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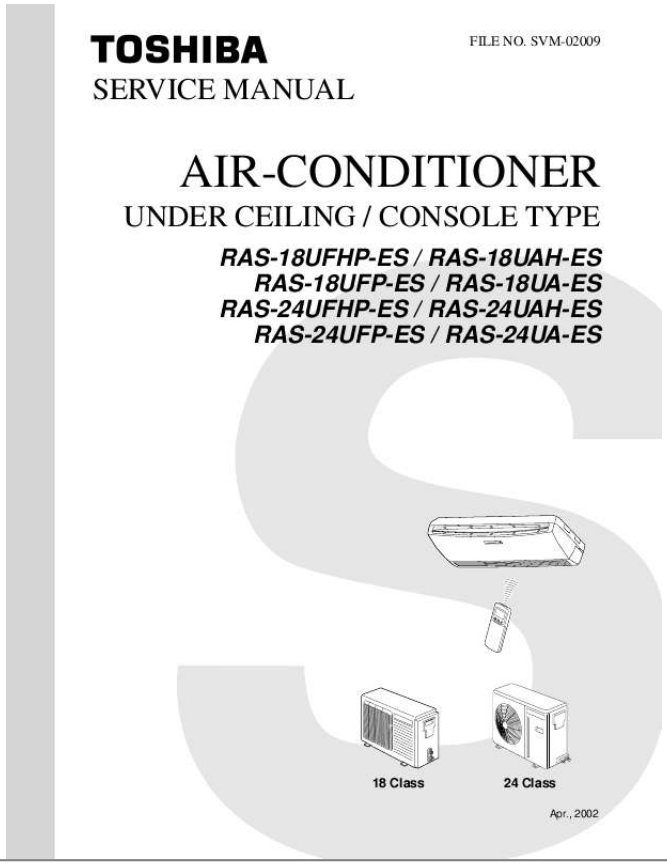
User manual TOSHIBA RAS-18UFHP-ES
User guide TOSHIBA RAS-18UFHP-ES
Operating instructions TOSHIBA RAS-18UFHP-ES
Instructions for use TOSHIBA RAS-18UFHP-ES
Instruction manual TOSHIBA RAS-18UFHP-ES



TOSHIBA

FILE NO. SVM-02009

SERVICE MANUAL

AIR-CONDITIONER

UNDER CEILING / CONSOLE TYPE

RAS-18UFHP-ES / RAS-18UAH-ES
RAS-18UFP-ES / RAS-18UA-ES
RAS-24UFHP-ES / RAS-24UAH-ES
RAS-24UFP-ES / RAS-24UA-ES

18 Class 24 Class

Apr., 2002

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Manual abstract:

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PARTS REPLACEMENT 10-1 Indoor Unit 10-2 Outdoor Unit (RAS-18UAH-ES, RAS-18UA-ES) 10-3 Outdoor Unit (RAS-24UAH-ES, RAS-24UA-ES) 11. EXPLODED VIEWS AND PARTS LIST 11-1 11-2 11-3 11-4 11-5 11-6 Indoor Unit (E-Parts Assy) Indoor Unit Outdoor Unit (RAS-18UAH-ES) Outdoor Unit (RAS-18UA-ES) Outdoor Unit (RAS-24UAH-ES) Outdoor Unit (RAS-24UA-ES) · This air conditioner is charged with HFC (R-410A) that does not deplete the Ozone layer. · This air conditioner requires special service tools for the refrigerant R-410A. 2 FILE NO. SVM-02009 1.

SPECIFICATIONS MODEL ITEM Capacity kW Phase Power source Power consumption Power factor Running current Starting current Moisture removal Noise Refrigerant Refrigerant control Gas side size Connection type Liquid side size Interconnection pipe Connection type Maximum length (One way) Maximum height difference INDOOR UNIT Width Dimensions Net weight Evaporator type Indoor fan type High fan Air volume Fan motor output Air filter OUTDOOR UNIT Width 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 10 ~ 24 Model Output W m3/h W 2105 2310 2150 42 PA225X3F-4L 1500 IOL, Td Sensor IOL, Case Thermo Automatic louver 15 ~ 43 15 ~ 43 -10 ~ 24 15 ~ 43 2310 1830 Height Depth mm mm mm kg 51 RAS-18UAH-ES 830 538 300 50 Finned tube Propeller fan 2010 3380 3560 3380 65 PA290X3F-4MS 2200 IOL, Td Sensor IOL, Case Thermo 3560 3380 3560 67 Medium fan Low fan m /h m3/h m3/h W 3 RAS-18UFHP-ES RAS-18UAH-ES Cooling 220V 5.00 240V 5.10 Heating 220V 5.70 240V 5.75 RAS-18UFP-ES RAS-18UA-ES Cooling 220V 5. 15 240V 5.25 1 220 240 50 220V 6.20 RAS-24UFHP-ES RAS-24UAH-ES Cooling 240V 6.30 Heating 220V 7.00 240V 7.10 RAS-24UFP-ES RAS-24UA-ES Cooling 220V 6.40 240V 6.45 V Hz W % Indoor Outdoor A A A lit/h Indoor (H/M/L) Outdoor Name of refrigerant Rated amount kg 1.3 1.2 db db 51 52 52 8.

60 8.30 7.70 47 2.0 43/39/36 53 51 1960 98 2010 96 1830 98 0.4 7.60 8.30 1880 96 1875 97 1925 93 8.15 2515 96 11.35 2570 92 11.20 2. 5 2430 96 2530 91 2540 94 11.85 2615 90 11.70 0.45 11.10 54 2.

