





## Sanyo SAP-CMRV3143GJH Technical & Service Manual

Dc inverter multi-system air conditioner



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# TECHNICAL & SERVICE MANUAL

## OUTDOOR UNIT: SAP-CMRV3143GJH

### DC INVERTER MULTI-SYSTEM AIR CONDITIONER

4-room multi Outdoor unit

SAP -CMRV3143GJH

Capacity

Indoor Model No.

9.0 kW

SAP -CMRV3143GJH-C

## Revised Edition

Destination: General area (50Hz)

Product Code No.

1 852 083 36



< Combined Indoor Units >

Concealed duct type

Wall mounted type

SAP-DMRV93GJH

SAP-KMRV93GJH

SAP-DMRV123GJH

SAP-KMRV123GJH

SAP-DMRV183GJH

SAP-KMRV183GJH

SAP-DMRV243GJH

SAP-KMRV243GJH

1. How these units may be combined is given in the Unit Combination Tables in the Appendix.

2. Be sure ~~to operate the air conditioning~~ system only when 2 or more indoor units have been installed. If operated with only a single unit installed, the returning fluid to the compressor may cause a malfunction.


These air conditioners employ new refrigerant R410A.

Pay special attention when servicing the unit.

REVISION NO.

NOV.2003

Europe (50Hz)

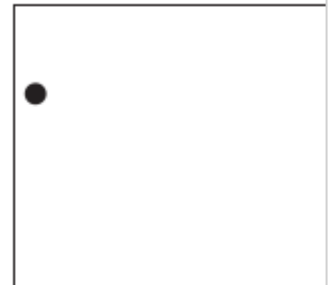
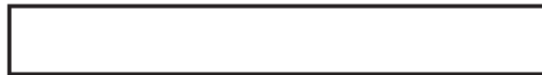
Australia (50Hz)

General area (60Hz)

**SM**

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## Related Manuals for Sanyo SAP-CMRV3143GJH

[Air Conditioner Sanyo SAP-KMRV93GJH Technical & Service Manual](#)

Dc inverter multi-system air conditioner (64 pages)

[Air Conditioner Sanyo SAP-KRV123EH Technical & Service Manual](#)

Dc inverter split system air conditioner (77 pages)

[Air Conditioner Sanyo SAP-K77RAX Technical & Service Manual](#)

Split system air conditioner (68 pages)

[Air Conditioner Sanyo SAP-KRV96EH Technical & Service Manual](#)

Dc inverter split system air conditioner (65 pages)

[Air Conditioner Sanyo SAP-KMRV74EH Installation Instructions Manual](#)

Inverter split system air conditioner (24 pages)

[Air Conditioner Sanyo SAP-CMRV1426EH Technical & Service Manual](#)

(148 pages)

[Air Conditioner Sanyo SAP-KMRV74EH Installation Instructions Manual](#)

Inverter multi split system air conditioner (28 pages)

[Air Conditioner Sanyo SAP-KRV9AEH Service Manual](#)

Dc inverter split system air conditioner (108 pages)

[Air Conditioner Sanyo SAP-CMRV1923GJH Technical & Service Manual](#)

(52 pages)

[Air Conditioner Sanyo SAP-K181AHA-S Technical & Service Manual](#)

(78 pages)

[Air Conditioner Sanyo SAP-K303A Technical & Service Manual](#)

(37 pages)

[Air Conditioner Sanyo SAP-K91A Technical & Service Manual](#)

Multi-split system air conditioner (62 pages)

[Air Conditioner Sanyo UR9X Installation Instructions Manual](#)

Split system air conditioner (52 pages)

[Air Conditioner Sanyo SAP-K71GH Technical & Service Manual](#)

(75 pages)

[Air Conditioner Sanyo SAP-K181GJH Technical & Service Manual](#)

Indoor/outdoor units (75 pages)

[Air Conditioner Sanyo SAP-K181AA Technical & Service Manual](#)

Split system air conditioner (66 pages)

## Summary of Contents for Sanyo SAP-CMRV3143GJH

[Page 1](#) TECHNICAL & SERVICE MANUAL Revised Edition NOV.2003 OUTDOOR UNIT: SAP-CMRV3143GJH Destination: General area (50Hz) Europe (50Hz) Australia (50Hz) General area (60Hz) DC INVERTER MULTI-SYSTEM AIR CONDITIONER Capacity Indoor Model No. Product Code No. 9.0 kW SAP -CMRV3143GJH-C 1 852 083 36 <...

