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You can read the recommendations in the user guide, the technical guide or the installation guide for TOSHIBA RAS-M10UKV-E3. You'll find the answers to all your questions on the TOSHIBA RAS-M10UKV-E3 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual TOSHIBA RAS-M10UKV-E3
User guide TOSHIBA RAS-M10UKV-E3
Operating instructions TOSHIBA RAS-M10UKV-E3
Instructions for use TOSHIBA RAS-M10UKV-E3
Instruction manual TOSHIBA RAS-M10UKV-E3

TOSHIBA FILE NO.SVM-04015

SERVICE MANUAL

AIR-CONDITIONER
SPLIT TYPE

*RAS-M10UKV-E3, RAS-M13UKV-E3, RAS-M16UKV-E3
RAS-4M27YAV-E*

*RAS-M10UKCV-E3, RAS-M13UKCV-E3, RAS-M16UKCV-E3
RAS-4M27YACV-E*

*RAS-M10UKV-E3, RAS-M13UKV-E3, RAS-M16UKV-E3
RAS-3M26YAV-E*

HFC
R410A

May 2004



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5 1.4 9.2 1.4 8.9 9.
0 9.0 0.8 11.0 0.8 10.

8 220/230/240V, 1Ph, 50/60Hz RAS-M10UKV-E3 RAS-M13UKV-E3 RAS-M16UKV-E3 0.15 0.15 0.15 30 30 30 91/87/83 91/87/83 91/87/83 Cooling Heating Cooling Heating 11.60/11.09/10.63 10.44/9.98/9.57 10.

44/9.98/9.57 11.83/11.31/10.84 2500 2250 2250 2550 98 98 98 98 11.60/11.09/10.63 11.83/11.31/10.84 3.20/4.00 3.33/3.

53 RAS-M10UKV-E3 RAS-M13UKV-E3 RAS-M16UKV-E3 36/39 39/40 42/42 33/35 35/35 39/39 28/29 28/29 33/33 RAS-4M27YAV-E RAS-3M26YAV-E 48/48 48/48 RAS-M10UKV-E3 RAS-M13UKV-E3 RAS-M16UKV-E3 275 275 275 790 790 790 208 208 208 10 10 10 19 19 19 470/520 520/560 600/600 RAS-4M27YAV-E RAS-3M26YAV-E 795 795 900 900 320 320 65 64 2000 Twin rotary type with DC-inverter variable speed control DA220A2F-20L 60 High : 3000, Medium : 2800 Flare connection RAS-M10UKV-E3 RAS-M13UKV-E3 RAS-M16UKV-E3 Ø6.35 Ø6.35 Ø6.35 Ø9.52 Ø9.52 52 Ø12.7 RAS-4M27YAV-E RAS-3M26YAV-E Ø6.35/Ø12.7 Ø6.35/Ø12.7 Ø6.35/Ø9.52 Ø6.35/Ø9.52 Ø6.

35/Ø9.52 Ø6.35/Ø9.52 Ø6.35/Ø9.52 -- 25 25 70 50 70 50 15 15 R410A 2.4 3 wires : includes earth 4 wires : includes earth 21 32/0 28 10 43/10 21 1 1 2 1 2 (Ø3.1 x 16L) 1 1 2 6 (Ø4 x 25L) 1 1 1 Total C.O.P.

(Cooling/Heating) Operating Indoor Unit model (Cooling/Heating) High noise Medium Low Unit model Outdoor (Cooling/Heating) Full indoor units operating Indoor unit Unit model Dimension Height Width Depth Net weight Fan motor output Air flow rate (Cooling/Heating) Outdoor unit Unit model Dimension Height Width Depth Net weight Compressor Motor output Type Model Fan motor output Air flow rate Piping Type connection Indoor unit Unit model Liquid side Gas side Outdoor unit Unit model A unit liquid side/gas side B unit liquid side/gas side C unit liquid side/gas side D unit liquid side/gas side Maximum length (per unit) Maximum length (total) Maximum chargeless length Maximum height difference Refrigerant Name of refrigerant Weight Wiring connection Power supply Interconnection Usable temperature range Indoor Outdoor Accessory Indoor unit Installation plate Wireless remote controller Label Remote controller holder Pan head wood screw Purifying filter Deodorizing filter Battery Mounting screw Installation manual Installation manual Outdoor unit Owner's manual (m) (m) (m) (m) (kg) (°C) (°C) · For performance when each indoor unit is combined with other unit, refer to the separate table. · The specifications may be subject to change without notice for purpose of improvement. 3 RAS-M10UKCV-E3, RAS-M13UKCV-E3, RAS-M16UKCV-E3/RAS-4M27YACV-E Unit model Indoor Outdoor (kW) (kW) Unit model Running current Power consumption Power factor Running current Power consumption Power factor Starting current Unit model High Medium Low Unit model 4 indoor units operating Height Width Depth RAS-M10UKCV-E3, RAS-M13UKCV-E3, RAS-M16UKCV-E3 RAS-4M27YACV-E 8.0 1.4 9.