*7 46/42/37 52 56 57 57 1.6 Capillary tube 12.70 Flare connection 6.35 Flare connection 15*1 58 56 57 R-410A 11.15 mm mm m m 8 RAS-18UFHP-ES mm mm mm kg 20* 2 25*2 10 RAS-18UFP-ES 1093 633 208 23 Finned tube Multi blade fan RAS-24UFHP-ES RAS-24UFP-ES Height Depth 800 680 580 830 700 650 800 680 580 50 900 750 550 930 760 660 900 750 650 Washable -filter RAS-18UA-ES RAS-24UAH-ES 880 690 310 64 RAS-24UA-ES 3 FILE NO. SVM-02009 Note : 1 · Capacity is based on the following temperature conditions. Condition Temperature Indoor unit inlet air temperature (DB) (WB) Outdoor unit inlet air temperature (DB) (WB) Cooling 27°C 19°C 35°C 24°C JIS C9612-1994 Heating 20°C 12°C 7°C 6°C Note : 2 · Charge refrigerant according to the table below. Refrigerant *1 *2 No need to charge refrigerant Need to charge refrigerant RAS-18UFHP-ES / RAS-18UAH-ES RAS-18UFP-ES / RAS-18UA-ES 15m or less Over 15m up to 20m (20g/m) RAS-24UFHP-ES / RAS-24UAH-ES RAS-24UFP-ES / RAS-24UA-ES 15m or less Over 15m up to 25m (20g/m) 4 FILE NO. SVM-02009 2. CONSTRUCTION VIEWS 2-1. Indoor Unit Front panel 1093 208 Knock out system Grille air inlet Back Body UNDER CEILING & CONSOLE INSTALLATION For stud bolt (8 - 10) For stud bolt (6) 20 200 Min 1093 1015 742 450 20 Installation plate Mount plate M10 Suspention bolt 330 460 633 633 165 74 70 Min 57 Wireless remote control Knock out system 5 160 18 FILE NO. SVM-02009 2-2. Outdoor Unit (RAS-18UAH-ES, RAS-18UA-ES) A 600 R10 325 52 120 325 6 hole A Detail Drawing 11x14 hole 8-6 holes (For fixing outdoor unit) 6-11x14 holes (For 8 - 10 anchor bolt) 25 Drain oulet Fan guard Handle 420 538 90 300 600 830 90 50 160 100 or more 325 Air inlet 600 or more Service Port Electric Parts cover Liquid side (Flare 6.35) Gas side (Flare 12.70) 100 or more Air inlet 600 or more 4x11x14 for 8-10 anchor bolt Installation dimension 344 6 91 54 FILE NO.*

SVM-02009 2-3. Outdoor Unit (RAS-24UAH-ES, RAS-24UA-ES) A 120 25 Drain outlet 68 52 600 340 64 50 27 340 12x18 hole 600 4-12x18 holes (for 8 - 10 anchor bolt) 140 A Detail Drawing 690 Handle 880 Handle 23 310 Electric Parts cover 600 100 or more 600 or more Liquid side (Flare 6.35) Gas side (Flare 12.70) 100 or more Air outlet 600 or more Mounting dimension of anchor bolt 4-12x18 for 8 - 10 anchor bolt 12 340 (pitch) 364 12 7 88 74 Service Port FILE NO. SVM-02009 3. WIRING DIAGRAM 3-1. RAS-18UFHP-ES / RAS-18UAH-ES ORN RED PNK YEL BRW BLU INFRARED RAYS RECEIVE AND INDICATION PARTS CN25 LOUVER MOTOR 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 BLU BLU BLU BLU BLU BLU BLU BLU BLU WHI BLK CN30 WHI CN31 RED C02 RY401 RY501 CR502 DC12V DC5V R405 CR501 IC03 POWER SUPPLY CIRCUIT COLOR IDENTIFICATION BRW : BROWN RED : RED WHI : WHITE YEL : YELLOW BLU : BLUE BLK : BLACK GRY : GRAY PNK : PINK ORN : ORANGE GRN&YEL : GREEN& YELLOW GRN : GREEN PUR : PURPLE 654321 CN07 6 5 4 3 2 1 SG01 BLK P04 R22 F01 FUSE T6.3A 250VAC R21 C15 L01 R09 R507 IC04 CN13 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 CN100 CN101 SWITCH 1 1 WHI 1 PCB 2 2 GRY 2 GRY MAIN PCB MCC-865A R01 C01 DB01 33 3 MCC-865B CN03 1 1 BLK BLK THERMO SENSOR (TA) 22 CN23 GRN&YEL J401 CR401 C501 CN01 1 1 BLK BLK HEAT EXCHANGER SENSOR (TC) 22 R506 2 1 CN402 FOR FLOAT SWITCH (OPTION) CN401 1 2 3 CN11 1 2 3 FOR DRAIN PUMP (OPTION) 123 5 5 3 3 1 CN10 1 WHI RED BLK 11 33 66 33 22 11 When you use float switch you should cut J401 BRW GRY YEL WHI RED PUR FAN MOTOR BLK BLU GRY TRANSFORMER BLK MAIN P.

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C. BOARD (MCC-1275) 11 2 CN06 33 POWER SUPPLY 220-240V~, 50 Hz POWER TERMINAL BLOCK LN INDOOR TERMINAL BLOCK OUTDOOR TERMINAL BLOCK FERRITE CORE 123 INDOOR UNIT OUTDOOR UNIT BLK DISCHARGE PIPE SENSOR (TD) 11 RED 1 1 RED 3 3 CN05 BLK 1 1 BLK 3 3 TNR R74 F01 T5A 250VAC TNR R73 BLK BLK CN07 2 33 123 BLK RED GRN&YEL BLK RED GRN&YEL CHASSIS WHI 5 5 RED 77 1 1 BLK CN01 CN08 2 33 BLK GRY 9 9 HEAT EXCHANGER SENSOR (TE) 11 33 5 CN04 RY07 RELAY BLU 1 1 11 13 15 CN11 A B YEL BLK 33 CR11 RY05 11 33 12 14 16 CN02 CR12 TNR R96 BLK COIL FOR 4 WAY VALVE CAPACITOR RED RED CAPACITOR IC07 CN03 WHI PNK S C R BLK 1 1 WHI RED BLK BLK 3 COMPRESSOR FAN MOTOR 8 FILE NO.

