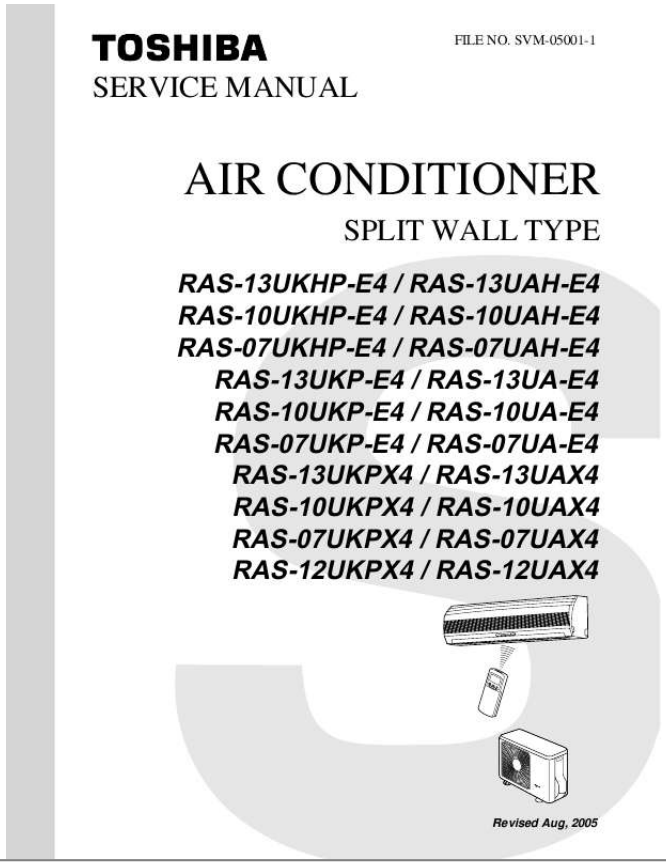

TOSHIBA

FILE NO. SVM-05001-1

SERVICE MANUAL

AIR CONDITIONER

SPLIT WALL TYPE

RAS-13UKHP-E4 / RAS-13UAH-E4
RAS-10UKHP-E4 / RAS-10UAH-E4
RAS-07UKHP-E4 / RAS-07UAH-E4
RAS-13UKP-E4 / RAS-13UA-E4
RAS-10UKP-E4 / RAS-10UA-E4
RAS-07UKP-E4 / RAS-07UA-E4
RAS-13UKPX4 / RAS-13UAX4
RAS-10UKPX4 / RAS-10UAX4
RAS-07UKPX4 / RAS-07UAX4
RAS-12UKPX4 / RAS-12UAX4

Revised Aug, 2005

Manual abstract:

@@SVM-05001 CONTENTS 1. 2. @@SVM-05001 7. @@PART REPLACEMENT 10-1 Indoor Unit 10-2 Outdoor Unit 11. @@SVM-05001 1. SPECIFICATIONS MODEL RAS-13UKHP-E4 / RAS-13UAH-E4 RAS-13UKP-E4 / RAS-13UA-E4 ITEM Capacity 220 V kW Phase Power source Power consumption Power factor Running current Indoor Outdoor V Hz kW % A A A lit/h dB 49 5.50 1.23 99 3.55 Cooling 240 V 3.60 220 V 4.
10 Heating 240 V 4.15 1Æ 220 - 240 50 1.27 97 5.30 25 2.0 41/35/31 51 1.
00 Capillary tube Æ12.7 Flare connection Æ6.35 Flare connection 49 R22 51 47 1.26 98 0.15 5.
35 5.15 5.75 1.33 96 1.24 98 220 V 3.70 Cooling 240 V 3.75 1.28 95 5.60 24 Starting current Moisture removal Noise Refrigerant Indoor (H/M/L) 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 Outdoor (220 - 240 V) dB kg mm mm 48 0.80 Refrigerant control m m RAS-13UKHP-E4 15 6 1 RAS-13UKP-E4 Height Dimensions Net weight Evaporator type Indoor fan type High fan Air volume Medium fan Low fan Fan motor output Air filter OUTDOOR UNIT mm mm mm kg 275 790 208 10 Finned tube Cross flow fan Width Depth m3/h m /h 3 630 520 430 650 550 490 20 Honeycomb woven filter with PP frame RAS-13UAH-E4 630 520 430 m3/h W RAS-13UA-E4 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 mm mm mm kg 37 550 780 270 34 Finned tube Propeller fan m /h 3 2120 2200 42 2120 2200 2030 30 2150 W W PH225X2C-4FT 1100 Fuse, Overload relay Automatic louver °C 15 ~ 43 -10 ~ 24 15 ~ 43 3 FILE NO.*

SVM-05001 MODEL RAS-10UKHP-E4 / RAS-10UAH-E4 RAS-10UKP-E4 / RAS-10UA-E4 ITEM Capacity 220 V kW Phase Power source Power consumption Power factor Running current Indoor Outdoor V Hz kW % A A A lit/h dB 47 4.30 0.93 95 2.65 Cooling 240 V 2.70 220 V 2.95 Heating 240 V 3.00 1Æ 220 - 240 50 0.98 92 4.27 0.84 94 0.
15 3.90 19 1.2 39/33/26 49 0.76 Capillary tube Æ9.52 Flare connection Æ6.
35 Flare connection 47 R22 49 44 3.77 3.60 0.86 91 0.80 97 220 V 2.
*65 Cooling 240 V 2.70 0.85 95 3.58 16 Starting current Moisture removal Noise Refrigerant Indoor (H/M/L) 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 Outdoor (220 - 240 V) dB kg mm mm 45 0.68 Refrigerant control m m RAS-10UKHP-E4 10*1 5 RAS-10UKP-E4 Height Dimensions Net weight Evaporator type Indoor fan type High fan Air volume Medium fan Low fan Fan motor output Air filter OUTDOOR UNIT mm mm mm kg 275 790 208 10 Finned tube Cross flow fan Width Depth m3/h m /h 3 570 460 340 610 520 400 20 Honeycomb woven filter with PP frame RAS-10UAH-E4 610 460 340 m3/h W RAS-10UA-E4 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 mm mm mm kg 32 550 780 270 31 Finned tube Propeller fan m /h 3 1740 1850 1740 20 1850 1740 1850 W PH180X1C-4DZDN3 W RM5510GNE94 750 Fuse, Overload relay Automatic louver °C 15 ~ 43 -10 ~ 24 15 ~ 43 -4- FILE NO. SVM-05001 MODEL ITEM Capacity kW Phase Power source Power consumption Power factor Running current Indoor Outdoor V Hz kW % A A A lit/h dB 44 45 0.60 Capillary tube mm mm 9.52 Flare connection 6.35 Flare connection m m 10*1 5 45 46 R-22 kg 0.57 2.*

