Operation Description - Toshiba RAS-B10SKVP-E Service Manual

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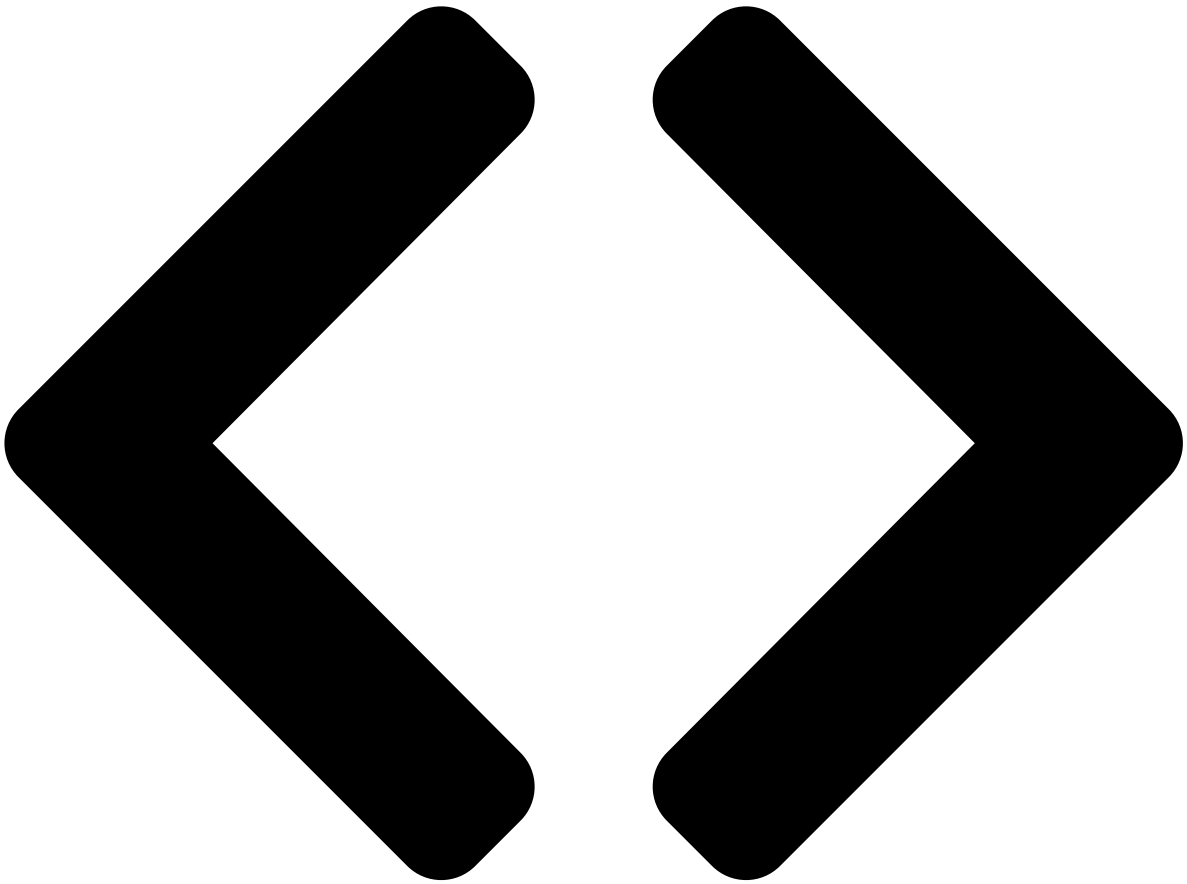
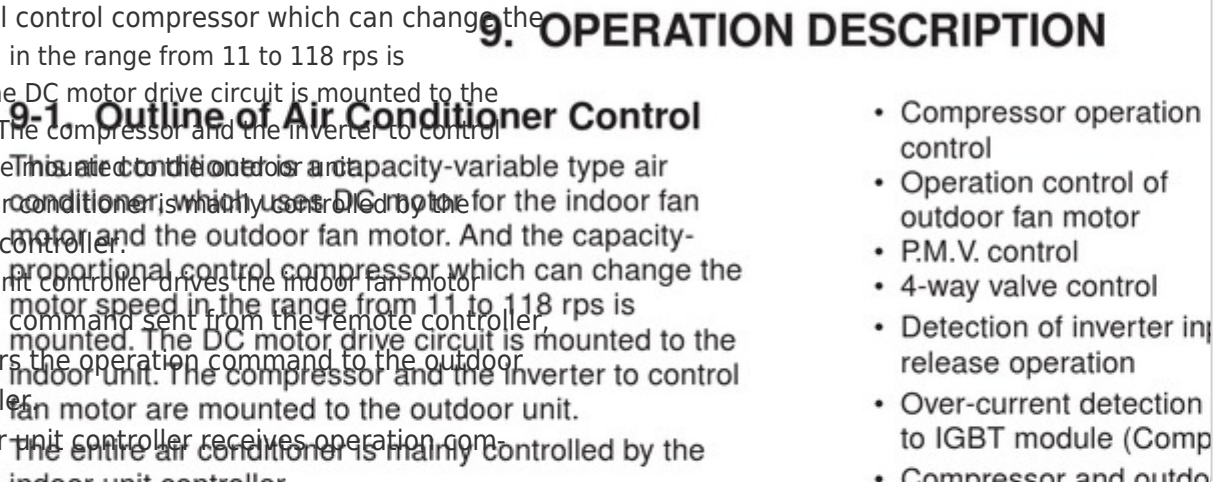