2 220/230/240V, 1Ph, 50/60Hz RAS-M10UKCV-E3 RAS-M13UKCV-E3 RAS-M16UKCV-E3 0.15 0.15 0.15 30 30 30 91/87/83 91/87/83 91/87/83 11.60/11.09/10.63 2500 98 11.60/11.09/10.63 3.20 RAS-M10UKCV-E3 RAS-M13UKCV-E3 RAS-M16UKCV-E3 36 39 42 33 35 39 28 28 33 RAS-4M27YACV-E 48 RAS-M10UKCV-E3 RAS-M13UKCV-E3 RAS-M16UKCV-E3 275 275 275 790 790 790 208 208 208 10 10 10 19 19 19 470 520 600 RAS-4M27YACV-E 795 900 320 63 2000 Twin rotary type with DC-inverter variable speed control DA220A2F-20L 60 High : 3000, Medium : 2800 Flare connection RAS-M10UKCV-E3 RAS-M13UKCV-E3 RAS-M16UKCV-E3 Ø6.35 Ø6.35 Ø6.35 Ø9.52 Ø9.

52 Ø12.7 RAS-4M27YACV-E Ø6.35/Ø12.7 Ø6.35/Ø9.52 Ø6.35/Ø9.52 Ø6.35/Ø9.52 25 70 70 15 R410A 2.

2 3 wires : includes earth 4 wires : includes earth 21 32 10 43 1 1 2 1 2 (Ø3.1 x 16L) 1 1 2 6 (Ø4 x 25L) 1 1 1 Cooling capacity Cooling capacity range Power supply Electric Indoor characteristics Total (A) (W) (%) (A) (W) (%) (A) C.O.P. Operating noise Indoor dB (A) dB (A) B (A) dB (A) (mm) (mm) (mm) (kg) (W) (m³/h) Outdoor Indoor unit Unit model Dimension Net weight Fan motor output Air flow rate Outdoor unit Unit model Dimension Height (mm)

Width (mm) Depth (mm) Net weight (kg) Compressor Motor output (W) Type Model Fan motor output (W) Air flow rate (m³/h) Piping Type connection Indoor unit Unit model Liquid side Gas side Outdoor unit Unit model A unit liquid side/gas side B unit liquid side/gas side C unit liquid side/gas side D unit liquid side/gas side Maximum length (per unit) (m) Maximum length (total) (m) Maximum chargeless length (m) Maximum height difference (m) Refrigerant Name of refrigerant Weight (kg) Wiring connection Power supply Interconnection Usable temperature range Indoor (°C) Outdoor (°C) Accessory Indoor unit Installation plate Wireless remote controller Label Remote controller holder Pan head wood screw Purifying filter Deodorizing filter Battery Mounting screw Installation manual Installation manual Outdoor unit Owner's manual · For performance when each indoor unit is combined with other unit, refer to the separate table.

· The specifications may be subject to change without notice for purpose of improvement. 4 1-2. Specifications of Performance When Each Indoor Unit is Combined with other Unit Outdoor Unit : RAS-4M27YAV-E <Cooling/220V> Power supply (V) 220 Operating status 1 unit Indoor unit A 10 13 16 2 units 10 13 16 13 16 16 3 units 10 13 16 13 16 13 16 16 16 16 4 units 10 13 16 13 16 13 16 13 16 B 10 10 10 13 13 16 10 10 10 13 13 13 16 13 16 16 10 10 10 13 13 13 13 16 C 10 10 10 10 10 13 10 13 13 16 10 10 10 10 13 13 13 10 D 10 10 10 10 10 10 10 13 10 A 2.7 3.7 4. 5 2.70 3.41 3.94 3.15 3.73 3.60 2.53 3.13 3.50 2.

82 3.22 2.



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9 to 8.3) 7.7 (4.0 to 8.5) 7.7 (4.0 to 8.5) 7.8 (4.1 to 8.

6) 7.8 (4.1 to 8.6) 7.9 (4.1 to 8.7) 7.9 (4.1 to 8.7) 7.
9 (4.2 to 8.9) 8.0 (4.3 to 9.
0) 7.9 (4.0 to 8.7) 7.9 (4.
1 to 8.8) 8.0 (4.1 to 9.0) 8.0 (4.1 to 9.0) 8.0 (4.2 to 9.

1) 8.0 (4.2 to 9.1) 8.0 (4.2 to 9.2) 8.0 (4.2 to 9.2) 8.

