When selecting a group number (blinking), a unit number and the latest error log, if any, are displayed alternately. * Temperature setting is disabled at this time.

Indication of unit number UNIT No. Alternate blinking R.C. No. Indication of alarm CHECK D To check other errors, choose a code (01 to 04) with TEMP. / buttons. E To check error log of another group, choose a group number with / buttons. Do not press [CL] as this button clears entire error log of the selected group. F Press [TEST] to finish the service check. 36 Troubleshooting (Continued) 3.

Troubleshooting for Each Check Code Check code [E01] (New code) Check code name I/U - R/C communication error (detected by R/C) Possible causes
AImproper R/C wire connection BFailure of I/U power supply CFailure of I/U board DInvalid R/C address setting EFailure of R/C board Are R/C wires A/B correct? YES NO Correct R/C wires. Improper harness connection from I/U terminal block? NO Group control operation? YES YES Correct connector connection. Check circuit wiring. NO Are all indoor units powered ON? @@18VDC NO Check I/U boards. @NO YES Correct one header/one follower.
(R/C address connector) Check R/C board. @@cable between R/C and I/U connected properly? @@Check communication wiring of R/C A and B.
@@@YES NO Is group address set correctly? YES Are 1/2/3 wires normal? YES Are connectors from I/U and O/U connected normally? YES Is I/U switch SW02 setting correct? @@(0-140 VDC) * Measure within 20 seconds YES from power on. Is 280VDC NO applied across IPDU main circuit capacitor? YES Is 280VDC supplied to CDB? (CN03) YES Is 7VDC supplied to CDB? Is CN06-CN800 connection normal? YES Is case thermo sensor connected? (CN500) YES Is case thermo sensor working? YES Check I/U boards. ® Replace defective board.
Check and correct refrigerant volume. NO NO NO NO Check MCC-1510 board. Replace it if necessary. @@@@ Replace it if necessary. Check CDB.
@@(R/C address connector) NO Check R/C board. Replace it if necessary. @@YES Improper harness connection from I/U terminal block? NO Is I/U switch SW02 setting correct? Bit 1, 2: OFF YES NO Correct R/C wire connection. YES Correct connector connection. Check circuit wiring.

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NO Correct switch setting on MCC-1510 board. NO Group control operation? YES Are all indoor units powered ON? YES NO Twin or triple control? YES Improper signal connection between I/U and O/U? NO YES Correct signal wire connection between I/U and O/U. Check MCC-1510 board. Replace it if necessary. NO Check I/U power connection (power off and on). 40 Troubleshooting (Continued) Check code [F01] (New code) Check code name I/U sensor TCJ error I/U sensor TCJ error Possible causes Is TCJ connector CN102 connected normally? YES NO Correct connector connection. Is TCJ resistor characteristic normal? YES NO Replace sensor TCJ. * See I/U temp. sensor characteristics-2. Check I/U main board. Replace it if necessary. Check code [F02] (New code) Check code name I/U sensor TC error Possible causes Sensor TC open or short-circuit Is TC connector CN101 connected normally? YES NO Correct connector connection. Is TC resistor characteristic normal? NO Replace sensor TC. * See I/U temp. sensor characteristics-2.

YES Check I/U boards. Replace defective board. 41 Check code [F10] (New code) Check code name I/U sensor TA error Possible causes Sensor TA open or short-circuit Is TA connector CN104 connected normally? YES NO Correct connector connection. Is TA resistor characteristic normal? YES NO Replace sensor TA. * See I/U temp. sensor characteristics-1. Check MCC-1510 board. Replace it if necessary. Check code [F29] (New code) Check code name Other indoor unit errors Failure of I/U board Possible causes This is an error of non-volatile EEPROM IC10 on the indoor unit board, which occurs during operation. Replace the service board. * If EEPROM is not mounted at power on or if no data can be read/written from/in the EEPROM, auto address mode is repeated. At this time, the AI-NET central controller indicates code "97". (About 3 minutes) (About 1 minutes) (Power on) "SETTING" appears "SETTING" disappears. on the R/C. LED (D02) on the I/U board blinks for about 10 seconds (1Hz).

