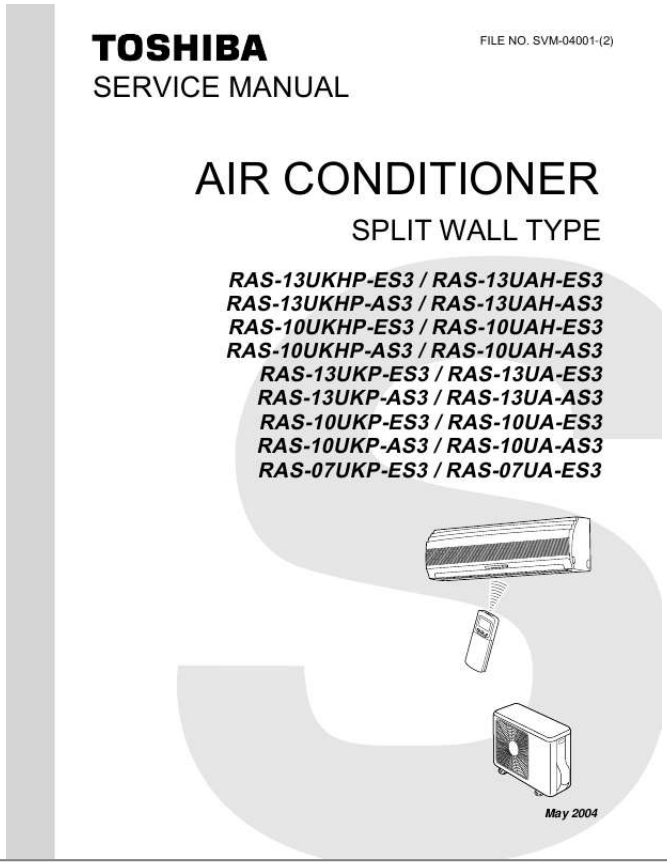

TOSHIBA

FILE NO. SVM-04001-(2)

SERVICE MANUAL

AIR CONDITIONER

SPLIT WALL TYPE

RAS-13UKHP-ES3 / RAS-13UAH-ES3
RAS-13UKHP-AS3 / RAS-13UAH-AS3
RAS-10UKHP-ES3 / RAS-10UAH-ES3
RAS-10UKHP-AS3 / RAS-10UAH-AS3
RAS-13UKP-ES3 / RAS-13UA-ES3
RAS-13UKP-AS3 / RAS-13UA-AS3
RAS-10UKP-ES3 / RAS-10UA-ES3
RAS-10UKP-AS3 / RAS-10UA-AS3
RAS-07UKP-ES3 / RAS-07UA-ES3

May 2004

Manual abstract:

@@SVM-04001 CONTENTS 1. 2. @@@@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-04001 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 49 51 49 R410A 0.95 Capillary tube 12.

7 Flare connection 6.35 Flare connection m m RAS-13UKHP-ES3, AS3 Height Dimensions Net weight Evaporator type Indoor fan type High fan Air 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-13UKHP-ES3, AS3 RAS-13UAH-ES3, AS3 Cooling 240V 3.60 220V 4.20 1 220 - 240 50 1.10 98 4.

95 1.12 97 4.65 27 2.0 41/35/31 51 1.14 97 0.

15 5.20 4.95 1.18 96 3.60 Heating 240V 4.26 RAS-13UKP-ES3, AS3 RAS-13UA-ES3, AS3 Cooling 220V 3.75 240V 3.75 1.13 98 5.10 28 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 pipe Maximum length (One way) Maximum height difference INDOOR UNIT 49 50 Refrigerant control 15*1 6 RAS-13UKP-ES3, AS3 275 790 208 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 RAS-13UAH-ES3, AS3 630 520 430 m3/h W RAS-13UA-ES3, AS3 550 780 270 mm mm mm kg 39 Width Depth 37 Finned tube Propeller fan 2120 2200 42 2120 2200 2030 30 2150 W PA150X2T-4FM1 1100 Fuse, Overload relay Automatic louver -10 ~ 24 15 ~ 43 -3- FILE NO. SVM-04001 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 47 3.65 0.82 98 2.70 RAS-10UKHP-ES3, AS3 RAS-10UAH-ES3, AS3 Cooling 240V 2.70 220V 2.90 1 220 - 240 50 0.84 97 3.45 0.*

78 97 0.15 3.50 18 1.2 39/33/26 49 0.70 Capillary tube 9.

