TOSHIBA

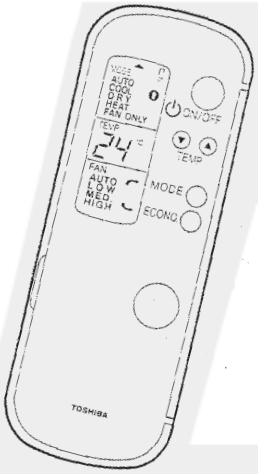
FILE NO. A90-9714

SERVICE MANUAL

AIR-CONDITIONER

RAV HEAT PUMP RANGE

INFRARED REMOTE CONTROL



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CONTENTS

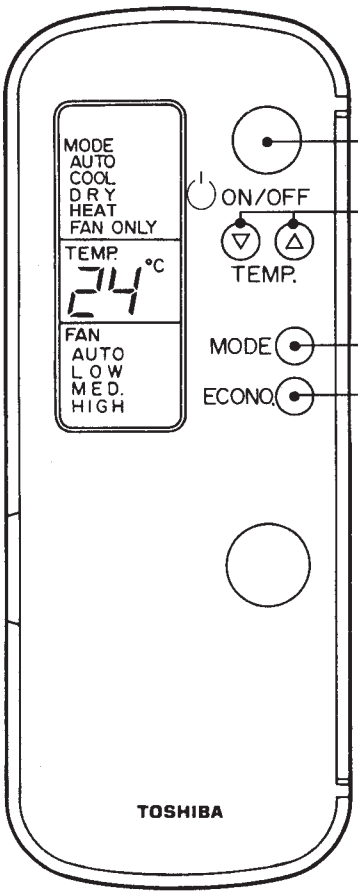
SUMMARY

- The infrared remote controller within this manual conforms with the protection requirements of European Directives 89/ 336/EEC Electromagnetic Compatibility and 73/23/EEC Low Voltage.

1. OPERATION DESCRIPTION

1-1. REMOTE CONTROLLER

1-1-1. Remote Functions (Cover closed)



ON/OFF Button

- Push this button to start operation. (A receiving beep is heard)
- Push the button to stop operation. (A receiving beep is heard)

Temperature button (TEMP)

▲ The set temperature is increased to a max 30ºC.

▼ The set temperature is decreased to a min of 17ºC.

Mode select button (MODE)

Push this button to select modes. Each time you push the button, a mode is selected in a sequence that goes from AUTO, COOL, DRY,HEAT, FAN ONLY, and back to AUTO. (A receiving beep is heard).

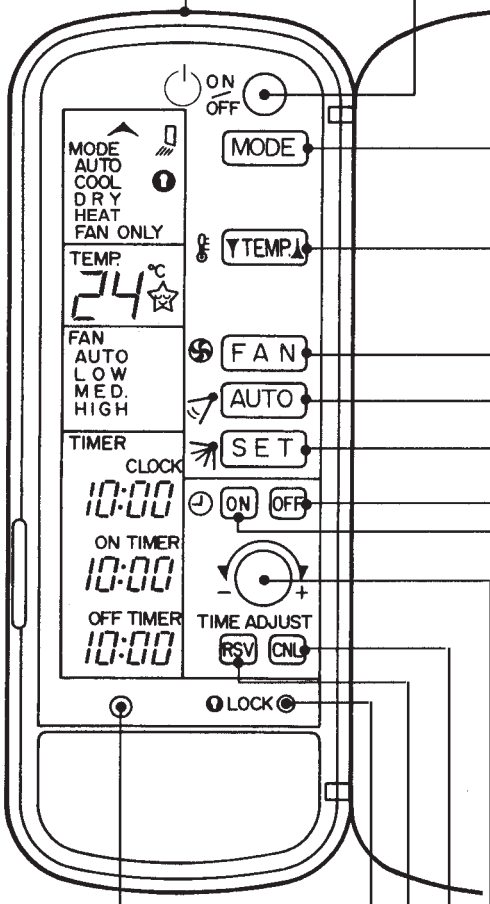
Economy button (ECONO)

- Push this button to set the economical operation mode of the air conditioner. (A receiving beep is heard)

1-1-2. Remote Functions (Cover Open)

ON/OFF Button
- Push this button to start operation. (A receiving beep is heard)
- Push the button to stop operation. (A receiving beep is heard)

Infrared signal transmitter
Transmits the signal to the indoor unit



Cover closed functions
- Push this button to show functions as with the cover closed.

Function lock button (LOCK)
- Push this button to lock settings.
- Push this button again to cancel lock function.

Reserve button (RSV)
- Push this button to set timer . (A receiving beep is heard).

Mode select button (MODE)
Push button to select modes. Each time you push the button, a mode is selected in a sequence that goes from AUTO, COOL, DRY, HEAT, FAN ONLY, and back to AUTO. (A receiving beep is heard).

Temperature button (TEMP)
▲ The set temperature is increased to a max 30ºC.
▼ The set temperature is decreased to a min of 17ºC.

Fan speed button (FAN)
- Push this button to select fan speed.
- When you select AUTO, the fan speed is automatically adjusted according to the room temperature. You can also manually select the desired fan speed from the three settings. Low, Med, High. (A receiving beep is heard).