Reboot (reset) (Repeated) 42 Troubleshooting (Continued) Check code [F31] (New code) Check code name O/U EEPROM error Possible causes A failure of O/U power supply (voltage, noise, etc.) B Failure of O/U CDB board. Is O/U free from power fluctuation? NO Check power voltage. Improve power lines. Check external noise. YES Check CDB board. Check code [E08][L03][L07][L08] (New code/old code) E08: I/U number duplicated L03: Multiple header I/U under group control L07: One or more group address "individual" under group control L08: I/U group address not set (99) When any of these codes is detected at power on, the unit enters auto address setting mode automatically. (No code is indicated.) However, if any of these codes is detected in the auto address setting mode, a check code is displayed in some cases. Check code [L09] (New code) Check code name Indoor unit capacity not set Possible causes Indoor unit capacity not set Is indoor unit capacity set? YES NO Set I/U capacity data. (DN=11) Check MCC-1510 board. Replace it if necessary. 43 Check code [L20] (New code) Check code name Duplication of central control address Possible causes Central control address is duplicated. Are U3/U4 communication cables connected normally? YES NO Correct cable connection. When a unit connected to U3/U4 is in a group, is it set to header unit? YES NO Set the connected unit to header unit. Check and correct I/U address, central control address. Check code [L30] (New code) Check code name I/U external interlock Possible causes When an external alarm is input Is external device connected to CN80? YES NO Check I/U boards. Replace defective board. Is external device working normally? YES NO Check external device. Replace it if necessary.

Check possible error causes. 44 Troubleshooting (Continued) Check code [P12] (New code) Check code name Malfunction of I/U fan motor Possible causes A Failure of fan motor connector B Failure of fan motor C Failure of I/U board D Failure of cross flow fan shaft Turn OFF the breaker. Turn it ON 10 seconds after. Does fan stop with operation OFF? YES NO Is min. 1VDC present between CN210 pin E and C ? YES NO Replace I/U fan motor. Start cooling with LOW fan speed. Does fan rotate? YES NO Change fan speed to HH. Is min. 280VDC present between CN210 pin A and C ? YES Is min. 15VDC present between CN210 pin D and C with motor connected? YES NO NO Stop operation and turn OFF breaker.

Disconnect CN210, turn ON breaker again, and then stop operation using R/C. Is min. 280VDC present NO between CN210 pin D and C ? YES Stop operation and unplug AC cord. Disconnect CN210, plug in AC cable again, and then stop operation using R/C. Operate I/U (except heating) by R/C. Is min. 1VDC present between CN210 pin E and C ? (Measure within 15 seconds.) YES Replace I/U MCC1510 board. Operate I/U (except heating) by R/C. Is min. 1VDC present between CN210 pin E and C ? (Measure within 15 seconds.) Does fan speed increase? YES NO YES NO NO Does cross flow fan rotate normally by hand? YES NO Fan motor is normal. Rotate the fan by hand with operation OFF. Is 0 to 15VDC (rev return signal) generated between CN210 pin F and C ? YES NO Repair cross flow fan shaft. 45 Check code [P12] (New code) Check code name Malfunction of I/U fan motor Possible causes A Failure of fan motor connector B Failure of fan motor C Failure of I/U board D Failure of cross flow fan shaft P. C. board When AC cord is plugged in, I/U fan starts rotating. Check the fan motor output DC voltage on the I/U board. Check voltage on the motor connector CN210 pin C (GND, black) and pin E (+V line, yellow) while fan is rotating. (Blue) Yellow (Yellow) (White) 1. 0VDC or higher Below 1.0VDC Black (Black) Failure of I/U MCC-1510 board Failure of I/U fan motor (Red) 46 Troubleshooting (Continued) Check code [P31] (New code) Check code name Other I/U errors (Group follower I/U error) Possible causes When an error occurs with other units in the group When header unit detects E03, L03, L07 or L08 during group operation, "P31" is indicated on follower units in the group and their operation stops. No code or alarm log is displayed on the R/C. 47 Check code [C05], [C06] (Central controller) Check code name TCC-LINK central control communication error Possible causes TCC-LINK central control communication error Is I/U powered ON? YES NO Power ON. Is harness from I/U terminal block connected properly? YES NO Correct connector connection. Can I/U be operated by R/C individually? YES NO Are U3/U4 com. cables.



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