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You can read the recommendations in the user guide, the technical guide or the installation guide for TOSHIBA MMY-MAP1202FT8. You'll find the answers to all your questions on the TOSHIBA MMY-MAP1202FT8 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual TOSHIBA MMY-MAP1202FT8
User guide TOSHIBA MMY-MAP1202FT8
Operating instructions TOSHIBA MMY-MAP1202FT8
Instructions for use TOSHIBA MMY-MAP1202FT8
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Manual abstract:

.....
.....
.....
.....
.....
.....
.....
.....

..... 2 Introduction ..

.....
.....
.....
.....
.....
.....

... 3 System overview ..

.....
.....
.....
.....
.....
.....

7 Capacity compensation chart

.....
.....

..17 Piping requirements ...

.....
.....
.....
.....

..... 25 Refrigerant cycle diagram ...

.....
.....
.....

.... 31 Sensible capacity table .

.....
.....
.....
.....

..... 43 Part load performance

.....
.....
.....

R410A. Incorporating advanced technology in all aspects of efficiency, durability, flexibility and comfort. Super HRM will meet various different site applications. 3 System Outline Outdoor unit Suction gas Discharge gas Liquid 3 pipe (Discharge gas / Suction gas / Liquid) FS unit (Flow Selector unit) Indoor unit (Heating) Indoor unit (Cooling) Energy saving No.1 COP in heat recovery VRF industry. DC twin rotary compressors are most congenial with R410A and are used within the outdoor units. All compressors are High-speed Calculation driven by a High-speed Calculation Vector Control Inverter. Vector Control Inverter Average COP 8HP System 10HP System Super-HRM(R410A) 3.83 3.45 Outdoor unit DC Twin Rotary Compressor Simultaneous Operation By control of the FS unit, Super HRM enables simultaneous operation of cooling and heating.

Super HRM also improves the energy efficiency by the recycling of exhaust heat. Ex. Mainly Cooling, Partly Heating Operation Main Heat Exchanger Sub-Heat Exchanger FS unit Indoor unit Heating Cooling Cooling Cooling Outdoor unit Compressor 5 Design Flexibility Piping flexibility Flexible Joint Combination 3 Equivalent piping length Up to 125m 50m (Elevation between CDU and FCU) 35m (elevation between FCU) 50m (from 1st branching) Y Branch after header branch (Toshiba unique technology) Header branch after Y joint Elevation between indoor units = 35m(No.1!) Furthest piping length from 1st branch = 50m(No.1!) Header after header branch (Toshiba unique technology) FS Unit Design The compact and light weight design of the FS unit(Flow Selector Unit)allows it to be easily installed within a limited space.

190H x 250W x 160D 5kg Easy of hanging (Only 2 hangers) Easy maintenance (Valve coil and P.C. board are on the same side) Centralized Control System By using the central control devices, individual control of indoor units is possible throughout multiple systems. Centralized control systems with Super MMS can also be integrated with Building Management System (BMS). Super MMS Super HRM Central remote controller 6 4 System overview 7 8 4 Foreword System overview 1.

OUTLINE OF TOSHIBA SUPER HRM (Super Heat Recovery Multi System) Shortest route design by free branching The Combination of line and header branching is highly flexible. This follows for the shortest design route possible, thereby saving on installation time and cost. Line/header branching after the header branching is only available with TOSHIBA Super HRM. Line branching Outdoor unit Branching joint FS unit Indoor unit 4 8F Header branching Outdoor unit Branching header FS unit Indoor unit 7F Line + Header branching Outdoor unit Header FS unit 2F Branching joint Indoor unit Line branching after header branching Outdoor unit Header Super Only MMS HRM Only Indoor unit Branching joint FS unit 1F Header branching after header branching Outdoor unit Header Super HRM Only Header FS unit Indoor unit 9 4 Non-polarized control wiring between outdoor and indoor units Outdoor unit U1 U2 Indoor unit U1 U2 U1 U2 U1 U2 8F Sub heat exchanger main heat exchanger Outdoor unit 7F FS unit Indoor unit Heating Cooling Cooling Cooling Compressor Simultaneous operation 2F Height difference between indoor unit and outdoor unit : 50m Height difference between indoor unit and indoor unit : 35m Outdoor unit Allowable pipe length : 150m equivalent length 1st branching section 1F From 1st branching to the furthest indoor unit : 50m 10 Energy saving No.1 COP in heat recovery VRF industry. Compared with the conventional chiller fan coil system, a large energy saving can be achieved. Advanced bus communication system Wiring between indoor and outdoor units is a simple 2 core wire system. Communication of addresses is also automatically configured. A default test mode operation is available. 4 Self diagnostics system Comprehensive troubleshooting codes allows for a timely identification of possible problems arising.

High lift and flexible piping design Equivalent pipe length of 150m and vertical lift of 50m is possible with TOSHIBA Super HRM. Vertical lift between indoor units of 35m is the highest in the industry. Also the maximum piping length from the 1st branch is 50m. This allows for greater flexibility within the building design of the system. Simultaneous operation By controlling the FS unit, Super HRM enables simultaneous operation of cooling and heating. This operation meets the various requirements of modern buildings that are highly airtight or have an increasing heat load due to the use of computers. Super HRM also improves energy efficiency by recycling of the exhaust heat. Extended outdoor temperature operating range By use of sophisticated system control with inverter driven compressors, the operating range in cooling has been increased from -5 to -10 . Compact FS unit design The compact and light weight design of the FS unit (Flow selector unit) allows it to be easily installed with in a limited space. Group control by one FS unit Up to 8 indoor units can be group controlled by the use of only one FS unit, this gives greater flexibility for various different types and sizes of rooms.

Intelligent control TOSHIBA Super HRM intelligent controls and modulating valves deliver the required capacity according to the load variation from 50% to 100%. The intelligent controls and modulating valves limit or increase the cooling capacity dynamically so humidity and temperature are kept within the comfort zone. Conforms to building control law IAQ (Indoor Air Quality) is also achieved by combining various accessories required by the Building Control Law. Wide control applications Artificial Intelligence Network system. Central control and monitoring system available.

Weekly schedule operation through weekly timer. Integration with Building Management System (BMS) is available. 11 2. SUMMARY OF SYSTEM EQUIPMENTS Equipment 1. Outdoor units Corresponding HP Inverter unit 8HP MAP0802FT8 22. 4 25.0 10HP MAP1002FT8 28.0 31.5 12HP MAP1202FT8 33.



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5 35.5 Appearance 4 Model name Cooling capacity (kW) Heating capacity (kW) MMY- 2. Outdoor units (Combination of outdoor units) Corresponding HP Combined model Cooling capacity (kW) Heating capacity (kW) Combined outdoor units No. of connectable indoor units Corresponding HP Combined model Cooling capacity (kW) Heating capacity (kW) Combined outdoor units No. of connectable indoor units MMYMMY8HP MAP0802FT8 22.4 25 8HP 13 20HP AP2002FT8 56 63 10HP 10HP 33 10HP MAP1002FT8 28 31.

5 10HP 16 24HP AP2402FT8 68 76.5 8HP 8HP 8HP 40 12HP MAP1202FT8 33.5 35.5 12HP 16 26HP AP2602FT8 73 81.5 10HP 8HP 8HP 43 16HP AP1602FT8 45 50 8HP 8HP 27 28HP AP2802FT8 78.5 88 10HP 10HP 8HP 47 18HP AP1802FT8 50.4 56.5 10HP 8HP 30 30HP AP3002FT8 84 95 10HP 10HP 10HP 48 3. FS units (Flow selector units) Model name RBM-Y1122FE RBM-Y1802FE RBM-Y2802FE Usage Total capacity for indoor unit : Below 11.2 kw Total capacity for indoor unit : 11.

2 to below 18.0 kw Total capacity for indoor unit : 18.0 to 28.0 kw or less Appearance *Accessory part (Sold separately): Connection cable kit (RBC-CBK15FE) up to 15m. 4.

Branching joints and headers Model name RBM-BY53FE RBM-BY103FE RBM-BY203FE Y-shape RBM-BY303FE branching RBM-BY53E joint (*3) RBM-BY103E RBM-BY203E RBM-BY303E RBM-HY1043FE RBM-HY2043FE 4-branching header (*4) (*5) RBM-HY1043E RBM-HY2043E RBM-HY1083FE RBM-HY2083FE 8-branching header (*4) (*5) RBM-HY1083E RBM-HY2083E T-shape branching joint (For connection of outdoor units) *1 *2 *3 *4 *5 *6 *7 Usage Indoor unit capacity code (*1) : Total below 6.4 Indoor unit capacity code (*1) : Total 6.4 or more and below 14.2 Indoor unit capacity code (*1) : Total 14.2 or more and below 25.