Auto louver button (AUTO)
- Push this button to operate the louver. (A receiving beep is heard).
- Push this button again to stop louver operation. (A receiving beep is heard).

Set louver button (SET)
- This button has no function on RAV units.

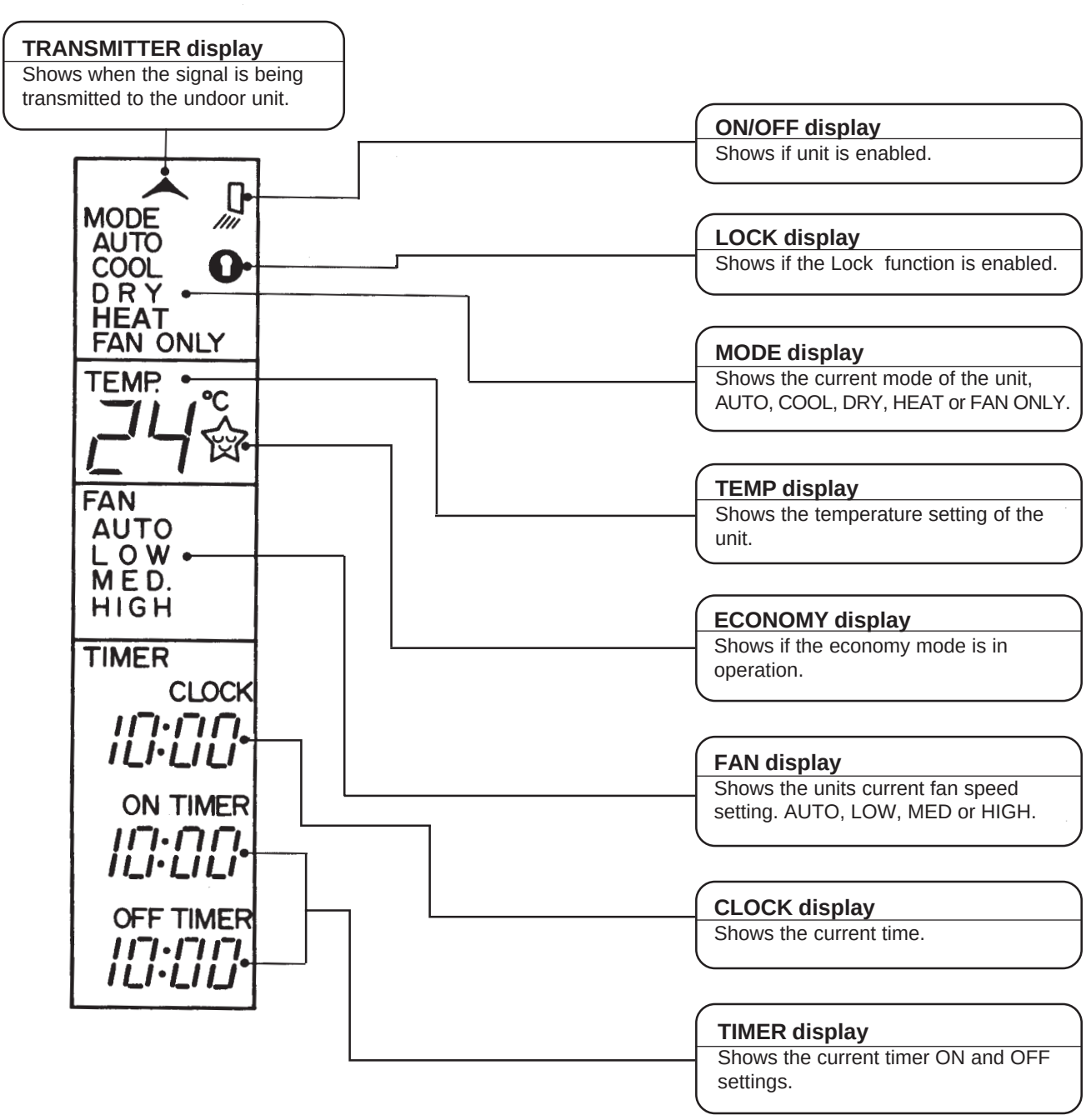
Off timer button (OFF)
- Push this button to set the OFF timer.

On timer button (ON)
- Push this button to set the ON timer.

Time adjust button
- Rotate this to increase/decrease time settings.