69 2.77 13 0.8 38/32/26 44 45 44 45 2.35 2.40 0.61 98 0.68 97 0.54 98 0.59 96 0.15 2.
55 2.55 11 2.55 2.55 2.00 RAS-07UKHP-E4/ RAS-07UAH-E4 Cooling 220V 240V 2.
05 2.00 RAS-07UKP-E4/ RAS-07UA-E4 Cooling 220V 2.10 1 220 - 240 50 0.58 98 0.62 96 240V 2.
15 2.05 240V RAS-07UKPX4/ RAS-07UAX4 Cooling 220V 2.10 240V 2.15 Heating 220V 0.58 98 0.62 96 Starting current Moisture removal Noise Indoor (H/M/L) Name of refrigerant Rated amount Gas side size Connection type Liquid side size Interconnection Connection type pipe Maximum length (One way) Maximum height difference Outdoor (220-240V) dB Refrigerant Refrigerant control INDOOR UNIT Height Dimensions Net weight Evaporator type Indoor fan type High fan Air volume Medium fan Low fan Fan motor output Air filter m3/h m3/h m3/h W 570 460 340 Width Depth mm mm mm kg RAS-07UKHP-E4 275 790 208 10 Finned tube RAS-07UKP-E4 RAS-07UKPX4 Cross flow fan 610 490 400 20 Honeycomb woven filter with PP frame 570 460 340 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 m3/h W 1280 Width Depth mm mm mm kg RAS-07UAH-E4 530 660 240 28 Finned tube Propeller fan 1360 1280 1360 20 RAS-07UA-E4 RAS-07UAX4 27 1280 1360 1280 1360 PH108X1C-4DZDN2 605 Fuse, Overload relay Automatic louver -10 ~ 24 15 ~ 43 21 ~ 43 5 FILE NO. SVM-05001 ITEM Capacity MODEL RAS-13UKPX4 / RAS-13UAX4 RAS-12UKPX4 / RAS-12UAX4 Cooling 220 V 240 V 3.75 220 V 3.40 1Æ 220 - 240 50 1.24 98 5.

60 1.28 95 5.45 24 2.0 41/35/31 47 48 0.80 Capillary tube Æ12.70 Flare connection 47 R22 48 1.24 98 0.15 5.60 5.45 1.
28 95 240 V 3.48 RAS-10UKPX4 / RAS-10UAX4 220 V 2.65 240 V 2.70 kW Phase V Hz kW % Indoor Outdoor A A A lit/h dB dB kg mm mm 3.70 Power source Power consumption Power factor Running current 0.
80 97 3.60 16 1.2 39/33/26 44 0.68 Æ9.52 0.
85 95 3.58 Starting current Moisture removal Noise Refrigerant Indoor (H/M/L) Outdoor 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 45 Refrigerant control 6.35 Flare connection m m RAS-13UKPX4 15 1 6 RAS-12UKPX4 275 790 208 10 Finned tube Cross flow fan 10* 1 5 RAS-10UKPX4 mm mm mm kg m3/h m /h m3/h W RAS-13UAX4 3 630 520 430 20 Honeycomb woven filter with PP frame RAS-12UAX4 550 780 270 34 Finned tube Propeller fan 610 460 340 RAS-10UAX4 mm mm mm kg 31 m /h W W 3 2030 2150 30 2030 2150 1740 20 1850 PH225X2C-4FT 1100 Fuse, Overload relay Automatic louver RM5510GNE94 750 °C 21 ~ 43 -6- FILE NO. @@@@SVM-05001 2. CONSTRUCTION VIEWS 2-1. @@SVM-05001 2-2. @@SVM-05001 2-3. Outdoor Unit (RAS-07UAH-E4, RAS-07UA-E4, RAS-07UAX4) 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 9.62) 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 CHASSIS SOLENOID COIL OVERLOAD RELAY BLK COMPRESSOR CAPACITOR RED RED RED CAPACITOR WHI BLK FAN MOTOR PNK WHI - 13 - FILE NO. SVM-05001 3-4. RAS-13UKP-E4 / RAS-13UA-E4 Infrared rays receiver and indication parts.

CN25 1 2 3 4 5 6 7 8 9 10 11 1 2 3 4 5 6 7 8 9 10 11 TRANS (TT-10) RED 1 1 BLU WHI 3 1 CN05 3 1 GRY 3 3 CN06 MCC-920 DB50 C50 + CN07 11 22 33 44 55 WHI YEL YEL YEL YEL BLU BLU BLU BLU BLU BLU BLU BLU BLU BLU WHI 1 2 3 4 5 6 7 8 9 10 11 1 2 3 4 5 6 7 8 9 10 11 CN14 BLK P04 3 Heat Exchanger Sensor (TC) CN01 11 22 CN03 11 22 F01 T6.3 A 250 VAC RY01 4 Regulator circuit DC 12 V DC 5 V 1 2 3 4 5 1 2 3 4 5 Thermo Sensor (TA) Louver motor SG01 DSA CN11 R47 R46 IC03 L01 2 2 11 22 33 YEL GRY BRW 1 2 3 4 5 6 1 2 3 4 5 6 150 C L N GRN&YEL BRW (L) BLU (N) R21 R22 CR03 D38 C58 CN10 55 33 WHI BLK RED Single Phase 220V~, 50Hz C15 1 C01 R48 3 4 11 Indoor FAN motor CN31 CN04 12 12 PNK TEMP FUSE 73 C INDOOR TERMINAL BLOCK 1 2 GRN&YEL PNK WHI BLK INDOOR OUTDOOR OUTDOOR TERMINAL BLOCK 1(L) 2(N) CHASSIS RED BLK BLK RED FAN MOTOR RED WHI CAPACITOR CAPACITOR COMPRESSOR PNK WHI - 14 - FILE NO. SVM-05001 3-5. RAS-10UKP-E4 / RAS-10UA-E4 RAS-07UKP-E4 / RAS-07UA-E4 Infrared rays receiver and indication parts. CN25 1 2 3 4 5 6 7 8 9 10 11 1 2 3 4 5 6 7 8 9 10 11 TRANS (TT-10) RED WHI CN14 1 2 3 4 5 6 7 8 9 10 11 1 2 3 4 5 6 7 8 9 10 11 BLK P04 3 Heat Exchanger Sensor (TC) CN01 11 22 CN03 11 22 F01 T6.