0 (4.2 to 9.2) Power consumption (W) 750 (640 to 950) 1200 (640 to 1520) 1650 (640 to 2000) 1530 (640 to 2040) 1810 (660 to 2220) 2040 (670 to 2400)
2040 (670 to 2400) 2320 (690 to 2570) 2550 (700 to 2750) 2400 (950 to 2720) 2410 (960 to 2740) 2410 (960 to 2790) 2410 (960 to 2790) 2430 (970 to 2810)
2430 (970 to 2810) 2440 (970 to 2830) 2440 (970 to 2830) 2440 (970 to 2880) 2450 (980 to 2900) 2450 (930 to 2800) 2450 (940 to 2820) 2500 (940 to 2860)

2500 (940 to 2860) 2500 (950 to 2880) 2500 (950 to 2880) 2500; The above specification values are those under the conditions that the indoor
DB/WB=27/19°C and the outdoor DB/ WB=35°C. · Indoor unit 10 : RAS-M10UKV-E3, 13 : RAS-M13UKV-E3, 16 : RAS-M16UKV-E3 7 Outdoor Unit :
RAS-4M27YAV-E <Heating/220V> Power supply (V) 220 Operating status 1 unit Indoor unit A 10 13 16 2 units 10 13 16 13 16 16 3 units 10 13 16 13 16 13
16 16 16 4 units 10 13 16 13 16 13 16 13 16 B 10 10 10 13 13 16 10 10 10 13 13 13 16 13 16 16 10 10 10 13 13 13 13 13 16 C 10 10 10 10 10 13
10 13 13 16 10 10 10 10 13 13 13 10 D 10 10 10 10 10 10 13 10 A 4.0 5.

0 5.5 3.60 4.22 4.57 3.

95 4.35 4.30 2.87 3.35 3.54 3.11 3.34 2.93 3.26 3.

16 3.06 3.00 2.23 2.62 2.83 2.50 2.68 2.37 2.54 2.

25 2.61 Unit capacity (kW) B 3.60 3.38 3.33 3.

95 3.95 4.30 2.87 2.68 2.

58 3.11 3.03 2.93 3.26 2.87 3.06 3.00 2.23 2.09 2.

06 2.50 2.43 2.37 2.31 2.25 2.61 C 2.87 2.68 2.58 2.

49 2.43 2.93 2.37 2.87 2.

78 3.00 2.23 2.09 2.06 2.

00 1.95 2.37 2.31 2.25 1.89 D 2.23 2.09 2.06 2.00 1.

95 1.89 1.85 2.25 1.89 Heating capacity (kW) 4.0 (0.8 to 5.2) 5.0 (0.8 to 6.

5) 5.5 (0.8 to 6.9) 7.2 (1.

5 to 10.0) 7.6 (1.5 to 10.1) 7.

9 (1.5 to 10.1) 7.9 (1.5 to 10.1) 8.3 (1.5 to 10.2) 8.6 (1.

5 to 10.2) 8.6 (2.0 to 10.4) 8.7 (2.0 to 10.5) 8.7 (2.0 to 10.

5) 8.7 (2.0 to 10.5) 8.8 (2.

0 to 10.6) 8.8 (2.0 to 10.6) 8.

9 (2.0 to 10.7) 8.9 (2.0 to 10.7) 8.9 (2.0 to 10.7) 9.0 (2.

0 to 10.8) 8.9 (2.2 to 10.8) 8.9 (2.2 to 10.9) 9.0 (2.2 to 10.

9) 9.0 (2.2 to 10.9) 9.0 (2.

2 to 11.0) 9.0 (2.2 to 11.0) 9.

0 (2.2 to 11.0) 9.0 (2.2 to 11.0) 9.0 (2.2 to 11.0) Power consumption (W) 1450 (300 to 1980) 2050 (310 to 2750) 2400 (310 to 3000) 2100 (320 to 3200) 2320
(320 to 3210) 2480 (320 to 3230) 2480 (320 to 3230) 2700 (320 to 3240) 2860 (320 to 3250) 2300 (380 to 2750) 2350 (380 to 2760) 2350 (380 to 2760) 2350
(380 to 2760) 2400 (380 to 2780) 2400 (380 to 2780) 2450 (380 to 2790) 2450 (380 to 2790) 2450 (380 to 2790) 2500 (380 to 2800) 2100 (450 to 2810) 2100
(460 to 2830) 2250 (460 to 2830) 2250 (470 to 2830) 2250 (480 to 2850) 2250 (480 to 2850) 2250 (490 to 2850) 2250 (490 to 2850) 2250 (500 to 2850)

Operating current (A) 6.73 (1.

87 to 9.18) 9.51 (1.93 to 12.76) 11.13 (1.93 to 13.91) 9.74 (1.94 to 14.

84) 10.76 (1.94 to 14.89) 11.50 (1.

94 to 14.98) 11.50 (1.94 to 14.98) 12.

52 (1.94 to 15.03) 13.27 (1.94 to 15.07) 10.67 (2.16 to 12.76) 10.90 (2.

16 to 12.80) 10.90 (2.16 to 12.80) 10.90 (2.16 to 12.80) 11.13 (2.16 to 12.