2 Indoor unit capacity code (*1) : Total 25.2 or more Indoor unit capacity code (*1) : Total below 6.4 Indoor unit capacity code (*1) : Total 6.4 or more and below 14.2 Indoor unit capacity code (*1) : Total 14.2 or more and below 25.2 Indoor unit capacity code (*1) : Total 25.2 or more Indoor unit capacity code (*1) : Total below 14.2 Indoor unit capacity code (*1) : Total 14.2 or more and below 25.

2 Indoor unit capacity code (*1) : Total below 14.2 Indoor unit capacity code (*1) : Total 14.2 or more and below 25.2 Indoor unit capacity code (*1) : Total below 14.2 Indoor unit capacity code (*1) : Total 14.2 or more and below 25.2 1 set 4 types T-shape joint pipes as described below: The required quantity is arranged and they are combined on site.

RBM-BT13FE Corresponded dia. (mm) Connection piping 9.5 Balance pipe 12.7 to 22.2 Piping at liquid side 19.

1 to 28.6 Piping at discharge gas side 22.2 to 38.1 Piping at suction gas side Qty 1 1 1 1 For 3 piping Appearance For 2 piping (*6) For 3 piping For 2 piping (*6) For 3 piping For 2 piping (*6) 12 `Capacity code `can be obtained from page 8. (Capacity code is not actual capacity) If total capacity code value of indoor unit exceeds that of outdoor unit, apply capacity code of outdoor unit.

When using Y-shape branching joint for 1st branching, select according to the capacity code of outdoor unit. Max. capacity code of 6.0 in total can be connected. If capacity code of outdoor unit is 26 or more, it is not used for the 1st branching. This is used for branching to `cooling only `indoor unit. Model names for outdoor and indoor units described in this guide are shortened because of the space constraint. 50Hz Super Heat Recovery Multi System Outdoor Unit HP (Capacity code) 8HP (8) 10HP (10) 12HP (12) 16HP (16) 18HP (18) 20HP (20) 24HP (24) 26HP (26) 28HP (28) 30HP (30) Model name MMYMAP0802HT8 MAP1002HT8 MAP1202HT8 No. of combined units 1 1 1 2 2 2 MAP0802FT8 MAP0802FT8 MAP0802FT8 3 2 1 MAP1002FT8 MAP1002FT8 MAP1002FT8 1 2 3 MAP0802FT8 MAP0802FT8 2 1 MAP1002FT8 MAP1002FT8 1 2 Inverter 8 HP MMYMAP0802FT8 Used Qty 1 MAP1002FT8 1 MAP1202FT8* 1 Inverter 10 HP MMYUsed Qty Inverter 12 HP MMYUsed Qty 4 * 12HP unit is for stand-alone use only. Outdoor unit combination with a 12HP unit is not available.

1. Allocation standard of model name MMY- M AP F T 8 Power supply specifications, 3 T : Capacity variable unit F : Heat recovery Development series No. Capacity rank HP x 10 New refrigerant R410A M : Single module unit, No mark : Combined Model nape 018 type 024 type 007 type 009 type 012 type 015 type 018 type 024 type 015 type 018 type 024 type 027 type 036 type 048 type 056 type 0.80 1.00 1.25 1.70 2.00 2.50 0.80 1.

00 1.25 0.80 1.00 1.25 1.

70 2.00 2.50 0.80 1.00 1.

25 1.70 2.00 2.50 1.70 2.00 2.50 3.00 4.00 5.00 6.

00 2.2 2.8 3.6 4.5 5.6 7.1 2.2 2.8 3.6 2.

2 2.8 3.6 4.5 5.6 7.

1 2.2 2.8 3.6 4.5 5.

6 7.1 4.5 5.6 7.1 8.0 11.2 14.0 16.0 2.5 3.

2 4.0 5.0 6.3 8.0 2.5 3.2 4.0 2.5 3.2 4.

0 5.0 6.3 8.0 2.5 3.

2 4.0 5.0 6.3 8.0 5.

0 6.3 8.0 9.0 10.0 16.0 18.0 High Wall Type (1 series) High Wall Type (2 series) 4 Floor Standing Cabinet Type Floor Standind Concealed Type Floor

Standind Type 15 5. Remote controller Name Model name Appearance Application Function Connected to indoor unit Wired remote controller 4 RBC-AMT21E/RBC-AMT31E Start / Stop Mode Change Temperature setting Change of air flow Timer function 1 On or off timer operation, setting in 30 minute CODE No. SET DATA UNIT No. SETTING TEST R.

C. No. increments. Automatic Off function. 2 Combined with the weekly timer, weekly schedule operation can be operated. Filter sign Displays automatically maintenance time of indoor filter. Filter sign flashes. Self-diagnosis function Pressing `CHECK `button displays cause of fault on the check code. Control by 2 remote controllers is available. Two remote controllers can be connected to one indoor unit.

The indoor unit can be separately operated from a different location. Start / Stop Temperature setting Change of air flow Check code display UNIT SET CL Wired remote Wired remote controller (In case of control by controller 2 remote controllers) Simple wired remote controller Connected to indoor unit RBC-AS21E/RBC-AS21E2 TEST SETTING ũC ũF Simple remote controller Connected to indoor unit 16-1 16 TCB-AX21E TCB-AX21E2 Start / Stop Mode change Temperature setting Change of air flow Timer function On or off timer operation, setting in 30 minute increments. Automatic Off function. Control by 2 remote controllers is available. Two wireless remote controllers can operate one indoor unit.

The indoor unit can be separately operated from a different location. Check code display TCB-AX21U(W)-E2 (for 4-way airdischarge cassette) RBC-AX22CE2 (for under ceiling) TCB-AX21-E2 (for other units except for the concealed duct high static pressure) Wireless remote controller kit RBC-AX22CE

RBC-AX22CE2 TCB-AX21U(W)-E TCB-AX21U(W)-E2 Name Model name Appearance Application Performance Connected to central remote controller or wired remote controller Weekly schedule operation 1 Setting different start / stop time for each day of the week a day. 2 ON / OFF can be set 3 times 4 OFF ON OFF ON OFF ON 8:00 12:00 13:00 18:00 19:00 21:00 RBC-EXW21E RBC-EXW21E2 3 `CHECK `` PROGRAM `` `DAY ``Wired remote controller SuMoTuWeTh Fr Sa PROGRAM1 PROGRAM2 PROGRAM3 ERROR Weekly timer Weekly timer button copying of settings easy.



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week can be specified. (Summer schedule and winter schedule, etc.

) 4 Two different schedules for a WEEKLY TIMER Outdoor unit 5 `CANCEL` `DAY` button enables holiday setting. 6 If power supply fails, the setting contents are stored in the memory for 100 hours. Central remote controller Weekly timer Connected to outdoor unit, indoor unit Outdoor unit Individual control up to 64 indoor units. Individual control for max. 64 indoor units divided into 4 zones. Up to 16 indoor units for each zone Up to 16 outdoor header units are connectable. Four selectable central control settings to restrict individual remote controller operations. Central remote controller ZONE ALL ZONE GROUP CODE No. TCB-SC642TLE TCB-SC642TLE2 1234 SET DATA SETTING UNIT No. No.

TEST Setting for one of 1 to 4 zones is available. Can be used with other central control devices (Up to 10 central control devices with in one control circuit) R.C. GROUP SELECT ZONE Central remote controller CL SET Two selectable control modes Central controller mode Remote controller mode Setting of simultaneous ON/OFF 3 times for each day of the week combined with a weekly timer. Central remote controller Indoor remote controller 16-2 17 Name Model name Appearance Application Performance Connected to outdoor unit, indoor unit Header Follower Individual control up to 16 indoor units. Setting of simultaneous ON-OFF 3 times for each day of the week when combined with a weekly timer. Connected to 2 remote controllers is possible. Outdoor unit ON-OFF controller TCB-CC163TLE2 ON-OFF controller Outdoor unit ON-OFF controller Indoor remote controller 16-3 18 5 Capacity compensation chart 17 18 5 Foreword Capacity compensation chart Cooling/heating capacity characteristics 1. Cooling capacity calculation method : Required cooling capacity = Cooling capacity x Factor (1 Indoor air wet bulb temperature vs. capacity correction value) kW Capacity correction value 1.