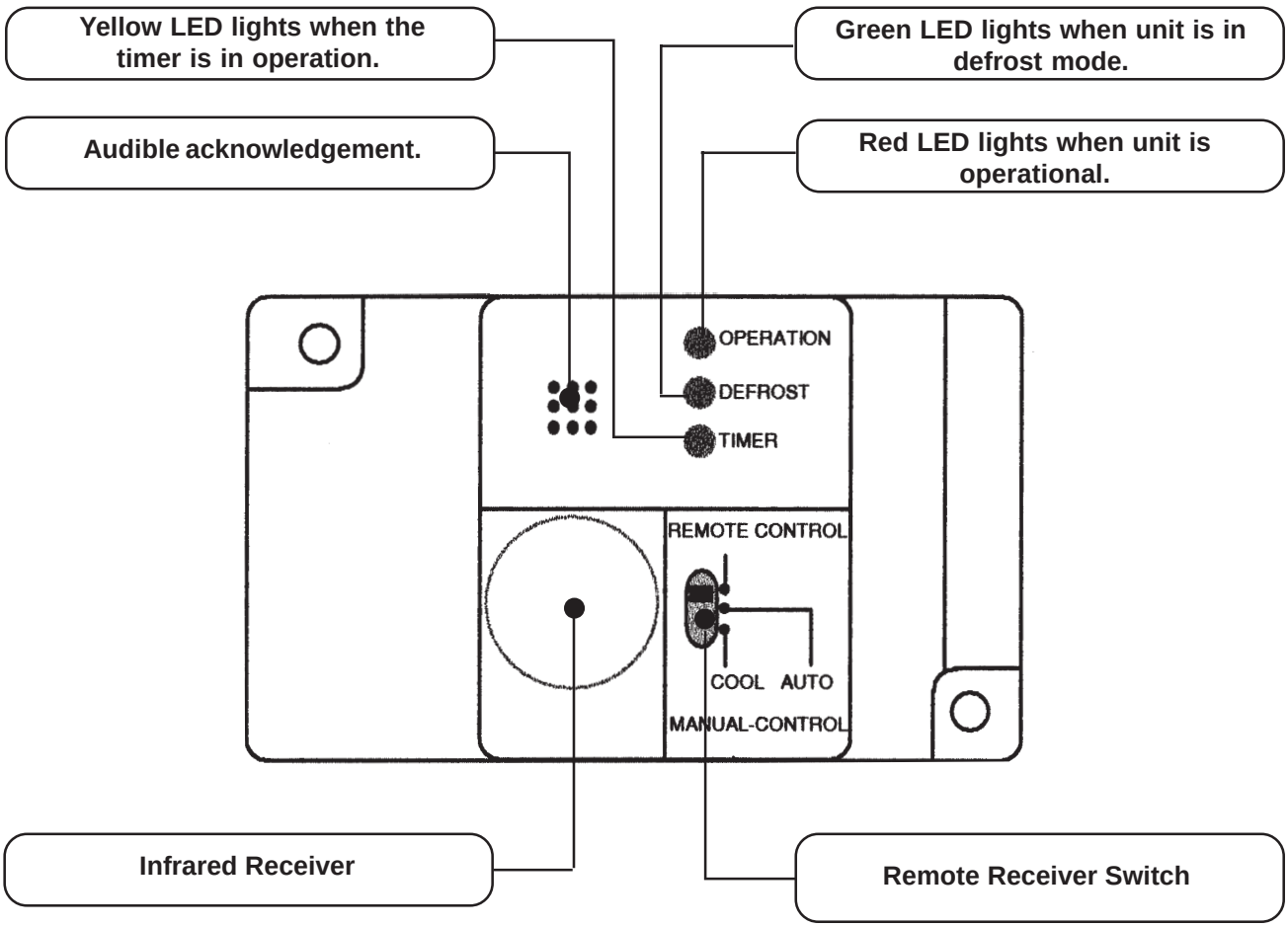
Cancel button (CNL)
- Push this button to cancel timer operation. (A receiving beep is heard).

1-1-3. Names and Functions of Indicators on Remote Controller



1-2. REMOTE RECEIVER FUNCTIONS (FITTED TO INDOOR UNIT)

1.2.1. Remote Receiver Features



1-2-2. Remote Receiver Switch

Remote control	**The unit will be controlled by the Infrared Remote Control.**
Auto	**The unit will operate in temporary Auto mode with the set temperature at 24°c**
Cool	**The unit will operate in temporary Cooling mode with the set temperature at 17°c**

The air conditioner can be controlled using this method in the event of misplacing the Infrared remote controller or its malfunction.

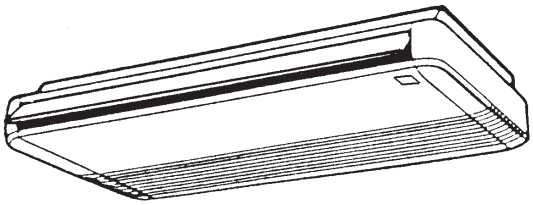
1-2-3. Audible acknowledgement

The remote receiver acknowledges each transmission from the Infrared remote controller, with an audible beep.

1-3. HANDLING THE REMOTE CONTROLLER

1-3-1. Location of the Remote Controller

Operate the remote controller where its signals can reach the receiver on the air conditioner (within 7m)



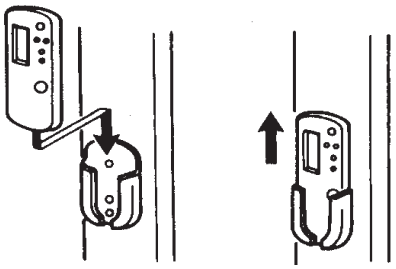
1-3-2. Remote Controller Mounting bracket

A mounting bracket is supplied with the remote controller.

(1) Installing the mounting bracket

Install the bracket for the remote controller where the unit can be operated, with the remote in the bracket.

