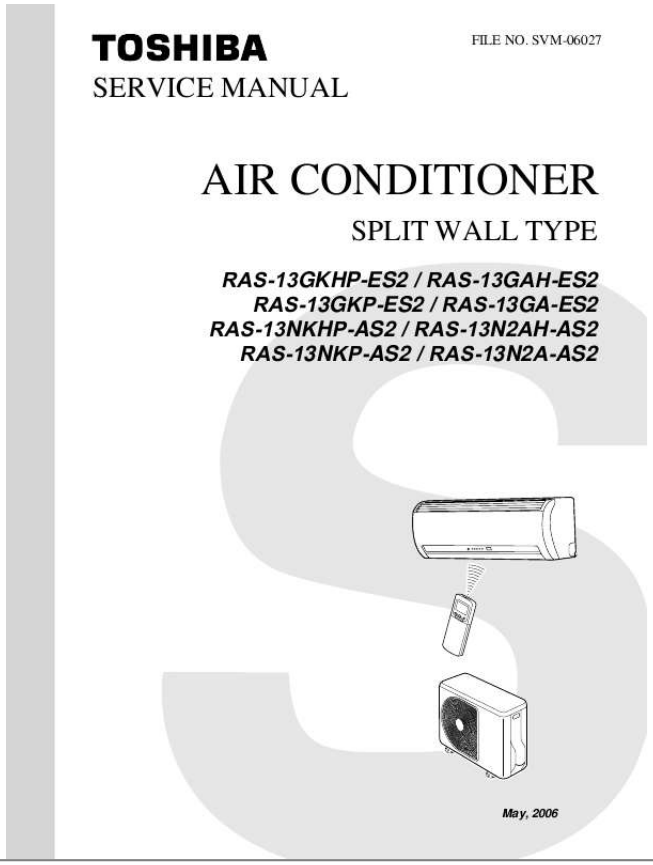

TOSHIBA

FILE NO. SVM-06027

SERVICE MANUAL

AIR CONDITIONER

SPLIT WALL TYPE

RAS-13GKHP-ES2 / RAS-13GAH-ES2
RAS-13GKP-ES2 / RAS-13GA-ES2
RAS-13NKHP-AS2 / RAS-13N2AH-AS2
RAS-13NKP-AS2 / RAS-13N2A-AS2

May, 2006

Manual abstract:

@@SVM-06027 CONTENTS 1. 2. @@SVM-06027 8. @@Board) 9. TROUBLESHOOTING CHART 9-1 9-2 9-3 9-4 9-5 9-6 10. PARTS REPLACEMENT 10-1 Indoor Unit 10-2 Outdoor Unit 11. @@· This air conditioner requires special installation for the refrigerant R410A. -2- FILE NO. SVM-06027 1. SPECIFICATIONS MODEL ITEM Capacity 220V kW Phase Power source Power consumption Power factor Running current Indoor Outdoor V Hz kW % A A A lit/h dB dB kg mm mm m m RAS-13GKHP-ES2 RAS-13NKHP-AS2 Height Dimensions Net weight Evaporator type Indoor fan type High fan Airflow volume Medium fan Low fan Fan motor output Air filter OUTDOOR UNIT Height Dimensions Net weight Condenser type Outdoor fan type Airflow volume Fan motor output Compressor Safety device Louver type Usable outdoor temperature range °C 15 ~ 43 Model Output W m /h 3 RAS-13GKHP-ES2 / RAS-13GAH-ES2 RAS-13NKHP-AS2 / RAS-13N2AH-AS2 Cooling 240V 3.

82 220V 4.20 1 220 - 240 50 1.15 98 5.20 1.19 96 5.

*00 30 2.0 41/35/31 50 51 50 R410A 1.08 Capillary tube 12.7 Flare connection 6.35 Flare connection 15*1 6 51 1.*

14 96 0.15 5.27 5.18 1.18 95 3.74 Heating 240V 4.26 RAS-13GKP-ES2 / RAS-13GA-ES2 RAS-13NKP-AS2 / RAS-13N2A-AS2 Cooling 220V 3.75 240V 3.75 1.13 98 5.

*10 26 1.17 97 4.90 Starting current Moisture removal Noise Refrigerant Indoor (H/M/L) Outdoor (220-240V) Name of refrigerant Rated amount Gas side size Connection type Liquid side size Interconnection Connection type Maximum length pipe (One way) Maximum height difference INDOOR UNIT 50 0.98 51 Refrigerant control RAS-13GKP-ES2 RAS-13NKP-AS2 275 790 218 10 Finned tube Cross flow fan mm mm mm kg Width Depth m3/h m /h 3 630 520 430 650 550 490 20 Honeycomb woven filter with PP frame 630 520 430 m3/h W RAS-13GAH-ES2,RAS-13N2AH-AS2 mm mm mm kg 39 Finned tube Propeller fan 2120 2200 42 PA150X2C-4FT 1100 Fuse, Overload relay Automatic louver -10 ~ 24 2120 2200 550 780 290 RAS-13GA-ES2,RAS-13N2A-AS2 Width Depth 38 2030 30 2150 W 15 ~ 43 -3- FILE NO. SVM-06027 Note : 1 · Capacity is based on the following temperature conditions. Condition (DB) (WB) (DB) (WB) JIS B8615-1 Cooling 27°C 19°C 35°C 24°C Heating 20°C 15°C 7°C 6°C Temperature Indoor unit inlet air temperature Outdoor unit inlet air temperature Note : 2 *1 No need to charge extra refrigerant. -4- FILE NO. SVM-06027 2. CONSTRUCTION VIEWS 2-1. @@SVM-06027 2.*

2. @@SVM-06027 3. WIRING DIAGRAM 3-1. @@4 + IC03 R26 DB01 C63 MAIN P.C.

@@SVM-06027 3-2. RAS-13GKP-ES2 / RAS-13GA-ES2 Infrared rays receiver and indication parts. CN25 1 2 3 4 5 6 7 8 9 10 11 1 2 3 4 5 6 7 8 9 10 11 TRANS (TT-10) RED 1 1 BLU WHI 3 1 3 CN05 1 GRY 3 3 CN06 MCC-920 DB50 C50 + CN07 11 22 33 44 55 WHI YEL YEL YEL YEL BLU BLU BLU BLU BLU BLU BLU BLU BLU BLU WHI 1 2 3 4 5 6 7 8 9 10 11 1 2 3 4 5 6 7 8 9 10 11 CN14 BLK P04 3 Heat Exchanger Sensor (TC) CN01 11 22 CN03 11 22 F01 T6.3 A 250 VAC RY01 4 Regulator circuit DC 12 V DC 5 V 1 2 3 4 5 1 2 3 4 5 Thermo Sensor (TA) Louver motor SG01 DSA CN11 R47 R46 IC03 L01 2 2 11 22 33 YEL GRY BRW 1 2 3 4 5 6 1 2 3 4 5 6 150 C L N BRW (L) BLU (N) GRN&YEL R21 R22 CR03 D38 C58 CN10 55 33 WHI BLK RED SINGLE PHASE 220-240V~, 50Hz 1 C01 R48 C15 3 4 11 Indoor FAN motor CN31 CN04 12 12 PNK TEMP FUSE 73 C INDOOR TERMINAL BLOCK 1 2 GRN&YEL PNK WHI BLK INDOOR OUTDOOR OUTDOOR TERMINAL BLOCK 1(L) 2(N) CHASSIS RED BLK BLK RED CAPACITOR CAPACITOR FAN MOTOR RED WHI COMPRESSOR PNK WHI -8- FILE NO. SVM-06027 3-3.