9-1. Outline of Air Conditioner Control

This air conditioner is a capacity-variable type air conditioner, which uses DC motor for the indoor fan motor and the outdoor fan motor. And the capacity-proportional control compressor which can change the motor speed in the range from 11 to 118 rps is mounted. The DC motor drive circuit is mounted to the indoor unit. The compressor and the inverter to control fan motor are mounted to the outdoor unit.
The entire air conditioner is mainly controlled by the indoor unit controller.
The indoor unit controller drives the indoor fan motor based upon command sent from the remote controller, and transfers the operation command to the outdoor unit controller.
The outdoor unit controller receives operation com-



mand from the indoor unit side, and controls the outdoor fan and the pulse motor valve. (P .M.V)
Besides, detecting revolution position of the compressor motor, the outdoor unit controller controls speed of the compressor motor by controlling output voltage of the inverter and switching timing of the supply power (current transfer timing) so that motors drive according to the operation command.
And then, the outdoor unit controller transfers reversely the operating status information of the outdoor unit to control the indoor unit controller.

As the compressor adopts four-pole brushless DC motor, the frequency of the supply power from inverter to compressor is two-times cycles of the actual number of revolution.

1. Role of indoor unit controller

The indoor unit controller judges the operation commands from the remote controller, and assumes the following functions.

- Judgment of suction air temperature of the indoor heat exchanger by using the indoor temp. sensor. (TA sensor)
- Judgment of the indoor heat exchanger temperature by using heat exchanger sensor (TC sensor) (Prevent-freezing control and super heat control, etc.)
- Judgment of inlet indoor heat exchanger temperature by using heat exchanger sensor (TCJ sensor) (Super heat control etc.)
- Louver motor control
- Indoor fan motor operation control
- LED (Light Emitting Diode) display control
- Transferring of operation command signal (Serial signal) to the outdoor unit
- Reception of information of operation status (Serial signal information) from the outdoor unit and judgment/display of error
- Air purifier operation control

2. Role of outdoor unit controller

Receiving the operation command signal (Serial signal) from the indoor unit controller, the outdoor unit performs its role.

9. OPERATION DESCRIPTION

- Compressor operation control
- Operation control of outdoor fan motor
- P.M.V. control

9. OPERATION DESCRIPTION

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- Compressor operation control
- Operation control of outdoor fan motor
- P.M.V. control
- 4-way valve control
- Detection of inverter in release operation
- Over-current detection to IGBT module (Comp
- Compressor and outdo serial signal is off (whe reach the board assem trouble of the signal sy
- Transferring of operatio signal) from outdoor un controller
- Detection of outdoor te revolution control
- Defrost control in heati measurement by outdo control for 4-way valve

3. Contents of operation (Serial signal) from in outdoor unit controlle

The following three types the indoor unit controller.

- Operation mode set on
- Compressor revolution by indoor temperature (Correction along with ture and correction of i temperature are added
- Temperature of indoor
- For these signals ([Ope pressor revolution] indo perature), the outdoor input current to the inve followed operation with does not exceed the all

4. Contents of operation (Serial signal) from ou to indoor unit control

The following signals are controller.

- The current operation

• 4-way valve control
• Detection of inverter input current and current release operation
• Over-current detection and prevention operation to IGBT module (Compressor stop function)
• Compressor and outdoor fan stop function when serial signal is off (when the serial signal does not reach the board assembly of outdoor control by trouble of the signal system)
• Transferring of operation information (Serial signal) from outdoor unit controller to indoor unit controller
• Detection of outdoor temperature and operation revolution control
• Defrost control in heating operation (Temp. measurement by outdoor heat exchanger and control for 4-way valve and outdoor fan)

3. Contents of operation command signal (Serial signal) from indoor unit controller to outdoor unit controller

The following three types of signals are sent from the indoor unit controller.
• Operation mode set on the remote controller
• Compressor revolution command signal defined by indoor temperature and set temperature. (Correction along with variation of room temperature and correction of indoor heat exchanger temperature are added.)
• Temperature of indoor heat exchanger
• For these signals ([Operation mode] and [Compressor revolution] indoor heat exchanger temperature), the outdoor unit controller monitors the input current to the inverter, and performs the followed operation within the range that current does not exceed the allowable value.

4. Contents of operation command signal (Serial signal) from outdoor unit controller to indoor unit controller

The following signals are sent from the outdoor unit controller.
• The current operation mode
• The current compressor revolution
• Outdoor temperature
• Existence of protective circuit operation

For transferring of these signals, the indoor unit controller monitors the contents of signals, and judges existence of trouble occurrence. Contents of judgment are described below.
• Whether distinction of the current operation status meets to the operation command signal

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The outdoor unit controller receives operation command from the indoor unit side, and controls the outdoor fan and the pulse motor valve. (P.M.V)
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And then, the outdoor unit controller transfers reversely the operating status information of the outdoor unit to control the indoor unit controller.

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• Whether protective circuit operates
When no signal is received from the outdoor unit controller, it is assumed as a trouble.

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- Compressor operation control
- Operation control of outdoor fan motor
- P.M.V. control
- 4-way valve control
- Detection of inverter in

Operations followed to judgment of serial signal from indoor side.

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