3 A 250 VAC SG01 DSA RY01 4 DB50 C50 + 1 1 3 3 CN05 BLU 1 1 3 3 CN06 MCC-920 CN07 11 22 33 44 55 WHI YEL YEL YEL YEL GRY BLU BLU BLU BLU BLU BLU BLU BLU BLU BLU WHI Regulator circuit DC 12 V DC 5 V 1 2 3 4 5 1 2 3 4 5 Thermo Sensor (TA) Louver motor CN11 R47 R46 IC03 L01 2 2 11 22 33 YEL GRY BRW 1 2 3 4 5 6 1 2 3 4 5 6 150 C L N GRN&YEL BRW (L) BLU (N) R21 R22 CR03 D38 C58 CN10 55 33 WHI BLK RED Single Phase 220V~, 50Hz C15 1 C01 R48 3 4 11 Indoor FAN motor CN31 CN04 12 12 PNK TEMP FUSE 73 C INDOOR TERMINAL BLOCK 1 2 GRN&YEL PNK WHI BLK INDOOR OUTDOOR OUTDOOR TERMINAL BLOCK 1(L) 2(N) CHASSIS RED BLK BLK RED FAN MOTOR RED WHI CAPACITOR CAPACITOR OVERLOAD RELAY BLK COMPRESSOR PNK WHI - 15 - FILE NO. SVM-05001 3-6. RAS-13UKPX4 / RAS-13UAX4 RAS-12UKPX4 / RAS-12UAX4 Infrared rays receiver and indication parts. CN25 1 2 3 4 5 6 7 8 9 10 11 1 2 3 4 5 6 7 8 9 10 11 TRANS (TT-10) RED 1 1 BLU WHI 3 1 3 CN05 1 GRY 3 3 CN06 MCC-920 DB50 C50 + CN07 11 22 33 44 55 WHI YEL YEL YEL YEL BLU BLU BLU BLU BLU BLU BLU BLU BLU BLU WHI 1 2 3 4 5 6 7 8 9 10 11 1 2 3 4 5 6 7 8 9 10 11 CN14 BLK P04 3 Heat Exchanger Sensor (TC) CN01 11 22 CN03 11 22 F01 T6.3 A 250 VAC RY01 4 Regulator circuit DC 12 V DC 5 V 1 2 3 4 5 1 2 3 4 5 Thermo Sensor (TA) Louver motor SG01 DSA CN11 R47 R46 IC03 L01 2 2 11 22 33 YEL GRY BRW 1 2 3 4 5 6 1 2 3 4 5 6 150 C Power Cord GRN&YEL BLU (N) BRW (L) R21 R22 CR03 D38 C58 CN10 55 33 WHI BLK RED Single Phase 220-240V 50Hz C15 1 C01 R48 3 4 11 Indoor FAN motor CN31 CN04 12 12 PNK TEMP FUSE 73 C INDOOR TERMINAL 387.

*3 or 235.2 466.2 or 260.1 3 4 5 DS451155BPQC AC 450V, 1.5µF DS371256CPNB AC 370V, 25µF JMRA99208-9201 U/T: 4.2A (80°C), OPEN: 135±5°C, CLOSE: 69±11°C - 19 - FILE NO. SVM-05001 4-5. Indoor Unit (RAS-13UKP-E4, RAS-10UKP-E4, RAS-07UKP-E4, RAS-13UKPX4, RAS-10UKPX4, RAS-12UKPX4, RAS-07UKPX4) No. 1 2 3 4 5 6 7 8 9 10 11 12 Parts name Fan motor (for indoor) Thermo sensor (TA-sensor) Transformer Microcontroller unit (IC30) Heat exchanger sensor (TC-sensor) Line filter (L01) Bridge rectifier (DB50) Capacitor (C50) Fuse (F01) Varistor (R21, R22) Louver motor Relay (Comp., RY01) *SS11V-06270 KBP06M/51 PF1E222MNN1625 BET6.*

3A 15G561K MP24Z DI1U TT-10 TMP87CM40AN 10k W at 25°C 27mH, 600mA 1.5A, 600 V 2200mF, 25 V T6.3A, 250VAC 560 V 12VDC Rating 25A/AC250 V, 3~48VDC Type SKF- 220-20-4A-1 Specifications AC Motor with 150 °C thermo fuse 10k W at 25°C 4-6. Outdoor Unit (RAS-13UA-E4) No. 1 Parts name Compressor Type PH225X2C-4FT Specifications Output (Rated) 1100 W, 2 poles, 1 phase, 220 - 240 V, 50Hz Winding resistance (W) (at 20 °C) 2 Fan motor (for outdoor) Running capacitor Running capacitor (for compressor) HF-240-30B Winding resistance (W) (at 20 °C) 3 4 DS451155BPQC AC 450 V,1.5µF DS371356CPNB AC 370 V, 35mF C-R 2.35 Red-Black 245 C-S 3.22 White-Black 388 Output (Rated) 30 W, 6 poles, 1 phase, 220 - 240 V, 50Hz - 20 - FILE NO. SVM-05001 4-7. Outdoor Unit (RAS-13UAX4, RAS-12UAX4) No.

1 Parts name Compressor Type PH225X2C-4FT Specifications Output (Rated) 1100 W, 2 poles, 1 phase, 220 - 240 V, 50Hz Winding resistance (W) (at 20°C) 2 Fan motor (for outdoor) Running capacitor (for fan motor) Running capacitor (for compressor) HF-240-30B Winding resistance (W) (at 20°C) 3 4 DS451155BPQC DS371356CPNB AC 450 V, 1.5mF AC 370 V, 35mF C-R 2.35 Red-Black 245 C-S 3.22 White-Black 388 Output (Rated) 30 W, 6 poles, 1 phase, 220 - 240 V, 50Hz 4-8. Outdoor Unit (RAS-10UA-E4, RAS-10UAX4) No.

1 Parts name Compressor Type RM5510GNE94 Specifications Output (Rated) 750 W, 2 poles, 1 phase, 220 - 240 V, 50Hz Winding resistance (W) (at 20°C) 2 Fan motor (for outdoor) Running capacitor (for fan motor) Running capacitor (for compressor) Overload relay HF-240-20B or SKF-240-20B DS451155BPQC DS371256CPNB LPAP960B Winding resistance (W) (at 20°C) 3 4 5 AC 450 V, 1.5mF AC 370 V, 25mF U/T : 6.1A (80°C), OPEN : 135±5°C, CLOSE : 78±11°C C-R 3.710 Red-Black 387.3 or 235.

2 C-S 4.099 White-Black 466.2 or 260.1 Output (Rated) 20 W, 6 poles, 1 phase, 220 - 240 V, 50Hz - 21 - FILE NO. SVM-05001 4-9. Outdoor Unit (RAS-07UAX4) No. 1 Parts name Compressor Type PH108X1C-4DZDN2 Specifications Output (Rated) 605W, 2poles, 1 phase, 220 - 240V, 50Hz Winding resistance () (at 20°C) 2 Fan motor (for outdoor) Running capacitor (for fan motor) Running capacitor (for compressor) Overload relay HF-240-20B or SKF-240-20B DS451155BPQC DS371256CPNB JMRA99208-9201 Winding resistance () (at 20°C) AC 450V, 1.5µF AC 370V, 25µF U/T: 4.2A (80°C), OPEN: 135±5°C, CLOSE: 69±11°C C-R 4.84 Red-Black C-S 4.