SVM-02009 3-2. RAS-18UFP-ES / RAS-18UA-ES ORN RED PNK YEL BRW BLU INFRARED RAYS RECEIVE AND INDICATION PARTS CN25 LOUVER MOTOR 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 BLU BLU BLU BLU BLU BLU BLU BLU BLU WHI BLK CN30 WHI CN31 RED CN27 C02 CR02 RY04 R405 RY401 RY501 CR502 DC12V DC5V POWER SUPPLY CIRCUIT COLOR IDENTIFICATION BRW : BROWN RED : RED WHI : WHITE YEL : YELLOW BLU : BLUE BLK : BLACK GRY : GRAY PNK : PINK ORN : ORANGE GRN&YEL : GREEN& YELLOW GRN : GREEN PUR : PURPLE 654321 CN07 6 5 4 3 2 1 BLK P04 SG01 R22 F01 FUSE T6.3A 250VAC R21 C15 L01 R09 R507 IC04 CN13 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 CN100 CN101 SWITCH 1 1 WHI 1 PCB 2 2 GRY 2 GRY MAIN PCB MCC-865A R01 C01 DB01 33 3 MCC-865B 11 33 CR401 C501 CR501 IC03 THERMO SENSOR (TA) CN03 1 1 BLK BLK 22 GRN&YEL J401 R506 CN01 1 1 BLK BLK HEAT EXCHANGER SENSOR (TC) 22 2 1 CN402 FOR FLOAT SWITCH (OPTION) CN401 1 2 3 CN11 1 2 3 FOR DRAIN PUMP (OPTION) 123 5 5 3 3 1 CN10 1 WHI RED BLK 11 33 66 33 22 11 WHI RED PUR When you use float switch you should cut J401 BRW GRY YEL FAN MOTOR BLK BLU GRY POWER SUPPLY 220 - 240V~, 50Hz INDOOR TERMINAL BLOCK OUTDOOR TERMINAL BLOCK 123 INDOOR UNIT OUTDOOR UNIT GRN&YEL CHASSIS POWER TERMINAL BLOCK LN BLK RED GRN&YEL RED BLK 123 BLK BLK SPARK KILLER RED BLK RELAY ORN 11 13 15 THERMOSTAT A ORN 12 14 16 B CAPACITOR RED CAPACITOR RED WHI PNK S C BLK WHI RED BLK R COMPRESSOR FAN MOTOR 9 FILE NO. SVM-02009 3-3. RAS-24UFHP-ES / RAS-24UAH-ES ORN RED PNK YEL BRW BLU INFRARED RAYS RECEIVE AND INDICATION PARTS CN25 LOUVER MOTOR 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 BLU BLU BLU BLU BLU BLU BLU BLU BLU WHI BLK CN30 WHI CN31 RED C02 RY401 RY501 CR502 DC12V DC5V R405 CR501 IC03 POWER SUPPLY CIRCUIT COLOR IDENTIFICATION BRW : BROWN RED : RED WHI : WHITE YEL : YELLOW BLU : BLUE BLK : BLACK GRY : GRAY PNK : PINK ORN : ORANGE GRN&YEL : GREEN& YELLOW GRN : GREEN PUR : PURPLE 654321 CN07 6 5 4 3 2 1 SG01 BLK P04 R22 F01 FUSE T6.

3A 250VAC R21 C15 L01 R09 R507 IC04 CN13 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 CN100 CN101 SWITCH 1 1 WHI 1 PCB 2 2 GRY 2 GRY MAIN PCB MCC-865A R01 C01 DB01 33 3 MCC-865B CN03 1 1 BLK BLK THERMO SENSOR (TA) 22 CN23 GRN&YEL J401 CR401 C501 CN01 1 1 BLK BLK HEAT EXCHANGER SENSOR (TC) 22 R506 2 1 CN402 FOR FLOAT SWITCH (OPTION) CN401 1 2 3 CN11 1 2 3 FOR DRAIN PUMP (OPTION) 123 5 5 3 3 1 CN10 1 WHI RED BLK 11 33 66 33 22 11 When you use float switch you should cut J401 BRW GRY YEL WHI RED PUR FAN MOTOR BLK BLU GRY TRANSFORMER BLK MAIN P.C. BOARD (MCC-1275) 11 2 CN06 33 POWER SUPPLY 220-240V~, 50 Hz POWER TERMINAL BLOCK LN INDOOR TERMINAL BLOCK OUTDOOR TERMINAL BLOCK FERRITE CORE 123 INDOOR UNIT OUTDOOR UNIT BLK DISCHARGE PIPE SENSOR (TD) 11 RED 1 1 RED 3 3 CN05 BLK 1 1 BLK 3 3 TNR R74 F01 T5A 250VAC TNR R73 BLK BLK CN07 2 33 123 BLK RED GRN&YEL BLK RED GRN&YEL CHASSIS WHI 5 5 RED 77 1 1 BLK CN01 CN08 2 33 BLK GRY 9 9 HEAT EXCHANGER SENSOR (TE) 11 33 5 CN04 RY07 MAGNETIC RELAY BLU 1 1 T S R A1 52C A2 YEL BLK BLK COIL FOR 4 WAY VALVE CN11 33 CR11 RY05 11 33 W V U CN02 CR12 TNR R96 CAPACITOR RED RED CAPACITOR IC07 CN03 WHI PNK S C R BLK 1 1 WHI RED BLK BLK 3 COMPRESSOR FAN MOTOR 10 FILE NO. SVM-02009 3-4. RAS-24UFP-ES / RAS-24UA-ES ORN RED PNK YEL BRW BLU INFRARED RAYS RECEIVE AND INDICATION PARTS CN25 LOUVER MOTOR 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 BLU BLU BLU BLU BLU BLU BLU BLU BLU WHI BLK CN30 WHI CN31 RED CN27 C02 CR02 RY04 R405 RY401 RY501 CR502 DC12V DC5V POWER SUPPLY CIRCUIT COLOR IDENTIFICATION BRW : BROWN RED : RED WHI : WHITE YEL : YELLOW BLU : Bo;F AC 420V, 45µF AC 220 240V 10k at 25°C / 50k at 25°C 220 240V, 50Hz 220 240V Red-Black 1.

07 Red-Black 64.4 White-Black 2.20 White-Black 127.4 Output (Rated) 51W, 6poles, 1phase, 220 240V, 50Hz 13 FILE NO. SVM-02009 4-5. Outdoor Unit (RAS-24UA-ES) No. 1 Parts name Compressor Type PA290X3F-4MS Specifications Output (Rated) 2200W, 2poles, 1phase, 220 240V, 50Hz Winding resistance () (at 20°C) 2 Fan motor (for outdoor) Running capacitor (for fan motor) Running capacitor (for compressor) Magnetic relay KPG6-71SB5P-T1 Winding resistance () (at 20°C) 3 4 5 SK45FMP3.5U2 SK42CMP45U1 CLK-35J AC 450V, 3.5µF AC 420V, 45µF 220 240V, 50Hz Red-Black 1.07 Red-Black 64.

4 White-Black 2.20 White-Black 127.4 Output (Rated) 51W, 6poles, 1phase, 220 240V, 50Hz 14 FILE NO. SVM-02009 5. REFRIGERATION CYCLE DIAGRAM 5-1. RAS-18UFHP-ES / RAS-18UAH-ES Cooling 0.39m (Connecting pipe) 12.70 mm 0.39m (Flexible pipe) 12.70 mm O.
D.:12.70 mm Packed valve (12.70) Heating Cooling 4-way valve Muffler Heating Indoor unit Evaporator T Multi blade fan 0.49m (Connecting pipe) 6.
35 mm P Packed valve (6.35) O.D.:6.35 mm Heating Cooling Compressor PA225X3F-4L Capillary tube 1.
*0x1500S Accumulator Condenser Capillary tube 1.7x700S Propeller fan Cooling Heating Outdoor unit Mark (Refrigerant R-410A 1.30 Kg) means check points of Gas Leak 50Hz Standard pressure P (MPaG) Surface temp. of heat exchanger interchanging pipe T (°C) Fan speed (indoor) Ambient temp. conditions DB/WB (°C) Indoor Outdoor Standard Heating High temperature*1 Low temperature Standard Cooling High temperature Low temperature 2.7 3.0 ~ 3.8 2.0 0.9 1.*