89) 11.13 (2.16 to 12.89) 11.36 (2.

16 to 12.



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95 4.30 2.
87 2.68 2.61 3.14 3.03 2.
93 3.26 2.87 3.09 C 2.87 2.
68 2.61 2.51 2.43 2.93 2.37 2.87 2.81 Heating capacity (kW) 4.0 (0.8 to 5.

2) 5.0 (0.8 to 6.5) 5.5 (0.8 to 6.9) 7.2 (1.5 to 10.0) 7.
6 (1.5 to 10.1) 7.9 (1.5 to 10.
1) 7.9 (1.5 to 10.1) 8.3 (1.
5 to 10.2) 8.6 (1.5 to 10.2) 8.6 (2.0 to 10.4) 8.7 (2.0 to 10.

5) 8.8 (2.0 to 10.6) 8.8 (2.0 to 10.6) 8.8 (2.0 to 10.6) 8.
8 (2.0 to 10.6) 8.9 (2.0 to 10.
7) 8.9 (2.0 to 10.7) 9.0 (2.

0 to 10.8) Power consumption (W) 1500 (300 to 1980) 2050 (310 to 2750) 2400 (310 to 3000) 2050 (320 to 3200) 2240 (320 to 3210) 2380 (320 to 3230)
2380 (320 to 3230) 2560 (320 to 3240) 2700 (320 to 3250) 2300 (380 to 2750) 2360 (380 to 2760) 2430 (380 to 2780) 2430 (380 to 2780) 2430 (380 to 2780)
2430 (380 to 2780) 2490 (380 to 2790) 2490 (380 to 2790) 2550 (380 to 2800) Operating current (A) 6.96 (1.87 to 9.18) 9.51 (1.93 to 12.76) 11.13 (1.93 to
13.

91) 9.51 (1.94 to 14.84) 10.39 (1.94 to 14.89) 11.04 (1.94 to 14.98) 11.
04 (1.94 to 14.98) 11.87 (1.94 to 15.
03) 12.52 (1.94 to 15.07) 10.67 (2.
16 to 12.76) 10.95 (2.16 to 12.80) 11.27 (2.16 to 12.89) 11.27 (2.16 to 12.

89) 11.27 (2.16 to 12.89) 11.27 (2.16 to 12.89) 11.55 (2.16 to 12.94) 11.
55 (2.16 to 12.94) 11.83 (2.16 to 12.

99) Outdoor noise (dB) 48 · The above specification values are those under the conditions that the indoor
DB/WB=27/19°C and the outdoor DB/ WB=35°C. · Indoor unit 10 : RAS-M10UKV-E3, 13 : RAS-M13UKV-E3, 16 : RAS-M16UKV-E3 17 Outdoor Unit :
RAS-3M26YAV-E <Heating/230V> Power supply (V) 230 Operating status 1 unit Indoor unit A 10 13 16 2 units 10 13 16 13 16 16 3 units 10 13 16 13 16 13
16 16 16 B 10 10 10 13 13 16 10 10 10 13 13 13 16 13 16 C 10 10 10 10 13 10 13 13 Unit capacity (kW) A 4.0 5.0 5.5 3.
60 4.22 4.57 3.95 4.35 4.30 2.87 3.35 3.59 3.14 3.

34 2.93 3.26 3.16 3.09 B 3.60 3.38 3.33 3.95 3.95 4.
30 2.87 2.68 2.61 3.14 3.
03 2.93 3.26 2.87 3.09 C 2.

87 2.68 2.61 2.51 2.43 2.93 2.37 2.87 2.81 Heating capacity (kW) 4.0 (0.

8 to 5.2) 5.0 (0.8 to 6.5) 5.5 (0.8 to 6.9) 7.2 (1.5 to 10.
0) 7.6 (1.5 to 10.1) 7.9 (1.
5 to 10.1) 7.9 (1.5 to 10.1) 8.
3 (1.5 to 10.2) 8.6 (1.5 to 10.2) 8.6 (2.0 to 10.4) 8.7 (2.

0 to 10.5) 8.8 (2.0 to 10.6) 8.8 (2.0 to 10.6) 8.8 (2.0 to 10.
6) 8.8 (2.0 to 10.6) 8.9 (2.
0 to 10.7) 8.9 (2.0 to 10.7) 9.

0 (2.0 to 10.8) Power consumption (W) 1500 (300 to 1980) 2050 (310 to 2750) 2400 (310 to 3000) 2050 (320 to 3200) 2240 (320 to 3210) 2380 (320 to 3230)
2380 (320 to 3230) 2560 (320 to 3240) 2700 (320 to 3250) 2300 (380 to 2750) 2360 (380 to 2760) 2430 (380 to 2780) 2430 (380 to 2780) 2430 (380 to 2780)
2430 (380 to 2780) 2490 (380 to 2790) 2490 (380 to 2790) 2550 (380 to 2800) Operating current (A) 6.65 (1.79 to 8.78) 9.09 (1.85 to 12.20) 10.65 (1.