(2) Fitting and removing the remote controller

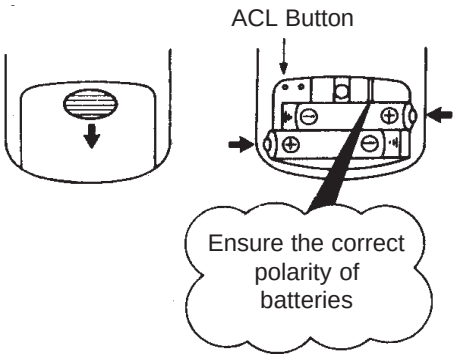


To mount, hold the remote controller parallel to the mounting bracket and push it in fully. To remove, slide the remote controller upwards and out from the mounting bracket.

1-3-3. Replacing Batteries

The remote controller uses two alkaline dry batteries (LR03 AAA size).

(1) Remove the cover of the battery compartment at the back of the remote controller by sliding it out in the direction of the arrow.
Remove used batteries and dispose of responsibly, then insert new batteries.
(2) Reset the remote controller by pressing the ACL button in the battery compartment, with a pointed object
(3) Replace the cover of the battery compartment.
(4) If remote controller fails to operate properly, repeat reseting by pressing ACC button.



Notes:

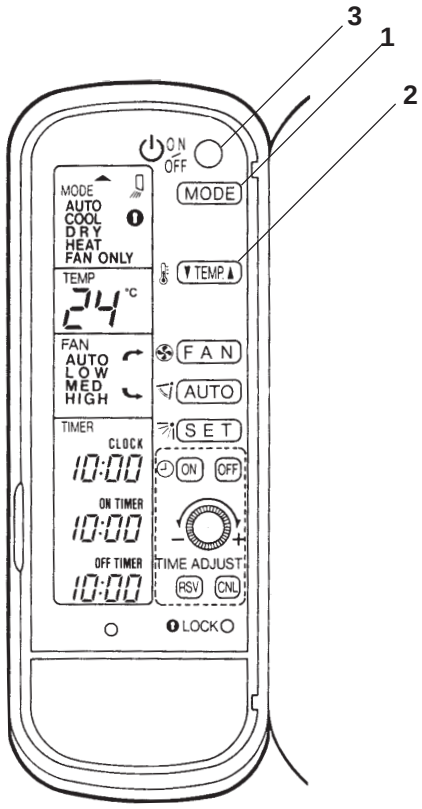
- When replacing batteries, use correct type. Incorrect batteries may cause the remote controller to malfunction.
- If you do not use the remote controller over a long period, remove the batteries. Otherwise, battery leakage may damage the remote controller.
- The average battery life during normal use is approximately one year.
- Replace the batteries when there is no receiving beep from the indoor unit or if the transmission indicator on the remote control unit fails to show.

1-3-4. Cautions

- The air conditioner will not operate if curtains, doors or other materials block the signal from the remote controller to the indoor unit.
- Protect the remote controller from moisture.
- Do not expose the remote controller to direct sunlight or heat.
- If the infrared signal receiver on the indoor unit is exposed to direct sunlight, the air conditioner may not function properly.
- If the room using the air conditioner has fluorescent lighting with electronic starters, signals may not be properly received. If you are planning to use such fluorescent lamps, consult your local dealer.
- If other electrical appliances react to the remote control, either move these appliances or consult your local dealer.

1-4 OPERATING MODES

Once selected the operating mode is stored in the unit's microcomputer memory. Thereafter, the air conditioner will operate under the same conditions when you operate the ON/OFF button of the remote controller.



1-4-1. AUTO Operation

When you set the air conditioner in AUTO mode, it initially selects cooling mode. Then depending on the room temperature the mode of operation may change.

Operation Steps

Supply Power On

The OPERATION LED on the remote receiver starts flashing.

(1) MODE button

- Select AUTO.

(2) TEMP. button

- Push the TEMP. button.
- Select the required temperature between 17°C to 30°C.

(3) ON/OFF button

- Push this button to start the air conditioner.
- The OPERATION LED on the remote receiver lights. The operating mode is selected in accordance with the room temperature and operation starts after approximately 3 minutes.

Stop: ON/OFF button

- Push this button again to stop the air conditioner.

Note:

- If the AUTO mode is uncomfortable, you can select the desired conditions manually.
- When you select the AUTO mode, you do not have to set the fan speed. The FAN speed display will show AUTO and the fan speed will be automatically controlled.

1-4-2. HEAT Operation

Operation Steps

Supply Power On

The OPERATION LED on the display panel of the indoor unit starts flashing.

(1) MODE button

- Select HEAT mode.

(2) TEMP button

- Set the required temperature.

(3) FAN button

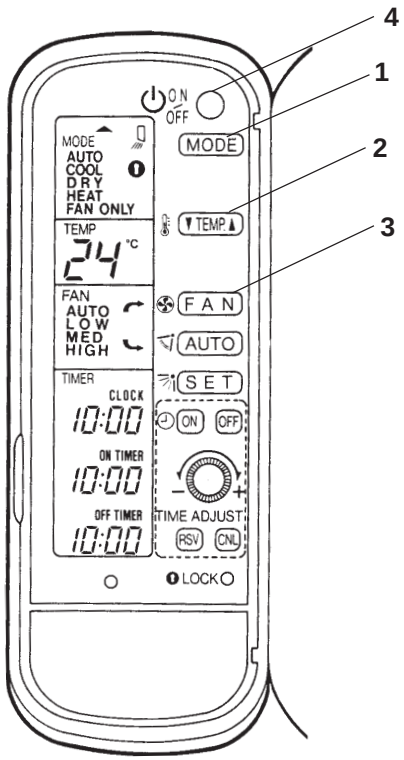
- Select any of the “AUTO”, “LOW”, “MED” and “HIGH”.