0 0.6 45.0 49.0 ~ 58.0 34.0 10.0 15.0 1.0 High Low High High High Low 20/ 27/ 20/ 27/19 32/23 21/15 7/6 24/18 10/10 35/24 43/26 21/15 Note : Measure the heat exchanger temperature at the center of U-bend. (By means of TC sensor.
*) *1 : During heating overload, the high temperature limit control operation is included.*


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15 FILE NO. SVM-02009 5-2. RAS-18UFP-ES / RAS-18UA-ES Indoor unit Evaporator T 0.39m (Connecting pipe) 12. 70 mm 0.39m (Flexible pipe) 12.70 mm O.D.:12. 70 mm Packed valve (12.70) 0.49m (Connecting pipe) 6.35 mm Multi blade fan P Packed valve (6.35) O.D.:6.35 mm Accumulator Muffler Compressor PA225X3F-4L Capillary tube 1.7x350S Condenser Propeller fan Outdoor unit Refrigerant R-410A 1.20 Kg Mark ( ) means check points of Gas Leak 50Hz Standard pressure P (MPaG) Ambient temp.

*Surface temp. of heat Fan speed conditions DB/WB exchanger interchanging (°C) (indoor) pipe T (°C) Indoor Outdoor Standard Cooling High temperature Low temperature 0.9 1.0 0.6 10.0 13.0 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.) 16 FILE NO. SVM-02009 5-3. RAS-24UFHP-ES / RAS-24UAH-ES Indoor unit Evaporator Cooling 0.39m (Connecting pipe) 12.70 mm 0.39m (Flexible pipe) 12. 70 mm O.D.:12.70 mm Packed valve (12.70) Heating Cooling 4-way valve Muffler Heating Multi blade fan T 0. 49m (Connecting pipe) 6.35 mm P Packed valve (6.35) O.D.:6.35 mm Heating Cooling Compressor PA290X3F-4MS Tank Condenser Capillary tube 2.0x700S Cooling Heating Propeller fan Outdoor unit Refrigerant R-410A 1.60 Kg Mark ( ) means check points of Gas Leak 50Hz Standard pressure P (MPaG) Surface temp. of heat exchanger interchanging pipe T (°C) Fan speed (indoor) Ambient temp. conditions DB/WB (°C) Indoor Outdoor Standard Heating High temperature*1 Low temperature Standard Cooling High temperature Low temperature 2.*

*7 3.1 ~ 4.0 2.7 0.9 0.8 0.5 43.0 52.0 ~ 59.0 36. 0 11.0 12.0 1.0 High Low High High High Low 20/ 27/ 20/ 27/19 32/23 21/15 7/6 24/18 10/10 35/24 43/26 21/15 Note : Measure the heat exchanger temperature at the center of U-bend. (By means of TC sensor.) *1 : During heating overload, the high temperature limit control operation is included. 17 FILE NO. SVM-02009 5-4. RAS-24UFP-ES / RAS-24UA-ES T Cooling 0.39m (Connecting pipe) 12. 70 mm 0.39m (Flexible pipe) 12.70 mm O.D.:12.70 mm Packed valve (12.70) Indoor unit Evaporator Multi blade fan 0.49m (Connecting pipe) 6.35 mm P Packed valve (6.35) O.*

D.:6.35 mm Tank Capillary tube 2.0x600S Compressor PA290X3F-4MS Condenser Propeller fan Cooling Outdoor unit Mark (Refrigerant R-410A 1.60 Kg) means check points of Gas Leak 50Hz Standard pressure P (MPaG) Ambient temp. Surface temp. of heat Fan speed conditions DB/WB exchanger interchanging (°C) (indoor) pipe T (°C) Indoor Outdoor Standard Cooling High temperature Low temperature 0.9 0.8 0.5 11. 0 12.0 1.0 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.) 18 FILE NO. SVM-02009 6. CONTROL BLOCK DIAGRAM 6-1. RAS-18UFHP-ES, RAS-24UFHP-ES Indoor Unit Control Panel M.C.U. Heat Exchanger Sensor Functions · Louver Control · 3-minute Delay at Restart for Compressor · Motor Revolution Control · Processing (Temperature Processing) · Timer Clock Frequence Oscillator Circuit · Drain Pump ON/OFF · Serial Signal Communication Power Supply Circuit 8 MHz Hi POWER Display FILTER Sign Display PRE DEF. Sign Display TIMER Display OPERATION Display Indoor Fan Motor Temperature Sensor Infrared Rays Signal Receiver Initiallizing Circuit Infrared Rays 36.7 kHz Remote Control Louver ON/OFF Signal Louver Driver Louver Motor Float Switch Drain Pump Noise Filter Serial Signal Transmitter/ Receiver Relay RY401 From Outdoor Unit Serial Signal Communication REMOTE CONTROL Infrared Rays 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 19 FILE NO. SVM-02009 6-2. RAS-18UFP-ES, RAS-24UFP-ES Indoor Unit Control Panel M.C.U. Heat Exchanger Sensor Functions · Louver Control · 3-minute Delay at Restart for Compressor · Motor Revolution Control · Processing (Temperature Processing) · Timer · Drain Pump ON/OFF · Compressor ON/OFF Power Supply Circuit Remote Control Noise Filter Relay RY04 Relay RY401 Float Switch Drain Pump From Outdoor Unit 8 MHz Hi POWER Display FILTER Sign Display FAN-ONLY Sign Display TIMER Display OPERATION Display Indoor Fan Motor Temperature Sensor Infrared Rays Signal Receiver Initiallizing Circuit Infrared Rays 36.7 kHz Clock Frequency Oscillator Circuit Louver ON/OFF Signal Driver Louver Driver Louver Motor Compressor REMOTE CONTROL Infrared Rays 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 20 FILE NO. SVM-02009 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. (1) Role of indoor unit controller The indoor unit controller receives the operation commands from the remote control and executes them. · Temperature measurement at air inlet of the indoor unit by the indoor temperature sensor. · Temperature setting of the indoor heat exchanger by the heat exchanger sensor. · Louver motor control. · Indoor fan motor operation control. · LED display control. · Transferring of operation commands to the outdoor unit. · Receiving of information of the operation status and judging of the information or indication of error. (2) Role of outdoor unit controller The outdoor unit controller receives the operation commands from the indoor controller and executes them. · Compressor operation Operations according control to the commands from · Operation control of the indoor unit outdoor fan motor · Turning off the compressor and outdoor fan when the outdoor unit receives the shutdown command. · Defrost control in heating operation (Temperature measurement by the outdoor heat exchanger and control for the four-way valve and the outdoor fan motor.