40 White-Black Output (Rated) 20W, 6poles, 1 phase, 220 - 240V, 50Hz 387.

3 or 235.2 466.2 or 260.1 3 4 5 4-10. Outdoor Unit (RAS-07UA-E4) No. 1 Parts name Compressor Type Specifications Output (Rated) 605W, 2poles, 1 phase, 220 - 240V, 50Hz PH108X1C-4DZDN2 Winding resistance () (at 20°C) 2 Fan motor (for outdoor) Running capacitor (for fan motor) Running capacitor (for compressor) Overload relay HF-240-20B or SKF-240-20B Winding resistance () (at 20°C) C-R 4.84 Red-Black C-S 4.40 White-Black Output (Rated) 20W, 6poles, 1 phase, 220 - 240V, 50Hz 387.3 or 235.

2 466.2 or 260.1 3 4 5 DS451155BPQC AC 450V, 1.5µF DS371256CPNB AC 370V, 25µF JMRA99208-9201 U/T: 4.2A (80°C), OPEN: 135±5°C, CLOSE: 69±11°C - 22 - FILE NO.

SVM-05001 5. REFRIGERATION CYCLE DIAGRAM 5-1. RAS-13UKHP-E4 / RAS-13UAH-E4 T1 Cooling 0.39 m (Connecting pipe) Æ12.7 Indoor unit Heat exchanger Heating Cross flow fan 0.

49 m (Connecting pipe) Æ6.35 O.D.:12.7 mm P Packed valve (Æ12.7) Heating Packed valve (Æ6.35) O.D.:6.35 mm Cooling 4-way valve Heating Cooling Compressor PH225X2C-4FT Accumulator Heat exchanger Capillary tube Æ1.

*5 x 900 l Capillary tube Æ1.0 x 800 l Cooling Heating Propeller fan Outdoor unit Refrigerant R22 : 1.00 kg. Mark ( ) means check points of Gas Leak. 50Hz Standard pressure P (MPaG) Surface temp. of heat exchanger interchanging 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 Note *1 1.84 2.00 ~ 2.42 1.*

50 0.49 0.60 0.45 46.0 52.

0 ~ 59.0 38.0 10.0 15.0 2.

0 High Low High High High Low 20/15 27/20/27/19 32/23 21/15 7/6 24/18 -10/-10 35/24 43/26 21/15 · Measure the heat exchanger temperature at the center of U-bend. (By means of TC sensor) · During heating overload operation, a value for the high temperature limit control operation is included. - 23 - FILE NO. SVM-05001 5-2. RAS-10UKHP-E4 / RAS-10UAH-E4 T1 Cooling 0.39 m (Connecting pipe) Æ9.52 Indoor unit Heat exchanger Heating Cross flow fan 0.49 m (Connecting pipe) Æ6.35 O.D.

:9.52 mm P Packed valve (Æ9.52) Heating Packed valve (Æ6.35) O.D.:6.35 mm Cooling 4-way valve Heating Cooling Compressor PH180X1C-4DZDN3 Capillary tube Æ1.5 x 1000l Accumulator Heat exchanger Cooling Heating Propeller fan Outdoor unit Refrigerant R22 : 0.76 kg. Mark ( ) means check points of Gas Leak.

*50Hz Standar d pressure P (MPaG) Surface temp. of heat exc hanger 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 Note *1 1.65 2.00 ~ 2.*

40 1.40 0.50 0.60 0.48 40.

0 52.0 ~ 59.0 35.0 12.0 15.0 5.0 High Low High High High Low 20/15 27/20/27/19 32/23 21/15 7/6 24/18 -10/-10 35/24 43/26 21/15 · Measure the heat exchanger temperature at the center of U-bend. (By means of TC sensor) · During heating overload operation, a value for the high temperature limit control operation is included. - 24 - FILE NO. SVM-05001 5-3.

RAS-07UKHP-E4 / RAS-07UAH-E4 Cooling 0.39m (Connecting pipe) 9.52 Indoor unit Heat exchanger T1 Heating Cross flow fan 0.49m (Connecting pipe) 6.35 O.D.:9.52mm P Packed valve (9.52) Heating Packed valve (6.35) O.

D.:6.35mm Cooling 4-way valve Heating Cooling Compressor PH108X1C-4DZDN2 Capillary tube 1.0x900S (2 pcs.) Accumulator Heat exchanger Cooling Heating Propeller fan Outdoor unit Refrigerant R-22 : 0.

60 kg. Mark( )means check points of Gas Leak. 50Hz Standard pressure P (MPaG) Surface temp. of heat exchanger interchanging pipe T1 (°C) Fan speed (indoor) Ambient temp. conditions DB/WB (°C) Indoor Outdoor Standard Heating Overload Low temperature Standard Cooling Overload Low temperature Note : 1.

32 1.69 1.10 0.59 0.68 0.50 33.0 49.0 30.0 12.0 16.

0 2.0 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 · Measure the heat exchanger temperature at the center of U-bend. (By means of TC sensor) 25 FILE NO. SVM-05001 5-4. RAS-13UKP-E4 / RAS-13UA-E4 RAS-13UKPX4 / RAS-13UAX4 RAS-12UKPX4 / RAS-12UAX4 Cooling 0.39 m (Connecting pipe) Æ12.7 Indoor unit Heat exchanger T1 Cross flow fan 0.49 m (Connecting pipe) Æ6.35 O.D.

:12.7 mm P Packed valve (Æ12.7) Packed valve (Æ6.35) O.D.

:6.35 mm Cooling Cooling Compressor PH225X2C-4FT Capillary tube Æ1.7 x 1000l Heat exchanger Cooling Propeller fan Outdoor unit Refrigerant R22 : 0.80 kg. Mark ( ) means check points of Gas Leak.

50Hz Standard pressure P (MPaG) Surface temp. of heat exchanger interchanging pipe T1 (°C) Fan speed (indoor) Ambient temp. conditions DB/WB (°C) Indoor Outdoor Standard Cooling Overload Low temperature Note 0.48 0.59 0.45 9.0 15.0 2.0 High High Low 27/19 32/23 21/15 35/24 43/26 21/15 · Measure the heat exchanger temperature at the center of U-bend. (By means of TC sensor) - 26 - FILE NO.

SVM-05001 5-5. RAS-10UKP-E4 / RAS-10UA-E4 RAS-10UKPX4 / RAS-10UAX4 Indoor unit Heat exchanger T1 Cooling 0.39 m (Connecting pipe) Æ9.52 Cross flow fan 0.49 m (Connecting pipe) Æ6.35 O.D.:9.52 mm P Packed valve (Æ9.52) Packed valve (Æ6.