RAS-13NKHP-AS2 / RAS-13N2AH-AS2 73°Cx2 THERMAL FUSE Louver Motor WHI YEL YEL YEL YEL 1 CN25 1 BLU INFRARED RAYS RECEIVE AND INDICATION PARTS 2 3 4 5 6 7 8 9 10 11 2 BLU 3 BLU 4 BLU 5 BLU 6 BLU 7 BLU 8 BLU 9 10 11 BLU WHI BLU PNK PNK 1 1 BLK P04 BRW(L) BLU(N) GRN & YEL 2 2 CN04 5 5 4 4 3 3 2 2 1 1 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 10 11 9 10 11 CN14 CN07 DC5V R21 VARISTOR SG01 DSA R22 VARISTOR T6.3A 250VAC FUSE F01 C01 L01 Voltage Regulator R319 Micro Power Module DC12V 3 RY01 C02 + IC03 R26 DB01 C63 SINGLE PHASE 220-240V~, 50Hz T02 C.T. CR03 BLK 4 MAIN P.C. BOARD WP-003 RY04 CR01 R25 RY03 R27 C15 150°C CN10 CN11 1 3 1 3 CN03 1 1 BLK CN27 CN01 CR02 2 2 BLK THERMO SENSOR (TA) 1 1 BLK 2 2 BLK HEAT EXCHANGER SENSOR (TC) 1 2 3 4 5 6 1 2 3 4 5 6 BLK GRY YEL BRW RED WHI 5 5 3 3 1 1 123 123 AC FAN MOTOR INDOOR TERMINAL BLOCK OUTDOOR TERMINAL BLOCK BLK 1 2 3 4 GRN&YEL RED BLK BLU WHI INDOOR OUTDOOR 1(L) 2(N) BLU 3 BLU 4 CHASSIS SOLENOID COIL RED RED COMPRESSOR CAPACITOR RED CAPACITOR WHI BLK FAN MOTOR PNK WHI -9- FILE NO. SVM-06027 3-4. RAS-13NKP-AS2 / RAS-13N2A-AS2 Infrared rays receiver and indication parts. CN25 1 2 3 4 5 6 7 8 9 10 11 1 2 3 4 5 6 7 8 9 10 11 TRANS (TT-10) RED 1 1 BLU WHI 3 1 3 CN05 1 GRY 3 3 CN06 MCC-920 DB50 C50 + CN07 11 22 33 44 55 WHI YEL YEL YEL YEL BLU BLU BLU BLU BLU BLU BLU BLU BLU BLU WHI 1 2 3 4 5 6 7 8 9 10 11 1 2 3 4 5 6 7 8 9 10 11 CN14 BLK P04 3 Heat Exchanger Sensor (TC) CN01 11 22 CN03 11 22 F01 T6.3 A 250 VAC RY01 4 Regulator circuit DC 12 V DC 5 V 1 2 3 4 5 1 2 3 4 5 Thermo Sensor (TA) Louver motor SG01 DSA CN11 R47 R46 IC03 L01 2 2 11 22 33 YEL GRY BRW 1 2 3 4 5 6 1 2 3 4 5 6 150 C R21 BRW (L) BLU (N) GRN&YEL R22 CR03 D38 C58 CN10 55 33 WHI BLK RED 1 C01 R48 C15 3 SINGLE PHASE 220-240V~, 50Hz 4 11 Indoor FAN motor CN31 CN04 12 12 PNK TEMP FUSE 73 C INDOOR TERMINAL BLOCK 1 2 GRN&YEL PNK WHI BLK INDOOR OUTDOOR OUTDOOR TERMINAL BLOCK 1(L) 2(N) CHASSIS RED BLK BLK RED CAPACITOR CAPACITOR FAN MOTOR RED WHI COMPRESSOR PNK WHI - 10 - FILE NO.

*SVM-06027 4. SPECIFICATION OF ELECTRICAL PARTS 4-1. Indoor Unit (RAS-13GKHP-ES2, RAS-13NKHP-AS2) No. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Parts name Fan motor (for indoor) Thermo sensor (TA-sensor) Micro Power Module (M01) Microcontroller unit (IC30) Heat exchanger sensor (TC-sensor) Line filter (L01) Bridge rectifier (DB01) Capacitor (C63) Fuse (F01) Varistor (R21, R22) Resistor (R319) Louver motor Relay (Comp., RY01) Relay (Fan, RY03) Relay (Solenoide, RY04) LC*SS11V-06270 D3SBA60 KMH400VSSN47M22S BET 6.3A TND15G561K RF-2TK5R6 MP24Z DI1U G5NB-1A G5NB-1A µRM1260V TMP87CM40AN 10k W at 25°C 27mH, 600mA 4A, 600 V 47mF, 400 V T6.3A, 250VAC 560 V 5.6 W , 2 W 12VDC Rating 25A/AC250 V, 3-48VDC Rating 3A/AC250 V, 12VDC Rating 3A/AC250 V, 12VDC Type SKF-220-20-4A-1 Specifications AC Motor with 150 ° C thermo fuse 10k W at 25°C DC 390V, Secondary DC 12V 4-2. Outdoor Unit (RAS-13GAH-ES2, RAS-13N2AH-AS2) No.*

1 Parts name Compressor Type Specifications Output (Rated) 1100W, 2poles, 1 phase, 220 - 240V, 50Hz Winding resistance () (at 20°C) 2 3 4 Fan motor (for outdoor) Running capacitor (for fan motor) Running capacitor (for compressor) Solenoid coil (for 4-way valve) (for Heat pump model) C-R C-S PA150X2C-4FT 2.
35 Red-Black 3.22 White-Black HF-240-42A or WLF-240-42A DS451155NPQB RS44B306U0214S Output (Rated) 42W, 6poles, 1 phase, 220 - 240V, 50Hz Winding resistance () (at 20°C) AC 450V, 1.5µF AC 440V, 30µF AC 220 - 240V, 50Hz 176.2 or 188 290.5 or 289 5 STF-01AJ503H1 - 11 - FILE NO. SVM-06027 4-3. Indoor Unit (RAS-13GKP-ES2, RAS-13NKP-AS2) No. 1 2 3 4 5 6 7 8 9 10 11 12 Parts name Fan motor (for indoor) Thermo sensor (TA-sensor) Transformer Microcontroller unit (IC30) Heat exchanger sensor (TC-sensor) Line filter (L01) Bridge rectifier (DB50) Capacitor (C50) Fuse (F01) Vssor Outdoor Fan Motor 4-Way Valve REMOTE CONTROL Infrared Rays Remote Control Operation ( ) Operation Mode Selection AUTO, COOL, DRY, HEAT, FAN ONLY Temperature Setting Fan Speed Selection ON TIMER Setting OFF TIMER Setting Louver Auto Swing Louver Direction Setting ECO Hi power TIMER 1.3.5.
9H COMFORT SLEEP QUIET - 15 - FILE NO. SVM-06027 6-2. RAS-13GKP-ES2 / RAS-13GA-ES2, RAS-13NKP-AS2 / RAS-13N2A-AS2 Main Unit Control Panel Heat Exchange sensor Functions M.C.U. Operation Display Timer Display Filter Sign Display Hi Power Sign Display Fan Only Sign Display Indoor Fan Motor Thermo. Sensor · Louver Control Infrared Rays Signal Reciver · 3-minutes Delay at Restart for Compressor Initiallizing Circuit Clock Frequency Oscillator Circuit · Motor Revolution Control · Processing (Temperature Processing) · Timer Power Supply Circuit Compressor ON/OFF Signal Relay Driver, Louver Driver Relay RY01 Louver ON/OFF Signal Louver Motor Noise Filter 220-240 V~, 50Hz Compressor, Outdoor Fan Motor REMOTE CONTROL Infrared Rays Remote Control Operation ( ) Operation Mode Selection AUTO, COOL, DRY, FAN ONLY Temperature Setting Fan Speed Selection ON TIMER Setting OFF TIMER Setting Louver Auto Swing Louver Direction Setting ECO Hi power TIMER 1.3.5.9H COMFORT SLEEP QUIET - 16 - FILE NO.