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) Heating and Cooling Model only. 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 microcomputer, 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 [SWING] button is pressed, it stops swinging. 7-1-2. Indoor fan control (AC Fan motor) (1) The indoor fan is operated by the stepless speed change AC motor. (2) For air flow level, speed of the indoor fan motor is controlled in five steps (LOW, LOW+, MED, MED+ and HIGH). If AUTO mode is selected, the fan motor speed is automatically controlled by the difference between the preset temperature and the room temperature. Table 7-1-1 RAS-18UFHP-ES MODEL Cooling and Fan only Heating HIGH MED LOW HIGH MED LOW RAS-24UFHP-ES Motor speed Air flow level Motor speed Air flow level (rpm) (m3/h) (rpm) (m3/h) 1060 900 800 1120 950 850 800 680 580 830 700 650 1170 1000 850 1210 1020 860 900 750 650 930 760 660 MODEL Cooling HIGH and MED Fan only LOW RAS-18UFP-ES 1060 800 900 680 800 580 RAS-24UFP-ES 1170 900 1000 750 850 650 LOW+ = LOW+MED 2 MED+ = MED+HIGH 2 21 FILE NO.

SVM-02009 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.) ON 0.5 ON OFF ON OFF OFF ON Common relay Fig.

*7-2-2 +3 +2.5 M+ *1 +2 *1 +1.5 (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.) *1 +1 L-- +0.5 0 +3 M+ +2.5 *1 +2 +1.*

*5 +1 +0.5 0 -0.5 L-- *1 *1 Preset temp. NOTE : *1: The values marked with *1 are calculated and controlled by the difference in motor speed between M+ and L. Fig. 7-2-1 Setting of air flow [FAN:AUTO] (2) ECO and 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] 22 OPERATION display Compressor 4-way valve Outdoor fan Preset temp.*

0 FILE NO. SVM-02009 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 *Heating and cooling 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 ON:5min. OFF:5min. ON:5min. OFF:5min. Preset temp.*

0 ON OFF ON (Room temp.) -- (Preset temp.) OFF ON ON OFF ON OFF OFF Common relay OPERATION display Compressor 4-way valve Outdoor fan Common relay Preset temp. -0.5 ON Compressor 4-way valve 0 ON OPERATION display Fig. 7-2-4 Fig. 7-2-6 (2) The microcontroller turns the compressor on and (2) When [FAN] button is set to AUTO, the indoor fan off at the regular intervals (4 to 6 minutes). While motor operates as shown in Fig. 7-2-7. When the compressor is turning off, the indoor fan motor [FAN] button is set to LOW, LOW+, MED, MED+ or operates in the SUPER LOW position.

HIGH, the motor operates with a constant air flow. The pattern of operation depending on the relation between room temperature and preset temperatures is shown in Fig. 7-2-5. Preset 0 L (Room temp.) -- (Preset temp.

*) temp. Room temp. -0.5 -1 -1.5 -2 *1 *2 Preset temp.*

*+1 Preset temp. M+ -5.0 -5.5 [FAN AUTO] Compressor Outdoor fan ON ON ON ON H OFF Indoor fan OFF OFF L. *S.L. L. S.L. L.*

*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 ECO and Hi POWER operations can not be set. 23 Outdoor fan FILE NO. SVM-02009 (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. Manual (one of 5 steps) 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 24°C and the indoor unit is controlled as shown in Fig. 7-2-9. °C Cooling operation The louver moves to the position same as Hi POWER operation.

*AUTO 46 45 34 33 *4 33 32 *2 21 20 SUL*3 LH (Up to setting speed) A+4 A+4 A8 A8 *6 *5 SUL*1 Stop NOTES : *1: The fan stops for 2 minutes after thermostat-OFF. *2: A is 24°C when the preset temperature is 24°C or more and A is the preset temperature when it is under 24°C. *3: SUL means Super Ultra Low. *4: Calculated from difference in motor speed between SUL and HIGH. Fig. 7-2-8 Cold draft preventing control *5 and *6: Table 7-2-1 Fan speed AUTO *5 Starting period · Up until 12 minutes passed after starting the unit · From 12 to 25 minutes passed after starting the unit and room temperature is 3°C lower than preset temperature *6 Stabilized period · From 12 to 25 minutes passed after starting the unit and room temperature is between preset temperature and 3°C lower than preset temperature · 25 minutes or more passed after starting the unit (Room temp.*

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) (Preset temp.) +4 Cooling operation 0 Fan only operation 1 Heating operation RAS-18UFHP-ES RAS-24UFHP-ES RAS-18UFP-ES RAS-24UFP-ES Fig. 7-2-9 Manual · Room temperature · Room temperature < Preset temperature Preset temperature (L H) 3.5°C 4°C 24 FILE NO.

SVM-02009 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 3°C. (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 *Heating and Cooling Model only · The preset temperature increases 2°C, (The value of the preset temperature on the remote control does not change.) · The indoor unit operates in normal heating mode except the preset temperature is higher (+2°C). 7-4. High-Temperature Limit Control 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 Fig. 7-4-1 7-5. Low-Temperature Limit Control The microcontroller detects the indoor heat exchanger temperature to prevent the indoor heat exchanger from freezing.
*The compressor and outdoor fan motor are controlled as shown in Fig. 7-5-1 Heat exchanger temperature Compressor Outdoor fan ON 6 2 Less than 2 continues for 5 minutes OFF Fig. 7-5-1 7-6. Defrosting Operation *Heating and Cooling Model only When the indoor unit is in heating operation, if the refrigerant evaporation temperature detected by the (4) The Hi POWER mode can not be set in Dry or Fan outdoor heat exchanger sensor is under the specified only operation. temperature, the outdoor unit starts the defrosting operation. At this time, the 4-way valve relay and the outdoor fan motor are turned off. The indoor fan motor is also turned off by the cold draft preventing control of the indoor microcomputer. Then, [PRE. DEF.] lamp on the indoor unit comes on.*

The defrosting operation stops and the 4-way valve relay, outdoor fan motor and the indoor fan motor are turned on automatically when the refrigerant evaporation increases to the specified temperature, or when the defrosting time is over 12 minutes. 25 FILE NO. SVM-02009 7-7. Auto Restart Function The indoor unit is equipped with an automatic restarting function which allows the unit to restart operating with the set operating conditions in the event of power supply being accidentally shut down. The operation will resume without warning three minutes after power is restored. This function is not set to work when shipped from the factory. Therefore it is necessary to set it to work. 7-7-1. 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. When the unit is on standby (Not operating) Operation Push [TEMPORARY] button for more than three seconds. The unit is on standby. The unit starts to operate.
Motions 0 Hi POWER FILTER PRE.D 3S The unit beeps three times and continues to operate. ¡ The green lamp is on. ¡ After approx. three seconds, The lamp changes from green to orange.
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 unit stops operating. ¡ The green lamp is turned off. ¡ After approx. three seconds, 0 Hi POWER FILTER PRE.D 3S The unit beeps three times. 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. TEMPORARY 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. 26 FILE NO. SVM-02009 7-7-2. 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.
The unit starts to operate. Motions 0 Hi POWER FILTER PRE.D 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. ¡¡ The orange lamp is on.
After approx. three seconds, The lamp changes from orange to green. When the unit is in operation Operation Push [TEMPORARY] button for more than three seconds. The unit is in operation. The unit stops operating.
Motions The orange lamp is on. The orange lamp is turned off. The unit beeps three times. 0 Hi POWER FILTER PRE.D ¡ ¡ After approx. three seconds, 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. 7-7-3. 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.