(4) ON/OFF button

- Push this button again to start the air conditioner.
- The OPERATION and DEFROST LEDs light on the remote receiver. After a period of preheating the DEFROST LED extinguishes and heating operation starts.

Stop: ON/OFF button

- Push this button again to stop the air conditioner.



(A) 1-4-3. COOL Operation

Operation Steps

Supply Power On

The OPERATION LED on the remote receiver starts flashing.

(1) MODE button

- Select COOL mode.

(2) TEMP button

- Push the TEMP. button.
- Cooling 17°C or higher

(3) FAN button

- Select any of the “AUTO”, “LOW”, “MED” and “HIGH”.

(4) ON/OFF button

- Push this button again to start the air conditioner.
- The OPERATION LED on the display panel of the Indoor unit lights. Operation starts after approximately 3 minutes.

Stop: ON/OFF button

- Push this button again to stop the air conditioner.

(B) 1-4-4. FAN ONLY Operation

- The FAN ONLY mode does not control temperature. Therefore, perform only steps (1), (3) and (4) to select this mode.

1-4-5. DRY Operation

Operation Steps

Supply Power On

The OPERATION LED on the display panel of the indoor unit starts flashing.

(1) MODE button

- Select DRY.

(2) TEMP button

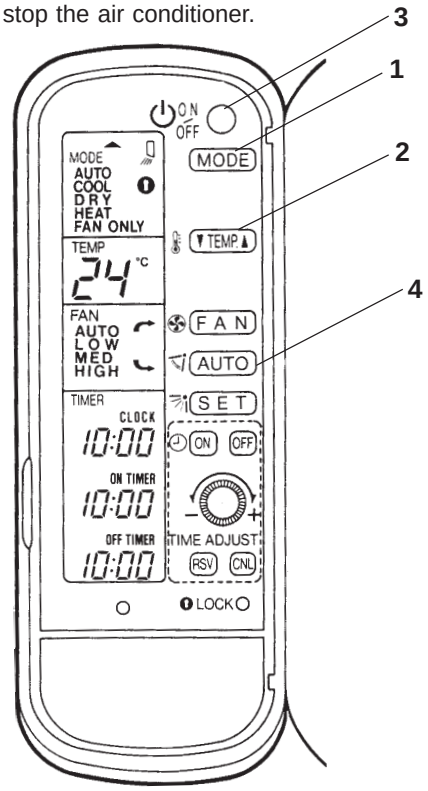
- Push the TEMP. button.
- Select the required temperature between 17°c to 30°c.
- The fan speed indicator displays AUTO.
- Low indoor fan speed will be selected automatically.

(3) ON/OFF button

- Push this button again to start the air conditioner.
- The OPERATION LED on the remote receiver unit lights. Operation starts after approximately 3 minutes. (If you select FAN ONLY mode, the unit will start immediately.)

Stop: ON/OFF button

- Push this button again to stop the air conditioner.



1-4-6. ECONO. Operation

Econo can be selected in the AUTO, COOL and HEAT modes of operation. The fan speed selector changes to AUTO. The air conditioner now operates in the economy mode.

1-4-7. Louver Operation

(4) AUTO Button

- When this button is first pressed the louver will oscilate, its position can be fixed in a desired direction by pressing the button again.

1-5. TIMER OPERATION

1-5-1. Setting the Clock

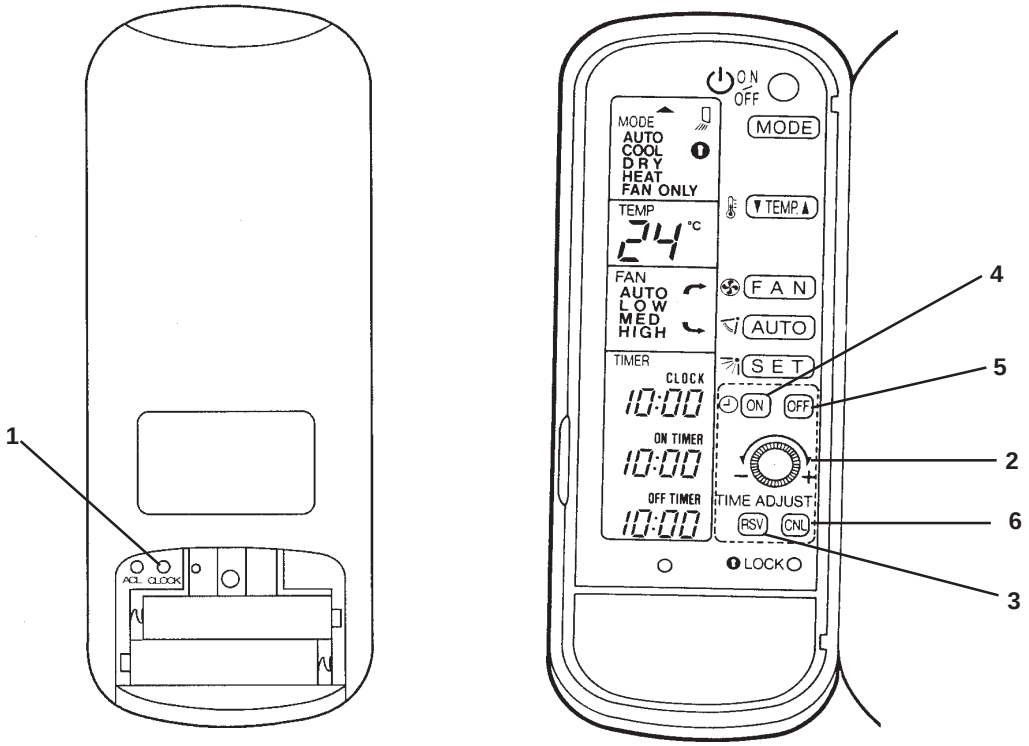
- (1) Push the clock set button in the battery compartment. The clock " : " starts flashing.
- (2) Rotate the TIME ADJUST dial to set the time
- (3) Press the RSV button when complete. The clock " : " remains constant.