SVM-06027 7. OPERATION DESCRIPTION 7-1. Outline of Air Conditioner Control 7-1-1. Louver control This is a fixed capacity type air conditioner, which uses (1) Vertical air flow louver Position of veritcal air flow louver is automatically AC motor for an indoor fan. The AC motor drive controlled according to the operation mode. circuit is mounted in the indoor unit. And electrical Besides, position of vertical air flow louver can be parts which driving the compressor and the outdoor arbitrarily set by pressing [FIX] button. fan motor, are mounted in the outdoor unit. The louver position which is set by [FIX] button is The air conditioner is controlled by the controller stored in the microcontroller, and the louver is mounted in the indoor unit. The controller operates all automatically set at the stored position for the next csplay on the remote control are controlled as shown in Fig.
7-2-4. (Room temp.) - (Preset temp.) ON:6min. OFF:4min.
*7-2-4. Heating operation *Heat pump model only ([MODE] button on the remote control is set to the heating operation.) (1) The compressor, 4-way valve, outdoor fan and operation display on the remote control are controlled as shown in Fig. 7-2-6. °C °C +3 +2 +1 ON:6min.*
OFF:4min. ON:5min. OFF:5min. ON:5min. OFF:5min. Preset temp. 0 OFF ON (Room temp.) - (Preset temp.) OFF ON OFF ON OFF 0 OFF -0.5 ON ON OPERATION display Compressor 4-way valve Outdoor fan Fig.

7-2-4 (2) The microcontroller turns the compressor on and off at the regular intervals (4 to 6 minutes). While the compressor is turning off, the indoor fan motor operates in the SUPER LOW position. The pattern of operation depending on the relation between room temperature and preset temperatures is shown in Fig. 7-2-5. Room temp. Fig. 7-2-6 (2) When [FAN] button is set to AUTO, the indoor fan motor operates as shown in Fig. 7-2-7. When [FAN] button is set to LOW, LOW+, MED, MED+ or HIGH, the motor operates with a constant air flow. Preset temp.
*(Room temp.) - (Preset temp.) °C 0 -0.5 -1 -1.5 -2 L *1 *2 Preset temp.*
*+1 Preset temp. M+ -5.0 -5.5 [FAN AUTO] Compressor Outdoor fan ON ON ON ON H OFF Indoor fan OFF L OFF L *SL SL L SL L *1, *2 : The values marked with *1 and *2 are calculated and controlled by the difference in motor speed between M+ and L. Fig.*
*7-2-7 Setting of air flow [FAN:AUTO] *Super Low Fig. 7-2-5 (3) [FAN] button on the remote control is set to AUTO only. (4) The Hi POWER, ECO, COMFORT SLEEP and QUIET operations cannot be set. - 19 - OPERATION display Preset temp. Compressor 4-way valve Outdoor fan FILE NO. SVM-06027 (3) The indoor heat exchanger restricts revolving speed of the fan motor to prevent a cold draft. The upper limit of the revolving speed is shown in Fig. 7-2-8 and Table 7-2-1. 7-2-5. Automatic operation ([MODE] button on the remote control is set to the automatic operation.*

*) (1) One of 3 operations (Cooling, Fan only or Heating) is selected according to difference between the preset temperature and the room temperature at which the automatic operation has started, as shown in Fig. 7-2-9. The Fan only operation continues until the room temperature reaches a level at which another mode is selected. (2) Temporary Auto When the [RESET] button on the indoor unit is pushed, the preset temperature is fixed at 24 °C and the indoor unit is controlled as shown in Fig. 7-2-9. °C Indoor heat exchanger temperature Manual AUTO (One of 5 steps) 45 34 34 33 32 31 21 20 *4 L- H (Up to seting speed) *2 A+8 A+8 A- 4 A- 4 *6 *5 SL*3 SL*1 Stop Fig. 7-2-8 Cold draft preventing control NOTES : *1: The fan stops for 2 minutes after thermostat-OFF *2: A is 24°C when the preset temperature is 24°C or more and A is the preset temperature when it is under 24 °C. *3: SL means Super Low. *4: Calculated from difference in motor speed between SL and H. °C (Room temp.*
*) - (Preset temp.) +4 Cooling operation The louver moves to the position same as Hi POWER operation. Cooling operation 0 Fan only operation -1 Heating operation Heating model Cooling model *5 and *6: Fan speed AUTO *5 Starting period *6 Stabilized period · From 12 to 25 minutes Up until 12 minutes passed after starting passed after starting the unit and room the unit temperature is From 12 to 25 minutes between preset passed after starting temperature and 3 °C the unit and room lower than preset temperature is 3 °C temperature lower than preset · 25 minutes or more temperature passed after starting the unit Room temperature · Room temperature Preset temperature < Preset temperature - 3.*

5 °C - 4 °C . Fig.
7-2-9 · · · · Manual (L - H) Table 7-2-1 - 20 - FILE NO. SVM-06027 7-3. Hi POWER Mode ([Hi POWER] button on the remote control is pressed.) When [Hi POWER] button is pressed while the indoor unit is in Auto, Cooling or Heating operation, Hi POWER mark is indicated on the display of the remote control and the unit operates as follows. (1) Automatic operation · The indoor unit operates in according to the current operation.
(2) Cooling operation · The setting temperature drops 3°C. (The value of the setting temperature on the remote control does not change.) · If the room temperature is higher than the setting temperature by 3.5°C or more, the horizontal louver moves to the Hi POWER position automatically. Then when the room temperature is 1°C less than the setting temperature the horizontal louver returns automatically. · FAN speed : [AUTO] If the room temperature is higher than the setting temperature by 3.5°C or more, the air conditioner operates at maximum airflow level. If the room temperature is higher than the setting temperature by less than 3.5°C, the air conditioner operates at normal airflow level. · FAN speed : One of 5 levels If the room temperature is higher than the setting temperature by 3.

*5°C or more, the air conditioner operates at higher consecutive airflow level. If the room temperature is higher than the setting temperature by less than 3.5°C, the air conditioner operates at normal airflow level. 7-4. High-Temperature Limit Control *Heat pump model only The microcontroller detects the indoor heat exchanger temperature to prevent pressure of a refrigerating cycle from increasing excessively. The compressor and outdoor fan motor are controlled as shown in Fig. 7-4-1. Compressor Outdoor fan OFF ON ON OFF OFF ON Heat exchanger temp. (°C) 60 53 52 Fig. 7-4-1 7-5. Low-Temperature Limit Control The microcontroller detects the indoor heat exchanger temperature to prevent the indoor heat exchanger from freezing. The compressor and outdoor fan motor are controlled as shown in Fig. 7-5-1 Heat exchanger temperature Compressor Outdoor fan ON (°C) 6 2 Less than 2°C continues for 5 minutes OFF (3) Heating operation (Heat pump model) · The preset temperature increases 2 °C, (The value of the preset temperature on the remote control does not change.) · The indoor unit operates in normal heating mode except the preset temperature is higher (+2°C). (4) The Hi POWER mode can not be set in Dry or Fan only operation.*
*Fig. 7-5-1 - 21 - FILE NO. SVM-06027 7-6. Defrost Operation *Heat pump model only <In case of C> (1) The heating operation is performed for at least 90 During the heating operation, the outdoor heat minutes. exchanger temperature goes down and sometimes it is frozen.*
(2) The defrost operating time is 10 minutes. In this case, the air conditioner stops the heating operation and starts the defrost operation to melt ice. 7-6-3. Ending condition at defrost operation 7-6-1. Condition to start the defrost operation The defrost operation starts whichever below conditions are satisfied. (1) When the compressor current becomes 7.5A or more during defrost operation, the defrost operation stops and the heating operation restarts. (The current sensor detects the compressor current.) Indoor heat exchanger temp - Room temp (1) When the cumulative compressor operating time is (2) The defrost operation continues for at most longer than 40 or 90 minutes and difference 6 minutes or 10 minutes. between the indoor heat exchanger temperature and the room temperature is less than the specified value.

