LC DX Interface
Installation manual

Model name:

For commercial use

RAV-DXC010 LC DX Interface

Installation manual

LC DX Interface 1

English



Please read this Installation Manual carefully before installing the LC DX interface.

- This Manual describes the installation method of the LC DX interface.
- You must also refer to the Installation Manual attached to the Toshiba outdoor unit.
- Please follow the manual(s) for your Air Handling Unit (local supply).
- Toshiba Carrier UK (Ltd) does not take any responsibility on the local design.

ADOPTION OF R410A REFRIGERANT

This Air Conditioner is a type which adopts a HFC refrigerant (R410A) instead of the conventional refrigerant R22 in order to prevent destruction of the ozone layer.

This appliance is for commercial use only and should not be accessible to the general public.
This appliance is not intended for use by person (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
Children should be supervised to ensure that they do not play with the appliance.

Contents

1	SUPPLIED PARTS	2
2	PRECAUTIONS FOR SAFETY	2
3	INSTALLATION	3
4	ELECTRICAL WORK	7
5	APPLICABLE CONTROLS	11
6	TEST RUN	18
7	TROUBLE SHOOTING	19
8	OPTIONAL PARTS	22
9	DECLARATION OF CONFORMITY	24
10	SERVICE PARTS	25



This symbol mark is for EU countries only.
This symbol mark is according to the directive 2002/96/EC Article 10 Information for users and Annex IV.
This product is designed and manufactured with high quality materials and components which can be recycled and reused.
This symbol means that electrical and electronic equipment, at the end-of-life, should be disposed of separately from your household waste.
Please dispose of this equipment at your local community waste collection / recycling centre.
In the European Union there are separate collection systems for used electrical and electronic product.

1 SUPPLIED PARTS

The LC DX Interface is designed to allow the connection of a third party air handling unit (with R410A DX Coil) to a Toshiba LC outdoor unit (DI / SDI / DI-Big).

The Interface consists of a LC DX Controller, including sensors (TC, TCJ and TA), and accessories that include parts which the installer needs to assemble (including brazing).

LC DX Interface

RAV-DXC010



Item	Description	Qty
	Panel Door Key	1
	Sensor Holder	2
	Fix Plate	2
	P Clamp (TA)	1
	Installation manual (English)	1
	IM Multi-Language CD	1

2 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this “PRECAUTIONS FOR SAFETY” carefully before installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
- Follow the installation manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the installation manual.

CAUTION **Refrigerant (R410A) Air Conditioner Installation**

- **THIS AIR CONDITIONER ADOPTS THE HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.
To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are changed from those of conventional refrigerant.
Accordingly the exclusive tools are required for the new refrigerant (R410A).
For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with the pressure-resistance force and impurity in it.

CAUTION **To Disconnect the Appliance from Main Power Supply**

This appliance must be connected to the main power supply by means of a switch with a constant separation of at least 3mm.

3 INSTALLATION



Use the following information to specify the appropriate AHU and DX Coil for each outdoor unit. The DX Coil design should be optimised for Cooling (Rated) Condition:-

- The DX Coil must be suitable for R410A.
- The counter flow principle must be observed.
- Cooling (Rated): Saturated Suction Temp. (Evaporating Temp.): 7°C
- Heating (Rated): Saturated Discharge Temp. (Condensing Temp.): 44°C
- Target Suction Super Heat: 5K
- System Maximum Operating Pressure: 4.15MPa
- DX Coil must satisfy Burst Pressure: More than 12.45MPa (3 times Maximum Operating Pressure)

Model	AHU Air Volume (m^3/hr)			Coil Internal Volume (dm^3)		Cooling Capacity (kW)			Heating Capacity (kW)			DI DI-Big [SM]	SDI [SP]
Size	Min.	Rated	Max.	Min.	Max.	Min.	Rated	Max.	Min.	Rated	Max.	(RAV-***-E)	(RAV-***-E)
2HP	720	900	1080	0.8	1.1	4.1	5.3	5.6 SM 5.6 SP	4.6	5.6	6.3 SM 7.4 SP	SM563AT	SP564AT
3HP	1060	1320	1580	1.0	1.4	5.4	7.1	7.4 SM 8.0 SP	7.5	8.0	9.0 SM 10.6 SP	SM803AT	SP804AT
4HP	1280	1600	1920	1.5	2.1	7.2	10.0	11.2 SM 12.0 SP	8.1	11.2	12.5 SM 13.0 SP	SM1103AT	SP1104AT(8)
5HP	1680	2100	2520	1.7	2.7	10.1	12.5	13.2 SM 14.0 SP	11.3	14.0	16.0 SM 16.5 SP	SM1403AT	SP1404AT(8)
6HP	1850	2800	3740	1.7	3.2	12.6	14.0	16.0	14.1	16.0	19.0	SM1603AT	SP1604AT8
8HP	2880	3600	4320	3.0	4.2	14.1	20.0	22.4	16.1	22.4	25.0	SM2244AT8	--
10HP	3360	4200	5040	3.0	5.4	20.1	23.0	27.0	22.5	27.0	31.5	SM2804AT8	--

Cooling & Heating output figures are based on calculations and 'general' test data. All figures are to be taken as approximations. The properties of the third party DX Coil will have an affect on the performance of the outdoor units. All capacity data shown is based on the following Rated Conditions: -

- Cooling (Rated): Indoor air temperature 27°C db / 19°C wb, Outdoor air temperature 35°C db
- Heating (Rated): Indoor air temperature 20°C db, Outdoor air temperature 7°C db / 6°C wb

NOTES

If the wiring is properly carried out by a specialist according to the local regulations, the device fulfills the protection class IP65.

