
TOSHIBA

Toshiba RAS-10SKVP2-E Service Manual

Split type indoor unit high wall, heat pump type outdoor unit heat pump type

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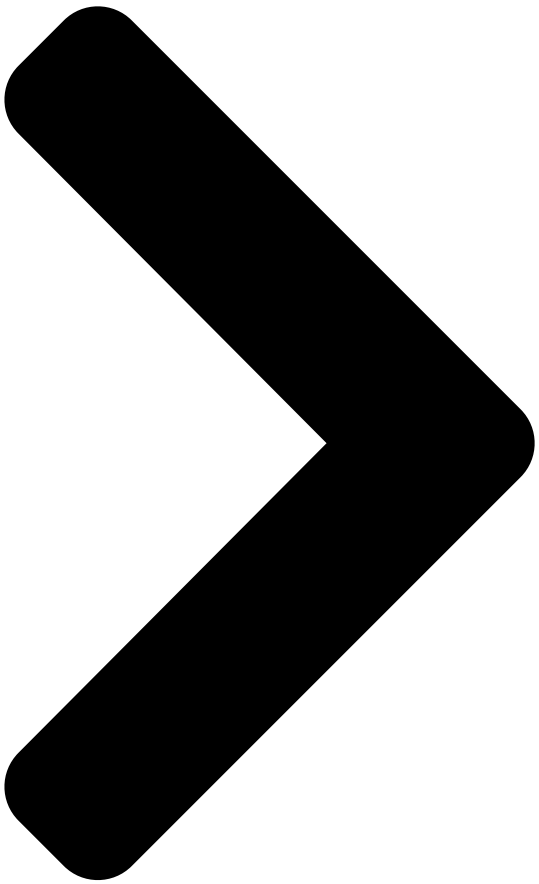

FILE NO. SVM-11015-1

SERVICE MANUAL

TOSHIBA

SPLIT TYPE

Indoor Unit

Outdoor Unit

<High Wall, Heat Pump Type>

<Heat Pump Type>

AIR CONDIT

RAS-10SKVP2-E / RAS-10SAVP2-E
RAS-13SKVP2-E / RAS-13SAVP2-E
RAS-16SKVP2-E / RAS-16SAVP2-E
R410A

Revised March, 2011

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Related Manuals for Toshiba RAS-10SKVP2-E

Air Conditioner Toshiba RAS-10SAV-A Service Manual

Split wall type (94 pages)

Air Conditioner Toshiba RAS-10SKVP-ND Owner's Manual

(61 pages)

Air Conditioner Toshiba RAS-16SKVP-ND Owner's Manual

(230 pages)

Air Conditioner Toshiba RAS-10SKVP-ND Installation Manual

(132 pages)

Air Conditioner Toshiba RAS-10 SKV Series Owner's Manual

(8 pages)

Air Conditioner Toshiba RAS-10SKVP2 series Owner's Manual

Split type (6 pages)

Air Conditioner Toshiba RAS-10SKVP2 Series Owner's Manual

Air conditioner (split type) (8 pages)

Air Conditioner Toshiba RAS-13SKV-E Service Manual

Indoor/outdoor unit, split type air conditioner (120 pages)

Air Conditioner Toshiba RAS-13SKV-E Service Manual

Split type indoor/outdoor unit (121 pages)

Air Conditioner Toshiba RAS-13SKV2-E Service Manual

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Air Conditioner Toshiba RAS-10SKH-E Service Manual

Split wall type air conditioner (62 pages)

Air Conditioner Toshiba RAS-10SKH-ES Service Manual

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Air Conditioner Toshiba RAS-10~16 SKV(R) Series Owner's Manual

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Air Conditioner Toshiba RAS-10(7)~16(7)SKV Series Installation Manual

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Air Conditioner Toshiba RAS-10 SKV Series Owner's Manual

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Air Conditioner Toshiba RAS-10SKP Series Owner's Manual

(8 pages)

Summary of Contents for Toshiba RAS-10SKVP2-E

Page 1: Service Manual

FILE NO. SVM-11015-1 SERVICE MANUAL SPLIT TYPE Indoor Unit Outdoor Unit <High Wall, Heat Pump Type> <Heat Pump Type> RAS-10SKVP2-E / RAS-10SAVP2-E RAS-13SKVP2-E /

RAS-13SAVP2-E RAS-16SKVP2-E / RAS-16SAVP2-E R410A Revised March, 2011...

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Page 3: Safety Precautions

FILE NO. SVM-11015 1. SAFETY PRECAUTIONS For general public use Power supply cord of outdoor unit shall be more than 1.5 mm (H07RN-F or 60245IEC66) polychloroprene sheathed flexible cord. • Read this “SAFETY PRECAUTIONS” carefully before servicing. • The precautions described below include the important items regarding safety. Observe them without fail. •...

Page 4 FILE NO. SVM-11015 • DO NOT INSTALL NEAR CONCENTRATIONS OF COMBUSTIBLE GAS OR GAS VAPORS. FAILURE TO FOLLOW THIS INSTRUCTION CAN RESULT IN FIRE OR EXPLOSION. • TO PREVENT THE INDOOR UNIT FROM OVERHEATING AND CAUSING A FIRE HAZARD, PLACE THE UNIT WELL AWAY (MORE THAN 2 M) FROM HEAT SOURCES SUCH AS RADIATORS, HEAT REGISTORS, FURNACE, STOVES, ETC.