85 to 13.31) 9.09 (1.86 to 14.20) 9.94 (1.86 to 14.24) 10.56 (1.86 to 14.
33) 10.56 (1.86 to 14.33) 11.36 (1.
86 to 14.37) 11.98 (1.86 to 14.42) 10.
20 (2.07 to 12.20) 10.47 (2.07 to 12.24) 10.78 (2.07 to 12.33) 10.78 (2.

07 to 12.33) 10.78 (2.07 to 12.33) 10.78 (2.07 to 12.33) 11.05 (2.07 to 12.
38) 11.05 (2.07 to 12.38) 11.31 (2.

07 to 12.42) Outdoor noise (dB) 48 · The above specification values are those under the conditions that
the indoor DB/WB=27/19°C and the outdoor DB/ WB=35°C. · Indoor unit 10 : RAS-M10UKV-E3, 13 : RAS-M13UKV-E3, 16 : RAS-M16UKV-E3 18
Outdoor Unit : RAS-3M26YAV-E <Heating/240V> Power supply (V) 240 Operating status 1 unit Indoor unit A 10 13 16 2 units 10 13 16 13 16 16 3 units 10
13 16 13 16 13 16 16 16 B 10 10 10 13 13 16 10 10 10 13 13 13 16 13 16 C 10 10 10 10 13 10 13 13 Unit capacity (kW) A 4.0 5.0 5.
5 3.60 4.22 4.57 3.95 4.35 4.30 2.87 3.35 3.59 3.

14 3.34 2.93 3.26 3.16 3.09 B 3.60 3.38 3.33 3.95 3.
95 4.30 2.87 2.68 2.61 3.
14 3.03 2.93 3.26 2.87 3.

09 C 2.87 2.68 2.61 2.51 2.43 2.93 2.37 2.87 2.81 Heating capacity (kW) 4.

0 (0.8 to 5.2) 5.0 (0.8 to 6.5) 5.5 (0.8 to 6.9) 7.2 (1.

Electrical Data Outdoor Unit : RAS-4M27YAV-E <Cooling> System Combination of indoor unit operation Hz 50 or 60 13 16 16 16 16 4 units 10 13
16 13 16 13 16 13 16 13 16 16 10 10 10 13 13 13 13 13 16 13 10 13 16 10 10 10 10 10 13 13 13 10 10 10 10 10 10 13 10 2301 198 264
13.24 13.30 13.30 13.30 13.35 13.

31 13.31 13.59 13.59 13.59 13.59 13.59 13.59 13.59 13.24 13.
30 13.30 13.30 13.35 13.31 13.
31 13.59 13.59 13.59 13.59 13.
59 13.59 13.59 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 9.83 9.88 9.88 9.88 9.92 9.77 9.77 9.

99 9.99 9.99 9.99 9.99 9.99 9.99 9.83 9.88 9.88 9.
88 9.92 9.77 9.77 9.99 9.
99 9.99 9.99 9.99 9.99 9.
99 0.15 x 3 = 0.45 0.15 x 3 = 0.45 0.15 x 3 = 0.45 0.15 x 3 = 0.45 0.15 x 3 = 0.
45 0.15 x 4 = 0.60 0.15 x 4 = 0.60 0.15 x 4 = 0.60 0.15 x 4 = 0.60 0.15 x 4 = 0.60 0.15 x 4 = 0.
60 0.15 x 4 = 0.60 0.15 x 4 = 0.60 0.
15 x 4 = 0.60 0.15 x 4 = 0.60 0.5 0.
5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.

5 0.5 0.5 VoltsPh. Voltage range Min. Max. Power supply MCA 4.48 6.70 9.18 8.29 9.
84 11.11 11.11 12.66 13.94 13.
08 13.13 13.13 13.13 13.24 ICF 4.
48 6.70 9.18 8.29 9.84 11.11 11.11 12.66 13.94 13.08 13.

13 13.13 13.13 13.24 MOCP (Amps) 20 20 20 20 20 20 20 20 20 20 20 20 20 20 Compressor MSC RLA Fan motor FLA Indoor Outdoor 1 unit 10 13 16 10
10 10 13 13 16 10 10 10 13 13 10 10 10 10 3.06 4.84 6.82 5.99 7.23 8.25 8.
25 9.49 10.51 9.70 9.74 9.
74 9.74 9.83 3.06 4.84 6.
82 5.99 7.23 8.25 8.25 9.49 10.51 9.70 9.74 9.74 9.

74 9.83 0.15 x 1 = 0.15 0.15 x 1 = 0.15 0.15 x 1 = 0.15 0.15 x 2 = 0.30 0.
15 x 2 = 0.30 0.15 x 2 = 0.30 0.15 x 2 = 0.
30 0.15 x 2 = 0.30 0.15 x 2 = 0.30 0.
15 x 3 = 0.45 0.15 x 3 = 0.45 0.15 x 3 = 0.45 0.15 x 3 = 0.45 0.15 x 3 = 0.45 0.
5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.