Cooling Mode Coil "Air On" Temp : Minimum 15°CWB (18°CDB) / Maximum 24°CWB (32°CDB)
Air temperatures flowing across the coil below this level, can in some circumstances, cause icing and freezing issues with the coil and eventually forcing the system to shut down and also be detrimental to the outdoor unit itself.

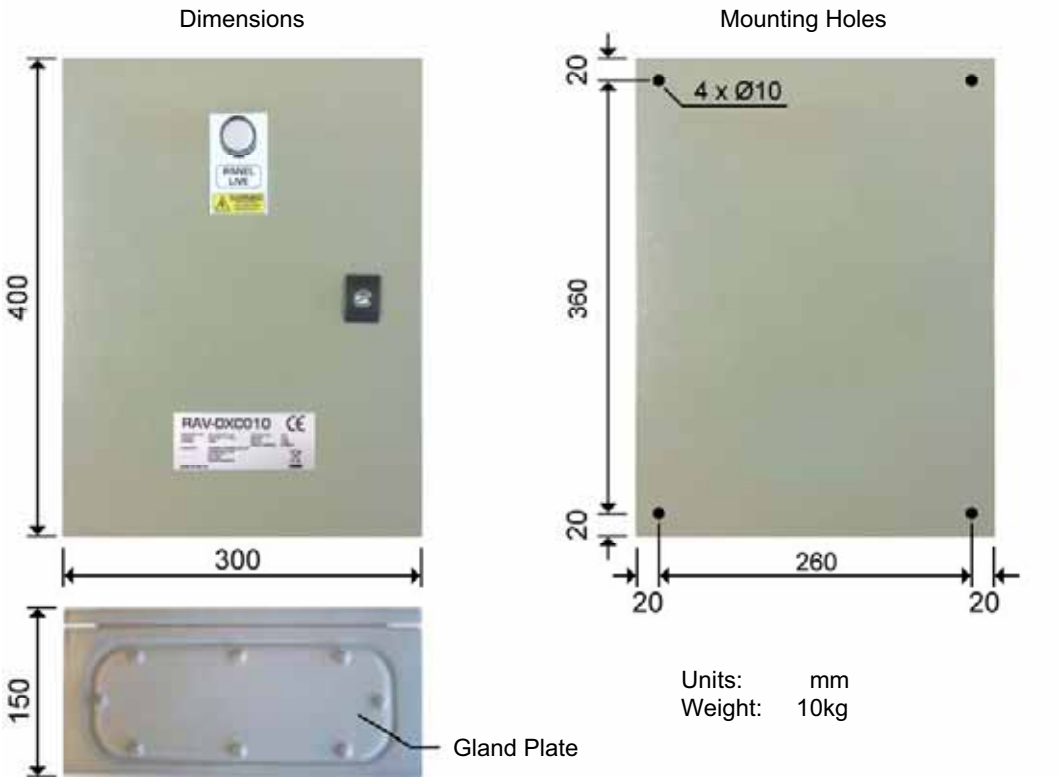
Heating Mode Coil "Air On" Temp : Minimum 15°CDB / Maximum 28°CDB
In the reverse cycle mode when the outdoor unit is producing hot gas, the coil in the AHU is effectively the condenser. Air temperatures flowing across the coil below this level, can cause over condensing of the refrigerant. This can result in liquid being returned to the compressor which will cause a mechanical failure of the outdoor unit. Low air temperatures will also cause the unit to use it's defrost mode more often.

Fresh Air Intake
If you wish to use Fresh Air which is outside of these Coil "Air On" limits it has to either be pre-conditioned by other equipment, or mixed with return air (or a combination of both) so that it remains inside these limits, in order to ensure reliable operation.

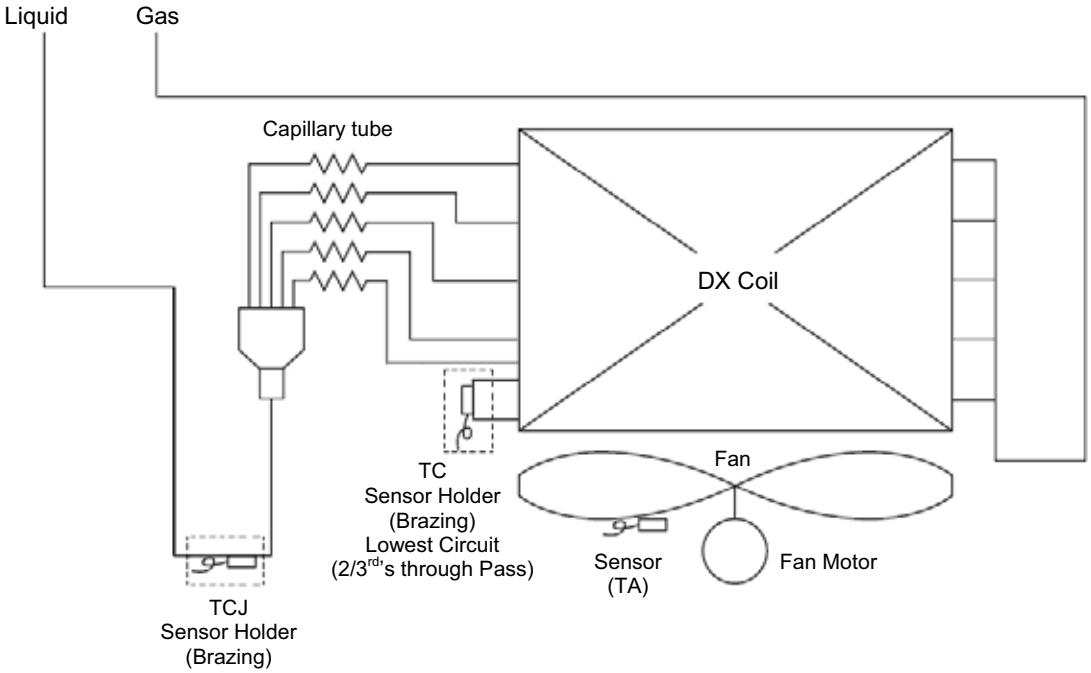
Automatic Mode
Please be aware that frequent mode changes could occur when using Automatic mode.