2 1.1 1.0 0.9 0.8 15 20 24 5 Indoor air wet bulb temp.

() 2 Outdoor air dry bulb temperature vs.capacity correction value Capacity correction value 1.2 1.1 1.0 0.

9 -5 0 5 10 15 20 25 30 35 40 43 Outdoor air dry bulb temp. () 3 Air flow variation ratio of indoor unit vs. capacity correction (For concealed duct type only) Capacity correction value 1.1 1.0 0.9 80 Air flow variation ratio (%) 90 100 110 120 *1: Coefficient to use for the correction of the outdoor unit capacity when the total capacity of the indoor units are not equal to the outdoor unit capacity. 19 4 Connecting pipe length and lift difference between indoor and outdoor units vs. capacity correction value Height of outdoor unit H (m) 5 50 40 30 20 10 0 -10 -20 -30 Outdoor unit (8 to 30HP) %100 98 96 94 92 90 88 86 84 82 80 78 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 Pipe length (Equivalent length) L (m) Outdoor unit ho lo , L, is the longest, one of , , , (l o + l a , l o + l b , l o + l c) H = ho + (Largest one of ha, hb, and hc) , hc hb ha la lb lc , , A B Indoor unit C , 5 Correction of outdoor unit diversity 120 Correction (%) 100 80 60 40 20 0 20 40 60 80 100 120 135 Standard capacity ratio Indoor units total capacity ratio (%) *1: Coefficient to use for the correction of the outdoor unit capacity when the total capacity of the indoor units are not equal to the outdoor unit capacity. 20 76 2. Heating capacity calculation method : Required heating capacity = Heating capacity x Factor (1 Indoor air dry bulb temperature vs.

capacity correction value) kW Capacity correction value 1.2 1.1 1.0 0.9 0.8 15 5 20 24 Indoor air dry bulb temp. () 2 Outdoor air wet bulb temperature vs. capacity correction value Capacity correction value 1.2 1.1 1.0 0.9 0.8 0.7 0.6 0.

5 -15 -10 -5 0 5 10 15 Outdoor air wet bulb temp. () 3 Air flow variation ratio of indoor unit vs. capacity correction (For concealed duct type only) Capacity correction value 1.1 1.0 0.

9 80 Air flow variation ratio (%) 90 100 110 120 *1: Coefficient to use for the correction of the outdoor unit capacity when the total capacity of the indoor units are not equal to the outdoor unit capacity. 2: Refer to item 3 on the next page. *2 1 4 Connecting pipe length and lift difference between indoor and outdoor units vs. capacity correction value Height of outdoor unit H (m) 5 50 40 30 20 10 0 -10 -20 -30 Outdoor unit (8 to 30HP) Outdoor unit , L, is the longest, one of , , , (l o + l a , l o + l b , l o + l c) , H = ho + (Largest one of ha, hb, and hc) 100% ho 99 98 97 96 95 94 93 92 91 , lo 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 hc hb ha Pipe length (Equivalent length) L (m) , la A , lb B Indoor unit , lc C 5 Correction of outdoor unit diversity 120 Correction (%) 100 80 60 40 20 0 20 40 60 80 100 120 135 Standard capacity ratio Indoor units total capacity ratio (%) *1: Coefficient to use for the correction of the outdoor unit capacity when the total capacity of the indoor units are not equal to the outdoor unit capacity. 3. Capacity correction in case of frost on the outdoor heat exchanger when in heating Correct the heating capacity when frost can be found on the outdoor heat exchanger. Heating capacity =Capacity after correction of outdoor unit Correction value of capacity resulted from frost (Capacity after correction of outdoor unit : Heating capacity calculated in the above item 2.) 6 Capacity correction in case of frost on the outdoor heat exchanger Capacity correction value 1.0 0.9 0.

8 -15 -10 -5 0 5 10 Outdoor air wet bulb temp. () 22 4. Capacity calculation for each indoor unit Capacity for each indoor unit Required standard capacity of indoor unit = Capacity after correction of outdoor unit x Total value of standard indoor unit capacity 5. Operating temperature range In cooling time 45 40 20 15 10 5 Usable range (in warming-up) In heating time 5 Outdoor air dry bulb temp. () 35 30 25 20 15 10 5 0 -5 -10 10 Continuously operable range Usable range (in pull down) Outdoor air wet bulb temp. () 0 -5 -10 -15 -20 Continuously operable range 15 20 25 28 30 5 10 15 20 25 30 Indoor air wet bulb temp. () Indoor air dry bulb temp. () * The unit can be operated even if the outdoor temperature goes below -20 , however you must note that the warranty only covers down to -15 this is because operation beyond this temperature is outside of specification. * When outdoor air temperature falls to below -15 , it may shorten the lifespan of the product. * When outdoor temperature goes out of the specified range ``or ``mark is indicated on the remote controller display and the required operation will stop.



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``& ``: When heating operation ````: When cooling operation [Notice] This indication is not a failure. When outdoor temperature goes back to within the specified range, ``or ``disappear and normal operation will start. Operation stops because the concurrent operation can not be kept in the condition, as it is out of specification for Super HRM. (Outdoor temp.(DB) <-10 : Cooling, >21 : Heating) * Do not use ``Super HRM ``other than for personal usage where the ambient temperature may go down below -10 .

(For example, fresh air intake equipment/Electric device/Food/Animals and plants/Art object) 6. Rated conditions Cooling : Indoor air temperature 27 Heating : Indoor air temperature 20 DB/19.0 WB, Outdoor air temperature 35 DB/6 WB DB DB, Outdoor air temperature 7 23 24 6 Piping requirements 25 26 6 Foreword Piping requirements 1. Allowable length/height difference of refrigerant piping Follower Unit C Note: In case of connecting method Ex.2, a large amount of refrigerant and refrigerant oil may return to the head unit.

Therefore, set the T-shape joint so that oil does not enter directly <Ex.1> Header Unit Follower Unit Follower Unit. A B C Height difference between outdoor units Header Unit Follower Unit B A Outdoor Unit H3 5m T-shape branching Main piping La LA Lb Lc Li Main connecting piping between outdoor units Length corresponded to farthest piping between outdoor units LO 25m Branching header <Ex.2> Header Unit Follower Unit A B C Height difference between outdoor and indoor units Branching piping L2 Connecting piping of indoor unit 1st branching section L3 L9 a g h b i c FS unit j k 6 50m L8 Height difference between indoor units H1 50m Indoor unit < Cooling only > < Cooling only > Equivalent length corresponded to farthest piping L 150m Equivalent length corresponded to farthest piping after 1st branching Li Lj L4 L5 L6 L7 FS unit f Lh o d FS unit l m Indoor unit e n H2 35m (Upper outdoor unit) Height difference between indoor units in group control by one FS unit H4 0.5 m (Header) p q (q) * Allowable length and height difference of refrigerant piping Allowable value Total extension of pipe (Liquid pipe, real length) Farthest piping length L (*1) Real length Equivalent length 300 m 125 m 150 m 85 m 50 m 30 m 15 m 25 m 10 m 30 m 15 m 50 m 30 m 35 m 15 m 5m 0.5 m Piping section LA+La+Lb+Lc+Li+L2+L3+L4+L5+L6+L7+L8+9 +a+b+c+d+e+f+g+h+i+j+k+l+m+n+o+p+q LA+Lc+Li+L3+L4+L5+L6+L7+L8+q Li L3+L4+L5+L6+L7+L8+q a+g, b+h, c+i, d+l, e+m, f+n, j, k, g, h, i, l, m, n, L7+o, L7+L8+p, L7+L8+q LA+Lc (LA+Lb) La, Lb, Lc L7+L8+q, L7+L8+p L7+o - Max. equivalent length of main piping Pipe Length Equivalent length of farthest piping from 1st branching Li (*1) Max. real length of indoor unit connecting piping Max. real length between FS unit and indoor unit (*2) Max. Equivalent length of outdoor unit connecting piping LO (*1) Max.

real length of outdoor unit connecting piping Max. equivalent length between FS unit and indoor unit Lj Max. real length between FS unit and header indoor unit Lh (*2) Height between indoor and outdoor units H1 Upper outdoor unit Lower outdoor unit Upper outdoor unit Height Height between indoor units H2 Lower outdoor unit Difference Height between outdoor units H3 Height difference between indoor units in group control by one FS unit H4 *1 : The furthest outdoor unit from 1st branch is to be named C, and furthest indoor unit from 1st branch to be named (q). *2 : The supplied connection cable can be used up to 5 m in pipe length between the indoor and FS unit. When the pipe length between the indoor and FS unit exceeds 5 m, you must use the connection cable kit (RBC-CBK15FE). 3 units 84.0 kW 48 units H2 15m 135% (*1) H2 > 15m 105% * System restrictions Max. No. of combined outdoor units Max. capacity of combined outdoor units Max.