1-5-2. Setting the On time

- (4) Press the on button. The ON TIME " : " starts flashing.
- (2) Rotate the TIME ADJUST dial to set the time.
- (3) Press the RSV button when complete. The ON TIME " : " remains constant.
- The yellow timer LED will Iluminate on the remote receiver and the air conditioner will begin to operate in the previous set mode at the set on time.

1-5-3 Setting the Off time

- (5) Press the off Button. The OFF TIME " : " starts flashing.
- (2) Rotate the TIME ADJUST dial to set the time.
- (3) Press the RSV button when complete. The OFF TIME " : " remains constant.
- The yellow timer LED will Iluminate on remote receiver and the Air conditioner will turn off at the set time.



1.5.4 Cancel Button

- Push the CNL button to cancel the timer setting.
  The yellow LED will extinguish.

2. TROUBLESHOOTING

2-1. FAULT FINDING

2-1-1. Role of Indoor Unit.

The indoor unit receives operation commands from the remote and monitors or controls the following factors.

- Measurement of the return air temperature using the sensor (T_A)
- Louver motor control
- Control of the indoor fan motor operation
- Control of the LED display
- Control of the outdoor unit compressor and the outdoor fan motor.

2-1-2. Remote Receiver Fault Functions

The L.E.D's on the receiver can display check code information.

	RED Operation LED Flash (1Hz)	**YELLOW** Timer LED Flash (5Hz)	**GREEN** Defrost LED Flash (5Hz)	**RED** Operation LED Flash (5Hz)
Power Failure (When power on)	◯			
Service Mode (Selected)		◯		
Service Mode (Check code)		◯		◯
High pressure Switch Fault		◯	◯	◯

2-1-3 Possible Causes of abnormal operation.

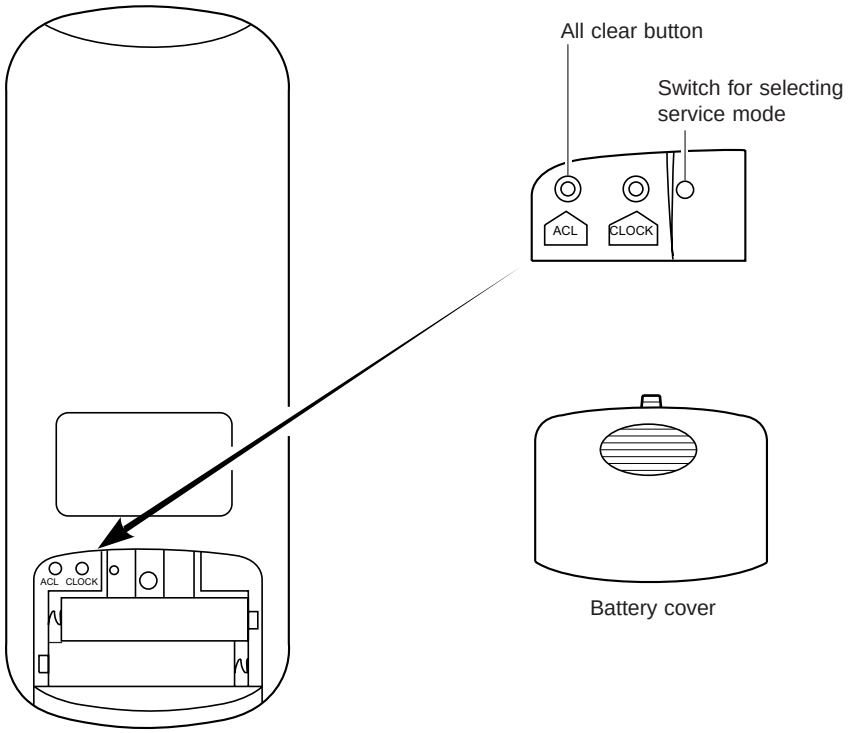
System	**Check**		**Primary judgement**
Indoor unit will not operate from infrared Remote Controller.	Isolate power supply and then reconnect before attempting to operate the remote control.	Remote control is not possible.	The indoor part (including the remote control) is defective. (Check batteries.)
		Remote control is possible.	O.K.