■ LC DX INTERFACE

The DX controller must not be installed outside. To avoid damage, when making holes for cables glands, please first remove the Gland Plate from the LC DX Interface. To maintain waterproof integrity IP65 glands must be used through the gland plate.



■ PIPING SCHEMATIC



Notes:

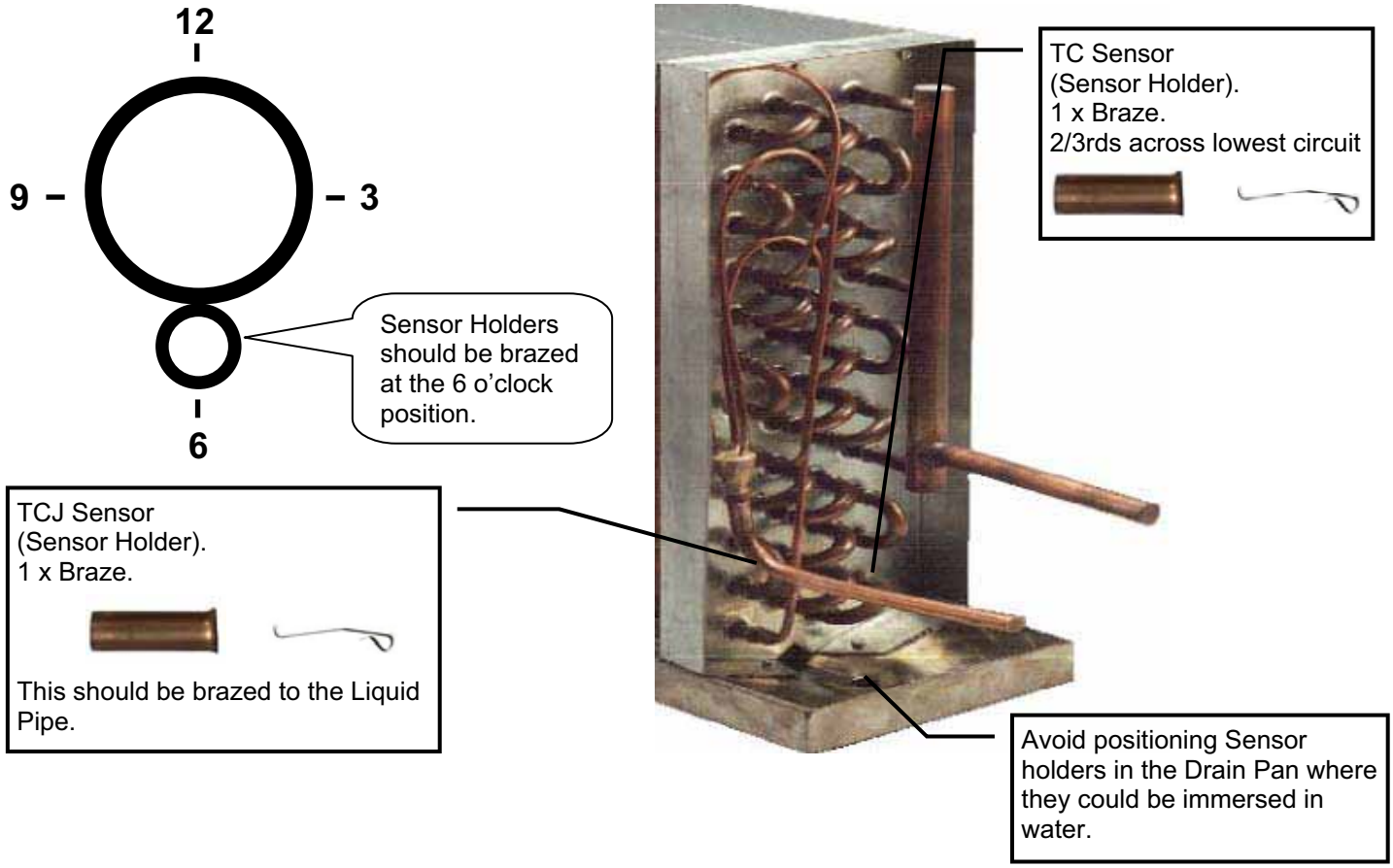
1) To ensure reliable operation, all Sensor Holders must be fitted by brazing.
2) The TC Sensor Holder must be brazed to return bend 2/3rd's through pass on the DX Coil's lowest circuit.
3) For brazing, be sure to use nitrogen gas to avoid oxidation of pipe inner surface.