[Page 2](#) Important! When Transporting Be careful when picking up and moving the indoor and Please Read Before Starting outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp This air conditioning system meets strict safety and edges or thin aluminum fins on the air conditioner can operating standards.

## [Page 3: Table Of Contents](#)

Table of Contents Page 1. OPERATING RANGE .....1 2. SPECIFICATIONS 2-1. Unit Specifications ..... 2 2-2. Major Component Specifications.....3 2-3. Other Component Specifications.....4 3. DIMENSIONAL DATA.....5 4. REFRIGERANT FLOW DIAGRAM .....6 5. PERFORMANCE DATA 5-1. Performance Charts (4-room multi) .....7 6.

## [Page 4: Operating Range](#)

1. OPERATING RANGE Temperature Indoor Air Intake Temp. Outdoor Air Intake Temp. Maximum 32°C D.B. / 23°C W.B. 43°C D.B. Cooling Minimum 19°C D.B. / 14°C W.B. 19°C D.B. Maximum 27°C D.B. 24°C D.B. / 18°C W.B. Heating Minimum 16°C D.B. —...

## [Page 5: Specifications](#)

For other combination of indoor units, please refer to the “Unit Combination Table” in this manual. Indoor units: SAP-KMRV93GJH 2 units Indoor units : SAP-KMRV93GJH 4 units (Outdoor unit: SAP-CMRV3143GJH 1 unit ) (Outdoor unit : SAP-CMRV3143GJH 1 unit) 2. Rating conditions are: 2. Rating conditions are: Cooling Indoor air temperature 27°C D.B.

## [Page 6: Major Component Specifications](#)

2-2. Major Component Specifications 2-2-1. Outdoor Unit Outdoor Unit SAP – CMRV3143GJH Control PCB / HIC PCB / Filter PCB POW-CM5A1-C-T / CR-HIC50A2-C-T / POW-CM5B1-C-T Compressor Type DC Twin Rotary (Hermetic) Compressor model C-9RVN273H0W 80867080 Compressor oil ... Amount FVC68S ... 1900 Ω...

## [Page 8: Dimensional Data](#)

3. DIMENSIONAL DATA Outdoor Unit SAP – CMRV3143GJH Unit: mm AIR INTAKE Drain hole AIR INTAKE AIR DISCHARGE Narrow tube service valve ø6.35 (1/4") Wide tube service valve ø9.52 (3/8") Wide tube service valve ø12.7 (1/2")

## [Page 9: Refrigerant Flow Diagram](#)

4. REFRIGERANT FLOW DIAGRAM Outdoor Unit SAP – CMRV3143GJH 4-Room Multi-Refrigerant Tubing System Diagram Unit: mm When cooling Service valve on When heating wide tube side When defrosting 4-way valve Muffler Solenoid valve for hot gas bypass Muffler Outdoor heat exchanger Indoor unit Main...

## [Page 10: Performance Data](#)

5. PERFORMANCE DATA 5-1. Performance Charts (4-room multi) Outdoor Unit SAP – CMRV3143GJH SAP – KMRV93GJH × × 1 Indoor Unit • Heating Characteristics • Cooling Characteristics (1) Low pressure performance chart (1) High pressure performance chart (RH: 46%, Indoor fan speed: High fan) (RH: 85%, Indoor fan speed: High fan) (50/60Hz, 220V) (50/60Hz, 220V)

[Page 11](#) Outdoor Unit SAP – CMRV3143GJH SAP – KMRV123GJH × × 1 Indoor Unit • Heating Characteristics • Cooling Characteristics (1) Low pressure performance chart (1) High pressure performance chart (RH: 46%, Indoor fan speed: High fan) (RH: 85%, Indoor fan speed: High fan) (50/60Hz, 220V) (50/60Hz, 220V) Lo fan...