(This value is decided by the DEFROST LAMP : microprocessor.) (Control example is shown in · During defrost operation, the PRE-DEF. lamp is Fig. 7-6-1. In case of B or C, the defrost operation on and the indoor and outdoor fans are off. starts.) · The compressor start protection timer is inter(2) When the current limit control or the high looked with the PRE-DEF. lamp. So the PRE-DEF. temperature limit control is performed for total of Lamp is off (the fans stop) for about 3 minutes 90 minutes.
after the [ ] button is turned on. When the compressor is turned on, the PRE-DEF. lamp comes on. After the heat ex-changer is preheated to about 24°C or higher, the PRE-DEF. Lamp goes off, and the indoor fan starts.
D A B C Cumulative compressor operating time Fig. 7-6-1 (Indoor fan speed : M) 7-6-2. Defrost operation time control <In case of B> (1) The heating operation is performed for at least 40 minutes. (2) The maximum defrost operating time is 6 minutes. The defrost operating time for the 4th cycle is 10 minutes.
*(When the outdoor temperature is very low, however, the defrost operating time is 10 minutes.) minutes 40 minutes 40 minutes 40 minutes 40 Heating Heating Heating Heating Defrost Defrost Defrost Max 6 minutes 10 minutes 1 cycle Fig. 7-6-2 Defrost - 22 - FILE NO. SVM-06027 7-7. Current Limit Control *Heat pump model only The microcontroller detects the input current so as to prevent it exceeds a specified value by means of controlling the outdoor fan control as described in (1) and (2). (1) Current limit control (Cooling operation) Control is performed as shown below by detecting the compressor operating current with a current sensor (C.T). Input current Compressor Outdoor fan More than I4 continues for 3 seconds OFF More than I3 continues for 5 minutes OFF ON 11A 10A I4 I3 Fig. 7-7-1 (2) Current limit control (Heating operation) Control is performed as shown in Fig. 7-7-2 Input current Compressor Outdoor fan More than I4 continues for 3 seconds OFF More than I3 continues for 5 minutes OFF 11A 10A 6A 5A I4 I3 I2 I1 ON OFF ON Fig.*

7-7-2 Remark : This function is available only for heat pump model (Cooling models have no a current sensor (C.T.)). - 23 - FILE NO. SVM-06027 7-8. Auto Restart Function The indoor unit is equipped with an automatic restarting function which allows the unit to restart operating with the set operating conditions in the event of power supply being accidentally shut down. The operation will resume without warning three minutes after power is restored. This function is not set to work when shipped from the factory. Therefore it is necessary to set it to work. 7-8-1.
How to set auto restart function To set the auto restart function, proceed as follows: The power supply to the unit must be on; the function will not set if the power is off. Push the [RESET] button located in the center of the front panel continuously for three seconds. The unit receives the signal and beeps three times. The unit then restarts operating automatically in the event of power supply being accidentally shut down. When the unit is on standby (Not operating) Operation Push [RESET] button for more than three seconds.
The unit is on standby.

¯The unit starts to operate. ¯RESET 0 Motions The green lamp is on. After approx. three seconds, The lamp changes from green to orange. 3S The unit beeps three times and continues to operate. RESET button If the unit is not required to operate at this time, push [RESET] button once more or use the remote control to turn it off. When the unit is in operation Operation Push [RESET] button for more than three seconds. The unit is in operation. ¯The unit stops operating. ¯RESET 0 Motions The green lamp is on. The green lamp is turned off. After approx. three seconds, The unit beeps three times 3S RESET button If the unit is required to operate at this time, push [RESET] button once more or use the remote control to turn it on. · While the filter check lamp is on, the [RESET] button has the function of filter reset button.

· · · While this function is being set, if the unit is in operation, the orange lamp is on. This function can not be set if the timer operation has been selected. When the unit is turned on by this function, the louver will not swing even though it was swinging automatically before shutting down. - 24 - FILE NO. SVM-06027 7-8-2. How to cancel auto restart function To cancel auto restart function, proceed as follows: Repeat the setting prodedure: the unit receives the signal and beeps three times. The unit will be required to be turned on with the remote control after the main power supply is turned off. When the unit is on standby (Not operating) Operation Push [RESET button for more than three seconds. The unit is on standby. Motions ¯The unit starts to operate. The orange lamp is on. ¯RESET 0 After approx. three seconds, The lamp changes from orange to green. 3S The unit beeps three times and continues to operate. ¯RESET button If the unit is not required to operate at this time, push [RESET] button once more or use the remote control to turn it off. When the unit is in operation Operation Push [RESET] button for more than three seconds. The unit is in operation. Motions The orange lamp is on. ¯The unit stops operating. The orange lamp is turned off.
¯RESET 0 After approx. three seconds, The unit beeps three times 3S RESET button If the unit is required to operate at this time, push [RESET] button once more or use the remote control to turn it on. · While this function is being set, if the unit is in operation, the orange lamp is on. 7-9. Filter Check Lamp When the elapsed time reaches 1000 hours, the filter check lamp indicates. After cleaning the filters, turn off the filter check lamp. 7-9-1. How to turn off filter check lamp Push [RESET] button on the indoor unit. Note: If [RESET] button is pushed while the filter check lamp is not indicating, the indoor unit will start the Automatic Operation. 7-8-3.

Power failure during timer operation When the unit is in Timer operation, if it is turned off because of power failure, the timer operation is cancelled. Therefore, set the timer operation again. - 25- FILE NO. SVM-06027 7-10. Self-Cleaning function Self-Cleaning function is designed to reduce humidity that causes mold to form inside the air conditioning unit. This advanced, efficient system reduces moisture in the coil. When air conditioner is turned off, the internal fan activates and dries the moisture in the coil for 20 minutes, then it turns off automatically. Operation display FCU fan FCU louver Timer display Compressor CDU fan ON ON rpm is depend on presetting. OPEN ON or OFF depend on presetting of timer function. ON or OFF depend on presetting per room temperature.
ON or OFF depend on presetting per room temperature. OFF ON rpm is SL speed. CLOSE ON OFF OFF OFF OFF CLOSE ON or OFF depend on presetting of timer function. OFF OFF 8 Cool mode or dry mode operation more than 10 mins. Self-Cleaning mode operate 20 mins.
8 Operation time Automatically turn-off. Turn off by remote controller or timer-off function. · The Self-Cleaning function is set as default at ex-factory. · Self-Cleaning operation can stop manually by press [ ] button of the remote control two more time. 7-10-1.
How to cancel Self-Cleaning function To cancel the Self-Cleaning function, proceed as follows: · 7-10-2. How to set Self-Cleaning function. · · · To set the Self-Cleaning function, proceed as follows. · Press [RESET] button one time or use remote control to turn on air conditioner. The OPERATION Press [RESET] button one time or use remote display will show in orange color (When AUTOcontrol to turn on air conditioner. The OPERATION RESET is ON) or green color (When AUTOdisplay will show in orange color (When AUTORESTART is OFF). RESTART is ON) or green color (When AUTO· Hold down the [RESET] button for more than RESTART is OFF). 20 seconds. (The air conditioner will stop suddenly Hold down the [RESET] button for more than when the [RESET] button is pressed but keep 20 seconds. (The air conditioner will stop suddenly holding it continue.

Then will beep 3 times is the first when the [RESET] button is pressed but keep 3 seconds but it is not related to Self-Cleaning holding it continue. Then will beep 3 times in the first function) 3 seconds but it is not related to Self-Cleaning · After holding about 20 seconds, the air conditioner function) will beep 5 times and OPERATION display blinks After holding about 20 seconds, the air conditioner 5 times. will beep 5 times without any blinking of display. · The Self-Cleaning function had been set. The Self-Cleaning Operation had been cancelled. Remarks · Per setting of Self-Cleaning function above, AUTORESTART function had been cancelled. To set AUTO-RESTART again, please follow item 7-8-1. Remarks · Per setting of Self-Cleaning function above, AUTORESTART function had been cancelled. To set AUTO-RESTART again, please follow item 7-8-1. RESET 26 FILE NO.
SVM-06027 7-11. QUIET Mode Quiet mode is the system which, control the revolving speed of indoor fan to work constantly at lower than speed L. In addition, noise level of indoor unit is less than usual. When the [QUIET] button is pressed, the fan of the indoor unit will be restricted the revolving speed at speed L - until the [QUIET] button is pressed once again (cancel Quiet mode). Remarks : 1.
Quiet mode is unable to work in dry mode. 2. Quiet mode is appropriate to work with less cooling load and less heating load condition. Because of the fan speed L- may cause not enough the cooling capacity or heating capacity. 7-12-1.
Cooling mode · The fan speed of indoor unit operates automatically, it relates with the compressor's operation. Compressor's Operation ON OFF Fan Speed LSL 7-12. COMFORT SLEEP mode The principles of comfort sleep mode are: · Quietness for more comfortable. · Save energy by changing room temperature automatically.