■ DX COIL PREPARATION

Sensor Holders MUST be brazed on to the DX Coil pipe work to ensure reliable temperature sensing. There are two coil sensors, these are inserted into the Sensor Holders, and secured with the sensor-fix-plate. The sensor holders should be brazed at the 6 o'clock position.

It is essential that the sensors are correctly located to ensure efficient system performance.

For brazing, be sure to use nitrogen gas to avoid oxidation of pipe inner surface.



■ TA SENSOR

Secure this sensor using the supplied plastic clamp. It must be located in the Return Air Flow (Prior to mixing with any fresh air). Ensure that the Resin Sensor bulb is not covered by the protective vinyl-tube.



4 ELECTRICAL WORK

⚠ WARNING

1. **Using the specified wires, ensure to connect the wires, and fix wires securely so that the external tension to the wires do not affect the connecting part of the terminals.**
   Incomplete connection or fixation may cause a fire, etc.
2. **Be sure to connect earth wire (grounding work).**
   Incomplete grounding cause an electric shock.
   Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone wires.
3. **Appliance shall be installed in accordance with national wiring regulations.**
   Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.

⚠ CAUTION

- This indoor unit has no power cord.
- If incorrect / incomplete wiring is carried out, it will cause an electrical fire or smoke.
- Install an earth leakage breaker.
  If an earth leakage breaker is not installed, an electric shock may be caused.
- Be sure to use the cord clamps attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting wires when peeling them.
- Use the power cord and inter-connecting wire of specified thickness, type and protective devices required

REQUIREMENT

- For power supply wiring, strictly conform to the Local Regulation for each country.
- For wiring of power supply of the outdoor units, follow the Installation manual of each outdoor unit.
- Never connect 220-240V power to the terminal blocks (Ⓐ, Ⓑ, etc) for control wiring (otherwise the system will fail).
- Perform the electric wiring so that it does not come in to contact with the high-temperature part of the pipe.
  The coating may melt in an accident
- After connecting wires to the terminal blocks, be sure to leave sufficient wire before fixing with the cord clamp.
- Run the refrigerant piping and control wiring line in the same line.
- Do not turn on the power of the indoor unit until vacuuming of the refrigerant pipes is completed.

Remote controller wiring

2-core non polarity wire is used for the remote controller wiring.

How to wire

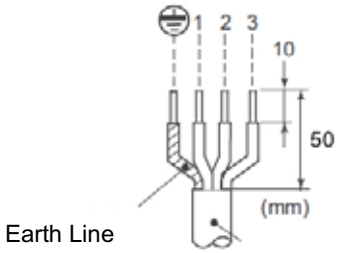
1. Connect the wires from the terminal block on the outdoor unit to the same numbered terminal on the LC DX Interface terminal block. Use wires to H07 RH-F or 60245 IEC 66 (1.5mm^2 or more).
2. In the case of unsheathed redundant cords (conductors) be sure to insulate with electrical insulation tape.
   Fix them so that they do not touch any electrical or metal parts.

REQUIREMENT

- Be sure to connect the wires matching the terminal numbers. Incorrect connection causes a trouble.
- Be sure to pass the wires through the bushing of the wiring connection port of the LC DX interface.
- Keep a margin (approx. 100mm) on a wire to hang down the electrical parts box at servicing, etc.
- The low-voltage circuit is provided for the remote controller (**Do not connect the high-voltage circuit).**

- **Wiring**

1. Open the LC DX interface using the key provided.
2. Strip wire ends (10mm).
3. Connect the wires from the terminal block on the outdoor unit to the same numbered terminal on the LC DX Interface terminal block.
4. Connect the ground wires to the corresponding terminals.
5. Close the LC DX Interface with key provided.



Remote controller wiring

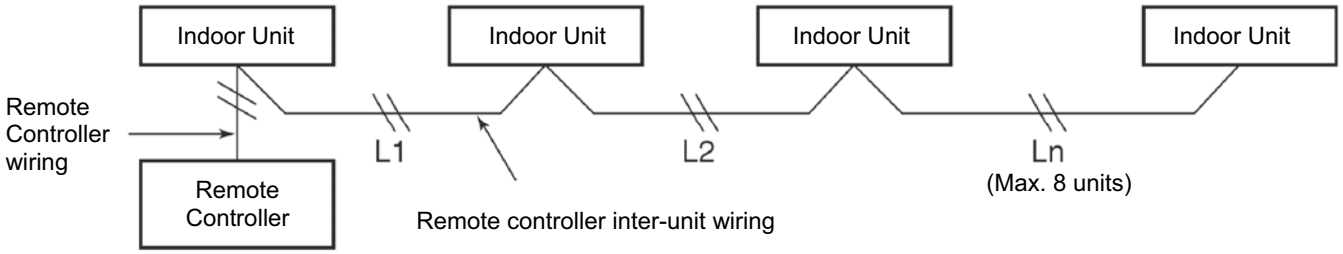
- 2-core with non-polarity wire is used for wiring of the remote controller wiring and group remote controllers wiring ($0.5mm^2$ to $2.0mm^2$)
- Strip off approx. 9mm the wire to be connected.