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Therefore, set the timer operation again.

7-8. 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. 7-8-1. How to turn off filter check lamp (1) Press [FILTER] button on the remote control. (2) 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. 27 FILE NO. SVM-02009 8. INSTALLATION PROCEDURE 8-1.

Safety Cautions For general public use Power supply cord of Outdoor unit shall be more than 4 mm2 (H07RN-F or 245IEC66 : polychloroprene sheathed flexible cord) or 3.5 mm2 (AWG-12). CAUTION New Refrigerant Air conditioner Installation · THIS AIR CONDITIONER USES THE NEW HFC REFRGERANT (R-410A), WHICH DOES NOT DESTROY THE OZONE LAYER. R-410A refrigerant is apt to be affected by impurity such as water, oxidizing membranes, and oils because the pressure of R-410A refrigerant is approx. 1.

6 times of refrigerant R-22. 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 (R-410A) as shown below. For connecting pipes, use new and clean piping materials with high-pressure withstand capabilities, designed for R-410A only, and ensure that water or dust does not enter. Moreover, do not use any existing piping as its pressure withstand may be insufficient, and may contain impurities. CAUTION To Disconnect the Appliance from the Main Power Supply This appliance must be connected to the main power supply by means of a circuit breaker or a switch with a contact separation of at least 3 mm. If this is not possible, a power supply plug with earth must be used. This plug must be easily accessible after installation. The plug must be disconnected from the power supply socket in order to disconnect the appliance completely from the mains. 28 FILE NO. SVM-02009 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 (R-410A) WITH ANY OTHER GASEOUS BODY INTO THE REFRIGERATION CYCLE. IF AIR OR ANY OTHER GAS IS MIXED IN THE REFRIGERANT, THE GAS PRESSURE IN THE REFRIGERATION CYCLE BECOMES ABNORMALLY HIGH AND IT RESULTINGLY CAUSES BURST OF THE PIPE AND INJURIES ON PERSONS. · IN THE EVENT THAT THE REFRIGERANT GAS LEAKS OUT OF THE PIPE DURING THE INSTALLATION WORK, IMMEDIATELY LET FRESH AIR INTO THE ROOM.

IF THE REFRIGERANT GAS IS HEATED BY FIRE OR SOMETHING ELSE, IT CAUSES GENERATION OF POISONOUS GAS. WARNING · Never modify this unit by removing any of the safety guards or bypassing any of the safety interlock switches. · Do not install in a place which cannot bear the weight of the unit. Personal injury and property damage can result if the unit falls. · Before doing the electrical work, attach an approved plug to the power supply cord. Also, make sure the equipment is properly earthed. · Appliance shall be installed in accordance with national wiring regulations. If you detect any damage, do not install the unit. Contact your TOSHIBA dealer immediately. CAUTION · Exposure of unit to water or other moisture before installation could result in electric shock.

Do not store it in a wet basement or expose to rain or water. · After unpacking the unit, examine it carefully for possible damage. · Do not install in a place that can increase the vibration of the unit. Do not install in a place that can amplify the noise level of the unit or where noise and discharged air might disturb neighbors. · To avoid personal injury, be careful when handling parts with sharp edges. · Please read this installation manual carefully before installing the unit. It contains further important instructions for proper installation. REQUIREMENT OF REPORT TO THE LOCAL POWER SUPPLIER Please make absolutely sure that the installation of this appliance is reported to the local power supplier before installation. If you experience any problems, or if the installation is not accepted by the supplier, the service agency will take adequate countermeasures. Remark per EMC Directive 89/336/EEC To prevent flicker impressions during the start of the compressor (technical process) following installation conditions do apply.

1. The power connection for the air conditioner has to be done at the main power distribution. This distribution has to be of an impedance. Normally the required impedance is reached at a 32A fusing point. Air conditioner fuse has to be 16A max.! 2. No other equipment should be connected to this power line. 3. For detailed installation acceptance, please contact your power supplier whether its restriction does apply for products like washing machines, air conditioners or electrical ovens. 4.

For power details of the air conditioner, refer to the rating plate of the product. 29 FILE NO. SVM-02009 8-2. Installation Diagram of Indoor and Outdoor Units For installation of the indoor unit, use the Paper pattern, which is inside the package box cover. (Under Ceiling Installation) (Console Installation) Hook mm or m ore 1 Installation plate Pipe shield 200 or m mm ore 200 8 Mounting screw 20 m 0m or m ore 70 m m or m or e 200 or m mm ore Before install the wireless remote control · With the remote control cover open, load the batteries supplied correctly, observing their polarity.

2 Wireless remote control Cover 2 Wireless remote control 6 Zeolite filter 5 Filter frame 70 mm or more 7 Purifying filter 3 Batteries Air filter 4 Remote control holder Insulate the refrigerant pipes separately with insulation, not together.

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9 Pan head wood screw 6 mm thick heat resisting polyethylene foam Saddle 600 mm or more Vinyl tape Apply after carrying out a drainage test. mm or more 600 mm or more 100 m m or more 100 Extension drain hose 1 or00 mm mo re Extension drain hose Electric parts cover 1 or00 mm mo re 6 m 00 m or m ore Electric parts cover 6 or00 mm mo re 600 mm or m ore 6 or00 mm mo re 18 Class Loop the connective cable (about 100 mm in diameter and 300 350 mm long). 24 Class Loop the connective cable (about 100 mm in diameter and 300 350 mm long). 30 FILE NO.