2-2. CHECK CODES

The fault codes can be checked by putting the remote controller into service mode, and then checking the LED's on the receiver according to the table in 2-1-2.

2-2-1. Selecting service mode

Push the button provided under the battery cover of the wireless remote control with a tip of pencil for more than 3 seconds. make sure **"00"** is showing on the display.



2-2-2. Reverting to Normal Mode

Push the all clear button (ACL) on the rear bottom of the wireless remote control with a tip of pencil for more than 3 seconds. Make sure the operation mode display, fan speed display, clock display and setting temperature display are turned on and " **:** " of the clock display is flashing.

2-2-3. Cautions when carrying out servicing

1) After completion of servicing, always push the all clear (ACL) button to return the operation mode to the normal mode.
2) After completion of servicing by the check code, isolate the power supply and then reconnect to reset memorized contents of the microcomputer to the initial status.

2-2-4. Check Code Diagnosis

The system can store and recall any of a predetermined selection of codes which can indicate associated electrical or refrigeration faults.

Diagnosis by the check codes is conducted with procedures shown below.

a) Enter the service mode and make sure the off timer display of the remote control shows "00".

b) Operate the "ON/OFF" key and make sure the timer lamp on the display section is flashing (5 Hz).

c) Next press the Temp △ key and the displayed HEX code will increase by one. The receiver will then beep. When the displayed check code matches the code on the indoor unit. The operation L.E.D will light and the HEX code shown should be looked up in the following tables.

d) If other buttons on the remote are pressed in the service mode, the display will change as shown in the table below. This option enables check code numbers to be quickly reached.

e) Fault codes can only be retrieved for the first unit if multiple units are wired in a group, therefore group operation is not recommended.

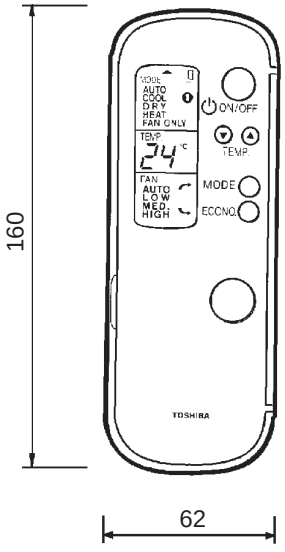
Operating key	Indication after operation
ON/OFF	"00"
TEMP. △ (Up)	The display code is increased by "1".e.g. "02" → "03"
TEMP. ▽ (Down)	The display code is decreased by "1".e.g. "02" → "01"
"AUTO" LOUVER	The display code is increased by 16 e.g. "02" → "12"
"SET" LOUVER	The display code is repeated e.g. "02" → "02"

2-2-5. List of Check Codes

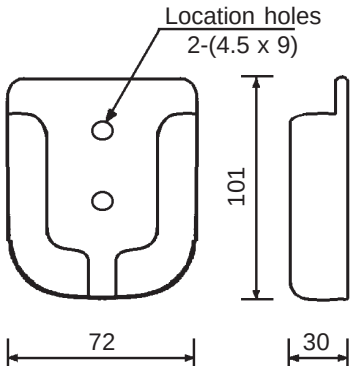
DIAGNOSTIC FUNCTIONS			JUDGEMENT AND ACTION
CHECK CODE	SYMPTON	STATUS OF AIR CONDITIONER	
01	ROOM TEMP. SENSOR (TA). Out of place, break, short-circuit.	Operation continuing	1. Check the indoor temp. sensor. 2. Check the indoor PC board.
0d	INDOOR HEAT-EXCHANGER SENSOR (TC). Out of place, break, short-circuit.	Operation continuing	1. Check the indoor heat-exchanger sensor. 2. Check the indoor PC board.
04	RETURN SIGNAL NOT COMING TO INDOOR 1) Wrong wiring in connecting cable (serial signal).	Operation continuing	1. If outdoor unit does not work at all. (1) Check the connecting cable correct wrong wiring. (2) Check the outdoor PC board. 2. If operates normally.Between indoor terminal plates 2 and 3, return signal is: Available: Check the indoor PC board. Not available: Check the outdoor PC board.
09	4-WAY VALVE SYSTEM 1) Indoor heat-exchanger temperature rises, after starting cooling operation. 2) Indoor heat-exchanger temperature drops after starting heating operation.	Operation continuing	1. Check the 4-way valve. 2. Check the 2-way valve and check valve. 3. Fault with indoor heat exchanger sensor. 4. Check the indoor PC board. 5. Two systems may be cross wired.