Remote controller wiring. Remote controller inter-unit wiring	Wire size: $0.5mm^2$ to $2.0mm^2$

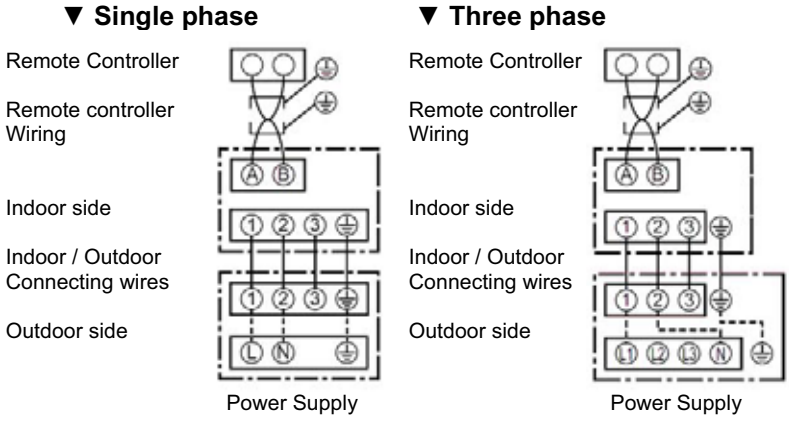
Total wire length of remote controller wiring and remote controller inter-unit wiring = L + L1 + L2 + ……..Ln	In case of wired type only	Up to 500m
	In case of wireless type included	Up to 400m
Total wire length of remote controller inter-unit wiring = L + L1 + L2 + ……..Ln		Up to 200m

⚠ CAUTION

The remote controller wire (communication line) and AC220-240V wires cannot be parallel to contact each other and cannot be stored in the same conduits. If doing so, a trouble may be caused on the control system due to noise, etc.



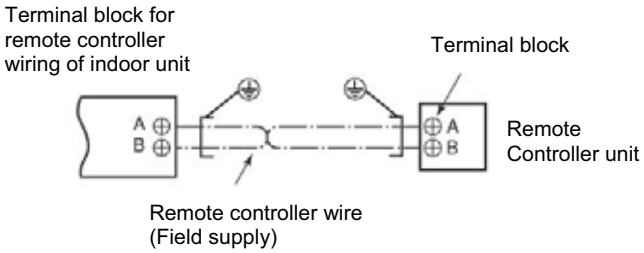
■ Wiring between indoor and outdoor units



■ Remote controller wiring

- As the remote controller wire has non-polarity, there is no problem if connections to indoor unit terminal blocks A and B are reversed.

▼ Wiring diagram



■ LC DX Interface wiring

Temperature sensors
The refrigerant temperature sensors are inserted into the brazed sensor holders and secured using the supplied FIX-PLATE.
The sensor cables are to be connected as follows:

TC Sensor	BLACK 2-pin plug	to	BLACK 2-pin socket
TCJ Sensor	RED 2-pin plug	to	RED 2-pin socket
TA Resin Bulb Sensor	YELLOW 2-pin plug	to	Yellow 2-pin socket

The sensor cables cannot be extended or shortened, they are supplied at the maximum permissible length of 5m. Please coil excess length within AHU.

Inter-unit Connecting wire
Terminal 1/2/3/PE on the LC DX Interface should be connected to the corresponding terminals on the outdoor unit.

External On / Off
Terminal 4/5 On/Off over an external dry contact. If the contact is closed, the system switches on. If the contact is opened, the system switches off. If the system is switched using and external contact, then switching on/off using the remote control is still possible.

Fan motor output (230V AC)
Terminal 6 / 7 Fan motor output 230V AC (3A Max.) controlled by system. No output when system is defrosting Outdoor unit.

Remote control BUS line (A/B)
Terminal A / B at these terminals an optional remote temperature sensor (TCB-TC21LE2) can be attached. Additionally one of either a second wired remote control or alternatively the RBC-FDP3-PE BMS accessory can be optionally attached. Note that you cannot have both a second remote control and the BMS accessory.

Operation Output
Terminal 8/9 during operation of the system the dry contact between 8/9 is closed.