Page 5: Specifications

FILE NO. SVM-11015 2. SPECIFICATIONS 2-1. Specifications Unit model Indoor RAS-10SKVP2-E RAS-13SKVP2-E RAS-16SKVP2-E Outdoor RAS-10SAVP2-E RAS-13SAVP2-E RAS-16SAVP2-E Cooling capacity (kW) 2.51 3.52 4.53 Cooling capacity range (kW) 0.50-3.50 0.60-4.50 0.80-5.00 Heating capacity (kW) 3.21 4.22 5.53 Heating capacity range (kW) 0.50-6.50...

Page 6 FILE NO. SVM-11015 2-2. Operation Characteristic Curve <Cooling> <Heating> RAS-16SKVP2-E RAS-13SKVP2-E RAS-16SKVP2-E RAS-13SKVP2-E RAS-10SKVP2-E Conditions RAS-10SKVP2-E Indoor : DB 20 C/WB 15 Outdoor : DB 7 C/WB 6 Indoor Air Flow : High Pipe Length : 5m Voltage : 230V...

Page 7: Refrigerant R410A

FILE NO. SVM-11015 3. REFRIGERANT R410A This air conditioner adopts the new refrigerant HFC 6. When an air conditioning system charged with a (R410A) which does not damage the ozone layer. large volume of refrigerant is installed in a small room, it is necessary to exercise care so that, The working pressure of the new refrigerant R410A even when refrigerant leaks, its concentration...

Page 8 FILE NO. SVM-11015 Table 3-2-1 Thicknesses of annealed copper pipes Thickness (mm) Nominal diameter Outer diameter (mm) R410A 6.35 0.80 0.80 9.52 0.80 0.80 12.70 0.80 0.80 15.88 1.00 1.00 2. Joints For copper pipes, flare joints or socket joints are used. Prior to use, be sure to remove all contaminants. a) Flare Joints Flare joints used to connect the copper pipes cannot be used for pipings whose outer diameter exceeds 20 mm.

Page 9 FILE NO. SVM-11015 d) Flare Processing Make certain that a clamp bar and copper pipe have been cleaned. ØD By means of the clamp bar, perform the flare processing correctly. Use either a flare tool for R410A or conven- tional flare tool. Flare processing dimensions differ according to the type of flare tool.

Page 10 FILE NO. SVM-11015 Table 3-2-6 Flare and flare nut dimensions for R22 Dimension (mm) Nominal Outer diameter Thickness Flare nut width diameter (mm) (mm) (mm) 6.35 9.52 13.0 13.5 12.70 16.2 16.0 12.9 15.88 19.7 19.0 16.0 19.05 23.3 24.0 19.2 Fig.

Page 11 FILE NO. SVM-11015 3-3. Tools 3-3-1. Required Tools The service port diameter of packed valve of the outdoor unit in the air-water heat pump using R410A is changed to prevent mixing of other refrigerant. To reinforce the pressure-resisting strength, flare processing dimensions and opposite side dimension of flare nut (For Ø12.7 copper pipe) of the refrigerant piping are lengthened.

Page 12: Recharging Of Refrigerant

FILE NO. SVM-11015 3-4. 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. 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.

Page 13 FILE NO. SVM-11015 1. Be sure to make setting so that liquid can be charged. 2. 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. 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.

Page 14 FILE NO. SVM-11015 2. Characteristics required for flux 3-5-3. Brazing • Activated temperature of flux coincides with the As brazing work requires sophisticated techniques, brazing temperature. experiences based upon a theoretical knowledge, it must be performed by a person qualified. •...

Page 15: Construction Views

FILE NO. SVM-11015 4. CONSTRUCTION VIEWS 4-1. Indoor Unit Air filter Air inlet Plasma purifier Front panel Heat exchanger Air ionizer Knock out system Knock out system 62 69 Installation plate hanger Wireless remote controller Installation plate hanger Drain hose (0.50m) Connecting pipe (0.35m) Connecting pipe (0.40m) (For 10,13 Series : Flared...

Page 16: Outdoor Unit

FILE NO. SVM-11015 4-2. Outdoor Unit 6 hole R5.5 A detail drawing (Back leg) 6 hole 11x14 hole 25 Drain outlet 11x14 Hole (For 10 anchor bolt) B detail drawing (Front leg) FAN-GUARD COVER-PV View Z Electrical part Liquid side (Flare 6.35) Gas side...

Page 17: Wiring Diagram

FILE NO. SVM-11015-1 5. WIRING DIAGRAM 220-240V ~50Hz 220-230V ~60Hz Air purifier Electrode Electrode 1 2 3 Outdoor Terminal Block High-voltage 1 2 3 Power Supply Indoor Terminal Block 1 2 3 4 Heat 1 2 3 4 Exchanger POWER SUPPLY (From outdoor Unit) GRN&YEL 1 2 3 4...

Page 18: Specifications Of Electrical Parts

FILE NO. SVM-11015-1 6. SPECIFICATIONS OF ELECTRICAL PARTS 6-1. Indoor Unit Part s n ame Type Specif icat io ns Fan motor (for indoor) MF-340-30-2 DC250~370, 30W Ω (-) Room temp. sensor (TA-sensor) at 25°C Heat exchanger temp. sensor (TC-sensor) 10kΩ...