09	OTHER CYCLE SYSTEM 1) Indoor heat exchange temperature does not change after starting cooling/heating operation. 2) When transmitting instruction for stopping compressor by freeze preventing control.	Operation continuing	1. Compressor case thermostat, IOL, OL operation. (contactor OFF, compressor stops: AH8 Models) (contactor ON, compressor stops: AH Models) 2. Indoor heat-exchange sensor out of place. 3. Check the indoor PC board. 4. Check that service valves are OPEN. 5. Two systems may be cross wired.
		Outdoor unit stops (indoor fan L)	1. Check the charged amount of refrigerant gas. (Gas shortage → gas supplement, check for gas leaks) 2. Indoor fan locked.
18	DEFROST SENSOR (TE) Out of place, break, short-circuit.	Full stop	1. Check the defrosting sensor. 2. Check the outdoor PC board.
19	OUTDOOR HEAT-EXCHANGER SENSOR (TL) Out of place, break, short-circuit.	Full stop	1. Check the outdoor heat-exchanger sensor. 2. Check the outdoor PC board.
21	HIGH PRESSURE SWITCH High pressure switch does not reset. {5 sec in cooling 30 sec in heating}	Full stop	1. Check the high pressure switch. 2. Check the outdoor PC board.
99	WRONG WIRING OF REMOTE CONTROL UNIT Indoor unit does not operate at all.	Full Stop	1. Check the wiring between remote control unit and indoor unit. 2. Check the indoor unit PC board.
1E	TD SENSOR	Full stop	1. Check the TD sensor 2. Check the outdoor PCB 3. Possible refrigerant gas leak 4. Refrigerant cycle failure 5. Overload relay

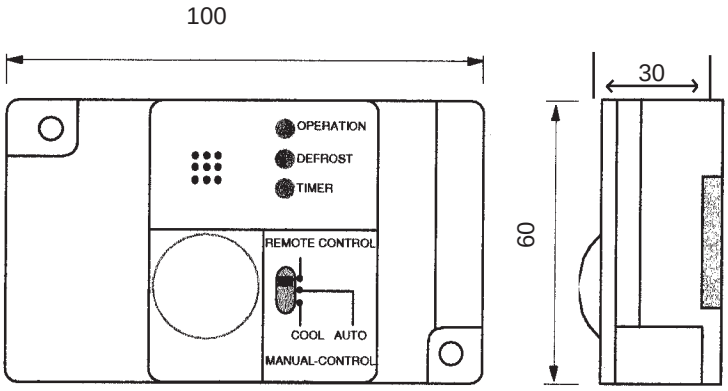
3. CONSTRUCTION VIEWS AND PARTS LIST



Remote controller



Remote Holder



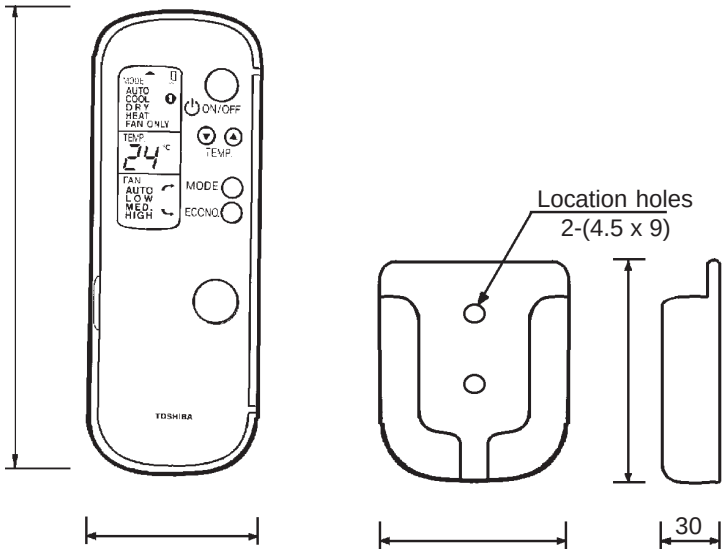
Remote Receiver

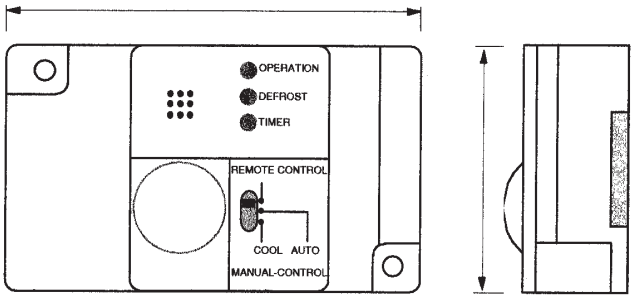
Description	Part Number
Remote controller	43069666
Holder, Remote	43063253
Remote Receiver	43A69009

4. SPECIFICATIONS OF ELECTRICAL PARTS

No	PARTS NAME	TYPE	SPECIFICATIONS
1	Remote Control	WH-C2YE	Infrared remote control transmitter
2	Remote Receiver	XWS-DS5	Infrared remote control receiver
3	Battery	2 x LR03 (AAA)	1.5v

3. CONSTRUCTION VIEWS AND PARTS LIST





4. SPECIFICATIONS OF ELECTRICAL PARTS

PARTS NAME	TYPE	SPECIFICATIONS
Remote Control	WH-C2YE	Infra-red remote control transmitter
Remote Receiver	XWS-DS5	Infra-red remote control receiver
Battery	2 x LR03 (AAA)	

TOSHIBA CONSUMER PRODUCTS (U.K.) LTD.
PORSHAM CLOSE, BELLIVER INDUSTRIAL ESTATE, PLYMOUTH, PL6 7DB, UK