SVM-02009 8-3. Installation 8-3-1. Optional installation parts Part Code A B C Parts name Refrigerant piping Liquid side : 6.35 mm Gas side : 12.70 mm Pipe insulating material (polyethylene foam, 6 mm thick) Putty, PVC tapes Q'ty One each 1 One each <Fixing bolt arrangement of outdoor unit> RAS-18UAH-ES, RAS-18UA-ES 600 mm Air inlet 120 mm 325 mm 52 mm Air outlet Drain outlet Fig. 8-3-1 RAS-24UAH-ES, RAS-24UA-ES, 600 mm Air inlet 120 mm 340 mm 64 mm Air outlet Drain outlet Fig. 8-3-2 · 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 Drain nipple ! to the bottom plate of the outdoor unit before installing it. 31 FILE NO.

SVM-02009 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 5 Filter frame x 2 9 Pan head wood screw 3.1 x 16 s x 2 2 Wireless remote control x 1 6 Zeolite filter x 1 ! Drain nipple x 1 (Packaged with the outdoor unit) 3 Battery x 2 7 Purifying filter x 1 " Flexible pipe x 1 4 Remote control holder x 1 8 Mounting screw 4 x 25 s x 8 # Pipe shield x 1 Others : Owner's manual, Installation manual Option : For the Extension drain hose, use an optionally available RB-821SW or commercially available one. This model is not equipped with an Extension drain hose. 32 FILE NO. SVM-02009 8-3-3. Installation/Servicing tools <Changes in the product and components> In the case of an air conditioner using R-410A, 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 R-410A Gauge manifold Applicable to R-22 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. -- 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 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 R-410A. If the vacuum pump mineral oil mixes with R-410A, a sludge may occur and damage the equipment. Exclusive for HFC refrigerant. Gas leakage detector · Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R-410A) and protector coating in the U. S ARI specified rose color (ARI color code: PMS 507). · Also, the "charge port and packing for refrigerant cylinder" require 1/2 UNF 20 threads per inch corresponding to the port size of the charge hose. 33 FILE NO.

SVM-02009 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. <Remote control usage> · Under Ceiling Installation Ceiling 7m Wall Remote control Reception range CAUTION · Direct sunlight or fluorescent light 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.) 5m <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. Remote control Reception range * Axial distance Fig. 8-4-1 · Console Installation 7m Remote control Wall Reception range Floor 5m *7 m Remote control Reception range * Axial distance Fig. 8-4-2 NOTICE The Paper pattern is inside the package box cover. Do not bend and dispose of it before installing. 34 *7 m 5m 5m FILE NO. SVM-02009 8-4-2. Before installation <Remove the Air inlet grille> 1. Open the Air inlet grille with both hands. 2. Loosen three screws for fixing the Panel arm. Do not remove the screws at this time. 1 2 2 8-4-3. After installation <Install the Air inlet grille> 1. Insert the three Panel arms on the Air inlet grille and fix each securely by screws. 1 Panel arm Screw Panel arm Fig. 8-4-3 3.*

First, move the Air inlet grille upward, then turn it backwards. 4. Remove the Grille stopper from the axis of the Front panel. After that, remove the Air inlet grille 5. Remove the Panel arms from the Front panel. Panel arm 3 Fig. 8-4-5 CAUTION · The screws that fixed with Panel arms must not be loose.


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2. Set the Air inlet grille arm to the axis of the Front panel. 3. Insert the Grille stopper to the correct position and fix it securely with screws. 4. Push the Air inlet grille to the correct position. Air inlet grille arm Axis of the Front panel Grille stopper 3 5 Fig. 8-4-4 Rib Fig. 8-4-6 35 FILE NO. SVM-02009 8-4-4. Under ceiling installation For the installation of the indoor unit, use the Paper pattern, which is inside the package box cover. <Install the Suspension bolts> · Install the suspension bolts so that it can support the indoor unit. 240 mm or more 1093 1015 <Install the indoor unit> 1. Remove the Side covers and the Installation plate 1. 2. Insert the Suspension bolts into the metal fittings of the indoor unit. 3. Set to nuts, spring washers and washers on both sides of the metal fittings and then move the indoor unit backward. 4. Secure it with the M10 Nuts. (4pcs) 5. Attach the Side covers to the unit. 330 60 235 mm or more 1 Installation plate Suspension bolt Side cover Suspension bolt 3 2 140 Fig. 8-4-7 · Adjust distance to ceiling before installation. 25~30 mm 4 Side cover Suspension bolt Washer Nut (M10) Spring washer 40~45 mm Nut (M10) Fig. 8-4-9 Suspension bolt (M10) <Condition for installation> · The unit must not decline more than 15 mm in either axis. Spring washer Washer Nut (M10) Fig. 8-4-8 15 mm 15 mm Fig. 8-4-10 36 FILE NO. SVM-02009 <Piping and Drain hose installation> · The piping direction can be 4 ways as illustrated. · The Drain hose is only one way. Upper piping · Rear side piping with Drain hose. (Recommended direction) Ceiling 175 mm or more Rear piping hole 80 Ceiling 140 mm Rear upper piping Side piping Rear piping Drain hose Wall Fig. 8-4-11 · How to install the Drain hose. 1. Remove the two screws and the Drain band. 2. Cut a slit for the drain hose hole. Fig. 8-4-14 1. Cut or remove the determined direction slit or cover. 2. Pipes and the Drain hose should be fixed together by the Drain band with two screws. Cut Slit for drain hose hole Drain band Screws Fig. 8-4-15 · Other direction piping. 1. Cut the slit of connecting only upper direction. Slit for upper piping Fig. 8-4-12 3. Place the Drain hose on the U- shape space and secure it with the Drain band and two screws. Cover for rear upper piping Cover for side piping Drain hose Fig. 8-4-13 Fig. 8-4-16 2. Connect the Flexible pipe " to the large pipe (Gas side). Big pipe " Flexible pipe Fig. 8-4-17 37 FILE NO. SVM-02009 8-4-5. Console installation · Select the terminal of Selector-SW from [C position] to [F position]. <Install the indoor unit> · Install the Installation plate 1 at the wall according to the Paper pattern. · Hang the indoor unit on the hooks of the Installation plate 1. · Fix the lower portion of the indoor unit with Mounting screws 8 (2 places). REMOCON Indoor unit Hook 1 Installation plate B INSTALL Fig. 8-4-18 <Cutting a hole and mounting the installation plate> · When installing the rear piping, determine the pipe hole position, drill the pipe hole (80 mm) at a slight downward slant to the outdoor side. · For mounting of the Installation plate 1, use the Paper pattern, which is inside the package box cover. 1093 742 C A F 8 Mounting screw 375 mm or more 8 Mounting screw 160 633 Fig. 8-4-21 <Condition for installation> · The unit must not decline more than 15 mm in either axis. 15 mm 390 mm or more 320 140 Floor Rear piping hole. 80 Fig. 8-4-19 Anchor bolt 5 mm dia. hole Projection 15 mm or less 8 Mounting screw 4 x 25 s Clip anchor (local parts) 60 Fig. 8-4-22 Fig. 8-4-20 CAUTION Failure to firmly install the unit may result in personal injury and property damage if the unit falls. · In case of block, brick, concrete or similar type walls, make 5 mm dia. holes in the wall. · Insert clip anchors for appropriate Mounting screws 8. NOTE: · Secure four corners and lower parts of the Installation plate 1 with 6 to 8 mounting screws to install it. 38 FILE NO. SVM-02009 <Piping and Drain hose installation> 8-4-6. Wiring connection · The piping direction can be the following 3 ways with <How to connect the connecting cable> the Drain hose. Terminal cover · Each piping direction should be connected with the Screws Flexible pipe ". Cord clamp Earth terminal Rear piping Side piping Fig. 8-4-25 Bottom piping Fig. 8-4-23 · Cut or remove the determined direction slit or cover. Slit for upper piping Cover for side piping Cover for rear upper piping 1. Remove the Terminal cover and the Cord clamp. 2. Insert the connecting cable into the pipe hole on the wall. 3. Insert the connecting cable fully into the Terminal block and secure it tightly with the screw. Tightening torque: 1.2 N·m (0.12kgf·m) 4. Fix the connecting cable by the Cord clamp with two screws. 5. Fix the Terminal cover. <Stripping length of the connecting cable> Fig. 8-4-24 10 10 50 40 Earth line Fig. 8-4-26 NOTE: Use strand wire only. · Wire type : More than 1.5 mm2 (H07RN-F or 245 IEC66) or 1.3 mm2 (AWG-16) Fig. 8-4-27 NOTE: Connect the earth line to the metallic part (i mark) located at the side of 3P terminal. 39 FILE NO. SVM-02009 8-4-7. Pipe shield for flare nut connection Joints in liquid and gas pipes of the indoor unit should be insulated with an attached Pipe shield #. <How to install the Pipe shield> 1. Cut the Pipe shield # to appropriate length. 2. Set the Pipe shield #. 3. In case of a ceiling installation, orient the slit at the top of the pipe. 4. Fix the Pipe shield # with vinyl tape. Vinyl tape Slit 50 mm or more 50 mm or more 8-4-8. Drainage 1. Run the Drain hose sloping downward. NOTE: · The hole should be made at a slight downward slant on the outdoor side. Under Ceiling Installation Console Installation Fig. 8-4-29 # Pipe shield NOTICE In the case of upward drainage from the unit, (Under Ceiling Installation), it is necessary to use Drain pump kit of optional part. Fig. 8-4-28 CAUTION 1. Do not raise the Drain hose. 2. Do not put the Drain hose into water. 3. Do not form the Drain hose into a wave shape. 4. Do not put the Drain hose end in the drainage ditch. 2. Open the louver manually and put some water into it. Then check the flow of water from the Drain hose. Fig. 8-4-30 3. When connecting the Extension drain hose, insulate the connecting part of Extension drain hose with the Pipe shield. Pipe Shield Drain hose Inside the room Extension drain hose Fig. 8-4-31 CAUTION Arrange the drain pipe for proper drainage from the unit. Improper drainage can result in dew-dropping. (Provided by customer) 40 FILE NO.