· The air condition can shut down by itself automatically. · The preset temperature will increase 1°C after the Comfort sleep mode has operated for 1 hour and the temperature will increase another 1°C after the comfort sleep mode has operated for 2 hour. (The value of the preset temperature on the remote control does not change.) · Press the [COMFORT SLEEP] button to choose the operating hours. Repeat pressing to select the hours. (1hr, 3hr, 5hr or 9hr) · If the [COMFORT SLEEP] button is pressed again means cancel comfort sleep mode.

7-12-2. Heating mode · The fan speed of indoor unit operates automatically, it relates with the compressor's operation. Compressor's Operation ON OFF Fan Speed LSL · The preset temperature will drop down 1°C after the Remarks: comfort sleep mode has operated for 1 hour and the 1. Comfort sleep mode will not operate in dry mode temperature will decrease another 1°C after the and fan only mode. comfort sleep mode has operated for 2 hour. (The 2. Comfort sleep mode is appropriate to work with less value of the preset temperature on the remote control. cooling load and less heating load condition. dose not change.) Because of the fan speed L- may cause not enough · Press the [COMFORT SLEEP] button to choose the the cooling capacity or heating capacity. operating hours. Repeat pressing to select the hours. (1hr, 3hr, 5hr or 9 hr) · If the [COMFORT SLEEP] button is pressed again means cancel comfort sleep mode. - 27 - FILE NO. SVM-06027 8.
INSTALLATION PROCEDURE 8-1. Safety Cautions For general public use Power supply cord of parts of appliance for Outdoor use shall be at least polychloroprene sheathed flexible cord (design H07 RN-F), or cord designation 245 IEC66. CAUTION New Refrigerant Air conditioner Installation · THIS AIR CONDITIONER USES THE NEW HFC REFRGERANT (R410A), WHICH DOES NOT DESTROY THE OZONE LAYER. R410A refrigerant is apt to be affected by impurity such as water, oxidizing membranes, and oils because the pressure of R410A refrigerant is approx. 1.
6 times of refrigerant R22. As well as the adoption of this new refrigerant, refrigerating machine oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating machine oil does not enter into the refrigerating cycle of a new-refrigerant air conditioner. To avoid mixing refrigerant and refrigerating machine oil, the sizes of charging port connecting sections on the main unit are different from those for the conventional refrigerant, and different size tools are also required. Accordingly, special tools are required for the new refrigerant (R410A) as shown below. For connecting pipes, use new and clean piping materials with high-pressure withstand capabilities, designed for R410A only, and ensure that water or dust does not enter. Moreover, do not use any existing piping as its pressure withstand may be insufficient, and may contain impurities. CAUTION To Disconnect the Appliance from the Main Power Supply This appliance must be connected to the main power supply by means of a circuit breaker or a switch with a contact separation of at least 3 mm. If this is not possible, a power supply plug with earth must be used. This plug must be easily accessible after installation.

The plug must be disconnected from the power supply socket in order to disconnect the appliance completely from the mains. - 28 - FILE NO. SVM-06027 DANGER · FOR USE BY QUALIFIED PERSONS ONLY. · TURN OFF MAIN POWER SUPPLY BEFORE ATTEMPTING ANY ELECTRICAL WORK. MAKE SURE ALL POWER SWITCHES ARE OFF. FAILURE TO DO SO MAY CAUSE ELECTRIC SHOCK. · CONNECT THE CONNECTING CABLE CORRECTLY. IF THE CONNECTING CABLE IS CONNECTED WRONGLY, ELECTRIC PARTS MAY BE DAMAGED. · CHECK THE EARTH WIRE THAT IT IS NOT BROKEN OR DISCONNECTED BEFORE INSTALLATION. · DO NOT INSTALL NEAR CONCENTRATIONS OF COMBUSTIBLE GAS OR GAS VAPORS.
FAILURE TO FOLLOW THIS INSTRUCTION CAN RESULT IN FIRE OR EXPLOSION. · TO PREVENT OVERHEATING THE INDOOR UNIT AND CAUSING A FIRE HAZARD, PLACE THE UNIT WELL AWAY (MORE THAN 2 M) FROM HEAT SOURCES SUCH AS RADIATORS, HEATORS, FURNACE, STOVES, ETC. · WHEN MOVING THE AIR-CONDITIONER FOR INSTALLING IT IN ANOTHER PLACE AGAIN, BE VERY CAREFUL NOT TO GET THE SPECIFIED REFRIGERANT (R410A) WITH ANY OTHER GASEOUS BODY INTO THE REFRIGERATION CYCLE. IF AIR OR ANY OTHER GAS IS MIXED IN THE REFRIGERANT, THE GAS PRESSURE IN THE REFRIGERATION CYCLE BECOMES ABNORMALLY HIGH AND IT RESULTINGLY CAUSES BURST OF THE PIPE AND INJURIES ON PERSONS. · IN THE EVENT THAT THE REFRIGERANT GAS LEAKS OUT OF THE PIPE DURING THE INSTALLATION WORK, IMMEDIATELY LET FRESH AIR INTO THE ROOM.
IF THE REFRIGERANT GAS IS HEATED BY FIRE OR SOMETHING ELSE, IT CAUSES GENERATION OF POISONOUS GAS. WARNING · Never modify this unit by removing any of the safety guards or bypassing any of the safety interlock switches. · Do not install in a place which cannot bear the weight of the unit. Personal injury and property damage can result if the unit falls. · Before doing the electrical work, attach an approved plug to the power supply cord. Also, make sure the equipment is properly earthed. · Appliance shall be installed in accordance with national wiring regulations. If you detect any damage, do not install the unit. Contact your TOSHIBA dealer immediately. CAUTION · Exposure of unit to water or other moisture before installation could result in electric shock. Do not store it in a wet basement or expose to rain or water. · After unpacking the unit, examine it carefully for possible damage. · Do not install in a place that can increase the vibration of the unit. Do not install in a place that can amplify the noise level of the unit or where noise and discharged air might disturb neighbors. · To avoid personal injury, be careful when handling parts with sharp edges.

· Please read this installation manual carefully before installing the unit. It contains further important instructions for proper installation. REQUIREMENT OF REPORT TO THE LOCAL POWER SUPPLIER Please make absolutely sure that the installation of this appliance is reported to the local power supplier before installation. If you experience any problems, or if the installation is not accepted by the supplier, the service agency will take adequate countermeasures. Remark per EMC Directive 89/336/EEC To prevent flicker impressions during the start of the compressor (technical process) following installation conditions do apply. 1. The power connection for the air conditioner has to be done at the main power distribution. This distribution has to be of an impedance. Normally the required impedance is reached at a 32A fusing point. Air conditioner fuse has to be 16A max.
! 2. No other equipment should be connected to this power line. 3. For detailed installation acceptance, please contact your power supplier whether its restriction does apply for products like washing machines, air conditioners or electrical ovens.

4.

For power details of the air conditioner, refer to the rating plate of the product. - 29 - FILE NO. SVM-06027 8-2. Installation Diagram of Indoor and Outdoor Units 65 mm or more 170 mm Hook or m ore 1 Installation plate For the rear left and left piping Wall Hoo k 170 mm or m ore Air filte r Insert the cushion between the indoor unit and wall, and tilt the indoor unit for better operation. Shield pipe (At tac h to the fron t pa nel .) 4 Sasa-Zeolite Vitamin C filter Do not allow the drain hose to get slack. 6 Bio-enzyme & Gingko filter Cut the piping hole sloped slightly Before installing the wireless remote control · With the remote control cover open, load the batteries supplied correctly, observing their polarity. 8 Pan head wood screw Make sure to run the drain hose sloped downward. 2 Wireless remote control Cover 2 Wireless remote control 4 Remote control holder 3 Batteries The auxiliary piping can be connected the left, rear left, rear right, right, bottom right or bottom left. Right Vinyl tape Apply after carrying out a drainage test. Rear right 600 mm or more Rear left Left Bottom left Bottom right 100 mm or m ore 100 mm or m ore Saddle Insulate the refrigerant pipes separately with insulation, not together. 600 mm m or o re Extension drain hose (Not available, provided by installer) 600 mm or m ore 6 mm thick heat resisting polyethylene foam 30 FILE NO. SVM-06027 8-3. Installation 8-3-1. Optional installation parts Part Code Parts name Refrigerant piping Liquid side : 6.