5 0.5 0.5 0.5 2 units 10 13 16 13 16 16 3 units 10 13 16 13 16 NOTE : Model of Indoor unit 10 : RAS-M10UKV-E3, 13 : RAS-M13UKV-E3, 16 : RAS-
M16UKV-E3 MCA : Minimum Circuit Amps. ICF : Maximum Instantaneous Current Flow (Equivalent to MCA in case of inverter air conditioner) MOCP :
Maximum Overcurrent Protection (Fuse only) MSC : Maximum Starting Current Indoor temp.
(°C) FLA : Full Load Amps. Outdoor temp. (°C) RLA : Rated Load Amps. RLA under conditions on the right. DB 27 35 WB 19 -- 21 Outdoor Unit :
RAS-4M27YAV-E <Heating> System Combination of indoor unit operation Hz 50 or 60 13 16 16 16 16 4 units 10 13 16 13 16 13 16 13 16 13 16 13
16 16 10 10 10 13 13 13 13 13 16 13 10 13 13 16 10 10 10 10 10 13 13 13 10 10 10 10 10 10 13 10 2301 198 264 13.
08 13.35 13.35 13.35 13.63 11.38 11.38 12.20 12.20 12.20 12.

20 12.20 12.20 12.20 13.08 13.35 13.35 13.35 13.63 11.38 11.
38 12.20 12.20 12.20 12.20 12.
20 12.20 12.20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 9.70 9.92 9.
92 9.92 10.14 8.22 8.22 8.88 8.88 8.88 8.88 8.88 8.

88 8.88 9.70 9.92 9.92 9.92 10.14 8.22 8.22 8.88 8.
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51 12.80 12.80 12.80 13.08 ICF 7.
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44 10.00 8.52 9.49 10.20 10.20 11.18 11.89 9.25 9.48 9.
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(°C) FLA : Full Load Amps. Outdoor temp. (°C) RLA : Rated Load Amps. RLA under conditions on the right. DB 20 7 WB -- 6 22 Outdoor Unit : RAS-4M27YACV-E <Cooling> System Combination of indoor unit operation Hz 50 or 60 13 16 16 16 16 4 units 10 13 16 13 16 13 16 13 16 13 16 13 16 10 10 10 13 13 13 10 10 10 10 10 10 13 13 13 10 10 10 10 10 10 13 10 2301 198 264 13.

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25 9.49 10.51 9.70 9.74 9.74 9.74 9.83 3.06 4.84 6.
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Voltage range Min. Max. Power supply MCA 4.48 6.70 9.
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66 13.94 50 or 60 3 units 10 13 16 13 16 13 16 16 10 10 10 13 13 13 16 13 16 10 10 10 10 10 13 10 13 13 2301 198 264 12.



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(°C) FLA : Full Load Amps. Outdoor temp. (°C) RLA : Rated Load Amps. RLA under conditions on the right. DB 27 35 WB 19 -- 24 Outdoor Unit :

RAS-3M26YAV-E <Heating> System Combination of indoor unit operation Hz VoltsPh. Voltage range Min. Max. Power supply MCA 8.15 11.20 13.

15 11.16 12.23 13.00 13.00 14.00 14.78 50 or 60 3 units 10 13 16 13 16 13 16 16 10 10 10 13 13 13 16 13 16 10 10 10 10 10 13 10 13 13 2301 198 264

12.51 12.85 13.24 13.

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90 12.51 12.85 13.24 13.24 13.

24 13.24 13.58 13.58 13.90 20 20 20 20 20 20 20 20 20 9.25 9.52 9.83 9.83 9.83 9.

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6.00 8.

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REFRIGERANT R410A This air conditioner adopts the new refrigerant HFC (R410A) which does not damage the ozone layer. The working pressure of the new refrigerant R410A is 1.6 times higher than conventional refrigerant (R22). The refrigerating oil is also changed in accordance with change of refrigerant, so be careful that water, dust, and existing refrigerant or refrigerating oil are not entered in the refrigerant cycle of the air conditioner using the new refrigerant during installation work or servicing time. The next section describes the precautions for air conditioner using the new refrigerant.

Conforming to contents of the next section together with the general cautions included in this manual, perform the correct and safe work. (5) After completion of installation work, check to make sure that there is no refrigeration gas leakage. If the refrigerant gas leaks into the room, coming into contact with fire in the fan-driven heater, space heater, etc., a poisonous gas may occur. (6) When an air conditioning system charged with a large volume of refrigerant is installed in a small room, it is necessary to exercise care so that, even when refrigerant leaks, its concentration does not exceed the marginal level.