Page 19: Refrigerant Cycle Diagram

FILE NO. SVM-11015-1 7. REFRIGERANT CYCLE DIAGRAM 7-1. Refrigerant Cycle Diagram Temp. measurement INDOOR UNIT Indoor heat exchanger Cross flow fan Max. : 25m : 2m Min. Pressure measurement Chargeless : 15m Deoxidized copper pipe Gauge attaching port Charge : 20g/m Outer dia.

Page 20: Operation Data

FILE NO. SVM-11015 7-2. Operation Data <Cooling> Tempeature Model name Standard Heat exchanger Indoor Outdoor Compressor condition(°C) RAS- pressure pipe temp. fan mode fan mode revolution Indoor Outdoor P (MPa) T1 (°C) T2 (°C) (rps) 27/19 35/- 10SKVP2-E 0.9 to 1.1 12 to 14 40 to 42 High...

Page 21: Control Block Diagram

FILE NO. SVM-11015 8. CONTROL BLOCK DIAGRAM 8-1. Indoor Unit Indoor Unit Control Unit M.C.U. Heat Exchanger Sensor (Tcj) Louver Functions Motor Heat Exchanger Sensor (Tc) • Cold draft preventing Function Room Temperature Sensor (Ta) Louver Motor • 3-minute Delay at Restart for Compressor Drive Control Infrared Rays Signal Receiver •...

Page 22 FILE NO. SVM-11015 8-2. Outdoor Unit (Inverter Assembly) – –...

Page 23: Operation Description

FILE NO. SVM-11015 9. OPERATION DESCRIPTION 9-1. Outline of Air Conditioner Control • Detection of inverter input current and current release operation This air conditioner is a capacity-variable type air • Over-current detection and prevention operation conditioner, which uses AC or DC motor for the indoor to IGBT module (Compressor stop function) for motor and

the outdoor fan motor.

Page 24 FILE NO. SVM-11015 9-2. Operation Description 1. Basic operation .....24 1. Operation control .....24 2. Cooling/Heating operation .....25 3. AUTO operation ..... 25 4. DRY operation .....25 2. Indoor fan motor control ..... 26 3. Outdoor fan motor control ..... 28 4.

Page 25: Basic Operation

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 1. Basic 1. Operation control operation Receiving the user's operation condition setup, the operation statuses of indoor/outdoor units are controlled. 1) The operation conditions are selected by the remote controller as shown in the below. 2) A signal is sent by ON button of the remote controller.

Page 26: Cooling/Heating Operation

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 1. Basic 2. Cooling/Heating operation operation The operations are performed in the following parts by controls according to cooling/heating conditions. 1) Receiving the operation ON signal of the remote controller, the cooling or heating operation signal starts being transferred form the indoor controller to the outdoor unit.

Page 27: Indoor Fan Motor Control

+1.5 *5 : Fan speed = (M + –L) x 1/4 + L +1.0 +0.5 (Linear approximation L(W6) from M+ and L) (Table 1) Indoor fan air flow rate RAS-10SKVP2-E RAS-13SKVP2-E RAS-16SKVP2-E Fan speed COOL HEAT level Fan speed Air flow rate...

Page 28 FILE NO. SVM-11015-1 Item Operation flow and applicable data, etc. Description 2. Indoor fan <In heating operation> 1) When setting the fan speed to L, motor control L+, M, M+, H or Quiet on the remote controller, the operation is per- formed with the constant speed HEAT ON shown in Fig.

Page 29: Outdoor Fan Motor Control

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 3. Outdoor fan The blowing air volume at the outdoor unit side is controlled. 1) The operation command sent motor control from the remote controller is Receiving the operation command from the controller of processed by the indoor unit indoor unit, the controller of outdoor unit controls fan speed.

Page 30: Capacity Control

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 4. Capacity The cooling or heating capacity depending on the load is 1) The difference between set control adjusted. temperature on remote controller (Ts) and room temperature (Ta) According to difference between the setup value of tempera- is calculated.

Page 31: Release Protective Control By Temperature Of Indoor Heat Exchanger

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 6. Release protective <In cooling/dry operation> 1) When temperature of the indoor control by tempera- heat exchanger drops below 5°C, (Prevent-freezing control for indoor heat exchanger) ture of indoor heat the compressor speed is In cooling/dry operation, the sensor of indoor heat exchanger...

Page 32: Defrost Control (Only In Heating Operation)

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 7. Defrost control (This function removes frost adhered to the outdoor The necessity of defrost operation is (Only in heating heat exchanger.) detected by the outdoor heat exchanger operation) temperature.

Page 33: Louver Control

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 8. Louver control This function controls the air direction of the indoor unit. • The position is automatically controlled according to the operation 1) Louver position mode (COOL/HEAT). • The set louver

position is stored in memory by the microcomputer, and the louver returns to the stored position when the next operation is performed.

Page 34: Eco Operation

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 9. ECO When pressing [ECO] button on the remote controller, a <Cooling operation> operation Economic operation is performed. 1) The control target temperature <Cooling operation> increase 0.5ºC per hour up to 2ºC This function operates the air conditioner with the difference starting from the set temperature between the set and the room temperature as shown in the...