35 mm Gas side : 12.7 mm Pipe insulating material (polyethylene foam, 6 mm thick) Putty, PVC tapes Q'ty A One each B C 1 One each <Fixing bolt arrangement of outdoor unit> 108 mm 32.5 mm 30 125 mm Air inlet 102 mm 90 mm 320 mm 7 mm Air outlet 600 mm 86 mm Drain outlet Fig. 8-3-1 · Secure the outdoor unit with fixing bolts and nuts if the unit is likely to be exposed to a strong wind. · Use 8 mm or 10 mm anchor bolts and nuts. · If it is necessary to drain the defrost water, attach 9 drain nipple and 10 cap water proof to the bottom plate of the outdoor unit before installing it. - 31 - FILE NO. SVM-06027 8-3-2. Accessory and installation parts Part No. Part name (Q'ty) Part No.

Part name (Q'ty) Part No. Part name (Q'ty) 1 Installation plate x 1 4 Remote control holder x 1 7 Mounting screw 4 x 25 s x 6 2 Wireless remote control x 1 5 Sasa-Zeolite Vitamin C filter x 1 8 Pan head wood screw 3.1 x 16 s x 2 3 Battery x 2 6 Bio-enzyme & Gingko filter x 1 9 Drain nipple x 1 (For Heat pump model only) Others Name Owner's manual Installation manual ! Cap water proof* x 2 (For Heat pump model only) The part marked with asterisk (*) is packaged with the outdoor unit. - 32 - FILE NO. SVM-06027 8-3-3.*

Installation/Servicing tools <Changes in the product and components> In the case of an air conditioner using R410A, in order to prevent any other refrigerant from being charged accidentally, the service port diameter of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch) · In order to increase the pressure withstand strength of the refrigerant piping, flare processing diameter and size of opposite side of flare nuts have been changed. (for copper pipes with nominal dimensions 1/2 and 5/8) New tools for R410A Gauge manifold Applicable to R22 model Changes As pressure is high, it is impossible to measure by means of conventional gauge. In order to prevent any other refrigerant from being charged, each port diameter has been changed. In order to increase pressure withstand strength, hose materials and port size have been changed (to 1/2 UNF 20 threads per inch).

When purchasing a charge hose, be sure to confirm the port size. As pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of a charging cylinder, as air bubbles occur. The size of opposing flare nuts has been increased. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8. By increasing the clamp bar's receiving hole, strength of spring in the tool has been improved. Used when flare is made with a conventional flare tool. Connected to conventional vacuum pump. It is necessary to use an adapter to prevent vacuum pump oil from flowing back to the charge hose. The charge hose connecting part has two ports: one for conventional refrigerant (7/16 UNF 20 threads per inch) and one for R410A. If the vacuum pump mineral oil mixes with R410A, a sludge may occur and damage the equipment.

Exclusive for HFC refrigerant. Charge hose Electronic balance for refrigerant charging Torque wrench (nominal dia. 1/2, 5/8) Flare tool (clutch type) Gauge for projection adjustment Vacuum pump adapter Gas leakage detector · Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R410A) and protector coating in the U. S ARI specified rose color (ARI color code: PMS 507). · Also, the "charge port and packing for refrigerant cylinder" require 1/2 UNF 20 threads per inch corresponding to the port size of the charge hose. 33 FILE NO. SVM-06027 8-4. Indoor Unit 8-4-1. Installation place · A place which provides the spaces around the indoor unit as shown in the above diagram. · A place where there is no obstacle near the air inlet and outlet. · A place that allows easy installation of the piping to the outdoor unit. · A place which allows the front panel to be opened. 8-4-2. Cutting a hole and mounting installation plate <Cutting a hole> When installing the refrigerant pipes from the rear. CAUTION · Direct sunlight to the indoor unit's wireless receiver should be avoided.

· The microprocessor in the indoor unit should not be too close to RF noise sources. (For details, see the owner's manual.) <Remote control> · A place where there are no obstacles such as a curtain that may block the signal from the indoor unit. · Do not install the remote control in a place exposed to direct sunlight or close to a heating source, such as a stove. · Keep the remote control at least 1 m apart from the nearest TV set or stereo equipment.

(This is necessary to prevent image disturbances or noise interference.) · The location of the remote control should be determined as shown below. Indoor unit (Side view) 7m Pipe hole 65 mm The center of the pipe hole is above the arrow. 100 mm Fig. 8-4-2 1. After determining the pipe hole position on the mounting plate (A), drill the pipe hole (65 mm) at a slight downward slant to the outdoor side. NOTE · When drilling a wall that contains a metal lath, wire lath or metal plate, be sure to use a pipe hole brim ring sold separately.

*<Mounting the installation plate> Hook (Top view) m Indoor unit 5 45° 45 ° 62 82.5 *7m 5 m 170 85 ° 75 Remote Reception control range Reception range * : Axial distance Remote control Pipe hole Hook Thread Weight Hook Pipe hole 1 Installation plate Fig. 8-4-1 Indoor unit 7 Mounting screw Fig.*

8-4-3 - 34 - FILE NO. SVM-06027 <When the installation plate is directly mounted on the wall> 1. Securely fit the installation plate onto the wall by screwing it in the upper and lower parts to hook up the indoor unit. 2. To mount the installation plate on a concrete wall with anchor bolts, utilize the anchor bolt holes as illustrated in the above figure. 3. Install the installation plate horizontally in the wall. 8-4-3. Electrical work 1. The supply voltage must be the same as the rated voltage of the air conditioner.
2. Prepare the power source for exclusive use with the air conditioner. CAUTION · This appliance can be connected to the mains in either of the following two ways. @@An approved circuit breaker or switches must used. @@An approved power supply cord and plug must be used.
@@@@@@@@@@holes in the wall. · Insert clip anchors for appropriate 7 mounting screws. @@@@1. Remove the air inlet grille. Open the air inlet grille upward and pull it toward you.
2. Remove the terminal cover and cord clamp. 3. @@4. @@5. Insert the connecting cable fully into the terminal block and secure it tightly with screws. 6. Tightening torque : 1.2 N·m (0.12 kgf·m) 7.

Secure the connecting cable with the cord clamp. 8. @@@@@@@@8-4-8 NOTE · Use stranded wire only. @@8-4-5 Earth line 80 mm 10 mm 70 mm Fig. @@8-4-6 - 36 - FILE NO. SVM-06027 8-4-4. @@@@@@Application causes deterioration and drain leakage of the plug. Insert a hexagon wrench (4 mm) 1. @@(A knife will produce splinters, so use nippers.) 2.
@@@@@@@@@@@@@8-4-11 Slit Fig. 8-4-15 - 37 - FILE NO. SVM-06027 <Left-hand connection with piping> 8-4-5. @@@@@@unit may unstably be set on the wall. When bending the 2.
@@as not to crush the pipe. 3. @@Pull the Bend the connection pipe within a radius of 30 mm. @@8-4-17 · For detaching the indoor unit from the installation plate, pull the indoor unit toward you while pushing its bottom up at the specified parts. 80 Use the handle of screwdriver, etc.
Fig. 8-4-16 NOTE If the pipe is bent incorrectly, the indoor unit may unstably be set on the wall. After passing the connecting pipe through the pipe hole, connect the connecting pipe to the auxiliary pipes and wrap the facing tape around them. Push Push CAUTION · Bind the auxiliary pipes (two) and connecting cable with facing tape tightly. In case of leftward piping and rear-leftward piping, bind the auxiliary pipes (two) only with facing tape. Indoor unit Auxiliary pipes Connecting cable Installation plate Fig. 8-4-18 · Carefully arrange pipes so that any pipe does not stick out of the rear plate of the indoor unit. · Carefully connect the auxiliary pipes and connecting pipes to each other and cut off the insulating tape wound on the connecting pipe to avoid double-taping at the joint, moreover, seal the joint with the vinyl tape, etc. · Since dewing results in a machine trouble, make sure to insulate both the connecting pipes. (Use polyethylene foam as insulating material.