*52 Flare connection 6.35 Flare connection 47 R410A 49 3.40 0.82 96 Heating 240V 2.96 RAS-10UKP-ES3, AS3 RAS-10UA-ES3, AS3 Cooling 220V 2.70 240V 2.70 0.82 98 3.80 0.84 97 3.60 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 pipe Maximum length (One way) Maximum height difference INDOOR UNIT Height Dimensions Net weight Evaporator type Indoor fan type High fan Air 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 Model Output Width Depth Width Depth 46 0.65 47 Refrigerant control m m RAS-10UKHP-ES3, AS3 mm mm mm kg 10*1 5 RAS-10UKP-ES3, AS3 275 790 208 10 Finned tube Cross flow fan m3/h m /h 3 570 460 340 610 520 400 20 Honeycomb woven filter with PP frame RAS-10UAH-ES3, AS3 610 460 340 m3/h W RAS-10UA-ES3, AS3 550 780 270 mm mm mm kg 35 30 Finned tube Propeller fan m /h 3 2030 2150 30 2030 2150 1740 20 1850 W W PA108X1T-4FZ1 750 Fuse, Overload relay Automatic louver C 15 ~ 43 -10 ~ 24 15 ~ 43 -4- FILE NO. SVM-04001 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 44 3.10 0.66 97 2.*

*15 RAS-07UKP-ES3 RAS-07UA-ES3 Cooling 240V 2.18 1 220 - 240 50 0.68 90 0.15 3.15 12 0.8 38/32/26 45 R410A 0.65 Capillary tube 9.52 Flare connection 6.35 Flare connection 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 pipe Maximum length (One way) Maximum height difference INDOOR UNIT Height Dimensions Net weight Evaporator type Indoor fan type High fan Air 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 Model Output Width Depth Width Depth Refrigerant control m m mm mm mm kg 10*1 5 RAS-07UKP-ES3 275 790 208 10 Finned tube Cross flow fan m3/h m /h 3 570 460 340 20 Honeycomb woven filter with PP frame RAS-07UA-ES3 m3/h W mm mm mm kg 530 660 240 27 Finned tube Propeller fan m /h 3 1420 30 PA79X1T-4FZ5 605 Fuse, Overload relay Automatic louver 1520 W W C 15 ~ 43 -5- FILE NO. @@@@@@SVM-04001 2.*

CONSTRUCTION VIEWS 2-1. @@SVM-04001 2-2. Outdoor Unit (RAS-13UAH-ES3, RAS-13UAH-AS3, RAS-10UAH-ES3, RAS-10UAH-AS3, RAS-13UA-ES3, RAS-13UA-AS3, RAS-10UA-ES3, RAS-10UA-AS3) A A Detail Drawing (Back Leg) 600 6 Hole 310 302 52 36 R15 32.5 115 125 B Detail Drawing (Front Leg) 310 302 102 310 302 6 Hole R5.5 30 Drain outlet 11x14 Hole 36 52 R15 2- 11x14 Hole (For 8- 10 anchor bolt) B 436 FAN GUARD COVER PV 530 Z 270 265 600 780 90 62 310 330 Electrical part cover Liquid side (Flare 6.

35) Gas side (Flare 9.52) 10 Series Gas side (Flare 12.7) 13 Series 54 120 Z View Installation dimension B or more 325 600 Air inlet 75 Service port 600 or more A 13 Series 600 mm 100 mm 10 Series 400 mm 45 mm 100 or more Air outlet A or more B 4x 11 Long holes (For 8- 10 anchor bolt) -8- FILE NO. SVM-04001 Outdoor Unit (RAS-07UA-ES3) A 97 A Detail Drawing (Back Leg) 660 6 Hole 50 36 B Detail Drawing (Front Leg) R 15 R 5.5 273.

5 273.5 265 6 Hole 11x14 Hole 25Drain outlet B 2-11x14 hole (for 8-10 anchor bolt) 273.5 265 59.5 36 50 R 15 660 Fan guard Cover PV 420 Z 530 242 500 660 97.5 56 (11) 273.5 (pitch) 297 (12.5) 126 48 Liquid side (Flare 6.35) Gas side (Flare 9.52) 54 Z View Service port Installation dimension 100 or more 600 Air inlet 600 or more 325 100 or more Air outlet 600 or more 4x11x14 Long holes (for 8-10 anchor bolt) - 9- FILE NO. SVM-04001 3.

WIRING DIAGRAM 3-1. RAS-13UKHP-ES3 / RAS-13UAH-ES3 RAS-13UKHP-AS3 / RAS-13UAH-AS3 THERMAL FUSE 73C INFRARED RAYS RECEIVE 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 PNK PNK YEL YEL YEL YEL WHI 12 12 CN04 BLK GRN&YEL P04 SG01 DSA R22 VARISTOR F01 T6.3A 250V 3 RY01 BLK T02 C.T WHI 54321 54321 CN07 R21 VARISTOR C01 MAIN P.C. BOARD MCC-862 R01 DB01 C02 Power Cord GRN&YEL BRW BLU C15 CR03 POWER SUPPLY SINGLE PHASE 220-240V~ , 50 Hz 4 L01 R47 R46 D38 R48 RY03 RY04 C58 123 123 YEL GRY BRW CN11 5 5 BLK 3 3 1 1 CN10 BLK BLK 3 CR02 123456 123456 RED WHI 1 INDOOR TERMINAL BLOCK OUTDOOR TERMINAL BLOCK BLK GRN&YEL HEAT THERMO SENSOR EXCHANGER SENSOR (TA) (TC) AC FAN MOTOR INDOOR OUTDOOR RED 1 2 3 BLU WHI BLK 4 1(L) 2(N) BLU 3 BLU 4 CHASSIS SOLENOID COIL RED RED COMPRESSOR CAPACITOR RED CAPACITOR WHI BLK FAN MOTOR PNK WHI - 10 - 150 BLK BLK CN27 CR01 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 CN13 POWER SUPPLY CIRCUIT DC 12V DC 5V IC03 12 12 CN03 1 2 CN01 12 FILE NO.