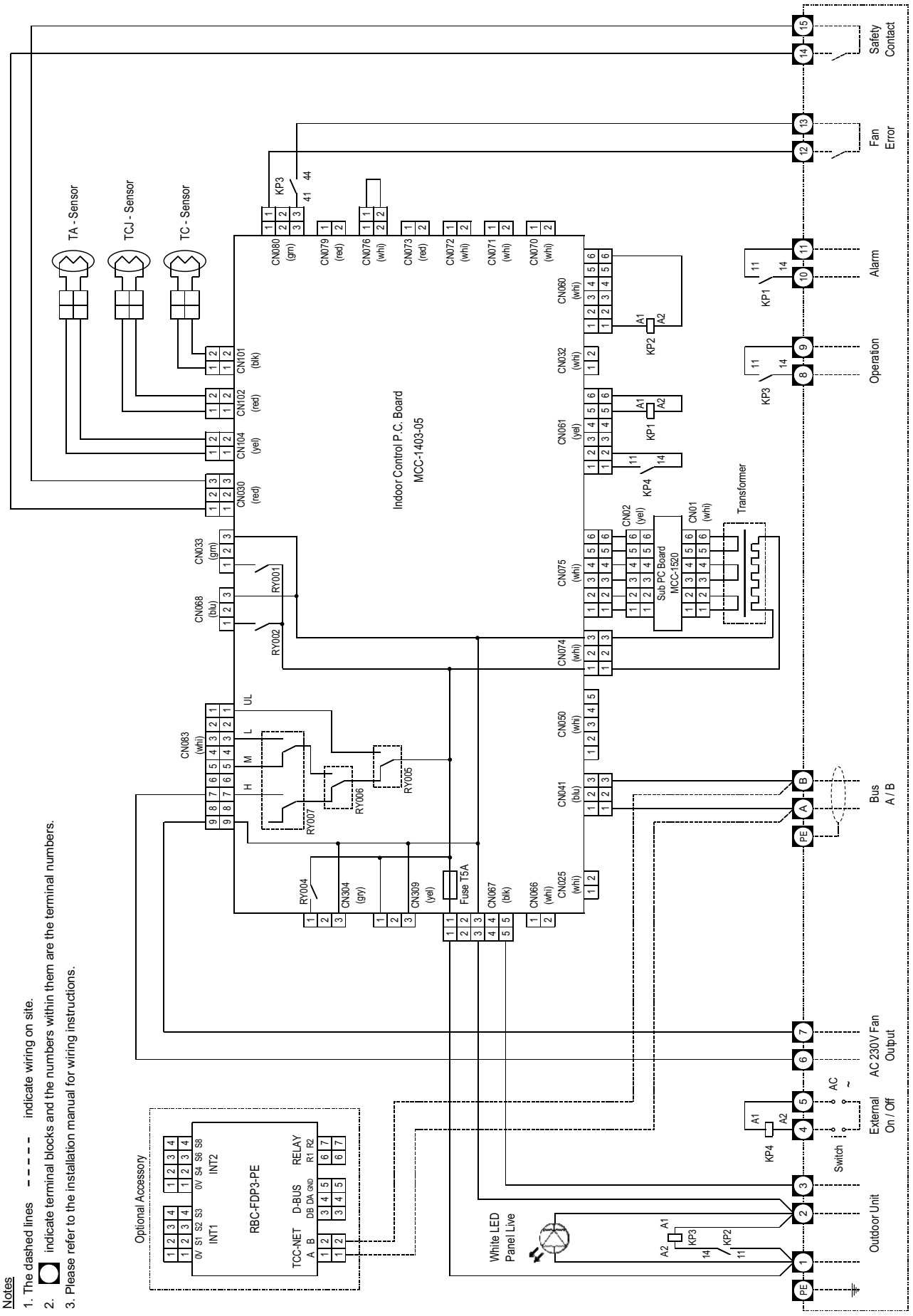
Alarm signal from the ventilation kit
Terminal 10/11 if there is an error at the system, this is indicated with a dry normally open contact at this terminal.

Fan Error Input
Terminal 12/13 an operation monitor (supplied locally), of the external fan is to be attached at this terminal as a dry contact (for instance, differential pressure monitor, vane relay or similar). A closed contact generates the error message L30.

External safety contact
Terminal 14/15 If this contact is open for more than 1 minute, the error message P10 is generated and the system switches off automatically. This contact can, for instance, be used with an onsite frost protection monitor.

If the External safety contact is not used, then the contact should be bridged.

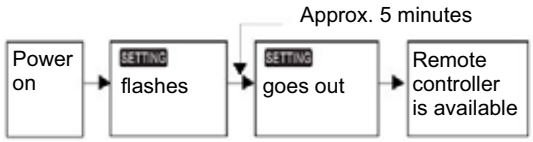
■ WIRING DIAGRAM



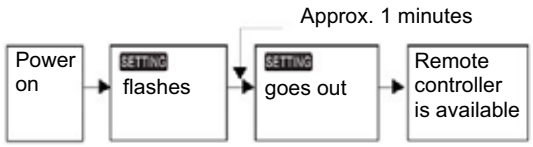
5 APPLICABLE CONTROLS

REQUIREMENT

- When you use this air conditioner for the first time, it takes approx. 5 minutes until the remote controller becomes available after power-on. This is normal.
  <When the power is turned on for the first time after installation>
  It takes **approx. 5 minutes** until the remote controller becomes available.



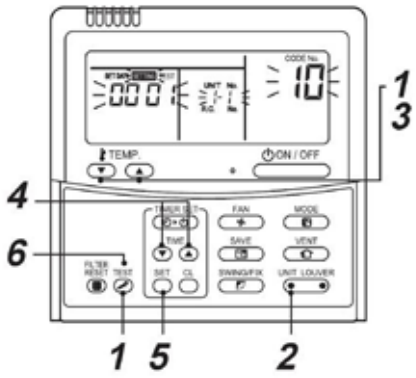
  <When the power is turned on for the second (or later) time>
  It takes **approx. 1 minute** until the remote controller becomes available.



- Normal settings were made when the unit was shipped from factory.
  Change the indoor unit as required.
- Use the wired remote controller to change the settings.
- The settings cannot be changed using the wireless remote controller, sub remote controller, or remote controllerless system (for central remote controller only).
  Therefore, install the wired remote controller to change the settings.

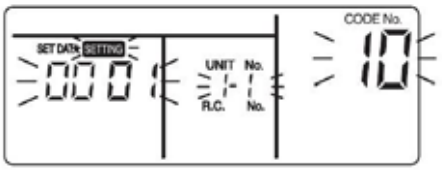
■ Changing of settings for applicable controls

Basic procedure for changing settings
Change the settings while the air conditioner is not working.
(Be sure to stop the air conditioner before making settings).
The display content for setting differs from that on former types of remote controller (RBC-AMT21E/AMT31E). The number of CODE No. has increased).



Procedure 1
Push TEST button and "TEMP." button simultaneously for at least 4 seconds.
After a while, the display flashes as shown in the figure.
Confirm that the CODE No. is [10].