No. of connected indoor units Max. capacity of combined indoor units *1 : MMY-MAP1201HT8 : UP to 120 % Note 1) Combination of outdoor units : Header unit (1 unit) + Follower unit (0 to 2 units). Header unit is outdoor unit nearest to the connected indoor units Note 2) Install the outdoor units in order of capacity. (Header unit Follower unit 1 Follower unit 2) Note 3) Refer to outdoor unit combination table in page.

6. Note 4) Piping to indoor units shall be perpendicular to piping to the head outdoor unit as Ex.1. Do not connect piping to indoor units in the same direction of head outdoor unit as Ex.2.

27.2. Selection of refrigerant piping Follower Unit Header Unit C Outdoor unit B A Balance pipe 1 Outdoor unit connecting piping 1 2 1 1st branching section Liquid pipe 4 Discharge gas pipe Suction gas pipe 8 Y-Shape branching joint 4 8 Y-Shape branching joint 5 FS unit 6 5 6 5 6 7 7 3 Main piping 8 9 T-shape branching joint Main connecting piping between outdoor units 10 4 < Cooling only > < Cooling only > 8 Liquid pipe Discharge gas pipe Suction gas pipe 4 8 4 8 4 4 4 6 * Selection of refrigerant piping No. 10 5 FS unit 6 Indoor unit 5 6 5 6 6 6 6 Group control Item Pipe size of outdoor unit Suction Discharge gas side gas side Liquid side O 22.2 / O 22.2 / O 28.6 / O 19.1 / O 19.1 / O 19.1 / O 12.7 / O 12.

7 / O 12.7 / Outdoor unit model name MMY-MAP0802FT8 MMY-MAP1002FT8 MMY-MAP1202FT8 Total capacity code of indoor units at downstream side Equivalent to Equivalent to HP capacity Below 61.5 Below 22 10 Selection of FS unit Model Name Total capacity code of indoor unit Equivalent to Equivalent capacity (kW) to HP Below 11.2 11.2 to below 18.0 18.0 to 28.0 or less Below 4.0 4.0 to below 6. 4 6.4 to 10.0 or less 1 No. Max.No.

of connected indoor units 5 8 8 Item Suction Discharge Balance gas side gas side Liquid side pipe O 28.6 / O 22.2 / O 15.9 / O 9.5 / RBM-Y1122FE RBM-Y1802FE RBM-Y2802FE 2 No.

Connecting pipe size between outdoor units Item Suction Discharge gas side gas side Liquid side O 22.2 / O 28.6 / O 28.6 / O 34.9 / O 34.9 / O 19.1 / O 19.1 / O 22.2 / O 28.6 / O 28.

6 / O 12.7 / O 12.7 / O 19.1 / O 19.1 / O 22.2 / Total capacity code of all outdoor units Equivalent to capacity Equivalent to HP 3 Size of main pipe No. Item Suction Discharge gas side gas side Liquid side O 15.9 / O 22.2 / O 28.6 / O 34.9 / O 15.9 / O 22.2 / O 12.7 / O 19.1 / O 22.2 / O 28.6 / O 28.6 / O 12.7 / O 19.1 / O 9.5 / O 12.7 / O 15.9 / O 15.9 / O 19.1 / O 9.5 / O 12.7 / Below 33.5 Below 12 12 33.5 45.

0 to below 61.5 16 to below 22 61.5 to below 73.0 22 to below 26 73.0 or more 26 or more Total capacity code of all outdoor units * Minimum wall thickness for R410A application Half Soft Hard or Hard OK OK OK OK NG NG NG NG OK OK OK OK OK OK OK Equivalent to capacity Below 18.0 18.0 to below 34.0 34.0 to below 56.5 56.

5 to below 70.5 70.5 or more Below 18.0 18.0 or more Equivalent to HP Below 6.



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4 6.4 to below 12.2 12.2 to below 20.2 20.

2 to below 25.2 25.2 or more Below 6.4 6.4 or more 4 5 Pipe size between the end of branch and FS unit Outer dia. (Inch) ,, 1/4 ,, 3/8 ,, 1/2 ,, 5/8 ,, 3/4 ,, 7/8 ,, 1.1/8 ,, 1.3/8 Outer dia. (mm) 6.35 9.

52 12.70 15.88 19.05 22.20 28.58 34.92 Minimum Wall Thickness (mm) 0.80 0.80 0.80 1.00 1.00 1.00 1.10 Suction Discharge No.

Item gas side gas side Liquid side O 9.5 O 6.4 // O 6.4 // 6 Piping of indoor unit O 12.7 O 15.

9 O 9.5 // O 22.2 O 12.7 // O 9.5 O 6.4 // O 12.7 O 9.5 // Piping of cooling only indoor unit (Between O 6.4 // 7 branching and indoor O 12.7 O 15.

9 O 9.5 // unit) *2 O 15.9 O 9.5 // O 22.2 O 12.7 // Capacity rank of indoor unit 007 to 012 Type 015 to 018 Type 024 to 056 Type 072 to 096 Type 15m or less 007 to 012 Type 15m above 15m or less 015 to 018 Type 15m above 024 to 056 Type 072 to 096 Type * Selection for branching section No. Y-Shape branching joint *4 *5 For Branching Header 4 Branching For *4, *5, *6 8 Branching *1 In case the pipe exceeds the main pipe size, it should be the same as the main pipe size. *2 2 pipes for cooling only indoor unit shall be used with liquid pipe and suction gas pipe. *3 2 pipes from the FS unit to the branching section shall be used with liquid pipe and suction gas pipe. *4 Branching pipe on the 1st branch should be selected according to the capacity code of the outdoor unit.

*5 In case total capacity code of indoor units exceeds the capacity code of the outdoor unit, the pipe size should be selected based on the capacity of the outdoor unit. *6 For 1 line after header branching, indoor units with a total maximum capacity code of 6.0 in total can be connected. 8 Total capacity code of indoor unit Equivalent to capacity Equivalent to HP Below 18.0 Below 6.

4 18.0 to below 40.0 6.4 to below 14.2 40.

0 to below 70.5 14.2 to below 25.2 70.5 or more 25.2 or more Below 40.0 Below 14.2 40.0 to below 70.5 14.

2 to below 25.2 Below 40.0 Below 14.2 40.0 to below 70.5 14.2 to below 25.2 Model Name For 3 piping For 2 piping RBM-BY53FE RBM-BY53E RBM-BY103FE RBM-BY103E RBM-BY203FE RBM-BY203E RBM-BY303FE RBM-BY303E RBM-HY1043FE RBM-HY1043E RBM-HY2043FE RBM-HY2043E RBM-HY1083FE RBM-HY1083E RBM-HY2083FE RBM-HY2083E 9 1 set of 4 types of T-shape joint pipes as described below T-Shape branching joint - Balance pipe (O 9.52) X 1 // (For connecting outdoor - Piping at liquid side (O 12.7 to O 22.

2) X 1 // unit) - Piping at discharge gas side (O 19.1 to O 28.6) X 1 // - Piping at suction gas side (O 22.2 to O 38.1) X 1 // RBM-BT13FE 28 3.

Charging requirement with additional refrigerant After the system has been vacuumed, replace the vacuum pump with a refrigerant cylinder and charge the system with additional refrigerant. Calculating the amount of additional refrigerant required Refrigerant in the system when shipped from the factory 8HP Refrigerant amount charged in factory Heat recovery model 11.5kg 10HP 11.5kg R410A 12HP 11.5kg When the system is charged with refrigerant at the factory, the amount of refrigerant needed for the pipes at the site is not included.

Therefore, calculate the additional amount needed and add the required amount to the system. (Calculation) Additional refrigerant charge amount is calculated based on the size of liquid pipe at site and its real length. [Additional refrigerant charge amount at site] = Additional refrigerant charge amount [Real length of liquid pipe] x per liquid pipe 1m (Table 1) 6 x 1.3 + Compensation by system HP (Table 2) Example : Additional charge amount R (kg) = (L1 x 0.025kg/m) + (L2 x 0.055kg/m) + (L3 x 0.105kg/m) + (L4 x 0.160kg/m) + (L5 x 0.250kg/m) x 1.3 L1 : Real total length of liquid pipe L2 : Real total length of liquid pipe L3 : Real total length of liquid pipe L4 : Real total length of liquid pipe L5 : Real total length of liquid pipe System : 24HP 6.