SVM-04001 3-2. RAS-10UKHP-ES3 / RAS-10UAH-ES3 RAS-10UKHP-AS3 / RAS-10UAH-AS3 Louver motor THERMAL FUSE 73C INFRARED RAYS RECEIVE 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 PNK PNK YEL YEL YEL YEL WHI 12 12 CN04 BLK GRN&YEL P04 SG01 DSA R22 VARISTOR F01 T6.3A 250V 3 RY01 BLK T02 C.T RY03 RY04 4 C15 R21 VARISTOR 54321 54321 CN07 MAIN P.
C. BOARD MCC-862 C01 R01 DB01 C02 POWER SUPPLY CIRCUIT Power Cord GRN&YEL BRW BLU L01 CR03 POWER SUPPLY SINGLE PHASE 220-240V~ , 50 Hz R47 R46 D38 R48 WHI C58 123 123 YEL GRY BRW CN11 5 5 BLK 3 3 1 1 CN10 BLK BLK 3 CR02 123456 123456 RED WHI 1 INDOOR TERMINAL BL(for outdoor) Running capacitor (for fan motor) Running capacitor (for compressor) Solenoid coil (for 4-way valve) HF-240-30B DS451155BPQC DS371256CPNB SQ-373 Winding resistance () (at 20C) AC 450V, 1.5F AC 370V, 25F AC 220 - 240V C-R 3.89 Red-Black 245 C-S 4.51 White-Black 388.
*3 Output (Rated) 30W, 6poles, 1 phase, 220 - 240V, 50Hz - 14 - FILE NO. SVM-04001 4-5. Indoor Unit (RAS-13UKP-ES3, RAS-13UKP-AS3, RAS-10UKP-ES3, RAS-10UKP-AS3, RAS-07UKP-ES3) No. 1 2 3 4 5 6 7 8 9 10 11 12 Parts name Fan motor (for indoor) Thermo sensor (TA-sensor) Switching transformer Microcontroller unit (IC30) Heat exchanger sensor (TC-sensor) Line filter (L01) Bridge rectifier (DB50) Capacitor (C50) Fuse (F01) Varistor (R21, R22) Louver motor Relay (Comp., RY01) LC*SS11V-06270 KBP06M/51 PF1E222MNN1625 BET6.*
3A 15G561K320 MP24Z DI1U TT-10 TMP87CM40AN 10k at 25C 27mH, 600mA 1.5A, 600V 2200F, 25V T6.3A, 250VAC 560V 12VDC Rating 25A/AC250V, 3~48VDC Type SKF-220-20-4A-1 Specifications AC Motor with 150C thermo fuse 10k at 25C 4-6. Outdoor Unit (RAS-10UA-ES3, RAS-10UA-AS3) No. 1 Parts name Compressor Type PA108X1T-4FZ1 Specifications Output (Rated) 750W, 2poles, 1 phase, 220 - 240V, 50Hz Winding resistance () (at 20C) 2 3 4 Fan motor (for outdoor) Running capacitor (for fan motor) Running capacitor (for compressor) HF-240-20B or SKF-240-20B DS451155BPQC DS371256CPNB Winding resistance () (at 20C) AC 450V, 1.5F AC 370V, 25F C-R 3.89 Red-Black 387.3 or 235.2 C-S 4.51 White-Black 466.

2 or 260.1 Output (Rated) 20W, 6poles, 1 phase, 220 - 240V, 50Hz - 15 - FILE NO. SVM-04001 4-7. Outdoor Unit (RAS-07UA-ES3) No. 1 Parts name Compressor Type PA79X1T-4FZ5 Specifications Output (Rated) 605W, 2poles, 1 phase, 220 - 240V, 50Hz Winding resistance () (at 20C) C-R 4.80 Red-Blac k 245 C-S 8.37 White-Black 388 Output (Rated) 30W, 6poles, 1 phase, 220 - 240V, 50Hz 2 Fan motor (for outdoor) Running capacitor (for fan motor) Running capacitor (for compressor) HF-240-30B Winding resistance () (at 20C) 3 4 DS451155BPQC DS371156CPNB AC 450V, 1.5F AC 370V, 15F 16 FILE NO. SVM-04001 5. REFRIGERATION CYCLE DIAGRAM 5-1.
RAS-13UKHP-ES3/ RAS-13UAH-ES3 RAS-13UKHP-AS3 / RAS-13UAH-AS3 T1 Cooling 0.39m (Connecting pipe) 12.7 Heating Indoor unit Evaporator Cross flow fan 0.49m (Connecting pipe) 6.35 O.
D.:6.35mm Packed valve (6.35) O.D.
*:12.7mm P Packed valve (12.7) Heating Cooling 4-way valve Heating Cooling Compressor PA150X2T-4FM1 Accumulator Condenser Capillary tube 1.5x1100l Capillary tube 1.0x600l Cooling Heating Propeller fan Outdoor unit Refrigerant R410A : 0.95 kg. Mark( )means check points of Gas Leak. 50Hz Standar d pressure P (MPaG) Surface temp. of heat exchang er inter changing pipe T1 (C) Fan speed (indoor) Ambient temp. conditions DB/WB (C) Indoor Outdoor Standard Heating Overload*1 Low temperature Standard Cooling Overload Low temperature .*