Page 35: Temporary Operation

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 10. Temporary Pressing [RESET] button starts the temporary opera- 1) When pressing [RESET] button, the operation tion of [AUTO] operation. When keeping [RESET] temporary [AUTO] operation starts. button pressed for 10 seconds or more, the temporary 2) When keeping [RESET] button pressed [COOL] operation is performed.

Page 36: Discharge Temperature Control

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 11. Air purifying control [Detection of abnormality] 1. Purpose The air purifying control function is to alert the user to trouble in the ionizing or Purifying operation air purifying operation. 2.

Page 37: Pulse Modulating Valve (P .M.v.) Control

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 13. Pulse This function controls throttle amount of the 1) When starting the operation, move the Modulating refrigerant in the refrigerating cycle. valve once until it fits to the stopper. valve (P.M.V.) (Initialize) According to operating status of the air conditioner,...

Page 38: Self-Cleaning Function

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 14. Self-Cleaning 1. Purpose function The Self-Cleaning operation is to minimize the growth of mold, bacteria etc. by running the fan and drying so as to keep the inside of the air conditioner clean. Unit now performing cooling or dry operation Self-Cleaning operation When the cooling or dry operation shuts...

Page 39: Remote-A Or B Selection

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description • Self-Cleaning diagram 14. Self-Cleaning function Operation display FCU fan rpm is depend on presetting. (500RPM) FCU louver OPEN OPEN (12.7º) CLOSE ON or OFF ON or OFF Timer display depend on presetting of timer function.

Page 40: Quiet Mode

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 16. QUIET mode When the [QUIET] selected form [Fan] button, the Quiet mode is the system which, control the fan of the indoor unit will be restricted the revolving revolving speed of indoor fan to work −...

Page 41: One-Touch Comfort

FILE NO. SVM-11015 Item Operation flow and applicable data, etc. Description 19. One-Touch One touch comfort is the fully automated operation Operation condition for model to Europe Comfort that is set according to the preferable condition in market a region. When an indoor unit receives "One Touch Comfort Signal"...

Page 42: P Ower Selection

FILE NO. SVM-11015 Item Operation flow and applicable data,etc Description • When the level is selected, Power-SEL ([POWER-SEL] button on the remote controller 22. POWER level flashes on LCD display for 3 is pressed) Selection Mode seconds. In case of 75% and 50% The function is used when its circuit breaker is level, number "75"...

Page 43: Auto Restart Function

FILE NO. SVM-11015 9-3. Auto Restart Function This 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 a power supply being accidentally shut down. The operation will resume without warning three minutes after power is restored.

Page 44: How To Cancel The Auto Restart Function

FILE NO. SVM-11015 9-3-2. How to Cancel the Auto Restart Function To cancel auto restart function, proceed as follows : Repeat the setting procedure : the unit receives the signal and beeps three times. The unit will be required to be turned on with the remote controller after the main power supply is turned off. •...

Page 45: Remote Controller And Its Fuctions

The coutomised settings control temperature air flow strength, air flow direction and other settings to provide you alternate contact with "ONE-TOUCH" OF THE BUTTON. If you prefer other settings you can select from the many other operation functions of your Toshiba unit Press : Start the operaton.

Page 46 FILE NO. SVM-11015 4. DRY OPERATION (COOLING ONLY) For dehumidification, a moderate cooling performance is controlled automatically. 1. Press : Select Dry 2. Press : Set the desired temperature. 5. AIR PURIFYING OPERATION (RAS-10,13,16SKVR-E Only) During air conditioner operation Press PURE to start and air ionizer operation.

Page 47 FILE NO. SVM-11015-1 Note: · Keep the remote control in accessible transmission to the indoor unit; otherwise, the time lag of up to 15 minutes will occur. · The setting will be saved for the next same operation. 10. PRESET OPERATION Set your preferred operation for future use.

Page 48: Name And Functions Of Indications On Remote Controller

FILE NO. SVM-11015-1 9-4-3. Name and Functions of Indications on Remote Controller [Display] All indications, except for the clock time indicator, are displayed by pressing the button. Transmission mark TIMER and clock time indicator This transmission mark indicates when the The time setting for timer operation or the clock remote controller transmits signals to the indoor time is indicated.

Page 49: Installation Procedure

FILE NO. SVM-11015 10. INSTALLATION PROCEDURE 10-1. Installation Diagram of Indoor and Outdoor Units For the rear left and left piping Hook Installation plate Wall Insert the cushion between the indoor unit and wall, and tilt the indoor unit for better operation.

Page 50 FILE NO. SVM-11015 10-2. Installation 10-2-1. Optional installation parts Part Parts name Q'ty Code Refrigerant piping Liquid side : ∅6.35 mm each ∅ Gas side 9.52 mm (10,13SKVP2 Series) ∅ 12.70 mm (16SKVP2 Series) Pipe insulating material (polyethylene foam, 6 mm thick) Putty, PVC tapes each Fixing bolt arrangement of outdoor unit...

Page 51 Installation plate x 1 Remote control holder x 1 Flat head wood screw ∅3.1 x 16 s x 2 Wireless remote control x 1 TOSHIBA New IAQ filter x 1 Drain nipple* x 1 Battery x 2 Plasma air purifier x 1 Others Name Owner’s manual...