35) O.D.:6.35 mm Cooling Cooling Compressor RM5510GNE94 Capillary tube Æ1.5 x 1100l Heat exchanger Cooling Propeller fan Outdoor unit Refrigerant R22 : 0.

68 kg. Mark ( ) means check points of Gas Leak. 50Hz Standard pressure P (MPaG) Surface temp. of heat exchanger interchanging pipe T1 (°C) Fan speed (indoor) Ambient temp. conditions DB/WB (°C) Indoor Outdoor Standard Cooling Overload Low temperature Note 0.

54 0.65 0.48 13.0 17.0 5.0 High High Low 27/19 32/23 21/15 35/24 43/26 21/15 · Measure the heat exchanger temperature at the center of U-bend. (By means of TC sensor) - 27 - FILE NO. SVM-05001 5-6. RAS-07UKP-E4 / RAS-07UA-E4 RAS-07UKPX4 / RAS-07UAX4 Cooling 0.39m (Connecting pipe) 9.

52 Indoor unit Heat exchanger T1 Cross flow fan 0.49m (Connecting pipe) 6.35 O.D.:9.52mm P Packed valve (9.52) Packed valve (6.35) O.D.:6.

35mm Cooling Cooling Compressor PH108X1C-4DZDN2 Capillary tube 1.5x1200S Heat exchanger Cooling Propeller fan Outdoor unit Refrigerant R-22 : 0.57 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 T1 (°C) Indoor Outdoor Standard Cooling Overload Low temperature Note : 0.59 0.69 0.32 13.

5 18.0 2.0 High High Low 27/19 32/23 21/15 35/24 43/26 21/15 · Measure the heat exchanger temperature at the center of U-bend.

(By means of TC sensor) 28 FILE NO. SVM-05001 6. CONTROL BLOCK DIAGRAM 6-1. RAS-13UKHP-E4 / RAS-13UAH-E4, RAS-10UKHP-E4 / RAS-10UAH-E4, RAS-07UKHP-E4 / RAS-07UAH-E4 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 Infrared Rays Operation ( ) Operation Mode Selection AUTO, COOL, DRY, HEAT, FAN ONLY Temperature Setting Fan Speed Selection ON TIMER Setting OFF TIMER Setting Louver Auto Swing Louver Direction Setting ECO Hi power TIMER 1.3.5.9H COMFORT SLEEP QUIET - 29 - FILE NO. SVM-05001 6-2. RAS-13UKP-E4 / RAS-13UA-E4, RAS-10UKP-E4 / RAS-10UA-E4, RAS-07UKP-E4 / RAS-07UA-E4 RAS-13UKPX4 / RAS-13UAX4, RAS-10UKPX4 / RAS-10UAX4, RAS-07UKPX4 / RAS-07UAX4 RAS-12UKPX4 / RAS-12UAX4 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 Infrared Rays Operation ( ) Operation Mode Selection AUTO, COOL, DRY, FAN ONLY Temperature Setting Fan Speed Selection ON TIMER Setting OFF TIMER Setting Louver Auto Swing Louver Direction Setting ECO Hi power TIMER 1.3.5.9H COMFORT SLEEP QUIET - 30 - FILE NO. SVM-05001 7. OPERATION DESCRIPTION 7-1. Outline of Air Conditioner Control 7-1-1. Louver control This is a fixed capacity type air conditioner, which uses (1) Vertical air flow louver Position of veritcal air flow louver is automatically AC motor for an indoor fan. The AC motor drive controlled according to the operation mode. circuit is mounted in the indoor unit.
And electrical Besides, position of vertical air flow louver can be parts which driving the compressor and the outdoor arbitrarily set by pressing [FIX] button. fan motor, are mounted in the outdoor unit. The louver position which is set by [FIX] button is The air conditioner is controlled by the controller stored in the microcontroller, and the louver is mounted in the indoor unit. The controller operates all automatically set at the stored position for the next components based on the commands transmitted from operation. the remote control and the feedback data of the sensor is as follow: (2) Swing If [SWING] button is pressed when the indoor unit · The temperature measurement at the air inlet of is in operation, the vertical air flow louver starts the indoor heat exchanger by the indoor swinging. When [SWING] button is pressed again, temperature sensor it stops swinging. · The temperature measurement at the indoor heat exchanger by the indoor heat exchanger 7-1-2. Indoor fan control (AC Fan motor) temperature sensor · Indoor fan motor operation control (1) The indoor fan is operated by the stepless speed · Louver motor control change AC motor. · LED display control (2) For air flow level, speed of the indoor fan motor is · Outdoor fan motor operation control controlled in five steps (LOW, LOW+, MED, MED+ · 4-WAYS-VALVE operation control and HIGH). If AUTO mode is selected, the fan (Heat pump model only) motor speed is automatically controlled by the · Compressor operation control difference between the preset temperature and · Receiving the information of the operation the room temperature.

status and judging the information or the indication of errors LOW+ = LOW+MED 2 MED+ = MED+HIGH 2 Table 7-1-1 FAN TAP Cooling OPERATION MODE Fan only Dry Heat rpm Air flow volume (m /h) 3 UH H H M M M L L L L L- LLLUL UL SL UL SL SL UH H M RAS-07UK Series 1350 650 1300 3 1300 1200 1050 1000 950 900 800 750 630 570 1250 610 490 460 430 400 900 400 900 340 310 800 750 340 310 800 750 700 280 700 280 700 280 700 280 850 800 370 340 850 800 370 340 650 250 650 250 650 250 650 250 750 700 310 280 750 700 310 280 RAS-07UKH Series rpm Air flow volume (m /h) rpm Air flow volume (m /h) 3 1200 1050 1000 570 490 460 630 1350 650 1300 RAS-10UK Series Model 1300 1250 1050 1000 950 630 1250 610 610 490 460 430 400 340 310 900 400 800 750 340 310 RAS-10UKH Series rpm Air flow volume (m /h) 3 1200 1100 1000 570 520 460 630 RAS-13UK Series rpm Air flow volume (m /h) 3 1350 650 1350 3 1300 1150 1100 1050 1000 950 900 630 550 520 490 460 430 400 RAS-13UKH Series rpm Air flow volume (m /h) 1300 1150 1100 1050 1020 950 900 630 550 520 490 470 430 400 650 - 31 - FILE NO. SVM-05001 7-2. Description of Operation Circuit (1) When turning on the breaker, the operation lamp blinks. This means that the power supply is on. (2) When pressing [ ] 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 [ ] 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. 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.) °C ON 0.5 ON OFF OFF OFF ON (Room temp.) - (Preset temp.
*) °C +3 +2.5 Fig. 7-2-2 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 +0.5 0 L- °C +3 M+ +2.*