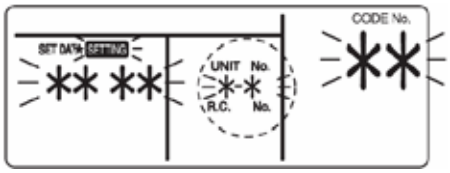
- If the CODE No. is not [10] push TEST button to erase the display content and repeat the procedure from the beginning.
  (No operation of the remote controller is accepted for a while after TEST button is pushed).
  (While air conditioners are operated under the group control, "ALL" is displayed first. When UNIT LOUVER is pushed, the indoor unit number displayed following "ALL" is the header unit).



(* Display content varies with the indoor unit model).

Procedure 2

Each time you push UNIT LOUVER button, indoor unit numbers in the control group change cyclically. Select the indoor unit you want to change settings for. The fan of the selected unit runs and the louvers start swinging. You can confirm the indoor unit for which you want to change settings.



Procedure 3

Using "TEMP", ▼ / ▲ buttons, specify CODE NO. [**].

Procedure 4

Using timer "TIME" ▼ / ▲ buttons, select SET DATA [****].

Procedure 5

Push SET button. When the display changes from flashing to lit, the setup is completed.

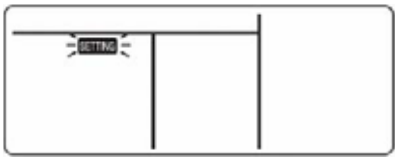
- To change settings of another indoor unit, repeat from procedure **2.**
- To change other settings of the selected indoor unit, repeat from procedure **3**.
  Use SET button to clear the settings.
  To make settings after SET button was pushed, repeat from procedure **2**.

Procedure 6

When settings have been completed, push TEST button to determine the settings.

When TEST button is pushed, SETTING flashes and then the display content disappears and the air conditioner enters the normal stop mode.

(While SETTING is flashing, no operation of the remote controller is accepted).



LC DX Interface Configuration

The circuit board of the ventilation kit is not preconfigured at delivery. Some parameters must be set using the DN code menu.

Follow to the basic operation procedure (***1*** → ***2*** → ***3*** → ***4*** → ***5*** → ***6***).

DN CODE	OUTDOOR MODEL (RAV-****-E)	SM563AT	SM803AT	SM1103AT	SM1403AT	SM1603AT	SM2244AT8	SM2804AT8
		SP564AT	SP804AT	SP1104AT(8)	SP1404AT(8)	SP1604AT8	-	-
11	CAPACITY CODE	0009	0012	0015	0017	0018	0021	0023
01	DIRTY FILTER ALARM (Disabled)	0000 (Default 0002)						
03	CENTRAL CONTROL ADDRESS (Unset)	0099* Default						
0d	AUTO MODE (Enabled)	0000** Default						
	AUTO MODE (Disabled)	0001**						
0f	AVAILABLE MODE (Heat Pump)	0000** Default						
	AVAILABLE MODE (Cooling Only)	0001**						
10	DEVICE TYPE (Duct)	0006 (Default 0000)						
12	POWER ADDRESS (Unset)	0099* Default						
13	DEVICE ADDRESS (Unset)	0099* Default						
14	GROUP ADDRESS (Unset)	0099* Default						
28	AUTOMATIC RESTART (Enabled)	0001 (Default 0000 Disabled)						

* 0099 = address not assigned (system addresses are assigned during the automatic addressing by the system. Central addresses can be assigned automatically with a central remote control or manually. Subsequent modifications may lead to malfunction.)

** AUTO MODE Enabled / Disabled and HEAT PUMP / COOLING ONLY are automatically selected by the connecting Outdoor unit.

■ To secure better effect of heating

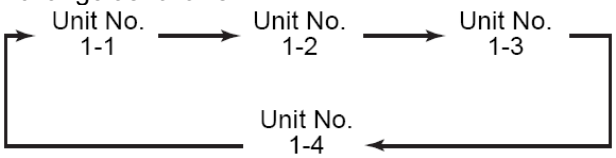
When it is difficult to obtain satisfactory heating due to installation place of the indoor unit or structure of the room, the detection temperature of heating can be raised. Also use the circulator, etc. to circulate heat air near the ceiling.
Follow to the basic procedure (**1→2→3→4→5→6**).

- For the CODE No. in Procedure **3,** specify [06].
- For the set data in Procedure **4**, select the setup data of shift value of detection temperature to be set up from the table below.

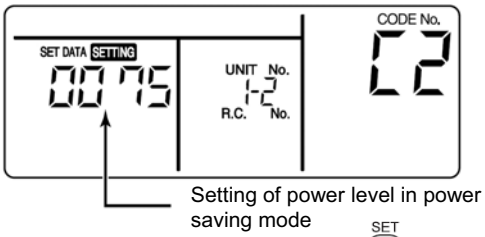
Setup Data	Detection temp shift value
0000	No shift
0001	+1°C
0002	+2°C (at shipment from factory)
0003	+3°C
0004	+4°C
0005	+5°C
0006	+6°C

■ How to set up power saving mode

1. Push SAVE button for at least four seconds when the air conditioner is not working.
   SETTING flashes.
   Indicates CODE No. “C2”
2. Select an indoor unit to set by pushing UNIT LOUVER (left side of the button).
   Each time you push the button, unit numbers change as follows:



   The fan of the selected unit runs.
3. Adjust the power save setting by pushing TIME ▼ / ▲ buttons.
   Each push of the button changes the power level by 1% within the range from 100% to 50%.
   * The factory setting is 75%
- This indication may not be true for types other than 4-series outdoor units (Super Digital Inverter)



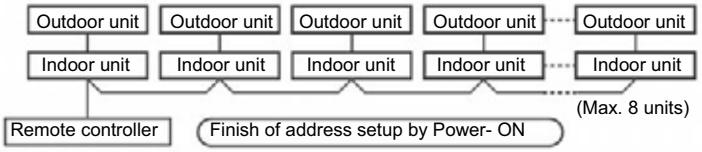
4. Determine the setting by pushing SET button.
5. Push TEST button to complete the setting.