Page 52 FILE NO. SVM-11015 10-2-3. 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) •...

Page 53 FILE NO. SVM-11015 10-3. Indoor Unit 10-3-2. Cutting a Hole and Mounting Installation Plate 10-3-1. Installation Place • A place which provides enough spaces around the Cutting a hole indoor unit as shown in the diagram. When installing the refrigerant pipes from the rear. •...

Page 54 FILE NO. SVM-11015 10-3-3. Electrical Work When the installation plate is directly mounted on the wall 1. The supply voltage must be the same as the rated voltage of the air conditioner. 1. Securely fit the installation plate onto the wall by 2.

Page 55 FILE NO. SVM-11015 CAUTION 1. Die-cutting front panel slit CAUTION Cut out the slit on the left or right side of the front • Be sure to refer to the wiring system diagram panel for the

left or right connection and the slit labeled inside the front panel.

Page 56 FILE NO. SVM-11015 2. Firmly insert drain cap. Left-hand connection with piping Bend the connecting pipes so that they are posi- tioned within 43 mm above the wall surface. No gap If the connecting pipes are positioned more than Do not apply lubricating oil 43 mm above the wall surface, the indoor unit may (refrigerant machine oil) be unstable.

Page 57 FILE NO. SVM-11015 10-3-7. Drainage CAUTION 1. Run the drain hose at a downward sloped angle. • Bind the auxiliary pipes (two) and connecting cable with facing tape tightly. NOTE : In case of leftward piping and rear-leftward • Hole should be made at a slight downward slant piping, bind the auxiliary pipes (two) only with on the outdoor side.

Page 58: Outdoor Unit

FILE NO. SVM-11015 10-4. Outdoor Unit Precautions for adding refrigerant 10-4-1. Installation Place • Use a scale having a precision with at least 10 g per index line when adding the refrigerant. • A place which provides enough space around the outdoor unit as shown in the diagram.

Page 59 FILE NO. SVM-11015 Tightening Connection Use a vacuum pump Align the centers of the connecting pipes and tighten Be sure to use a vacuum pump with counter-flow the flare nut as much as possible with your fingers. prevention function so that oil inside the pump does Then tighten the nut with a wrench and torque not flow back into the air conditioner pipes when the wrench as shown in the figure.

Page 60 FILE NO. SVM-11015 10-4-2. Draining the Water 10-4-3. Refrigerant Piping Connection • Holes are provided on the base plate of the Flaring outdoor unit to ensure that the defrost water produced during heating operations is drained off 1. Cut the pipe with a pipe cutter. efficiently.

Page 61 FILE NO. SVM-11015 Revi110 Packed Valve handling precautions • Open the valve stem all the way; but do not try to open it beyond the stopper. 1 2 3 • Securely tighten the valve stem cap with torque in the following table: Gas side (Ø12.7 mm) 50 to 62 N•m (5.0 to 6.2 kgf•m) Earth line...

Page 62: Test Operation

FILE NO. SVM-11015 10-5. Test Operation 10-5-4. Remote Controller A or B Selection Setting 10-5-1. Gas Leak Test When two indoor units are installed in the separated rooms, it • Check the flare nut connections for gas leaks with is not necessary to change the selector switches. a gas leak detector and/or soapy water.

Page 63: How To Diagnose The Trouble

FILE NO. SVM-11015-1 11. HOW TO DIAGNOSE THE TROUBLE The pulse motor circuits are mounted to both indoor and outdoor units. Therefore, diagnose troubles according to the trouble diagnosis procedure as described below. (Refer to the check points in servicing written on the wiring diagrams attached to the indoor/outdoor units.) Table 11-1 Troubleshooting Procedure...

Page 64 FILE NO. SVM-11015 CAUTION A high voltage (equivalent to the supply voltage) is also energized to ground through the sensors, PMV and other low-voltage circuits. The sensor leads and other wires are covered with insulated tubes for protection. Nevertheless, care must be taken to ensure that these wires are not pinched.

Page 65: First Confirmation

FILE NO. SVM-11015 11-1. First Confirmation 11-1-1. Confirmation of Power Supply Confirm that the power breaker operates (ON) normally. 11-1-2. Confirmation of Power Voltage Confirm that power voltage is AC 220–230–240 ± 10%. If power voltage is not in this range, the unit may not operate normally. 11-1-3.

Page 66: Primary Judgment

FILE NO. SVM-11015 11-2. Primary Judgment To diagnose the troubles, use the following methods. 1) Judgment by flashing LED of indoor unit 2) Self-diagnosis by service check remote controller 3) Judgment of trouble by every symptom Firstly use the method 1) for diagnosis.

Then, use the method 2) or 3) to diagnose the details of troubles. 11-3.

Page 67 FILE NO. SVM-11015 11-4. Self-Dia gnosis by Remote Controller (Check Code) 1. If the lamps are indicated as shown B to E in Table 11-4-1, execute the self-diagnosis by the remote controller. 2. When the remote controller is set to the service mode, the indoor controller diagnoses the operation condition and indicates the information of the self-diagnosis on the display of the remote controller with the check codes.