0 20.0 2.0 High High Low 27/19 32/23 21/15 35/24 43/26 21/15 Note : Measure the heat exchanger temperature at the center of U-bend. (By means of TC sensor) - 21 - FILE NO. SVM-04001 6. CONTROL BLOCK DIAGRAM 6-1. RAS-13UKHP-ES3 / RAS-13UAH-ES3, RAS-13UKHP-AS3 / RAS-13UAH-AS3, RAS-10UKHP-ES3 / RAS-10UAH-ES3, RAS-10UKHP-AS3 / RAS-10UAH-AS3 Main Unit Control Panel Heat Exchange sensor Thermo. Sensor Current Sensor (Compressor Current) Infrared Rays Signal Reciver Initiallizing Circuit Clock Frequency Oscillator Circuit Motor Revolution Control Processing (Temperature Processing) Timer Functions Louver Control 3-minutes Delay at Restart for Compressor M.C.U.
Operation Display Timer Display Filter Sign Display Hi Power Sign Display PRE DEF. Sign Display Indoor Fan Motor Power Supply Circuit Compressor ON/OFF Signal Outdoor Fan 4-Way Valve ON/OFF ON/OFF Signal Signal Relay Driver, Louver Driver Louver ON/OFF Signal Louver Motor Relay RY04 Noise Filter Relay RY01 Relay RY03 220-240 V~, 50Hz Compressor Outdoor Fan Motor 4-Way Valve REMOTE CONTROL Remote Control Operation (START/STOP) 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 Filter Reset Infrared Rays - 22 - FILE NO. SVM-04001 6-2. RAS-13UKP-ES3 / RAS-13UA-ES3, RAS-13UKP-AS3 / RAS-13UA-AS3 RAS-10UKP-ES3 / RAS-10UA-ES3, RAS-10UKP-AS3 / RAS-10UA-AS3 RAS-07UKP-ES3 / RAS-07UA-ES3 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 Remote Control Operation (START/STOP) 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 Filter Reset Infrared Rays - 23 - FILE NO. SVM-04001 7. OPERATION DESCRIPTION 7-1.
Outline of Air Conditioner Control This is a fixed capacity type air conditioner, which uses a AC motor for an indoor fan. The AC motor drive circuit is mounted in the indoor unit. And electrical parts which operate the compressor and the outdoor fan motor, are mounted in the outdoor unit. The air conditioner is mainly controlled by the indoor unit controller. The controller operates the indoor fan motor based upon commands transmitted by the remote control and transfers the operation commands to the outdoor unit controller. The outdoor unit controller receives operation commands from the indoor unit, and operates the outdoor fan motor and the compressor. 7-1-1. Louver control (1) Vertical air flow louver Position of veritcal air flow louver is automatically controlled according to the operation mode. Besides, position of vertical air flow louver can be arbitrarily set by pressing [FIX] button.

The louver position which is set by [FIX] button is stored in the microcontroller, and the louver is automatically set at the stored position for the next operation.