[Page 12](#) Outdoor Unit SAP – CMRV3143GJH SAP – KMRV183GJH × × 1 Indoor Unit • Heating Characteristics • Cooling Characteristics (1) Low pressure performance chart (1) High pressure performance chart (RH: 46%, Indoor fan speed: High fan) (RH: 85%, Indoor fan speed: High fan) (50/60Hz, 220V) (50/60Hz, 220V) Lo fan...

[Page 13](#) Outdoor Unit SAP – CMRV3143GJH SAP – KMRV243GJH × × 1 Indoor Unit • Heating Characteristics • Cooling Characteristics (1) Low pressure performance chart (1) High pressure performance chart (RH: 46%, Indoor fan speed: High fan) (RH: 85%, Indoor fan speed: High fan) (50/60Hz, 220V) (50/60Hz, 220V) Lo fan...

## [Page 14: Electrical Data](#)

6. ELECTRICAL DATA 6-1. Electric Wiring Diagram Outdoor Unit SAP – CMRV3143GJH Electric Wiring Diagram for 4-room multi outdoor unit (CMRV3143GJH) Before replacing PCBs, turn off the power and check that all CAUTION lamps on the PCB are off before starting work. Electric



shock Electric Shock will occur if work is performed while the lamps are lit.

### [Page 15: Installation Instructions](#)

7. INSTALLATION INSTRUCTIONS Installation Site Selection 7-1. Indoor Unit To prevent abnormal heat WARNING generation and the possibility of fire, do not place obstacles, enclosures and grilles in front of or surrounding the air conditioner in a way that may block air flow.

[Page 16](#) In the case below, a joint for connecting tubes of different sizes is needed when connecting the inter-unit tube ( $\phi 9.52$ ) to the outdoor unit valve ( $\phi 12.7$ ). (1) Connecting indoor unit types 93 to 123 at D Indoor unit Outdoor unit  $\phi 6.35$  (93 123 types)  $\phi 9.52$ ...

### [Page 17: Outdoor Unit](#)

7-2. Outdoor Unit Exhaust fan AVOID: Hot air heat sources, exhaust fans, etc. (Fig. 3) Heat source damp, humid or uneven locations. Outdoor unit choose a place as cool as possible. choose a place that is well ventilated. allow enough room around the unit for air intake/ Fig.

### [Page 18: Diagram Of Outdoor Unit Installation](#)

7-3. Diagram of Outdoor Unit Installation Never install only a single indoor unit. Be sure to connect indoor and outdoor units only in combinations that are listed in the catalog or in the Indoor unit A combination table that was provided with the outdoor unit. (Use caution.

### [Page 19: Recommended Wire Length And Diameter](#)

7-4. Recommended Wire Length and Diameter Regulations on wiring diameter differ from locality to locality. For field wiring requirements, please refer to your local electrical codes. Carefully observe these regulations when carrying out the installation. Table 2 shows maximum wire lengths for control line and power line and fuse or circuit capacity. NOTE Refer to the wiring system diagram (Fig).

### [Page 20: Functions](#)

8. FUNCTIONS 8-1. Defrost Detection and End 8-1-1. Non-stop defrosting Defrost sequence 4-way valve ON Defrost detection occurs in either of the following cases: • The temperature of the heat exchanger remains at or below the L1 line for 35 minutes after the start of HEAT operation. • ...

### [Page 21: Current Control](#)

8-2. Current Control 8-3. Low Start Current The operating current may rise as a result of causes Operation starts at 10 Hz, and the start current is less than including increasing heating or cooling loads or the normal operating current. This prevents the flickering of decreases in power voltage.

### [Page 22: Control At Heat Start-Up](#)

8-5-2. HEAT operation (1) The fan speed is changed as shown in the figure below, based on the outdoor air temperature and the operating frequency. 5°C or below Above 5°C Outdoor air 5°C Above 35 Hz Fan H Fan H 19 Hz Frequency Fan H Fan L...