4 (m) 9.5 (m) 12.7 (m) 15.9 (m) 19.1 (m) Table 1 Pipe dia. at liquid side Additional refrigerant amount/1m 6.4 0.025kg 9.5 0.055kg 12.7 0.105kg 15.9 0.160kg 19.1 0.250kg

250kg 22.2 0.350kg Table 2 Combined horse power (HP) 8 10 12 16 18 20 24 26 28 30 Outdoor combination (HP) 8 10 12 8 10 10 8 10 10 8 10 8 10 10 8 8 10 Compensation by system HP (kg) 2.0 2.5 3.

0 -1.5 0.0 2.0 -4.5 -3.0 -1.5 0.0 29 30 7 Refrigerant cycle diagram 31 32 7 Foreword Refrigerant cycle diagram 1. Inverter Unit (8,10,12HP) Model : MMY-MAP0802FT8, MAP1002FT8, MAP1202FT8 Propeller fan M Fan motor Sensor (TE1) Strainer Pulse motor valve Solenoid valve (SV12) Strainer (Right side) Main heat exchanger Sensor (TO) (Left side) Main heat exchanger (PMV1) (PMV2) Sub-heat exchanger Sub-heat exchanger Strainer Check valve (PMV3) Check valve Solenoid valve (SV5) Solenoid valve (SV11) Capillary tube 4-way valve 7 Sensor (TS1) Low pressure sensor Sensor (TS2) Capillary tube Check valve Sensor (TL) Solenoid Capillary Check joint valve tube Capillary (SV6) tube High pressure sensor Solenoid valve (SV2) Oil Separator Check joint Strainer Solenoid valve (SV3D) Capillary tube Strainer Capillary tube Liquid tank Solenoid valve (SV41) Check valve Check valve Strainer Solenoid valve Solenoid valve (SV42) Check joint High-pressure Switch Capillary tube Sensor (TD1) High-pressure Switch Accumulator (SV3C) Sensor (TK3) Sensor (TD2) Compressor 1 Compressor 2 (Inverter) Strainer Check Valve Strainer Check Valve Capillary tube Capillary tube Sensor (TK1) Solenoid valve Sensor (TK2) Oil tank (SV3E) Capillary tube Strainer Strainer Sensor (TK4) Capillary tube Strainer Solenoid valve (SV3A) Strainer Check valve Solenoid valve (SV3B) Check valve Balance pipe service valve Liquid side service valve Discharge gas side service valve Suction gas side service valve (Inverter) 33 2. Explanation of Functional Parts Functional part name Solenoid valve 1.

SV3A 2.SV3B 3.SV3C 4.SV3D 5.SV3E 6.SV2 Functional outline (Connector CN324: Red) 1) Collects oil in the oil tank during OFF time. (Connector CN313: Blue) 1) Returns oil in the balance pipe to the compressor. (Connector CN314: Black) 1) Pressurizes oil reserved in the oil tank during operation. (Connector CN323: White) 1) Reserves oil in the oil separator during OFF time, and supplies oil during operation. (Connector CN323: White) 1) Turns on during operation and balances oil between the compressors.

(Hot gas bypass) (Connector CN312: White) 1) Low pressure release function 2) High pressure release function 3) Gas balance function during off time (Start compensation valve of compressor) (Connector CN311: Blue) 1) For gas balance start 2) High pressure release function 3) Low pressure release function (Connector CN310: White) 1) For gas balance during operation mode change 2) For low pressure balance in all cooling operation (Connector CN309 : White) 1) Liquid bypass function for releasing discharge temperature (Connector CN322 : White) 1) Discharge gas line shut-down function in all cooling and defrosting operation (Connector CN319 : White) 1) Controls flow rate for sub-heat exchanger in simultaneous operation 2) Controls flow rate for sub-heat exchanger when defrosting (Connector CN317: Blue) 1) Cooling/heating exchange 2) Reverse defrost 3) Main/sub heat exchanger exchange PMV1,2 (Connector CN300, 301: White) 1) Super heat control function in all heating and majority heating operation 2) Sub-cool adjustment function in cooling operation 3) Distribution control in simultaneous operation (Connector CN302 : Red) 1) Controls flow rate for sub-heat exchanger in simultaneous operation 2) Preventive function for high-pressure rising in all cooling and all heating operation 1) Prevention for rapid decreasing of oil (Decreases oil flowing into the refrigeration cycle) 2) Reserve function of surplus oil (TD1: Connector, CN502: White, TD2: Connector, CN503: Pink) 1) Protection of compressor discharge temp.



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Used for release (Connector CN504: White) 1) Controls super heat in heating operation (Connector CN522 : Black) 1) For refrigerant recovery control in all cooling and majority cooling operation 2) Detects overheating on refrigeration cycle. (Connector CN505: Green) 1) Controls defrost in all heating and majority heating operation 2) Controls outdoor fan in all heating and simultaneous operation TK1 Connector CN514: Black, TK2 Connector CN515: Green, (TK3 Connector CN516: Red, TK4 Connector CN523: Yellow) 1) Determines oil level of the compressor (Connector CN521: White) 1) Detects sub-cool in all cooling and simultaneous operation (Connector CN507: Yellow) 1) Detects outside temperature (Connector CN501: Red) 1) Detects high pressure and controls compressor capacity 2) Detects high pressure in all cooling operation, and controls the fan in low ambient cooling operation 3) Controls sub-cool of heating indoor unit. 4) Controls outdoor fan speed in majority cooling operation. (Connector CN500: White) 1) Detects low pressure in all cooling and simultaneous operation and controls compressor capacity 2) Detects low pressure in all heating and simultaneous operation, and controls the super heat (Compressor 1 Connector CN316: White, Compressor 2 Connector CN315: Blue) 1) Prevents liquid accumulation to the compressor (Connector CN321: Red) 1) Prevents liquid accumulation to the accumulator 1) Oil balancing in each outdoor unit (This model doesn't use balance pipe) 7. SV4(n) 8.SV5 7 4-way valve 9.SV6 10.SV11 11.SV12 Pulse motor valve PMV3 Oil separator Temp. sensor 1.TD1 TD2 2.TS1 3.TS2 4.TE1 5.TK1,TK2, TK3,TK4 6.TL 7.TO Pressure sensor 1.High pressure sensor 2. Low pressure sensor Heater Compressor case heater Accumulator case heater 34 Balance pipe 3.