(2) Swing If [SWING] button is pressed when the indoor unit is in operation, the vertical air flow louver starts swinging. When [FIX] button is pressed, it stops swinging. (1) Role of indoor unit controller The indoor unit controller receives the operation 7-1-2. Indoor fan control (AC Fan motor) commands from the remote control and executes them. (1) The indoor fan is operated by the stepless speed Temperature measurement at the air inlet of the change AC motor. indoor heat exchanger by the indoor (2) For air flow level, speed of the indoor fan motor is temperature sensor controlled in five steps (LOW, LOW+, MED, MED+ Temperature setting of the indoor heat and HIGH). If AUTO mode is selected, the fan exchanger by the heat exchanger sensor motor speed is automatically controlled by the Louver motor control difference between the preset temperature and Indoor fan motor operation control the room temperature. LED display control Transferring of operation commands to the LOW+ = LOW+MED outdoor unit 2 Receiving of information of the operation status MED+ = MED+HIGH and judging of the information or indication of 2 error Table 7-1-1 Model HIGH MED+ MED LOW+ LOW HIGH MED+ MED LOW+ LOW Cooling and Fan only Heating Model Cooling and Fan only HIGH MED+ MED LOW+ LOW RAS-13UKHP-ES3 RAS-10UKHP-ES3 RAS-13UKHP-AS3 RAS-10UKHP-AS3 Motor speed Air flow level Motor speed Air flow level Motor speed Air flow level (m3/h) (m3/h) (rpm) (rpm) (m3/h) (rpm) 1,300 630 1,200 570 1,200 570 1,100 520 1,100 520 1,000 460 1,020 470 900 400 950 430 800 340 1,350 650 1,250 610 1,250 610 1,170 560 1,150 550 1,100 520 1,100 520 1,000 460 1,050 490 900 400 RAS-13UKP-ES3 RAS-10UKP-ES3 RAS-07UKP-ES3 RAS-13UKP-AS3 RAS-10UKP-AS3 1,300 630 1,250 610 1,200 570 1,200 570 1,120 530 1,100 520 1,100 520 1,000 460 1,000 460 1,020 470 900 400 900 400 950 430 800 340 800 340 - 24 - FILE NO. SVM-04001 7-2. Description of Operation Circuit (1) When turning on the breaker, the operation lamp blinks.
This means that the power is on (or the power supply is cut off.) (2) When pressing [START / STOP] button on the remote control, receiving beep sounds from the indoor unit, and the next operation is performed together with opening the vertical air flow louver. (3) Once the operation mode is set, it is memorized in the microcontroller so that the previous operation can be effected thereafter simply by pressing [START / STOP] button. 7-2-1. Fan only operation ([MODE] button on the remote control is set to the fan only operation.
) (1) When [FAN] button is set to AUTO, the indoor fan motor operates as shown in Fig. 7-2-1. When [FAN] button is set to LOW, LOW+, MED, MED+ or HIGH, the motor operates with a constant air flow. (Room temp.) - (Preset temp.
) 7-2-2. Cooling operation ([MODE] button on the remote control is set to the cooling operation.) (1) The compressor, 4-way valve, outdoor fan and operation display on the remote control are controlled as shown in Fig. 7-2-2. (Room temp.) - (Preset temp.) 0.5 ON ON OFF OFF OFF ON Fig. 7-2-2 +3 +2.5 +2 +1.

*5 +1 +0.5 0 M+ *1 *1 *1 (2) When [FAN] button is set to AUTO, the indoor fan motor operates as shown in Fig. 7-2-3. When [FAN] button is set to LOW, LOW+, MED, MED+ or HIGH, the motor operates with a constant air flow. (Room temp.) - (Preset temp.) +3 +2.5 +2 +1.5 +1 +0.5 0 -0.*
*5 Preset temp. M+ *1 *1 *1 NOTE : *1: The values marked with *1 are calculated and controlled by the difference in motor speed between M+ and L-. Fig. 7-2-1 Setting of air flow [FAN:AUTO] (2) The Hi POWER operation cannot be set. Preset temp.*
*NOTE : *1: The values marked with *1 are calculated and controlled by the difference in motor speed between M+ and L-. Fig. 7-2-3 Setting of air flow [FAN:AUTO] - 25 - OPERATION display Compressor 4-way valve Outdoor fan Preset temp. 0 FILE NO. SVM-04001 7-2-3.*
Dry operation ([MODE] button on the remote control is set to the dry operation.) (1) The compressor, 4-way valve, outdoor fan and operation display on the remote control are controlled as shown in Fig. 7-2-4. (Room temp.) - (Preset temp.) ON:6min. OFF:4min. 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. +3 +2 +1 Preset temp. 0 OFF ON (Room temp.) - (Preset temp.) ON:5min. OFF:5min. ON:5min. OFF:5min.*
OFF ON OFF ON OFF 0 OFF -0.5 OPERATION display Compressor 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. Preset temp.+1 Preset 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 (Room temp.) - (Preset temp.) temp. 0 -0.5 -1 -1.5 -2 L *1 *2 M+ -5.0 -5.*

*5 [FAN AUTO] Compressor Outdoor fan ON OFF L. ON OFF L. S.L. ON OFF L. S.L. ON H Indoor fan *S.L. L.*
*Super Low *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] Fig. 7-2-5 (3) [FAN] button on the remote control is set to AUTO only. (4) The Hi POWER operations cannot be set.*
*- 26 - OPERATION display Compressor 4-way valve 4-way valve Outdoor fan Preset temp. ON ON FILE NO. SVM-04001 (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. RAS-13UKHP-ES3, RAS-13UKHP-AS3 Indoor heat exchanger temperature 42 41 29 28 34 33 21 20 *5 and *6: Fan speed AUTO *5 Table 7-2-1 Stabilized period From 12 to 25 minutes passed after starting the unit and room temperature is between preset temperature and 3C lower than preset temperature 25 minutes or more passed after starting the unit Room temperature Room temperature Preset temperature < Preset temperature -3.5C -4C Up until 12 minutes passed after starting the unit From 12 to 25 minutes passed after starting the unit and room temperature is 3C lower than preset temperature Starting period *6 Manual AUTO (One of 5 steps) *4 L-H (Up to seting speed) *2 A+4 A+4 A-8 A-8 *6 *5 SUL*3 SUL*1 Stop Manual (L H) RAS-10UKHP-ES3, RAS-10UKHP-AS3 Manual AUTO (One of 5 steps) Indoor heat exchanger temperature 46 45 34 33 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 TEMPORARY button on the indoor unit is pushed, the preset temperature is fixed at 24C and the indoor unit is controlled as shown in Fig. 7-2-9. 32 31 21 20 *4 L-H (Up to seting speed) *2 A+4 A+4 A-8 A-8 *6 *5 SUL*3 SUL*1 Stop Fig. 7-2-8 Cold draft preventing control NOTES : *1: The fan stops for 2 minutes after thermostat-OFF.*