### [Page 23: Troubleshooting](#)

9. TROUBLESHOOTING Both the indoor unit and outdoor unit include electronic control circuits. Be sure to pay attention to the following before inspecting or repairing the outdoor-side electronic circuits. High-capacity electrolytic capacitors are used inside the outdoor unit controller (inverter). They retain an electrical charge (charging voltage DC 311 V) even after the power is turned OFF, and some time is required for the charge to dissipate.

### [Page 24: Outdoor Unit Trouble Diagnostics](#)

9-2. Outdoor Unit Trouble Diagnostics If a protective device has activated or there is a sensor failure in the outdoor unit, the 6 error monitor lamps on the outdoor control circuit board will indicate the nature of the trouble. : ON : OFF E R R E R R...

### [Page 25: Checking The Outdoor System](#)

9-3. Checking the Outdoor System 9-3-1. Checking the outdoor unit Control Check items (unit operation) • Apply 220 V AC between terminals 1 and 2 on the • The LED (red) on the control

circuit board must outdoor unit 3P terminal block. illuminate.

## [Page 26: Unit Problems And Inspection Points](#)

9-4. Unit Problems and Inspection Points Indoor unit Outdoor unit Others Problems Note  
Inspection points Self-Diagnostics check 1 Indoor controller (control unit) 2 Indoor fan motor 3  
Room temperature sensor 4 Heat exchanger temperature sensor 5 Inter-unit cable 6 Switch  
circuit board 7 Outdoor control circuit board 8 Diode module...

[Page 27](#) 9-4-1. Outdoor control circuit board Refer to 9-3-1. Checking the outdoor unit. NOTE:  
Do not remove or insert the outdoor control circuit board connector when power is being  
supplied to it. (The controller will be damaged.) 9-4-2. HIC HIC measurement points -...

[Page 28](#) 9-4-9. Electric expansion valve When replacing the electric expansion valve and coil,  
be sure to attach the connectors in the correct positions. Labels are applied to the valve body  
and coil, corresponding to the connector colors, to identify them. Use a tester to measure the  
voltage (12 V). When the power is turned ON, the needle will move from MMV (white) →...

## [Page 29: Explanation Of Functions](#)

9-5. Explanation of Functions e i l t i s operation c i t e i l c i t button on the remote e l l  
controller is pressed. operational mode, refer to the HEAT, SENSOR DRY, or COOL item.  
operation u l l button on the remote...

[Page 30](#) When defrost operation Non-stop defrost begins, frost has formed on the outdoor  
unit (when the ambient air Non-stop defrost (Refer to Fig. 1 below.) temperature is low). n i l n i  
l) . t o l l . t i v i t 1 below.

[Page 31](#) The ON/OFF operation button on the remote minutes even after the breaker is  
turned ON. controller is pressed. . s t ) . t a z i l f o β 2 below.) v i t z i l t l ( l i c i t .

[Page 32](#) (1/f fluctuation fan) operation button on the remote minutes even after the breaker  
is turned ON. controller is pressed. . s t ) . t a z i l β v i t . s t z i l v i t y f i "Low"...

## [Page 33: Refrigerant R410A: Special Precautions When Servicing Unit](#)

10. REFRIGERANT R410A: SPECIAL PRECAUTIONS WHEN SERVICING UNIT 10-1. Characteristics  
of New Refrigerant R410A 10-1-1. What is New Refrigerant R410A? R410A is a new refrigerant  
that contains two types of pseudo-non-azeotropic refrigerant mixture. Its refrigeration capacity  
and energy efficiency are about the same level as the conventional refrigerant, R22. 10-1-2.

[Page 34](#) Tubing precautions Refrigerant R410A is more easily affected by dust or moisture  
compared with R22, thus be sure to temporarily cover the ends of the tubing with caps or tape  
prior to installation. Never use 0.7mm-thick copper tubing or tubing which is less than 0.8mm  
in thickness, since air conditioners with R410A are subject to higher pressure than those using R22  
and R407C.

## [Page 35: Tools Specifically For R410A](#)

10-3. Tools Specifically for R410A For servicing, use the following tools for R410A Tool  
Distinction Tool Name Gauge manifold Charging hose Gas leak detector Refrigerant cylinder  
Charging cylinder Refrigerant recovery unit Vacuum pump with anti-reverse flow (\*1) Tools  
specifically for R410A (Solenoid valve-installed type, which prevents oil from flowing back into  
the unit when the power is off, is recommended.) Vacuum pump (\*2) .....