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SVM-02009 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 15 m (Refer to the table of TO CHARGE REFRIGERANT for detail.) · An allowable height level is up to 8 m. · A place where the drain water does not raise any problem. 8-5-2. Refrigerant piping connection 1. Cut the pipe with a pipe cutter.
Roughness 90° Obliquity Warp Fig. 8-5-2 2. Insert a flare nut into the pipe, and flare the pipe. A Die Pipe Fig. 8-5-3 Projection margin in flaring : A (Unit : mm) Outer dia.
of copper pipe 6.35 12.70 A Rigid 1.0 to 1.5 1.
0 to 1.5 Imperial 1.5 to 2.0 2.0 to 2.5 CAUTION 1. Install the outdoor unit without anything blocking the air discharging. 2. When the outdoor unit is installed in a place 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.

Especially in windy area, install the unit to prevent the 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. Strong wind Fig. 8-5-1 41 FILE NO.
SVM-02009 <Tightening connection> Align the centers of the connecting pipes and tighten the flare nut as far as possible with your fingers. @@8-5-3. @@@@Do not use the refrigerant in the outdoor unit. For details, see the manual of the vacuum pump. <Using a vacuum pump> (Unit : N·m) Outer dia. @@@@@@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 for evacuating. @@@@5. Close the low pressure side valve handle of gauge manifold. 6. @@7. Remove the charging hose from the service port. 8. @@1.6 times). @@@@@@@@@@(2) Tight connection (between pipes and unit).

(3) Evacuate the air in the connecting pipes using VACUUM PUMP. (4) Check gas leak (connected points). 42 Fig. 8-5-6 FILE NO.
@@@@@@@@@@@@· Every wire must be connected firmly. @@Wiring connection 1. Remove the electric parts 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. 43 FILE NO.
SVM-02009 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. 2) Remove the Air inlet grille. (Refer to page 35, 8-4-2) 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. A B A B PRESET START/STOP FAN MODE ECO TIMER AUTO Hi-POWER MEMO SET CLR Fig. 8-6-1 3) Select the terminal of selector switch from [A position] to [B position]. SWING FIX ON OFF FILTER [MODE] button RESET CLOCK CHECK [CHECK] button C INSTALL A B REMOCON F Fig. 8-6-3 3. Confirm that the indoor unit can operate with the new setting. Fig. 8-6-2 44 FILE NO.
SVM-02009 8-7. How to Use Drain Pump Kit of Option In the case of upward drainage from the unit (Under ceiling installation). It is necessary to use Drain pump kit of option parts. By using a Drain pump kit, it becomes possible to raise 300 mm from a ceiling side. Please follow the installation manual of Drain pump kit (TCB-DP10CE) attachment.
8-8. Others 8-8-1. Gas leak test Electric parts cover D C Flare nut connections (Indoor unit) Valve stem cap connection Flare nut connections (Outdoor unit) A 300 mm B Service cap connection Valve stem cap connection Fig. 8-8-1 · Check the flare nut connections, valve stem cap connections and service port cap connections for gas leak with a leak detector or soap water. 8-8-2.
Test operation To switch the TEST RUN (COOL) mode, press TEMPORARY button for 10 sec. (The beeper will make a short beep.) Drain pump kit Fig. 8-7-1 Hi POWER FILTER PRE.D TEMPORARY button Fig. 8-8-2 8-8-3. 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. 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. 45 FILE NO. SVM-02009 9. TROUBLESHOOTING CHART 9-1. Troubleshooting Procedure Follow the details of 9-2.


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