Page 68 FILE NO. SVM-11015-1 11-4-2 Caution at Servicing 1. After using the service mode of remote controller finished, press the [ ] button to reset the remote controller to normal function. 2. After finished the diagnosis by the remote controller, turn OFF power supply and turn its ON again to reset the air conditioner to normal operation.

Page 69 FILE NO. SVM-110015-1 Block distinction Operation of diagnosis function Action and Judgment Check Check Display flashing Block Cause of operation conditioner code code error status Serial signal 1) Defective wiring of the Indoor unit Flashes when 1) to 3) The outdoor unit never and connecting connecting cable or operates...

Page 70 FILE NO. SVM-111015-1 Block distinction Operation of diagnosis function Action and Judgment Check Check Display flashing Block Cause of operation conditioner code code error status Outdoor P.C. Current on inverter circuit All OFF Flashes after 1. Remove connecting lead wire of the board is over limit in short time.

Page 71 FILE NO. SVM-11015-1 Block distinction Operation of diagnosis function Action and Judgment Check Check Display flashing Block Cause of operation conditioner code code error status Compressor drive output error. All OFF Flashes after 1. Check installation conditions such as (Relation of voltage, current error is detected packed valve opening, refrigerant and frequency is abnormal)

Page 72 FILE NO. SVM-11015-1 Block distinction Operation of diagnosis function Action and Judgment Check Check Display Block Cause of operation conditioner code code flashing error status Compressor does not rotate. All OFF Flashes after 1. Remove connecting lead wire of the Because of missed wiring, error is detected compressor, and operate again.

Page 73: Judgment Of Trouble By Every Symptom

FILE NO. SVM-11015 11-5. Judgment of Trouble by Every Symptom 11-5-1. Indoor Unit (Including Remote Controller) (1) Power is not turned on (Does not operate entirely) <Primary check> 1. Is the supply voltage normal? 2. Is the normal voltage provided to the outdoor unit? 3.

Page 74 FILE NO. SVM-11015 (3) Only the indoor motor fan does not operate <Primary check> 1. Is it possible to detect the power supply voltage (AC220–240V) between on the terminal block? 2. Does the indoor fan motor operate in cooling operation? (In heating operation, the indoor fan motor does not operate for approximately 10 minutes after it is turned on, to prevent a cold air from blowing in.) Turn off power...

Page 75 FILE NO. SVM-11015 (4) Indoor fan motor automatically starts to rotate by turning on power supply (For DC fan motor) <Cause> The IC is built in the indoor fan motor. Therefore the P.C. board is also mounted to inside of the motor. If the P .C.

Page 76 FILE NO. SVM-11015 (5) Troubleshooting for remote controller <Primary check> Check that A or B selected on the main unit is matched with A or B selected on the remote controller. The unit does not beep at all. Push the START/STOP button. Operation lamp on indoor unit is not indicated.

Page 77 FILE NO. SVM-11015 11-5-2. Wiring Failure (Interconnecting and Serial Signal Wire) (1) Outdoor unit does not operate 1) Is the voltage between of the indoor terminal block varied? Confirm that transmission from indoor unit to outdoor unit is correctly performed based upon the follow- ing diagram.

Page 78 FILE NO. SVM-11015 11-6. Check Code 1C (Miswiring in indoor/outdoor units) and 1E <Check procedure> Gas leakage, Discharge temp. error, disconnection of TS/TC gas leakage sensors (Check code 02, 1C) (Check code 03, 1E) Valve drive check Is coil of the pulse motor

valve Set it correctly.

Page 79: Troubleshooting

FILE NO. SVM-11015 11-7. Troubleshooting 11-7-1. How to Check Whether the Air Purifier is Good or Not Turn off the power breaker once, and turn on again after 10 seconds. To item “Power supply is not turned on” Does the OPERATION indicator flash? Turn off the power breaker and remove CN41 (Micro switch connector).

Page 80 FILE NO. SVM-11015 11-7-2. How to Check Whether the Minus Ion Generator is Good or Not Turn off the power breaker once, and turn on again after 10 seconds. Does the OPERATION indicator flash? To item “Power supply is not turned on” Turn off the power breaker and remove CN41 (Micro switch connector).

Page 81: How To Diagnose Trouble In Outdoor Unit

FILE NO. SVM-11015 11-8. How to Diagnose Trouble in Outdoor Unit 11-8-1. Summarized Inner Diagnosis of Inverter Assembly Table 11-8-1 Diagnosis/Process flowchart Item Contents Summary Preparation Turn “OFF” the power supply breaker, and remove 3P Remove connector connector which connects of compressor.

Page 82: How To Check Simply The Main Parts

FILE NO. SVM-11015 Diagnosis/Process flowchart Item Contents Summary Check Check winding resistance between phases of compres- sor, and resistance between outdoor frames by using a tester. → OK if 10MΩ or more • Is not grounded. Replace control board assembly. ...

Page 83 FILE NO. SVM-11015 (3) Check procedures Table 11-9-1 Procedure Check points Causes Turn off the power supply breaker Check whether or not the fuse (F01) Impulse voltage was applied or the and remove the P.C. board is blown. indoor fan motor short-circuited. assembly from electronic parts base.