*5 *1 +2 +1.5 +1 +0.5 0 -0.5 L*1 *1 Preset temp. (Preset temp.: 22 °C) NOTE : *1: The values marked with *1 are calculated and controlled by the difference in motor speed between M+ and L-. (2) The Hi POWER, ECO and COMFORT SLEEP operation cannot be set. Fig. 7-2-1 Setting of air flow [FAN:AUTO] 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] - 32 - OPERATION display Compressor 4-way valve Outdoor fan Preset temp. 0 FILE NO. SVM-05001 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. 7-2-4. Heating operation *Heat pump model only ([MODE] button on the remote control is set to the heating operation.) (1) The compressor, 4-way valve, outdoor fan and operation display on the remote control are controlled as shown in Fig. 7-2-6. °C °C +3 +2 +1 ON:6min. OFF:4min. ON:5min. OFF:5min. ON:5min.*

OFF:5min. Preset temp. 0 OFF ON (Room temp.) - (Preset temp.) OFF ON OFF ON OFF 0 OFF -0.5 ON ON OPERATION display Compressor 4-way valve Outdoor fan Fig. 7-2-4 (2) The microcontroller turns the compressor on and off at the regular intervals (4 to 6 minutes). While the compressor is turning off, the indoor fan motor operates in the SUPER LOW position. The pattern of operation depending on the relation between room temperature and preset temperatures is shown in Fig. 7-2-5.
Room temp. Fig. 7-2-6 (2) When [FAN] button is set to AUTO, the indoor fan motor operates as shown in Fig. 7-2-7. When [FAN] button is set to LOW, LOW+, MED, MED+ or HIGH, the motor operates with a constant air flow.
Preset temp. (Room temp.) - (Preset temp.) °C 0 -0.5 -1 -1.
*5 -2 L *1 *2 Preset temp.+1 Preset temp. M+ -5.0 -5.5 [FAN AUTO] Compressor Outdoor fan ON ON ON ON H OFF Indoor fan OFF L OFF L *SL SL L SL L *1, *2 : The values marked with *1 and *2 are calculated and controlled by the difference in motor speed between M+ and L. Fig. 7-2-7 Setting of air flow [FAN:AUTO] *Super Low Fig. 7-2-5 (3) [FAN] button on the remote control is set to AUTO only. (4) The Hi POWER, ECO, COMFORT SLEEP and QUIET operations cannot be set. - 33 - OPERATION display Preset temp.*

*Compressor 4-way valve Outdoor fan FILE NO. SVM-05001 (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. 13UKH Series °C *5 and *6: Fan speed AUTO *5 Table 7-2-1 *6 Starting period Stabilized period · From 12 to 25 minutes Up until 12 minutes · passed after starting passed after starting the unit and room the unit · From 12 to 25 minutes temperature is between preset passed after starting temperature and 3 °C the unit and room lower than preset temperature is 3 °C temperature lower than preset · 25 minutes or more · temperature passed after starting the unit · Room temperature · Room temperature Preset temperature < Preset temperature - 3.5 °C - 4 °C Indoor heat exchanger temperature Manual AUTO (One of 5 steps) 42 41 34 33 29 28 21 20 *4 L- H (Up to seting speed) *2 A+4 A+4 A- 8 A- 8 *6 *5 SL*3 SL*1 Stop Manual (L - H) 10UKH Series 07UKH Series °C Indoor heat exchanger temperature Manual AUTO (One of 5 steps) 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 24 °C and the indoor unit is controlled as shown in Fig. 7-2-9. 32 31 21 20 *4 L- H (Up to seting speed) SL*3 *2 A+4 A+4 A- 8 A-8 *6 *5 SL*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: SL means Super Low.*
**4: Calculated from difference in motor speed between SL and H. Fig. 7-2-8 Cold draft preventing control °C (Room temp.) - (Preset temp.) +4 Cooling operation The louver moves to the position same as Hi POWER operation.*
Cooling operation 0 Fan only operation -1 Heating operation UKH Series UK Series Fig. 7-2-9 - 34 - FILE NO. SVM-05001 7-3. Hi POWER Mode ([Hi POWER] button on the remote control is pressed.) When [Hi POWER] button is pressed while the indoor unit is in Auto, Cooling or Heating operation, Hi POWER mark is indicated on the display of the remote control and the unit operates as follows. (1) Automatic operation · The indoor unit operates in according to the current operation. (2) Cooling operation · The setting temperature drops 3°C. (The value of the setting temperature on the remote control does not change.) · If the room temperature is higher than the setting temperature by 3.5°C or more, the horizontal louver moves to the Hi POWER position automatically.

Then when the room temperature is 1°C less than the setting temperature the horizontal louver returns automatically. · FAN speed : [AUTO] If the room temperature is higher than the setting temperature by 3.5°C or more, the air conditioner operates at maximum airflow level. If the room temperature is higher than the setting temperature by less than 3.5°C, the air conditioner operates at normal airflow level. · FAN speed : One of 5 levels If the room temperature is higher than the setting temperature by 3.5°C or more, the air conditioner operates at higher consecutive airflow level. If the room temperature is higher than the setting temperature by less than 3.5°C, the air conditioner operates at normal airflow level. 7-4.
*High-Temperature Limit Control *Heat pump model only The microcontroller detects the indoor heat exchanger temperature to prevent pressure of a refrigerating cycle from increasing excessively. The compressor and outdoor fan motor are controlled as shown in Fig. 7-4-1. Compressor Outdoor fan OFF ON ON OFF OFF ON Heat exchanger temp. (°C) 60 53 52 Fig.*
7-4-1 7-5. Low-Temperature Limit Control The microcontroller detects the indoor heat exchanger temperature to prevent the indoor heat exchanger from freezing.