**2: A is 24C when the preset temperature is 24C or more and A is the preset temperature when it is under 24C. C (Room temp.) - (Preset temp.) *3: SUL means Super Ultra Low. *4: Calculated from difference in motor speed between SUL and HIGH. +4 Cooling operation The louver moves to the position same as Hi POWER operation. Cooling operation 0 Fan only operation Heating operation RAS-13UKHP-ES3 RAS-13UKHP-AS3 RAS-10UKHP-ES3 RAS-10UKHP-AS3 RAS-13UKP-ES3 RAS-13UKP-AS3 RAS-10UKP-ES3 RAS-10UKP-AS3 RAS-07UKP-ES3 Fig. 7-2-9 - 27 - FILE NO. SVM-04001 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 preset temperature drops 3C. (The value of the preset temperature on the remote control does not change.) If the difference between the preset temperature and the room temperature is big, the horizontal louver moves to the Hi POWER position automatically.

*Then when the difference between them gets smaller, the horizontal louver returns automatically. FAN speed : [AUTO] If the difference between the preset temperature and room temperature is big, the air conditioner operates at maximum airflow level. If the difference between the preset temperature and the room temperature is small, the air conditioner operates at normal airflow level. FAN speed : One of 5 levels The air conditioner operates at normal airflow level. (3) Heating operation *Heat pump model only The preset temperature increases 2C, (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 (+2C). (4) The Hi POWER mode can not be set in Dry or Fan only operation. 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. 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 and 7-5-2. RAS-13UKHP-ES3 RAS-13UKHP-AS3 RAS-13UKP-ES3 RAS-13UKP-AS3 Heat exchanger temperature Compressor Outdoor fan ON 6 2 Less than continues for 5 minutes OFF Fig. 7-5-1 RAS-10UKHP-ES3 RAS-10UKHP-AS3 RAS-10UKP-ES3 RAS-10UKP-AS3 RAS-07UKP-ES3 Heat exchanger temperature Compressor Outdoor fan ON 7 5 Less than continues for 5 minutes OFF Fig. 7-5-2 - 28 - FILE NO. SVM-04001 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 START/STOP 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 24C 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 1 cycle 10 minutes Fig.

*7-6-2 Defrost - 29 - FILE NO. SVM-04001 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).*

RAS-13UKHP-ES3, RAS-13UKHP-AS3 / RAS-10UKHP-ES3, RAS-10UKHP-AS3 Input current 13.5A/ 19.2A I4 12.5A/ 17.8A I3 Compressor Outdoor fan More than I4 continues for 3 seconds OFF More than I3 continues for 5 seconds OFF ON Fig.

7-7-1 (2) Current limit control (Heating operation) Control is performed as shown in Fig. 7-7-2 RAS-13UKHP-ES3, RAS-13UKHP-AS3 / RAS-10UKHP-ES3, RAS-10UKHP-AS3 Input current 13.5A/ 19.2A I4 12.5A/ 17.8A I3 10A/ 15.6A I2 9A/ 15.

0A I1 Compressor Outdoor fan More than I4 continues for 3 seconds OFF More than I3 continues for 5 seconds OFF 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.

) - 30 - FILE NO. SVM-04001 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. When the unit is on standby (Not operating) Operation Push [TEMPORARY] button for more than three seconds. 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 [TEMPORARY] 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. Motions The unit is on standby. The unit starts to operate. The green lamp is on.

The lamp changes from green to orange. 0 After approx. three seconds, 3S The unit beeps three times and continues to operate. TEMPORARY button If the unit is not required to operate at this time, push [TEMPORARY] button once more or use the remote control to turn it off. When the unit is in operation Operation Push [TEMPORARY] button for more than three seconds.

The unit is in operation. Motions The green lamp is on. The green lamp is turned off. The unit stops operating. 0 After approx. three seconds, The unit beeps three times 3S TEMPORARY button If the unit is required to operate at this time, push [TEMPORARY] button once more or use the remote control to turn it on. While the filter check lamp is on, the TEMPORARY 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.

- 31 - FILE NO. SVM-04001 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 [TEMPORARY] button for more than three seconds. The unit is on standby. Motions The unit starts to operate. The orange lamp is on. The lamp changes from orange to green. 0 After approx.

three seconds, 3S The unit beeps three times and continues to operate. TEMPORARY button If the unit is not required to operate at this time, push [TEMPORARY] button once more or use the remote control to turn it off. When the unit is in operation Operation Push [TEMPORARY] button for more than three seconds. The unit is in operation. Motions The orange lamp is on.