Heat Exchanger of Outdoor Unit Propeller Fan Fan motor Main Heat Exchanger Air Direction Air Direction Sub Heat Exchanger Sub Heat Exchanger 7 Front side (Left) Rear side (Right) 4. FS Unit (Flow Selector Unit) Model Liquid Pipe RBM-Y1122FE Discharge gas Pipe Suction gas Pipe Strainer Capillary tube Capillary tube Model Liquid Pipe RBM-Y1802FE Discharge gas Pipe Suction gas Pipe Strainer Capillary tube Capillary tube Model Liquid Pipe RBM-Y2802FE Discharge gas Pipe Suction gas Pipe Strainer Capillary tube Capillary tube Check valve Strainer Capillary tube Check valve Strainer Check valve Strainer SVS SVD Capillary tube SVS Capillary tube SVS SVD SVD Check valve Check valve SVDD SVSS Strainer Check valve SVDD SVSS Strainer SVDD SVSS Strainer To liquid side of indoor unit To gas side of indoor unit To liquid side of indoor unit To gas side of indoor unit To liquid side of indoor unit To gas side of indoor unit Functional part name Functional outline (Discharge gas pipe shut-down valve) Solenoid SVD 1) High pressure line in heating Valve (Suction gas pipe shut-down valve) SVS 1) Low pressure line in cooling (Pressurization valve) SVDD 1) Pressurizes indoor unit during the ON operation when indoor unit starts heating. (Depressurization valve) SVSS 1) Returns refrigerant in indoor unit when stopped or in thermo-OFF status. 2) Depressurizes indoor unit during the ON operation when the indoor unit stops heating. 35 5. Indoor Unit Liquid side Gas side Strainer Capillary tube 7 Pulse Motor Valve (PMV) Sensor (TC2) Strainer Sensor (TCJ) Air heat exchanger at indoor side 7 Fan Sensor (TC1) Sensor (TA) M Fan motor (NOTE) MMU-AP0071YH to AP0121YH type air conditioners do not have a TC2 sensor. Functional part name Pulse Motor Valve PMV Functional outline (Connector CN082 (6P): Blue) 1)Controls super heat in cooling operation 2)Controls sub-cooling in heating operation 3)Recovers refrigerant oil in cooling operation 4)Recovers refrigerant oil in heating operation (Connector CN104 (2P): Yellow) 1)Detects indoor suction temperature (Connector CN100 (3P): Brown) 1)Controls PMV super heat in cooling operation (Connector CN101 (2P): Black) 1)Controls PMV sub-cool in heating operation (Connector CN102 (2P): Red) 1)Controls PMV super heat in cooling operation 2)[MMU-AP0071 to AP0121YH only] Controls PMV sub-cool in heating operation Temp. sensor 1. TA 2. TC1 3. TC2 4. TCJ 36 6. SYSTEMATIC DRAWING 1. All Cooling Operation Header Unit (Outdoor temperature : 10 or more) Follower Unit FM TE1 FM TE1 Co n denser Condenser TO Condenser Condenser TO SV1 2 PMV1 PMV2 SV1 2 PMV1 PMV2 PMV3 SV1 1 4 - way v a l v e OFF PMV3 SV1 1 P s e n s o r 4 - way v a l v e OFF SV5 Pd S e n s o r TS1 SV5 Pd S e n s o r TS1 P s e n s o r TS2 SV2 OS TS2 SV2 OS SV6 SV6 TL SV3 D Li qui d Ta n k TL SV3 D SV4 2 Li qui d Ta n k SV4 1 SV4 1 SV4 2 HP TD1 Compressor 1 HP Ac c u m u l a t o r HP TD1 Compressor 1 HP Ac c u m u l a t o r SV3 C TK3 TD2 Compressor 2 SV3 C TK3 TD2 Compressor 2 7 TK1 SV3 E TK4 TK2 Oil tank SV3 E TK1 TK4 TK2 Oil tank SV3 A SV3 B SV3 A SV3 B Suction gas pipe Discharge gas pipe Liquid pipe Flow Selector Unit SVS SVD SVDD SVSS SVD SVDD SVSS SVS SVD SVDD SVSS SVS SVD SVDD SVSS SVS Indoor Unit ST PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ Cooling Outdoor unit ON SV3A (*1) SV3B OFF SV3C Control SV3D ON SV3E Control PMV1,2 Control PMV3 Cooling FS unit and Indoor unit Stop SVD OFF OFF SVD SVS ON OFF SVS SVDD OFF OFF SVDD SVSS ON ON SVSS PMV Control Close PMV Cooling Stop High-pressure gas or condensate liquid refrigerant Low-pressure gas Low-pressure gas (refrigerant recovery line) High-pressure refrigerant (plunging circuit) 4WV SV4(n) SV5 SV6 SV11 SV12 Fan Control Control Control Control ON Control Close (*1) Turns on during compressor off status. 37 2. All Cooling Operation Header Unit (Outdoor temperature : 10 or more) Follower Unit FM TE1 TE1 FM TO TO SV1 2 PMV1 PMV2 SV1 2 Condenser PMV3 SV1 1 PMV1 PMV2 Condenser PMV3 SV1 1 Condenser 4 - way v a l v e ON Condenser 4 - way v a l v e ON SV5 Pd S e n s o r TS1 P s e n s o r SV5 Pd S e n s o r TS1 P s e n s o r TS2 SV2 OS TS2 SV2 OS SV6 SV6 TL SV3 D Li qui d Ta n k TL SV3 D SV4 2 Li qui d Ta n k SV4 1 SV4 1 SV4 2 HP HP TD1 Ac c u m u l a t o r HP TD1 HP Ac c u m u l a t o r Compressor 2 Compressor 1 TK3 Compressor 1 TK3 TK1 SV3 E TK4 TK2 Oil tank SV3 A SV3 B SV3 A SV3 B Suction gas pipe Discharge gas pipe Liquid pipe Flow Selector Unit SVS SVD SVDD SVSS SVD SVDD SVSS SVS SVD SVDD SVSS SVS SVD SVDD SVSS Compressor 2 7 SV3 C TD2 SV3 C TD2 SVS Indoor Unit ST ST ST ST ST ST ST ST ST PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ Cooling Outdoor unit ON SV3A (*1) SV3B OFF SV3C Control SV3D ON SV3E Control PMV1,2 Control PMV3 Cooling FS unit and Indoor unit Stop SVD OFF OFF SVD SVS ON OFF SVS SVDD OFF OFF SVDD SVSS ON ON SVSS PMV Control Close PMV Cooling Stop High-pressure gas or condensate liquid refrigerant Low-pressure gas Low-pressure gas (refrigerant recovery line) High-pressure refrigerant (plunging circuit) 4WV SV4(n) SV5 SV6 SV11 SV12 Fan Control Control Control Control ON Control(*2) Close Cooling thermo-ON (*1) Turns on during compressor off status.



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(*2) Control depends on the operation status. 38 3. All Heating Operation Header Unit High-pressure gas or condensate liquid refrigerant Low-pressure gas (refrigerant recovery line) Low-pressure gas High-pressure refrigerant (plunging circuit) Follower Unit FM TE1 FM TE1 Evaporator Evaporator TO Evaporator Evaporator TO SV1 2 PMV1 PMV2 SV1 2 PMV1 PMV2 PMV3 SV1 1 4 - way valve ON PMV3 SV1 1 Ps sensor 4 - way valve ON SV5 Pd Sensor TS1 SV5 Pd Sensor TS1 Ps sensor TS2 SV2 OS TS2 SV2 OS SV6 SV6 TL SV3 D Li qui d Ta n k TL SV3 D SV4 2 Li qui d Ta n k SV4 1 SV4 1 SV4 2 HP TD1 Compressor 1 HP Ac c u m l a t o r HP TD1 Compressor 1 HP Ac c u m l a t o r SV3 C TK3 TD2 Compressor 2 SV3 C TK3 TD2 Compressor 2 7 TK1 SV3 E TK4 TK2 Oil tank SV3 E TK1 TK4 TK2 Oil tank SV3 A SV3 B SV3 A SV3 B Suction gas pipe Discharge gas pipe Liquid pipe Flow Selector Unit SVS SVD SVDD SVSS SVD SVDD SVSS SVS SVD SVDD SVSS SVS SVD SVDD SVSS SVS SVD SVDD SVSS SVS Indoor Unit ST ST ST ST ST ST ST ST PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ Heating 4WV SV4(n) SV5 SV6 SV11 SV12 Fan Outdoor unit ON SV3A (*1) SV3B OFF SV3C Control SV3D ON SV3E OFF PMV1,2 Control PMV3 Control ON Control Control ON Control Close(*2) Heating Heating thermo-ON Heating FS unit and Indoor unit Heating thermo-OFF Stop SVD SVS SVDD SVSS PMV ON OFF OFF OFF Control SVD SVS SVDD SVSS PMV OFF OFF OFF OFF Close Stop OFF SVD OFF SVS OFF SVDD ON SVSS Close PMV (*1) Turn on during compressor stop status. (*2) Control based on operation status.