) · When bending a pipe, carefully do it, not to crush it. - 38 - FILE NO. SVM-06027 8-4-6. Drainage 1. Run the drain hose sloped downwards. NOTE · Hole should be made at a slight downward slant on the outdoor side. Do not rise the drain hose. Do not form the drain hose into a wavy shape. 8-5. Outdoor Unit 8-5-1.
Installation place · A place which provides the spaces around the outdoor unit as shown in the left diagram. · A place which can bear the weight of the outdoor unit and does not allow an increase in noise level and vibration. · A place where the operation noise and discharged air do not disturb your neighbors. · A place which is not exposed to a strong wind. · A place free of a leakage of combustible gases.
· A place which does not block a passage. · When the outdoor unit is to be installed in an elevated position, be sure to secure its feet. · An allowable length of the connecting pipe is up to 15m · An allowable height level is up to 6m. · A place where the drain water does not raise any problem. 50 mm or more Do not put the drain hose end into water.
Do not put the drain hose end in the drainage ditch. Fig. 8-4-19 2. Put water in the drain pan and make sure that the water is drained out of doors. 3. When connecting extension drain hose, insulate the connecting part of extension drain hose with shield pipe. Shield pipe CAUTION 1. Install the outdoor unit without anything blocking the air discharging. 2. When the outdoor unit is installed in a place exposed always exposed to strong wind like a coast or on a high storey of a building, secure the normal fan operation using a duct or a wind shield.

3. In particularly windy areas, install the unit such as to avoid admission of wind. 4. Installation in the following places may result in trouble. Do not install the unit in such places. · A place full of machine oil. · A saline-place such as the coast. · A place full of sulfide gas. · A place where high-frequency waves are likely to be generated as from audio equipment, welders, and medical equipment. Drain hose Inside the room Extension drain hose Fig.
@@Improper drainage can result in dew-dropping. @@@@8-5-1 Fig. 8-4-21 - 39 - FILE NO. SVM-06027 8-5-2. Refrigerant piping connection 1. @@@@8-5-2 2. Insert a flare nut into the pipe, and flare the pipe. @@(Approx. 1.6 times).
@@@@8-5-3 Rigid (Clutch type) Outer dia. @@8-5-4 Imperial (wing nut type, conventional tool) Outer dia. @@@@8-5-5 Flare nut Externally threaded side Internally threaded side CAUTION · Do not apply excess torque. · Otherwise, the nut may crack depending on the conditions. Use a wrench to secure. Use a torque wrench to tighten. Fig. 8-5-6 CAUTION · KEEP IMPORTANT 4 POINTS FOR PIPING WORK (1) Take away dust and moisture (Inside of the connecting pipes.) (2) Tight connection (between pipes and unit) (3) Evacuate the air in the connecting pipes using VACUUM PUMP. (4) Check gas leak (connected points) - 40 - FILE NO.

SVM-06027 8-5-3. Evacuating After the piping has been connected to the indoor unit, you can perform the air purge together at once. AIR PURGE Evacuate the air in the connecting pipes and in the indoor unit using a vacuum pump. Do not use the refrigerant in the outdoor unit. For details, see the manual of the vacuum pump. <Using a vacuum pump> Be sure to use a vacuum pump with counter-flow prevention function so that inside oil of the pump does not flow backward into pipes of the air conditioner when the pump stops.

(If oil inside of the vacuum pump enters into the air conditioner, which use R410A, refrigeration cycle trouble may result.) 1. Connect the charge hose from the manifold valve to the service port of the gas side packed valve. 2. Connect the charge hose to the port of the vacuum pump. 3. Open fully the low pressure side handle of the gauge manifold valve. 4. Operate the vacuum pump to start evacuating. Perform evacuating for about 15 minutes if the piping length is 20 meters. (15 minutes for 20 meters) (assuming a pump capacity of 27 liters per minute.) Then confirm that the compound pressure gauge reading is -101 kPa (-76 cmHg). 5. Close the low pressure side valve handle of gauge manifold. 6. Open fully the valve stem of the packed valves (both sides of Gas and Liquid). 7. Remove the charging hose from the service port. 8. Securely tighten the caps on the packed valves. Compound pressure gauge -101kPa (-76cmHg) Manifold valve Handle Lo Charge hose (For R410A only) Connecting pipe Handle Hi (Keep full closed) Charge hose (For R410A only) Vacuum pump adapter for counter-flow prevention (For R410A only) Vacuum pump <Packed valve handling precautions> · Open the valve stem all the way out; but do not try to open it beyond the stopper. · Securely tighten the valve stem cap with torque in the following table: Gas side (12.70 mm) Liquid side (6.35 mm) Service port 50 to 62 N·m (5.

0 to 6.2 kgf·m) 16 to 18 N·m (1.6 to 1.8 kgf·m) 9 to 10 N·m (0.9 to 1.0 kgf·m) Hexagonal wrench is required. 4m m Fig. 8-5-8 Pressure gauge Packed valve at gas side Service port (Valve core (Setting pin)) Packed valve at liquid side Fig. 8-5-7 - 41 - FILE NO. SVM-06027 8-5-4. Wiring connection 1. Remove the valve cover from the outdoor unit. 2. Connect the connecting cable to the terminal as identified with their respective matched numbers on the terminal block of indoor and outdoor unit. 3. When connecting the connecting cable to the outdoor unit terminal, make a loop as shown in the installation diagram of indoor and outdoor unit, to prevent water coming in the outdoor unit. 4. Insulate the unused cords (conductors) from any water coming in the outdoor unit. Proceed them so that they do not touch any electrical or metal parts. <Stripping length of connecting cable> For RAS-13GAH-ES2, RAS-13N2AH-AS2 Terminal block 100 mm 10 mm 8-6. How to Set Remote Control Selector Switch When two indoor units ae installed in seperated rooms, there is no need to change the selector switch. <Remote control selector switch> · When two indoor units are installed in the same room or the adjacent two rooms, they may be controlled simultaneously with a single remote control. To prevent this, set either unit and its remote control to B setting. (Both units are set to A setting before shipment.) · The remote control signal is not recived when the indoor unit setting is different from the remote control one. 1. Set the remote control selector switch with the indoor unit. Earth line Terminal screw 1(L) 2(N) 3 4 Earth line Screw 1) Turn the circuit breaker of the main power switch off before setting the selector switch. 2) Remove the Air inlet grille and Front panel. (Refer to page 59, 10-1) 10 mm 50 mm Connecting cable Cord clamp 3) Select the terminal of selector switch from [A position] to [B position].

Fig. 8-5-9 For RAS-13GA-ES2, RA-S13N2A-AS2 Terminal block 100 mm 10 mm Earth line 1(L) 2(N) Terminal screw Screw 10 mm 40 mm Earth line Connecting cable Selector Switch Cord clamp Fig. 8-5-10 CAUTION · Wrong wiring connection may cause some electrical parts burn out. · Be sure to comply with local codes on running the wire from indoor unit to outdoor unit (size of wire and wiring method etc.) · Every wire must be connected firmly. NOTE · Wire type: H07 RN-F or 245 IEC66 (2.0 mm2 or more) LED Assembly Fig. 8-6-1 - 42 - FILE NO. SVM-06027 2. Set the remote control selector switch with the remote control [B] is indicated on the liquid crystal display when setting remote control selector switch to B. [A] is not indicated on the display even if the selector switch is set to A. 1) Load the remote control with the batteries. 2) Press the [CHECK] button using something with sharp point. (The preset temperature on the remote control changes to [00].) 3) Press the [MODE] button while pressing the [CHECK] button, [B] is indicted at the right of the present temperature display. · To reset the switch to the [A] setting, press the [MODE] button again while pressing the [CHECK] button. Valve stem cap connection Service cap connection 8-7. Others 8-7-1. Gas leak test Valve cover Fig. 8-7-1 · Check the flare nut connections, valve stem cap connections and service port cap connections for gas leak with a leak detector or soap water. 8-7-2. Test operation To switch the TEST RUN (COOL) mode, press RESET button for 10 sec. (The beeper will make a short beep.) RESET [MODE] button RESET button Fig. 8-7-2 [CHK] button 8-7-3. Auto restart setting This product is designed so that, after a power failure, it can restart automatically in the same operating mode as before the power failure. Fig. 8-6-2 3. Confirm that the indoor unit can operate with the new setting. Information The product was shipped with Auto Restart function in the off position.