Page 84 FILE NO. SVM-11015-1 11-9-2. P .C . Board Layout +12V [1] Sensor characteristic table TD : Discharge temp. sensor TA : Room temp. sensor TC and Tcj : Heat exchanger temp. sensor TO : Outdoor temp. sensor TA,TC,Tcj,TO,TE,TS TE : Outdoor heat exchanger temp. sensor TS : Suction temp.

Page 85 FILE NO. SVM-11015-1 11-9-3. Indoor Unit (Other Parts) Part name Checking procedure Room temp. (TA) sensor Disconnect the connector and measure the resistance value with tester. Heat exchanger (TC,Tcj) (Normal temp.) sensor Temperature 10°C 20°C 25°C 30°C 40°C Sensor TA, TC, Tcj (kΩ) 20.7 12.6 10.0...

Page 86 FILE NO. SVM-11015 11-9-5. Checking Method for Each Part Part name Checking procedure Electrolytic capacitor 1. Turn OFF the power supply breaker. (For boost, smoothing) 2. Discharge all three capacitors completely. 3. Check that safety valve at the bottom of capacitor is not broken. 4.

Page 87: How To Simply Judge Whether Outdoor Fan Motor Is Good Or Bad

FILE NO. SVM-11015 11-10. How to Simply Judge Whether Outdoor Fan Motor is Good or Bad 1. Symptom • Outdoor fan motor does not rotate. • Outdoor fan motor stops within several tens seconds though it started rotating. • Outdoor fan motor rotates or does not rotate according to the position where the fan stopped, etc. Remote controller check code “02 : Outdoor block, 1A : Outdoor fan drive system error”...

Page 88: How To Replace The Main Parts

FILE NO. SVM-11015 12. HOW TO REPLACE THE MAIN PARTS WARNING • Since high voltages pass through the electrical parts, turn off the power without fail before proceeding with the repairs. Electric shocks may occur if the power plug is not disconnected. •...

Page 89 FILE NO. SVM-11015 Part name Procedures Remarks Front panel 4) Press "PUSH" part under the front panel and remove hooks of the front panel from Installation plate the installation plate. Front panel Press 5) Remove the front panel fixing screws. (2 pcs.) 6) Take off three hooks of panel from rear side.

Page 90 FILE NO. SVM-11015 Part name Procedures Remarks □ □ High voltage 1) Follow to the procedure in the item generator 2) To remove the air ionizer from the back body, pull it toward you. 3) Disconnect the connectors of the high voltage generator.

Page 91 FILE NO. SVM-11015-1 Part name Procedures Remarks □ □ Electric parts 1) Follow the procedure up to 3) in above. box assembly 2) Remove screw of earth lead attached to the end plate of the evaporator. 3) Remove the lead wire cover, and remove connector for the fan motor and connec- tor for the louver motor from the electric parts box assembly.

Page 92 FILE NO. SVM-11015 Part name Procedures Remarks □ Horizontal louver 1) Remove shaft of the horizontal louver from the back body. (First remove the left shaft, and then remove other shafts while sliding the horizontal louver leftward.) □ □ Evaporator 1) Follow to the procedure in the item (Heat exchanger) 2) Remove the pipe holder from the rear side of the main unit.

Page 93 FILE NO. SVM-11015 Part name Procedures Remarks □ ... Bearing 1) Follow to the procedure in the item 2) Remove the two screws used to secure the bearing base. Two screws 3) Remove the bearing base. <Caution at assembling> • If the bearing is out from the housing, push it into the specified position and then incorporate it in the main body.

Page 94 FILE NO. SVM-11015 Part name Procedures Remarks □ ... Fan motor 1) Follow to the procedure till item 2) Loosen the set screw of the cross flow fan. 3) Remove two fixing screws of the motor cover and them remove the motor cover. 4) Remove two more fixing screws of the motor band and remove the motor band.

Page 95 FILE NO. SVM-11015 Part name Procedures Remarks □ Cross flow fan <Caution at reassembling> 5 mm 1) To incorporate the fan motor, remove the fan motor rubber (at shaft core side), incorporate the motor into the position in the following figure, and then install the fan motor.

Page 96 FILE NO. SVM-11015 12-2. Microcomputer Part name Procedure Remarks □ Common procedure 1) Turn the power supply off to stop the Replace terminal block, operation of air-conditioner. microcomputer ass'y and the P .C. board ass'y. 2) Remove the front panel. •...

Page 97 FILE NO. SVM-11015 12-3. Outdoor Unit Part name Procedure Remarks □ Common 1. Detachment procedure Upper cabinet NOTE Wear gloves for this job. Otherwise, you may injure your hands on the parts, etc. Waterproof cover 1) Stop operation of the air conditioner, and turn off the main switch of the breaker for air conditioner.

Page 98 FILE NO. SVM-11015 Part name Procedure Remarks □ Front cabinet 1. Detachment □ 1) Perform step 1 in 2) Remove the fixing screws (ST1TØ4 × 10L 2 pcs.) used to secure the front cabinet and inverter cover, the screws (ST1TØ4 ×...

Page 99 FILE NO. SVM-11015 Part name Procedure Remarks □ □ Inverter 1) Perform work of item 1 in Inverter cover assembly 2) Remove screw (ST1TØ4 × 10L 2 pcs.) of the P.C. board upper part of the front cabinet. (Soldered surface) •...