39 4. Mainly Cooling, Partly Heating Operation High-pressure gas or condensate liquid refrigerant Low-pressure gas (refrigerant recovery line) Low-pressure gas High-pressure refrigerant (plunging circuit) Header Unit Follower Unit FM TE1 TE1 FM TO TO SV1 2 PMV1 PMV2 SV1 2 Condenser PMV3 SV1 1 PMV1 PMV2 Condenser PMV3 SV1 1 Condenser 4 - way valve ON Condenser 4 - way valve ON SV5 Pd Sensor TS1 Ps sensor SV5 Pd Sensor TS1 Ps sensor TS2 SV2 OS TS2 SV2 OS SV6 SV6 TL SV3 D Li qui d Ta n k TL SV3 D SV4 2 Li qui d Ta n k SV4 1 SV4 1 SV4 2 7 HP TD1 HP Ac c u m l a t o r HP TD1 HP Ac c u m l a t o r SV3 C TK3 TD2 SV3 C TK3 TD2 Compressor 2 Compressor 1 TK1 SV3 E TK4 Compressor 1 TK2 Oil tank SV3 E TK1 TK4 TK2 Oil tank SV3 A SV3 B SV3 A SV3 B Suction gas pipe Discharge gas pipe Liquid pipe Flow Selector Unit SVS SVD SVDD SVSS SVD SVDD SVSS SVS SVD SVDD SVSS Compressor 2 SVS Indoor Unit ST ST ST ST ST ST ST ST PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ Cooling 4WV SV4(n) SV5 SV6 SV11 SV12 Fan Outdoor unit ON SV3A (*1) SV3B OFF SV3C Control SV3D ON SV3E Control PMV1,2 Control PMV3 Control Control ON Control Close(*2) Close Cooling Cooling, thermo-ON Stop FS unit and Indoor unit Heating thermo-ON Heating Stop OFF SVD SVS OFF SVDD OFF SVSS ON PMV Close SVD SVS SVDD SVSS PMV OFF ON OFF ON Control SVD SVS SVDD SVSS PMV ON OFF OFF OFF Control (*1) Turns on during compressor off status. (*2) Control based on operation status. 40 5. Mainly Heating, Partly Cooling Operation High-pressure gas or condensate liquid refrigerant Low-pressure gas (refrigerant recovery line) Low-pressure gas High-pressure refrigerant (plunging circuit) Header Unit Follower Unit FM TE1 FM TE1 Evaporator Evaporator TO Evaporator Evaporator TO SV1 2 PMV1 PMV2 SV1 2 PMV1 PMV2 PMV3 SV1 1 4 - way valve ON PMV3 SV1 1 Ps sensor 4 - way valve ON SV5 Pd Sensor TS1 SV5 Pd Sensor TS1 Ps sensor TS2 SV2 OS TS2 SV2 OS SV6 SV6 TL SV3 D Li qui d Ta n k TL SV3 D SV4 2 Li qui d Ta n k SV4 1 SV4 1 SV4 2 HP TD1 HP Ac c u m l a t o r HP TD1 HP Ac c u m l a t o r SV3 C TK3 TD2 SV3 C TK3 7 TD2 Compressor 2 Compressor 1 TK1 SV3 E TK4 Compressor 1 TK2 Oil tank SV3 E TK1 TK4 TK2 Oil tank SV3 A SV3 B SV3 A SV3 B Suction gas pipe Discharge gas pipe Liquid pipe Flow Selector Unit SVS SVD SVDD SVSS SVD SVDD SVSS SVS SVD SVDD SVSS SVS SVD SVDD SVSS Compressor 2 SVS Indoor Unit ST ST ST ST ST ST ST ST PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ Heating 4WV SV4(n) SV5 SV6 SV11 SV12 Fan Outdoor unit SV3A ON SV3B (*1) SV3C OFF Control SV3D SV3E ON Close(*2) PMV1,2 Control PMV3 Control Control Control ON Control Close(*2) Heating Heating thermo-ON Stop FS unit and Indoor unit Heating thermo-OFF Cooling Stop SVD OFF SVS OFF SVDD OFF SVSS ON PMV Close SVD SVS SVDD SVSS PMV OFF ON OFF ON Control SVD SVS SVDD SVSS PMV ON OFF OFF OFF Control (*1) Turns on during compressor off status. (*2) Control based on operation status. 41 6. Defrosting Header Unit FM TE1 High-pressure gas or condensate liquid refrigerant Low-pressure gas Low-pressure gas (refrigerant recovery line) Follower Unit FM TE1 TO TO SV1 2 PMV1 PMV2 PMV1 PMV2 SV1 2 PMV3 SV11 4-way valve OFF PMV3 SV11 4-way valve OFF SV5 TS1 Ps sensor SV5 TS1 Ps sensor Pd S ensor TS2 SV2 OS Pd S ensor TS2 SV2 OS SV6 SV6 TL SV3D Liquid Tank TL SV3D SV42 Liquid Tank SV41 SV41 SV42 HP TD1 HP Accumulator HP TD1 HP Accumulator SV3C Compressor TD2 SV3C TK3 1 TD2 7 Compressor Compressor TK3 1 Compressor 2 TK1 SV3E TK 4 TK2 Oil tank SV3E TK1 TK 4 TK2 Oil tank SV3A SV3B SV3A SV3B Suction gas pipe Discharge gas pipe Liquid pipe Flow Selector Unit SVS SVD SVDD SVSS SVD SVDD SVSS SVS SVD SVDD SVSS SVS SVD SVDD SVSS 2 SVS Indoor Unit ST ST ST ST ST ST ST ST PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ PMV TC1 TC2 TCJ Cooling indoor unit Heating indoor unit Heating indoor unit FS unit and Indoor unit Others SVD OFF OFF SVD SVS ON ON SVS SVDD OFF OFF SVDD SVSS ON ON SVSS PMV Control Control PMV Fan Stop Control Fan Stop indoor unit Defrosting is performed during "All heating" or "Mainly heating, partly cooling" operation. 4WV SV4(n) SV5 SV6 SV11 SV12 Fan Outdoor unit SV3A OFF OFF SV3B (*1) OFF SV3C ON OFF Control SV3D Control SV3E OFF ON Close PMV1,2 Control Stop(*2) PMV3 Control Cooling thermo-ON (*1) Turns on during compressor off status.



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(*2) Control based on operation status.

42 8 Sensible capacity table 43 44 8 unit size Sensible capacity table outdoor air temp. DB 10.0 12.0 14.0 16.0 18.0 20.0 21.0 23.0 25.

0 27.0 29.0 31.0 33.0 35.

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9 5.1 3.8 009 012 015 018 TC : Total capacity [kW] indoor air temp. 19.0 WB 20.0 WB 27 DB 28 DB TC SHC TC SHC 2.8 2.1 2.9 2.1 2.

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4 3.8 SHC : Sensible capacity [kW] 22.0 WB 30 DB TC SHC 3.1 2.1 3.1 2.1 3.1 2.1 3.1 2.

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7 24.0 WB 32 DB TC SHC 3.2 2.0 3.2 2.0 3.2 2.0 3.2 2.0 3.2 2.0 3.
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4 3.9 6.4 3.9 6.4 3.9 6.4 3.9 6.4 3.9 6.

4 3.9 6.4 3.9 6.4 3.9 6.2 3.7 6.0 3.6 8 45 4-way Discharge Cassette Type (MMU-AP****H) unit size outdoor air temp.
DB 10.0 12.0 14.0 16.0 18.

0 20.0 21.0 23.0 25.0 27.
0 29.0 31.0 33.0 35.0 37.0 39.0 10.0 12.0 14.0 16.

0 18.0 20.0 21.0 23.0 25.0 27.0 29.0 31.0 33.0 35.
0 37.0 39.0 10.0 12.0 14.

0 16.0 18.0 20.0 21.0 23.
0 25.0 27.0 29.0 31.0 33.0 35.0 37.0 39.0 10.0 12.

0 14.0 16.0 18.0 20.0 21.0 23.0 25.0 27.0 29.0 31.
0 33.0 35.0 37.0 39.0 024 027 8 030 036 14.

0 WB 20 DB TC SHC 5.8 4.3 5.8 4.3 5.
8 4.3 5.8 4.3 5.8 4.3 5.8 4.3 5.8 4.3 5.

8 4.3 5.8 4.3 5.8 4.3 5.8 4.3 5.8 4.3 5.
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9 6.4 4.7 6.2 4.6 7.
4 5.5 7.4 5.5 7.4 5.5 7.4 5.5 7.4 5.5 7.

4 5.5 7.4 5.5 7.4 5.5 7.4 5.5 7.4 5.5 7.
4 5.5 7.4 5.5 7.4 5.

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0 5.2 9.2 6.8 9.2 6.8 9.2 6.8 9.2 6.8 9.

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9 6.6 8.7 6.4 16.0 WB 23 DB TC SHC 6.4 4.6 6.4 4.6 6.4 4.

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9 8.2 5.9 8.2 5.9 8.2 5.9 8.2 5.9 8.2 5.
9 8.2 5.9 8.2 5.9 8.
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9 8.2 5.9 8.2 5.9 8.2 5.9 7.9 5.7 7.7 5.

5 10.2 7.3 10.2 7.3 10.2 7.3 10.2 7.3 10.2 7.
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0 9.6 6.8 18.0 WB 26 DB TC SHC 6.9 4.9 6.9 4.9 6.9 4.9 6.
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8 5.5 7.8 5.5 7.5 5.3 7.3 5.2 8.7 6.2 8.
7 6.2 8.7 6.2 8.7 6.
2 8.7 6.2 8.7 6.2 8.
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7 6.2 8.7 6.2 8.7 6.2 8.5 6.0 8.2 5.9 10.
9 7.7 10.9 7.7 10.9 7.
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9 7.7 10.9 7.7 10.9 7.7 10.9 7.7 10.5 7.5 10.