The orange lamp is turned off. The unit stops operating. 0 After approx. three seconds, The unit beeps three times 3S TEMPORARY button If the unit is required to operate at this time, push [TEMPORARY] 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.

7-8-3. 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. 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 Press [FILTER] button on the remote control. OR push [TEMPORARY] button on the indoor unit. Note: If [TEMPORARY] button is pushed while the filter check lamp is not indicating, the indoor unit will start the Automatic Operation.

- 32 - FILE NO. SVM-04001-(1) 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 you turn off your air conditioner, the internal fan activates and dries the moisture in the coil for 20 minutes, then turns off automatically. Operation display FCU fan FCU louver Timer display Compressor CDU fan ON ON rpm is depend on preseting. OPEN ON or OFF depend on preseting of timer function. ON or OFF depend on preseting per room temperature. ON or OFF depend on preseting per room temperature.

OFF ON rpm is SUL speed. CLOSE ON OFF OFF OFF OFF CLOSE ON or OFF depend on preseting of timer function. OFF OFF Cool mode or dry mode operation more than 10 mins. Self-Cleaning mode operate 20 mins. Automatically turn-off.

Turn off by remote controller or timer-off function. Operation time The Self-Cleaning function is set as default at ex-factory. Self-Cleaning operation can stop manually by press START/STOP botton of the remote control one more time. 7-10-1. How to cancel Self-Cleaning function To cancel the Self-Cleaning function, proceed as follows: Press TEMPORARY button one time or use remote control to turn on air conditioner.

The OPERATION display will show in orange color (When AUTO-RESTART is ON) or green color (When AUTO-RESTART is OFF). Hold down the TEMPORARY button for more than 20 seconds. (The air conditioner will stop suddenly when the TEMPORARY is pressed but keep holding it continue. Then will beep 3 times in the first 3 seconds but it is not related to Self-Cleaning function) After holding about 20 seconds, the air conditioner will beep 5 times without any blinking of display. The Self-Cleaning Operation had been concelled. Remarks Per setting of Self-Cleaning function above, AUTO-RESTART function had been cancelled. To set AUTO-RESTART again, please follow item 7-8-1. 7-10-2. How to set Self-Cleaning function. To set the Self-Cleaning function, proceed as follows.

Press TEMPORARY button one time or use remote control to turn on air conditioner. The OPERATION display will show in orange color (When AUTO-RESTART is ON) or green color (When AUTO-RESTART is OFF). Hold down the TEMPORARY button for more than 20 seconds. (The air conditioner will stop suddenly when the TEMPORARY is pressed but keep holding it continue. Then will beep 3 times is the first 3 seconds but it is not related to Self-Cleaning function) AAfter holding about 20 seconds, the air conditioner will beep 5 times and OPERATION display blinks 5 times. The Self-Cleaning function had been set.

Remarks Per setting of Self-Cleaning function above, AUTO-RESTART function had been cancelled. To set AUTO-RESTART again, please follow item 7-8-1. - 32-(1) - FILE NO. SVM-04001 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. - 33 - FILE NO. SVM-04001 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. - 34 - FILE NO. SVM-04001 8-2. Installation Diagram of Indoor and Outdoor Units 65 mm or more Before installing the wireless remote control With the remote control cover open, load the batteries supplied correctly, observing their polarity. 2 Wireless remote control Cover 170 or m mm ore Hook For the rear left and left piping plate Wall 1 Installation Hoo k 170 or m mm ore 3 Batteries Air filte r Insert the cushion between the indoor unit and wall, and tilt the indoor unit for better operation.

Do not allow the drain hose to get slack. (At tac h to the fron t pan el) Shield pipe 5 Zeolite filter 6 Bioenzyme filter 8 Pan head wood screw Cut the piping hole sloped slightly 2 Wireless remote control Make sure to run the drain hose sloped downward. 4 Remote control holder The auxiliary piping can be connected the left, rear left, rear right, right, bottom right or bottom left. 13 series A B 600 mm 100 mm 07,10 series 400 mm 45 mm Right Vinyl tape Apply after carrying out a drainage test. Saddle 600 mm or more Rear right Rear left Left Bottom left Bm r mo mo re Bottom right 100 mm or mo re A mm m or ore Extension drain hose (Option: RB821SW) 60 0 mm or m ore Insulate the refrigerant pipes separately with insulation, not together.