The compressor and outdoor fan motor are controlled as shown in Fig. 7-5-1 and 7-5-2. 13UKH Series 13UK Series 12UK Series Heat exchanger temperature Compressor Outdoor fan ON (°C) 6 2 Less than 2°C continues for 5 minutes OFF (3) Heating operation (UKH Series 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). (4) The Hi POWER mode can not be set in Dry or Fan only operation. Fig. 7-5-1 10UKH Series 10UK Series 07UKH Series 07UK Series Heat exchanger temperature Compressor Outdoor fan ON (°C) 7 5 Less than 5 °C continues for 5 minutes OFF Fig. 7-5-2 - 35 - FILE NO. SVM-05001 7-6. Defrost Operation *Heat pump model only <In case of C> (1) The heating operation is performed for at least 90 During the heating operation, the outdoor heat minutes. exchanger temperature goes down and sometimes it is frozen. (2) The defrost operating time is 10 minutes. In this case, the air conditioner stops the heating operation and starts the defrost operation to melt ice.*

7-6-3. Ending condition at defrost operation 7-6-1. Condition to start the defrost operation The defrost operation starts whichever below conditions are satisfied. (1) When the compressor current becomes 7.5A or more during defrost operation, the defrost operation stops and the heating operation restarts. (The current sensor detects the compressor current.) Indoor heat exchanger temp - Room temp (1) When the cumulative compressor operating time is (2) The defrost operation continues for at most longer than 40 or 90 minutes and difference 6 minutes or 10 minutes. between the indoor heat exchanger temperature and the room temperature is less than the specified value. (This value is decided by the DEFROST LAMP : microprocessor.) (Control example is shown in · During defrost operation, the PRE-DEF.
lamp is Fig. 7-6-1. In case of B or C, the defrost operation on and the indoor and outdoor fans are off. starts.) · The compressor start protection timer is inter(2) When the current limit control or the high looked with the PRE-DEF.
lamp. So the PRE-DEF. temperature limit control is performed for total of Lamp is off (the fans stop) for about 3 minutes 90 minutes. after the [ ] button is turned on. When the compressor is turned on, the PRE-DEF.
lamp comes on. After the heat ex-changer is preheated to about 24°C or higher, the PRE-DEF. Lamp goes off, and the indoor fan starts. D A B C Cumulative compressor operating time Fig. 7-6-1 (Indoor fan speed : M) 7-6-2. Defrost operation time control <In case of B> (1) The heating operation is performed for at least 40 minutes. (2) The maximum defrost operating time is 6 minutes. The defrost operating time for the 4th cycle is 10 minutes. (When the outdoor temperature is very low, however, the defrost operating time is 10 minutes.) minutes 40 minutes 40 minutes 40 minutes 40 Heating Heating Heating Heating Defrost Defrost Defrost Max 6 minutes 10 minutes 1 cycle Fig.

*7-6-2 Defrost - 36 - FILE NO. SVM-05001 7-7. Current Limit Control *Heat pump model only The microcontroller detects the input current so as to prevent it exceeds a specified value by means of controlling the outdoor fan control as described in (1) and (2). (1) Current limit control (Cooling operation) Control is performed as shown below by detecting the compressor operating current with a current sensor (C.T). Input current 13UKH Series / 10UKH Series / 07UKH Series 13.5A / 19.2A 12.5A / 17.8A I4 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 Input current 13UKH Series / 10UKH Series / 07UKH Series 13.5A / 19.2A 12.5A / 17.
8A 10A / 15.6A 9A / 15.0A I4 I3 I2 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 : 1. This function is available only for heat pump model (Cooling models have no a current sensor (C.
T.)). 2. For 07UKH Series and 10UKH Series, the value of currents shown on the diagram above are two times the actual operating value. This is because the lead wire operated two times through the C.T. - 37 - FILE NO. SVM-05001 7-8. Auto Restart Function The indoor unit is equipped with an automatic restarting function which allows the unit to restart operating with the set operating conditions in the event of power supply being accidentally shut down. The operation will resume without warning three minutes after power is restored.

This function is not set to work when shipped from the factory. Therefore it is necessary to set it to work. 7-8-1. How to set auto restart function To set the auto restart function, proceed as follows: The power supply to the unit must be on; the function will not set if the power is off. Push the [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.
¯0 Motions The green lamp is on. After approx. three seconds, The lamp changes from green to orange. 3S The unit beeps three times and continues to operate. [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. ¯ The unit stops operating. ¯0 Motions The green lamp is on. The green lamp is turned off.
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. - 38 - FILE NO. SVM-05001 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. ¯ 0 After approx. three seconds, The lamp changes from orange to green. 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 unit stops operating. The orange lamp is turned off. ¯ 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. 7-9. Filter Check Lamp When the elapsed time reaches 1000 hours, the filter check lamp indicates. After cleaning the filters, turn off the filter check lamp. 7-9-1.

How to turn off filter check lamp Push [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. 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. - 39 - FILE NO. SVM-05001 7-10. Self-Cleaning function Self-Cleaning function is designed to reduce humidity that causes mold to form inside the air conditioning unit. This advanced, efficient system reduces moisture in the coil. When air conditioner is turned off, the internal fan activates and dries the moisture in the coil for 20 minutes, then it turns off automatically.

Operation display FCU fan FCU louver Timer display Compressor CDU fan ON ON rpm is depend on presetting. OPEN ON or OFF depend on presetting of timer function. ON or OFF depend on presetting per room temperature. ON or OFF depend on presetting per room temperature. OFF ON rpm is SL speed. CLOSE ON OFF OFF OFF OFF CLOSE ON or OFF depend on presetting of timer function. OFF OFF 8 Cool mode or dry mode operation more than 10 mins. Self-Cleaning mode operate 20 mins. 8 Operation time Automatically turn-off. Turn off by remote controller or timer-off function.

· The Self-Cleaning function is set as default at ex-factory. · Self-Cleaning operation can stop manually by press [ ] button of the remote control two more time. 7-10-1. How to cancel Self-Cleaning function To cancel the Self-Cleaning function, proceed as follows: · 7-10-2. How to set Self-Cleaning function. · · · To set the Self-Cleaning function, proceed as follows. · Press [TEMPORARY] button one time or use remote control to turn on air conditioner. The OPERATION Press [TEMPORARY] button one time or use remote display will show in orange color (When AUTOcontrol to turn on air conditioner. The OPERATION RESET is ON) or green color (When AUTOdisplay will show in orange color (When AUTORESTART is OFF). RESTART is ON) or green color (When AUTO· Hold down the [TEMPORARY] button for more than RESTART is OFF).

20 seconds. (The air conditioner will stop suddenly Hold down the [TEMPORARY] button for more than when the [TEMPORARY] button is pressed but keep 20 seconds. (The air conditioner will stop suddenly holding it continue. Then will beep 3 times is the first when the [TEMPORARY] button is pressed but keep 3 seconds but it is not related to Self-Cleaning holding it continue. Then will beep 3 times in the first function) 3 seconds but it is not related to Self-Cleaning · After holding about 20 seconds, the air conditioner function) will beep 5 times and OPERATION display blinks After holding about 20 seconds, the air conditioner 5 times. will beep 5 times without any blinking of display. · The Self-Cleaning function had been set. The Self-Cleaning Operation had been cancelled. Remarks · Per setting of Self-Cleaning function above, AUTORESTART function had been cancelled. To set AUTO-RESTART again, please follow item 7-8-1.