Turn it on as required. <How to set the auto restart> · Press and hold the RESET button for about 3 seconds. After 3 seconds, the electronic beeper makes three short beeps to tell you the Auto Restart has been selected. · To cancel the Auto Restart, follow the steps described in the section Auto Restart Function of the Owner's Manual. - 43 - FILE NO. SVM-06027 9. TROUBLESHOOTING CHART 9-1. Troubleshooting Procedure Follow the details of 9-2. Basic Check Items. If there is no troub le corresponding to 9-2, check whether or not there are faulty parts following 9-4. Self-Diagnosis by Remote Control. 9-2-2. Incorrect cable connection between Indoor and outdoor units The indoor unit is connected to the outdoor unit with 5 cables (Heat pump model) or 3 cables (Cooling Only model). Check that the indoor and outdoor units have been properly connected with terminals assigned the same numbers. If the connectors are not properly connected, the outdoor unit will not operate normally, or OPERATION lamp and TIMER lamp will blink (5Hz). 9-2-3. Program control The microcontroller operates as shown in Table 9-2-1 to control the air conditioner. If there are any operational problems, check whether or not the problems correspond to Table 9-2-1. If they correspond to the Table, they are not problems with the air conditioner, but they are indispensable operations to control and maintain the air conditioner properly. 9-2. Basic Check Items 9-2-1. Power supply voltage The line voltage must be AC 220 - 240V. If it is not within this range, the air conditioner may not operate normally.

Table 9-2-1 No. 1 Operation of air conditioner When the main power supply is turned on, the OPERATION lamp on the indoor unit blinks. The indoor fan motor speed does not change in the Dry operation. Descriptions The OPERATION lamp blinks to indicate that power is turned on. If the [ ] button is pressed, the lamp stops blinking. The indoor fan motor speed is automatically controlled in the Dry operation. 2 3 The compressor is not turned off even though The compressor has a function that it is not turned off for the room temperature is in the range that the 3 minutes after it is turned on even though the room temperature compressor is turned off.

is in the range that the compressor is turned off. The compressor is not turned on and off even In the Dry operation, the compressor is turned on and off though the thermo control is operated in the automatically at the regular intervals, independent of the thermo Dry operation. control. The PRE-DEF. lamp is indicated when the Heating operation starts. The PRE-DEF. lamp is indicated during the Defrosting operation or if the indoor heat exchanger temperature is low when the Heating operation starts. At this time, the indoor fan motor stops to prevent cold air from blowing in the room. When the indoor heat exchanger temperature is high, the outdoor fan motor is stopped by the high-temperature limit control operation. 4 5 6 The outdoor fan motor stops in the Heating operation.

7 The compressor is not turned on even though The compressor is not turned on in the restart delay timer the room temperature is in the range that the (3-minutes timer) operation. It is also not turned on after the power compressor is turned on. supply is turned on because of this timer operation. The operation mode changes in the Automatic operation. In Automatic operation, the room temperature is detected all time for control fan speed and the operation mode is changed every 15 minutes according to difference between the room temperature and the preset temperature.

When the room temperature is in the range (Preset temperature ± 1°C), the Fan only operation is selected. This operation does not work when the unit is in the Dry operation or Fan only operation. 8 9 10 The Fan only operation continues in the Automatic operation. The Hi-POWER operation does not work. - 44 - FILE NO.

SVM-06027 9-3. Primary Judgement 9-3-1. Role of indoor unit controller The indoor unit controller receives the operation commands from the remote control and executes them. · Temperature measurement at the air outlet of the indoor heat exchanger by the indoor temperature sensor · Temperature setting of the indoor heat exchanger by the heat exchanger sensor · Louver motor control · Indoor fan motor operation control · LED display control · Transferring of operation commands to the outdoor unit 9-3-2. Failure diagnosis The indoor unit diagnoses the operation condition and indicates the information of the self-diagnosis with the lamps on the display panel of the indoor unit. Table 9-3-1 Lamps A B C D E F G OPERATION lamp is blinking. (1Hz) OPERATION lamp is blinking. (5Hz) OPERATION lamp is blinking. (5Hz) OPERATION lamp is blinking. (5Hz) OPERATION lamp is blinking.

(5Hz) OPERATION and TIMER lamps are blinking. (5Hz) OPERATION, TIMER and PRE-DEF. (or FAN ONLY for cooling only model) lamps are blinking. Self-diagnosis Power failure (when the power supply is turning on) Thermo sensor (TA) short or break Heat exchanger sensor (TC) short or break Indoor fan motor lock or failure Indoor P.C. board failure Wrong wiring of connecting cable Cycle failure · Gas shortage or other refrigerant cycle trouble · Heat exchanger sensor open, break or short · Overload relay or thermostat trouble of compressor Table 9-3-2 Diagnosis by detective operation Symptom The remote control does not work. Check Turn off the power supply once, The remote control then turn it on. Try to operate still does not work. the remote control. The remote control works.

The compressor operates. The compressor does not operate. Primary judgement The indoor unit (and/or remote control) is/are defective. OK. The outdoor unit (Outdoor fan motor) is defective.

An internal part of the compressor or PCB is defective. The outdoor fan does not rotate. - 45 - FILE NO. SVM-06027 9-4. Self-Diagnosis by Remote Control (Check Code) (1) If the lamps are indicated as shown B to G in Table 9-3-1, exchanger the self-diagnosis by the remote control.

(2) When the remote control is set to the service mode, the indoor controller diagnoses the operation condition and indicate the information of the self-diagnosis on the display of the remote control with the check codes. If a fault is detected, all lamps on the indoor unit will blink at 5Hz and it will beep for 10 seconds (Pi, Pi, Pi....). The timer lamp usually blinks (5Hz) during the self-diagnosis. 9-4-1. How to use remote control in service mode (1) Press [CHK] button with a tip of pencil to set the remote control to the service mode. · "00" is indicated on the display of the remote control.

· The timer lamp on the indoor unit blinks continuously. (5 times per 1 sec.) (2) Press [TIMER 8] button. If there is no fault with a code, the indoor unit will beep once (Pi) and the display of the remote control will change as follows: 00 01 02 1d 1E 22 · Check the unit with all 35 check codes (00 to 22). as shown in Table 9-4-1. · Press [TIMER 9] button to change the check code backwards. If there is a fault, the indoor unit will beep for 10 seconds (Pi, Pi, Pi...). Note the check code on the display of the remote control. · 2-digits alphanumeric will be indicated on the display. · All lamps on the indoor unit will blink. (5 times per 1 sec.) (3) Press [CLR] button.

After service finish for clear service code in memory. · "7F" is indicated on the display of the remote control. · Alphanumeric characters are used for the check code. is 5. is A.

*is C. is 6. is B. is D. (4) Press [ ] button to release the service mode. · The display of the remote control returns to as it was before service mode was engaged. * This illustration in only for Heat pump model. For Cooling only model, there is not the ( ) symbol. - 46 - FILE NO. SVM-06027 Table 9-4-1 Block level Diagnosis function Check code Block Indoor P.*

C. board Check code Symptom Air Conditioner status Condition Judgement and action Thermo. sensor short/break. Continued operation. Indicated when detected abnormal Indicated when detected abnormal 1.Check thermo sensor. 2.If it is OK, check P.C. board.

1.Check heat exchanger sensor. 2.If it is OK, check P.C.

board. 1.Check heat thermal fuse is blow or not? (Terminal block part.) 2.If the thermal fuse is not blow, check indoor fan motor.

(Refer to trouble shooting flow charts.) Replace P.C. borad. Heat exchanger sensor short/break. Continued operation. Indoor fan lock, abnormality of indoor fan or thermal fuse break.