2 7.3 TC : Total capacity [kW] indoor air temp. 19.0 WB 20.0 WB 27 DB 28 DB TC SHC TC SHC 7.

1 4.9 7.3 4.9 7.1 4.
9 7.3 4.9 7.1 4.9 7.3 4.9 7.1 4.9 7.3 4.

9 7.1 4.9 7.3 4.9 7.1 4.9 7.3 4.9 7.1 4.
9 7.3 4.9 7.1 4.9 7.
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9 7.3 4.9 7.1 4.9 7.3 4.9 7.1 4.9 7.3 4.
9 6.9 4.7 7.1 4.7 6.
7 4.6 6.9 4.6 8.0 5.
5 8.2 5.5 8.0 5.5 8.2 5.5 8.0 5.5 8.2 5.

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5 8.0 5.5 8.2 5.5 7.
7 5.3 8.0 5.3 7.5 5.
2 7.8 5.2 9.0 6.2 9.3 6.2 9.0 6.2 9.3 6.

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2 SHC : Sensible capacity [kW] 22.0 WB 30 DB TC SHC 7.7 4.9 7.7 4.9 7.7 4.9 7.7 4.9 7.
7 4.9 7.7 4.9 7.7 4.
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5 4.7 7.3 4.6 8.7 5.4 8.7 5.4 8.7 5.4 8.
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5 12.8 7.5 12.8 7.5 12.8 7.5 12.8 7.5 12.8 7.
5 12.8 7.5 12.8 7.5 12.

4 7.2 12.0 7.0 46 4-way Discharge Cassette Type (MMU-AP****H) unit size outdoor air temp. DB 10.
0 12.0 14.0 16.0 18.0 20.0 21.0 23.0 25.0 27.0 29.

0 31.0 33.0 35.0 37.0 39.0 10.0 12.0 14.0 16.0 18.
0 20.0 21.0 23.0 25.0 27.
0 29.0 31.



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0 39.0 048 056 14.0 WB 20 DB TC SHC 11.5 8.7 11.5 8.7 11.5 8.7 11.5 8.

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7 9.8 18.0 WB 26 DB TC SHC 13.6 9.8 13.6 9.8 13.6 9.8 13.6 9.

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4 15.5 10.4 SHC : Sensible capacity [kW] 22.0 WB 30 DB TC SHC 15.3 9.

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1 17.4 10.9 17.4 10.9 17.4 10.9 17.4 10.9 17.4 10.

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5 16.4 10.3 24.0 WB 32 DB TC SHC 16.0 9.5 16.0 9.5 16.0 9.5 16.

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2 10.6 18.2 10.6 17.7 10.3 17.2 10.0 8 47 2-way Air Discharge Cassette Type (MMU-AP***WH) unit size outdoor air temp. DB 10.0 12.

0 14.0 16.0 18.0 20.0 21.0 23.0 25.0 27.0 29.0 31.
0 33.0 35.0 37.0 39.0 10.
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0 37.0 39.0 007 009 8 012 015 14.0 WB 20 DB TC SHC 1.8 1.5 1.8 1.5 1.8 1.5 1.
8 1.5 1.8 1.5 1.8 1.
5 1.8 1.5 1.8 1.5 1.
8 1.5 1.8 1.5 1.8 1.5 1.8 1.5 1.8 1.5 1.

8 1.5 1.7 1.5 1.7 1.4 2.3 1.8 2.3 1.8 2.
3 1.8 2.3 1.8 2.3 1.
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7 2.7 3.7 2.7 3.7 2.7 3.7 2.7 3.6 2.6 3.
5 2.5 16.0 WB 23 DB TC SHC 2.0 1.6 2.
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6 2.0 1.6 2.0 1.6 2.0 1.6 2.0 1.6 2.0 1.

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9 2.5 1.9 2.5 1.8 2.
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2 2.1 3.1 2.0 4.1 2.
9 4.1 2.9 4.1 2.9 4.1 2.9 4.1 2.9 4.1 2.

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9 4.1 2.9 4.1 2.9 4.
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7 18.0 WB 26 DB TC SHC 2.1 1.7 2.1 1.7 2.1 1.7 2.1 1.7 2.

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1 1.7.2.1 1.7.2.1 1.
72.1 1.7.2.1 1.7.2.
1 1.7.2.0 1.6.2.7 2.0.2.7 2.0.2.7 2.0.2.

72.0 2.7 2.0 2.7 2.0 2.7 2.0 2.7 2.0 2.7 2.0 2.
72.0 2.7 2.0 2.7 2.
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72.0 2.6 1.9 2.6 1.9 3.5 2.3 3.5 2.3 3.

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5 2.3 3.5 2.3 3.4 2.2 3.3 2.2 4.4 3.1 4.

4 3.1 4.4 3.1 4.4 3.1 4.4 3.1 4.4 3.1 4.
4 3.1 4.4 3.1 4.4 3.
1 4.4 3.1 4.4 3.1 4.

4 3.1 4.4 3.1 4.4 3.1 4.2 3.0 4.1 2.9 TC : Total capacity [kW] indoor air temp.

19.0 WB 20.0 WB 27 DB 28 DB TC SHC TC SHC 2.2 1.7 2.3 1.7 2.2 1.7 2.3 1.
72.2 1.7 2.3 1.7 2.
2 1.7 2.3 1.7 2.2 1.
72.3 1.7 2.2 1.7 2.3 1.7 2.2 1.7 2.3 1.

72.2 1.7 2.3 1.7 2.2 1.7 2.3 1.7 2.2 1.
72.3 1.7 2.2 1.7 2.
3 1.7 2.2 1.7 2.3 1.
72.2 1.7 2.3 1.7 2.2 1.7 2.3 1.7 2.1 1.

6 2.2 1.6 2.1 1.6 2.1 1.6 2.8 2.0 2.9 2.
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3 3.7 2.3 3.6 2.3 3.7 2.3 3.5 2.2 3.6 2.
2 3.4 2.2 3.5 2.2 4.
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1 4.6 3.1 4.5 3.1 4.6 3.1 4.5 3.1 4.6 3.

1 4.5 3.1 4.6 3.1 4.5 3.1 4.6 3.1 4.5 3.
1 4.6 3.1 4.5 3.1 4.
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1 4.5 3.1 4.6 3.1 4.5 3.1 4.6 3.1 4.5 3.

1 4.6 3.1 4.5 3.1 4.6 3.1 4.5 3.1 4.6 3.
1 4.4 3.0 4.5 3.0 4.

2 2.9 4.4 2.9 SHC : Sensible capacity [kW] 22.0 WB 30 DB TC SHC 2.

4 1.7 2.4 1.7 2.4 1.7 2.4 1.7 2.4 1.7 2.

4 1.7 2.4 1.7 2.4 1.7 2.4 1.7 2.4 1.7 2.
4 1.7 2.4 1.7 2.4 1.
7 2.4 1.7 2.3 1.6 2.

3 1.6 3.1 2.0 3.1 2.0 3.1 2.0 3.1 2.0 3.

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5 3.2 1.9 3.2 1.9 3.2 1.9 3.2 1.9 3.2 1.

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0 16.0 18.0 20.0 21.0 23.

0 25.0 27.0 29.0 31.0 33.

0 35.0 37.0 39.0 10.0 12.0 14.0 16.0 18.0 20.0 21.

0 23.0 25.0 27.0 29.0 31.0 33.0 35.0 37.0 39.0 10.

0 12.0 14.0 16.0 18.0 20.

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0 20.0 21.0 23.0 25.0 27.0 29.0 31.0 33.0 35.0 37.

0 39.0 018 024 027 030 14.0 WB 20 DB TC SHC 4.6 3.4 4.

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0 16.0 WB 23 DB TC SHC 5.1 3.6 5.1 3.6 5.1 3.6 5.1 3.6 5.

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9 3.5 4.8 3.4 6.4 4.5 6.4 4.5 6.4 4.5 6.

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0 WB 26 DB TC SHC 5.4 3.8 5.4 3.8 5.4 3.8 5.4 3.8 5.4 3.8 5.4 3.

8 5.4 3.8 5.4 3.8 5.
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0 8.7 6.0 8.7 6.0 8.5 5.8 8.2 5.7 TC : Total capacity [kW] indoor air temp. 19.

0 WB 20.0 WB 27 DB 28 DB TC SHC TC SHC 5.6 3.8 5.8 3.

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