## [Page 36: In Case Of Compressor Malfunction](#)

10-5. In Case of Compressor Malfunction Should the compressor malfunction, be sure to make  
the switch to a replacement CAUTION compressor as quickly as possible. Use only the tools  
indicated exclusively for R410A. See "10-3. Tools Specifically for R410A." 10-5-1. Procedure for  
replacing compressor (1) Recovering refrigerant Any remaining refrigerant inside the unit  
should not be released to the atmosphere, but recovered using the...

[Page 37](#) (5) Recharging Configuration and characteristics of cylinders Valve Be sure to charge  
the specified amount of refrigerant in liquid state using the service port of the wide tube service  
valve. The proper amount is listed on the unit's nameplate. When the entire amount cannot be

charged all at once, charge gradually while operating the unit in Cooling Operation.

### [Page 38: In Case Refrigerant Is Leaking](#)

10-6. In Case Refrigerant is Leaking Never attempt to charge additional refrigerant when refrigerant has been leaking CAUTION from the unit. Follow the procedure described below to locate points of leaks and carry out repairs, then recharge the refrigerant. (1) Detecting Leaks Use the detector for R410A to locate refrigerant leak (1) Detect leaks points.

[Page 39](#) (6) Recharging Configuration and characteristics of cylinders Valve Be sure to charge the specified amount of refrigerant in liquid state using the service port of the wide tube service valve. The proper amount is listed on the unit's nameplate. When the entire amount cannot be charged all at once, charge gradually while operating the unit in Cooling Operation.

### [Page 40: Charging Additional Refrigerant](#)

10-7. Charging Additional Refrigerant 10-7-1. When Tubes are Extended Observe the proper amount of refrigerant as stated in this service manual or the installation manual that came with the indoor unit. Charge additional refrigerant in liquid state only. Never charge additional refrigerant if refrigerant is leaking from the unit. Follow CAUTION instructions given in "10-6.

### [Page 41: Appendix](#)

APPENDIX UNIT COMBINATION TABLES NOTE Be sure to operate the air conditioning system only when 2 or more indoor units have been installed. If operated with only a single unit installed, the returning fluid to the compressor may cause a malfunction.

[Page 42](#) 4-Room Outdoor Unit Combination Table Outdoor Unit SAP - CMRV3143GJH NOTE 2.8: SAP-#MRV93GJH 3.6: SAP-#MRV123GJH Single-room operation 5.0: SAP-#MRV183GJH 7.0: SAP-#MRV243GJH Indoor Unit Capacity (kW) Indoor Unit Indoor unit Combination Combination Room A Room B Room C Room D Total Performance Power Input (W) Current (A) Min.

[Page 43](#) Outdoor Unit SAP - CMRV3143GJH NOTE 2.8: SAP-#MRV93GJH 3.6: SAP-#MRV123GJH 5.0: SAP-#MRV183GJH 3-room operation Three-room operatio 7.0: SAP-#MRV243GJH Indoor Unit Capacity (kW) Indoor Unit Indoor unit Combination Combination Room A Room B Room C Room D Total Performance Power Input (W) Current (A) Min.

[Page 44](#) Outdoor Unit SAP - CMRV3143GJH NOTE 2.8: SAP-#MRV93GJH 3.6: SAP-#MRV123GJH 4-room operation 5.0: SAP-#MRV183GJH Four-room operation 7.0: SAP-#MRV243GJH Indoor Unit Capacity (kW) Indoor Unit Indoor unit Combination Combination Room A Room B Room C Room D Total Performance Power Input (W) Current (A) Min.

[Page 45](#) SANYO Electric Co., Ltd. Osaka, Japan 700543 MAY/2003 Printed in Japan...

This manual is also suitable for:

[Sap-cmr3143gjh-cSap-kmrv93gjhSap-kmrv123gjhSap-kmrv183gjhSap-kmrv243gjhSap-dmrv93gjh](#) ... [Show all](#)