Remarks · Per setting of Self-Cleaning function above, AUTORESTART function had been cancelled. To set AUTO-RESTART again, please follow item 7-8-1. - 40 FILE NO. SVM-05001 7-11. QUIET Mode Quiet mode is the system which, control the revolving speed of indoor fan to work constantly at lower than speed L. In addition, noise level of indoor unit is less than usual. When the [QUIET] button is pressed, the fan of the indoor unit will be restricted the revolving speed at speed L - until the [QUIET] button is pressed once again (cancel Quiet mode). Remarks : 1. Quiet mode is unable to work in dry mode. 2. Quiet mode is appropriate to work with less cooling load and less heating load condition. Because of the fan speed L- may cause not enough the cooling capacity or heating capacity. 7-12-1. Cooling mode · The fan speed of indoor unit operates automatically, it relates with the compressor's operation. Compressor's Operation ON OFF Fan Speed LSL 7-12.

COMFORT SLEEP mode The principles of comfort sleep mode are: · Quietness for more comfortable. · Save energy by changing room temperature automatically. · The air condition can shut down by itself automatically. · The preset temperature will increase 1°C after the Comfort sleep mode has operated for 1 hour and the temperature will increase another 1°C after the comfort sleep mode has operated for 2 hour. (The value of the preset temperature on the remote control does not change.

) · Press the [COMFORT SLEEP] button to choose the operating hours. Repeat pressing to select the hours. (1hr, 3hr, 5hr or 9hr) · If the [COMFORT SLEEP] button is pressed again means cancel comfort sleep mode. 7-12-2. Heating mode · The fan speed of indoor unit operates automatically, it relates with the compressor's operation. Compressor's Operation ON OFF Fan Speed LSL · The preset temperature will drop down 1°C after the Remarks: comfort sleep mode has operated for 1 hour and the 1. Comfort sleep mode will not operate in dry mode temperature will decrease another 1°C after the and fan only mode. comfort sleep mode has operated for 2 hour. (The 2. Comfort sleep mode is appropriate to work with less value of the preset temperature on the remote control.

cooling load and less heating load condition. dose not change.) Because of the fan speed L- may cause not enough · Press the [COMFORT SLEEP] button to choose the the cooling capacity or heating capacity. operating hours. Repeat pressing to select the hours. (1hr, 3hr, 5hr or 9 hr) · If the [COMFORT SLEEP] button is pressed again means cancel comfort sleep mode.

- 41 - FILE NO. SVM-05001 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 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. 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. - 42 - FILE NO.

SVM-05001 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. - 43 - FILE NO.

SVM-05001 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. 170 or m mm ore Hook For the rear left and left piping plate Wall 1 Installation 2 Wireless remote control Cover 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 Bio-enzyme & Gingko filter 6 Sasa-zeolite plus 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. 12,13 series A B 600 mm 100 mm 07,10 series 400 mm 45 mm Vinyl tape Apply after carrying out a drainage test. Saddle Right 600 mm or more Rear right Bm r mo mo re Rear left Left Bottom left Bottom right 100 mm or mo re A mm or mo re Extension drain hose (Not available, provided by installer) 60 0m m or m ore Insulate the refrigerant pipes separately with insulation, not together. 6 mm thick heat resisting polyethylene foam - 44 - FILE NO. SVM-05001 8-3.

Installation 8-3-1. Optional installation parts Part Code A Parts name Q'ty Refrigerant piping Liquid side : Æ 6.35 mm One Gas side : Æ 9.52 mm (07,10 series) each Gas side : Æ12.70 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-10,12,13 Series 115 mm 32.

5 mm 125 mm RAS-07 Series 500 mm 97 mm Air inlet 30 Air inlet 102 mm Æ 310 mm 73 mm Air outlet 600 mm 90 mm Drain outlet 275 mm 60 mm 7 mm 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 Æ8 mm or Æ10 mm anchor bolts and nuts. · If it is necessary to drain the defrost water, attach drain nipple 9 and cap water proof 10 to the bottom plate of the outdoor unit before installing it. 45 FILE NO.

SVM-05001 8-3-2.

Accessory and installation parts Part No. Part name (Q'ty) Part No. Part name (Q'ty) Part No. Part name (Q'ty) 1 Installation plate x 1 4 Remote control holder x 1 7 Mounting screw 4 x 25 s x 6 2 Wireless remote control x 1 5 Sasa-zeolite plus filter x 1 8 Pan head wood screw 3.1 x 16 s x 2 3 Battery x 2 6 Bioenzyme & Gingko filter x 1 9 Drain nipple x 1 (For Heat pump model only) Others Name Owner's manual Installation manual ! Cap water proof* x 2 (For Heat pump model only) The part marked with asterisk (*) is packaged with the outdoor unit. - 46 - FILE NO. SVM-05001 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 Installation plate 1 Fig. 8-4-1 Indoor unit 7 Mounting screw Fig. 8-4-3 - 47 - FILE NO. SVM-05001 <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.
Model RAS-13UKHP-E4 RAS-13UKP-E4 RAS-13UKPX4 RAS-12UKPX4 RAS-10UKHP-E4 RAS-07UKHP-E4 RAS-10UKP-E4 RAS-07UKP-E4 RAS-10UKPX4 RAS-07UKPX4 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 N·m (0.12 kgf·m) 7. Secure the connecting cable with the cord clamp. 8. @@@@@@For RAS-13/10/07UKHP Terminal cover Connecting cable abo 10 mm 50 mm Stripping length of the connecting cable Fig.

*8-4-8 Terminal block Cord clamp Screw 4 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. 4 12 3 12 3 ut 1 5 cm Earth line Screw Screw Connecting cable Fig. 8-4-5 80 mm 10 mm 10 mm 70 mm Earth line Fig. 8-4-9 10 mm 50 mm Stripping length of the connecting cable Fig. 8-4-6 - 49 - FILE NO. SVM-05001 8-4-4. Piping and drain hose installation <Piping and drain hose forming> * Since dewing results in a machine trouble, make sure to insulate both the connecting pipes. (Use polyethylene foam as insulating material.) Rear right 4 mm How to fix the drains cap 1) Insert hexagonal wrench (4 mm) in a center head.*
Left Bottom right Right Die-cutting Front panel slit Bottom left Changing drain hose Rear left Piping preparation Fig. 8-4-12 2) Firmly insert drains cap. No gap Do not apply lubricating oil (refrigerant machine oil) when inserting the drain cap. Application causes deterioration and drain leakage of the plug. Insert a hexagon wrench (4 mm) 1.
Die-cutting Front panel slit For leftward connection, cut out slit on the left side of the front panel. (A knife will produce splinters, so use nippers.) 2. @@@@@@@@@@@@8-4-11 Slit Fig. 8-4-15 - 50 - FILE NO.
SVM-05001 <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. @@@@@@@@@@@@@@@@@@@@- 51 - FILE NO. SVM-05001 8-4-6. Drainage 1. Run the drain hose sloped downwards.

@@Outdoor Unit 8-5-1. @@· 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.