If the refrigerant gas leakage occurs and its concentration exceeds the marginal level, an oxygen starvation accident may result. (7) Be sure to carry out installation or removal according to the installation manual. Improper installation may cause refrigeration trouble, water leakage, electric shock, fire, etc. (8)

Unauthorized modifications to the air conditioner may be dangerous. If a breakdown occurs please call a qualified air conditioner technician or electrician.

Improper repair's may result in water leakage, electric shock and fire, etc. 2-1. Safety During Installation/Service As R410A's pressure is about 1.6 times higher than that of R22, improper installation/servicing may cause a serious trouble. By using tools and materials exclusive for R410A, it is necessary to carry out installation/servicing safely while taking the following precautions into consideration.

(1) Never use refrigerant other than R410A in an air conditioner which is designed to operate with R410A. If other refrigerant than R410A is mixed, pressure in the refrigeration cycle becomes abnormally high, and it may cause personal injury, etc. by a rupture. (2) Confirm the used refrigerant name, and use tools and materials exclusive for the refrigerant R410A. The refrigerant name R410A is indicated on the visible place of the outdoor unit of the air conditioner using R410A as refrigerant. To prevent mischarging, the diameter of the service port differs from that of R22. (3) If a refrigeration gas leakage occurs during installation/servicing, be sure to ventilate fully. If the refrigerant gas comes into contact with fire, a poisonous gas may occur. (4) When installing or removing an air conditioner, do not allow air or moisture to remain in the refrigeration cycle. Otherwise, pressure in the refrigeration cycle may become abnormally high so that a rupture or personal injury may be caused.

2-2. Refrigerant Piping Installation 2-2-1. Piping Materials and Joints Used For the refrigerant piping installation, copper pipes and joints are mainly used. Copper pipes and joints suitable for the refrigerant must be chosen and installed. Furthermore, it is necessary to use clean copper pipes and joints whose interior surfaces are less affected by contaminants.

(1) Copper Pipes It is necessary to use seamless copper pipes which are made of either copper or copper alloy and it is desirable that the amount of residual oil is less than 40 mg/10 m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants. As an air conditioner using R410A incurs pressure higher than when using R22, it is necessary to choose adequate materials. Thicknesses of copper pipes used with R410A are as shown in Table 2-2-1.



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Never use copper pipes thinner than 0.8 mm even when it is available on the market. 26 Table 2-2-1 Thicknesses of annealed copper pipes Thickness (mm)
Nominal diameter 1/4 3/8 1/2 Outer diameter (mm) 6.35 9.52 12.70 R410A 0.80 0.80 0.80 R22 0.80 0.

80 0.80 (2) Joints For copper pipes, flare joints or socket joints are used. Prior to use, be sure to remove all contaminants. a) Flare Joints Flare joints used to connect the copper pipes cannot be used for pipings whose outer diameter exceeds 20 mm. In such a case, socket joints can be used. Sizes of flare pipe ends, flare joint ends and flare nuts are as shown in Tables 2-2-3 to 22-6 below. b) Socket Joints Socket joints are such that they are brazed for connections, and used mainly for thick pipings whose diameter is larger than 20 mm. Thicknesses of socket joints are as shown in Table 2-2-2. Table 2-2-2 Minimum thicknesses of socket joints Nominal diameter 1/4 3/8 1/2 Reference outer diameter of copper pipe jointed (mm) 6.35 9.
52 12.70 Minimum joint thickness (mm) 0.50 0.60 0.70 2-2-2.

Processing of Piping Materials When performing the refrigerant piping installation, care should be taken to ensure that water or dust does not enter the pipe interior, that no other oil other than lubricating oils used in the installed air conditioner is used, and that refrigerant does not leak. When using lubricating oils in the piping processing, use such lubricating oils whose water content has been removed. When stored, be sure to seal the container with an airtight cap or any other cover. (1) Flare Processing Procedures and Precautions a) Cutting the Pipe By means of a pipe cutter, slowly cut the pipe so that it is not deformed. b) Removing Burrs and Chips If the flared section has chips or burrs, refrigerant leakage may occur.

Carefully remove all burrs and clean the cut surface before installation. 27 c) Insertion of Flare Nut d) Flare Processing Make certain that a clamp bar and copper pipe have been cleaned. By means of the clamp bar, perform the flare processing correctly. Use either a flare tool for R410A or conventional flare tool. Flare processing dimensions differ according to the type of flare tool. When using a conventional flare tool, be sure to secure "dimension A" by using a gauge for size adjustment. ØD A Fig. 2-2-1 Flare processing dimensions Table 2-2-3 Dimensions related to flare processing for R410A Outer diameter (mm)
6.35 9.52 12.

70 A (mm) Thickness (mm) Flare tool for R410A clutch type 0 to 0.5 0 to 0.5 0 to 0.5 Conventional flare tool Clutch type 1.0 to 1.5 1.0 to 1.5 1.0 to 1.5 Wing nut type 1.
5 to 2.0 1.5 to 2.0 2.0 to 2.