Page 100 FILE NO. SVM-11015-1 Part name Procedure Remarks □ Control board 1. Disconnect the leads and connectors connected to assembly the other parts from the control board assembly. 1) Leads CN603 • 3 leads (black, white, orange) connected to terminal block. CN601 CN600 CN701...

Page 101 FILE NO. SVM-11015 Part name Procedure Remarks □ Side cabinet 1. Side cabinet (right) □ 1) Perform step 1 in and all the steps in □ 2) Remove the fixing screw (ST1TØ4 × 10L 3 pcs.) used for securing the side cabinet to the bottom plate and valve fixing panel.

Page 102 FILE NO. SVM-11015 Part name Procedure Remarks □ □ □ □ □ Compressor 1) Perform work of item 1 of □ 2) Extract refrigerant gas. 3) Remove the partition board. (ST1TØ4 × 10L 4 pcs.) 4) Remove the sound-insulation material. 5) Remove terminal cover of the compressor, and disconnect lead wire of the compressor from the terminal.

Page 103 FILE NO. SVM-11015 Part name Procedure Remarks □ Electronic 1. Detachment expansion valve □ □ 1) Perform step 1 in , all the steps in coil □ and 1 in 2) Remove the coil by

pull it upward. 2. Attachment 1) Insert a valve coil to value body by push it downward.

Page 104 FILE NO. SVM-11015 Part name Procedure Remarks TE sensor (outdoor heat exchanging temperature sensor) • Attachment Install the sensor onto the straight pipe part of the condenser output pipe. Arrow D Straight Part Sensor lead Detail C Detail B Detail C Detail A TS sensor (Suction pipe temperature sensor) •...

Page 105 FILE NO. SVM-11015 Part name Procedure Remarks Replacement of 1) Cut the sensor 100 mm longer than old temperature sensor one. Cutting here Thermal for servicing only Connector sensor part 2) Cut the protective tube after pulling out it (200 mm). Common service 3) Move the protective tube toward the Cutting here...

Page 106: Exploded Views And Parts List

FILE NO. SVM-11015 13. EXPLODED VIEWS AND PARTS LIST 13-1. Indoor Unit Location Part Location Part Description Description 43T21420 STEPPING-MOTOR 43T09409 HORIZONTAL LOUVER 43T21409 FAN MOTOR 43T79313 CAP, DRAIN 43T22312 BEARING ASSY, MOLD 43T44471 REFRIGEERANT CYCLE ASSEMBLY 43T70313 HOSE, DRAIN (FOR RAS-10,13SKVP2-E) 43T20325 CROSS FLOW FAN ASSEMBLY...

Page 107 FILE NO. SVM-11015-1 13-2. Indoor Unit (E-Parts Assy) Location Part Location Part Description Description 43T69319 TEMPERATURE SENSOR 43T69923 PC BOARD (RAS-10SKVP2-E) 43T60365 TERMINAL BLOCK; 3P 43T69924 PC BOARD (RAS-13SKVP2-E) 43T69320 TEMPERATURE SENSOR 43T69925 PC BOARD (RAS-16SKVP2-E) 43T62003 CORD CLAMP 43T50320...

Page 108 FILE NO. SVM-11015 13-3. Outdoor Unit Location Part Location Part Description Description 43T00559 FRONT CABINET 43T00448 FIXING PLATE VALVE 43T00560 LEFT CABINET 43T00563 RIGHT SIDE CABINET ASSEMBLY 43T42345 BASE PLATE ASSEMBLY 43T46347 BODY PMV 43T00561 UPPER CABINET 43T63329 COIL PMV 43T19349 FAN GUARD 43T58311...

Page 109 FILE NO. SVM-11015 13-4. P.C. Board Layout RAS-10SAVP2-E TE Sensor (Ø6) TS Sensor (Ø6) TO Sensor (Ø6) TD Sensor (Ø4) Location Part Location Part Description Description 43T62320 HEATSINK 43T60377 TEMPERATURE SENSOR 43T69917 PC BOARD 43T50304 SENSOR;HEAT EXCHANGER 43T60392 TERMINAL-5P 43T62313 BASE-PLATE-PC 43T60326 FUSE...

Page 110 FILE NO. SVM-11015 13-5. P.C. Board Layout RAS-13SAVP2-E, RAS-16SAVP2-E TE Sensor (Ø6) TS Sensor (Ø6) TO Sensor (Ø6) TD Sensor (Ø4) Location Part Location Part Description Description 43T62331 HEATSINK 43T60326 FUSE 43T69918 PC BOARD (FOR RAS-13SAVP2-E) 43T60377 TEMPERATURE SENSOR 43T69919 PC BOARD (FOR RAS-16SAVP2-E) 43T50304 SENSOR;HEAT EXCHANGER...

Page 111 FILE NO. SVM-03005 TOSHIBA CARRIER (THAILAND) CO.,LTD. 144/9 MOO 5, BANGKADI INDUSTRIAL PARK, TIVANON ROAD, TAMBOL BANGKADI, AMPHUR MUANG, PATHUMTHANI 12000, THAILAND. – 56 –...

This manual is also suitable for:

Ras-10savp2-eRas-16savp2-eRas-13savp2-eRas-13skvp2-eRas-16skvp2-e