6 mm thick heat resisting polyethylene foam - 35 - FILE NO. SVM-04001 8-3. Installation 8-3-1. Optional installation parts Part Code Parts name Q'ty A Refrigerant piping Liquid side : 6.35 mm One Gas side : 9.52 mm (07, 10 series) each Gas side : 12.70 mm (13 series) Pipe insulating material (polyethylene foam, 6 mm thick) Putty, PVC tapes 1 One each B C <Fixing bolt arrangement of outdoor unit> RAS-10, 13 Series 115 mm 32.5 mm 125 mm RAS-07 Series 500 mm 97 mm Air inlet Air inlet 30 310 mm 102 mm 73 mm Air outlet 600 mm 90 mm 275 mm 7 mm 60 mm Drain outlet Air outlet 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. - 36 - FILE NO. SVM-04001 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 Zeolite filter x 1 8 Pan head wood screw 3.1 x 16 s x 2 3 Battery x 2 6 Bioenzyme 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) This model is not equipped with an extension drain hose. The part marked with asterisk (*) is packaged with the outdoor unit. Option : For the extension drain hose, use an optionally available RB-821SW or commercially available one.*
- 37 - FILE NO. SVM-04001 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. 38 FILE NO. SVM-04001 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> For installation of the indoor unit, use the paper pattern on the back. Hook 62 82.5 (Top view) m Indoor unit 5 45 45 *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 - 39 - FILE NO. SVM-04001 <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. (1) Connection to fixed wiring: A switch or circuit breaker which disconnects all poles and has a contact separation of at least 3 mm must be incorporate in the fixed wiring.

An approved circuit breaker or switches must used. (2) Connection with power supply plug: Attach power supply plug with power cord and plug it into wall outlet. An approved power supply cord and plug must be used.

NOTE Ensure all wiring is used within its electrical rating. RAS-13UKHP-ES3 RAS-13UKHP-AS3 RAS-13UKP-ES3 RAS-13UKP-AS3 RAS-10UKHP-ES3 RAS-10UKHP-AS3 RAS-10UKP-ES3 RAS-10UKP-AS3 RAS-07UKP-ES3 CAUTION When installing the installation plate with a mounting screw, do not use the anchor bolt hole. Otherwise the unit may fall down and result in personal injury and property damage. Installation plate <Keep horizontal direction> Anchor bolt 5 mm dia. @@@@@@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. @@6.

Tightening torque : 1.2 Nm (0.12 kgfm) 7. Secure the connecting cable with the cord clamp. 8. @@@@@@For RAS-13/10UKH Terminal cover Cord clamp Terminal block 10 mm 50 mm Stripping length of the connecting cable Fig. 8-4-8 NOTE Use stranded wire only. Wire type : H07 RN-F or more <How to install the air inlet grille on the indoor unit> When attaching the air inlet grille, the contrary of the removed operation is performed. Screw Connecting cable abo 4 4 12 3 12 3 ut 1 5 cm Earth line Screw Screw Connecting cable Fig. 8-4-5 Earth line 80 mm 10 mm 70 mm Fig.

8-4-9 10 mm 10 mm 50 mm Stripping length of the connecting cable Fig. 8-4-6 - 41 - FILE NO. SVM-04001 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 - 42 - FILE NO. SVM-04001 <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. @@@@@@@@@@@@@@ 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. - 43 - FILE NO. SVM-04001 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 10 m (RAS-10UA) or 15 m (RAS-13UA). An allowable height level is up to 5 m (RAS-10,07UA) or 6 m (RAS-13UA). 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. 8-4-20 CAUTION Arrange the drain pipe for proper drainage from the unit. Improper drainage can result in dew-dropping.

This air conditioner has the structure designed to drain water collected from dew, which forms on the back of the indoor unit, to the drain pan. Therefore, do not store the power cord and other parts at a height above the drain guide. Wall Drain guide Strong wind Space for pipes Fig. 8-5-1 Fig. 8-4-21 - 44 - FILE NO.

SVM-04001 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. @@@@@@@@@@(4) Check gas leak (connected points) - 45 - FILE NO. SVM-04001 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) Gas side (9.52 mm) Liquid side (6.

35 mm) Service port 50 to 62 Nm (5.0 to 6.2 kgfm) 30 to 42 Nm (3.0 to 4.2 kgfm) 16 to 18 Nm (1.

6 to 1.8 kgfm) 9 to 10 Nm (0.9 to 1.0 kgfm) 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 - 46 - FILE NO. SVM-04001 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-13/10UAH Terminal block 70 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. 1) Turn the circuit breaker of the main power switch off before setting the selector switch. Earth line Terminal screw Screw Earth line 10 mm 60 mm 2) Remove the Air inlet grille and Front panel. (Refer to page 63, 10-1) 3) Select the terminal of selector switch from [A position] to [B position]. Connecting cable Cord clamp Fig. 8-5-9 For RAS-13/10/07UA Terminal block 60 mm 10 mm Earth line Terminal screw Screw Earth line 10 mm 50 mm 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 - 47 - FILE NO. SVM-04001 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 TEMPORARY button for 10 sec.

(The beeper will make a short beep.) A B A B PRESET START/STOP FAN SWING FIX ON OFF FILTER MODE ECO TIMER AUTO Hi-POWER MEMO SET CLR [MODE] button TEMPORARY button RESET CLOCK CHECK Fig. 8-7-2 [CHECK] 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 TEMPORARY 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. - 48 - FILE NO. SVM-04001 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 [START/STOP] 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.