5 Nominal diameter 1/4 3/8 1/2 0.8 0.8 0.8 Table 2-2-4 Dimensions related to flare processing for R22 Outer diameter (mm) 6.35 9.

52 12.70 A (mm) Thickness (mm) Flare tool for R22 clutch type 0 to 0.5 0 to 0.5 0 to 0.5 Conventional flare tool Clutch type 0.5 to 1.0 0.5 to 1.0 0.5 to 1.

0 Wing nut type 1.0 to 1.5 1.0 to 1.5 1.5 to 2.0 Nominal diameter 1/4 3/8 1/2 0.8 0.8 0.8 Table 2-2-5 Flare and flare nut dimensions for R410A Nominal diameter 1/4 3/8 1/2 Outer diameter (mm) 6.
35 9.52 12.70 Thickness (mm) 0.8 0.8 0.

8 Dimension (mm) A 9.1 13.2 16.6 B 9.2 13.

5 16.0 C 6.5 9.7 12.9 D 13 20 23 Flare nut width (mm) 17 22 26 28 Table 2-2-6 Flare and flare nut dimensions for R22 Nominal diameter 1/4 3/8 1/2 Outer diameter (mm) 6.35 9.52 12.70 Thickness (mm) 0.8 0.8 0.

8 Dimension (mm) A 9.0 13.0 16.2 B 9.2 13.5 16.0 C 6.5 9.7 12.9 D 13 20 20 Flare nut width (mm) 17 22 24 to 45° 46° B A C D 43° to 4 5° Fig. 2-2-2 Relations between flare nut and flare seal surface (2) Flare Connecting Procedures and Precautions a) Make sure that the flare and union portions do not have any scar or dust, etc. b) Correctly align the processed flare surface with the union axis. c) Tighten the flare with designated torque by means of a torque wrench. The tightening torque for R410A is the same as that for conventional R22. Incidentally, when the torque is weak, the gas leakage may occur.

When it is strong, the flare nut may crack and may be made non-removable. When choosing the tightening torque, comply with values designated by manufacturers. Table 2-2-7 shows reference values. Note : When applying oil to the flare surface, be sure to use oil designated by the manufacturer. If any other oil is used, the lubricating oils may deteriorate and cause the compressor to burn out.

Table 2-2-7 Tightening torque of flare for R410A [Reference values] Nominal diameter 1/4 3/8 1/2 Outer diameter (mm) 6.35 9.52 12.70 Tightening torque N·m (kgf·cm) 14 to 18 (140 to 180) 33 to 42 (330 to 420) 50 to 62 (500 to 620) Tightening torque of torque wrenches available on the market N·m (kgf·cm) 16 (160), 18 (180) 42 (420) 55 (550) 29 2-3. Tools 2-3-1. Required Tools The service port diameter of packed valve of the outdoor unit in the air conditioner using R410A is changed to prevent mixing of other refrigerant. To reinforce the pressure-resisting strength, flare processing dimensions and opposite side dimension of flare nut (For Ø12.7 copper pipe) of the refrigerant piping are lengthened. The used refrigerating oil is changed, and mixing of oil may cause a trouble such as generation of sludge, clogging of capillary, etc. Accordingly, the tools to be used are classified into the following three types.

(1) Tools exclusive for R410A (Those which cannot be used for conventional refrigerant (R22)) (2) Tools exclusive for R410A, but can be also used for conventional refrigerant (R22) (3) Tools commonly used for R410A and for conventional refrigerant (R22) The table below shows the tools exclusive for R410A and their interchangeability. Tools exclusive for R410A (The following tools for R410A are required.) Tools whose specifications are changed for R410A and their interchangeability R410A air conditioner installation No. Used tool Usage Existence of new equipment for R410A Yes Yes Yes Whether conventional equipment can be used Conventional air conditioner installation Whether new equipment can be used with conventional refrigerant Flare tool Copper pipe gauge for adjusting projection margin Torque wrench (For Ø12.7) Gauge manifold Charge hose Vacuum pump adapter Electronic balance for refrigerant charging Refrigerant cylinder Leakage detector Charging cylinder Pipe flaring Flaring by conventional flare tool Connection of flare nut Evacuating, refrigerant charge, run check, etc. Vacuum evacuating Refrigerant charge Refrigerant charge Gas leakage check Refrigerant charge * (Note 1) * (Note 1) * (Note 1) Yes Yes Yes Yes Yes (Note 2) (Note 1) When flaring is carried out for R410A using the conventional flare tools, adjustment of projection margin is necessary. For this adjustment, a copper pipe gauge, etc. are necessary. (Note 2) Charging cylinder for R410A is being currently developed. General tools (Conventional tools can be used.)

) In addition to the above exclusive tools, the following equipments which serve also for R22 are necessary.



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