■ Group Control

In case of group control for system of multiple units.

One remote controller can control maximum 8 indoor units as a group.

▼ In case of group control in single system.



- For wiring procedure and wiring method of the individual line (Identical refrigerant line) system, follow to “Electrical work”.
- Wiring between lines is performed in the following procedure.
  Connect the terminal block (A/B) of the indoor unit connected with a remote controller to the terminal blocks (A/B) of the indoor units of other indoor units by wiring the inter-unit wire of the remote controller.
- When the power supply has been turned on, the automatic address setup starts and which indicates that address is being set up on the display part. during setup of automatic address, the remote controller operation is not accepted.

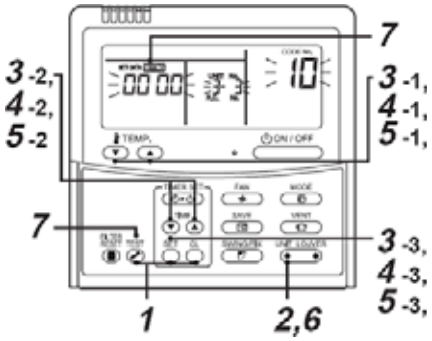
Required time up to the finish of automatic addressing is approx. 5 minutes.

NOTE

In some cases, it is necessary to change the address manually after setup of the automatic address according to the system configuration of the group control.

Procedure example ①

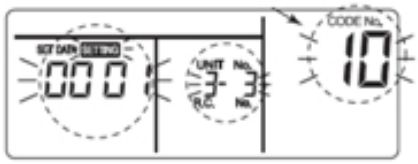
Manual address setup procedure
While the operation stops, change the setup.
(Be sure to stop operation of the unit).



Procedure 1

Push simultaneously SET + CL + TEST buttons for 4 seconds or more. After a while, the display part flashes as shown below. Check the displayed CODE No. is [**10**].

- When the CODE No. is other than [**10**], push TEST button to erase the display and repeat procedure from the first step.
  (After pushing TEST button, operation of the remote controller is not accepted for approx. 1 minute).
  (For group control, No. of the first displayed indoor unit becomes the header unit).



(* Display changes according to the model No. of indoor unit.)

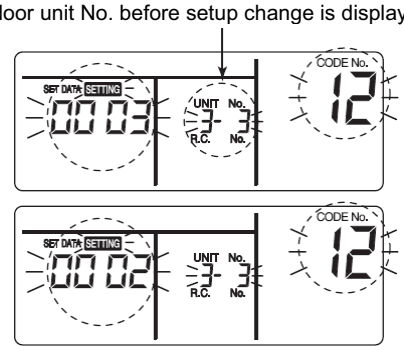
Procedure 2

Every pushing UNIT LOUVER button, the indoor unit No. in the group control is displayed in order. Select the indoor unit of which setup is changed.
In this time, the position of the indoor unit of which setup is changed can be confirmed because fan of the selected indoor unit operate.

Procedure 3

1. Using temp. setup ▼ ▲ buttons, specify CODE No. [**12**].
   (CODE No. [**12**]: Line address).
2. Using timer time ▼ ▲ buttons, change the line address from [**3**] to [**2**].
3. Push SET button.
   In this time, the setup finishes when the display changes from flashing to lighting.

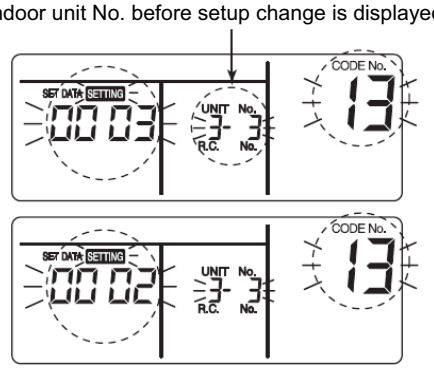
Indoor unit No. before setup change is displayed.



Procedure 4

1. Using temp. setup ▼ ▲ buttons, specify CODE No. [**13**].
   (CODE No. [**13**]: Indoor address)
2. Using timer time ▼ ▲ buttons, change the indoor address form [**3**] to [**2**].
3. Push SET button.
   In this time, the setup finishes when the display changes from flashing to lighting.

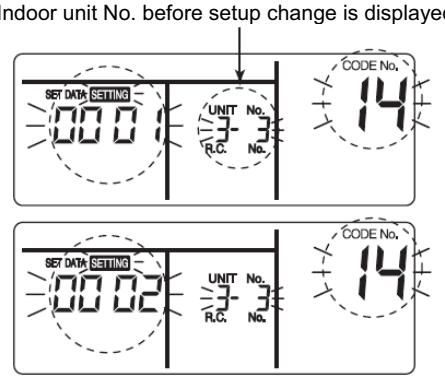
Indoor unit No. before setup change is displayed



Procedure 5

1. Using temp. setup ▼ ▲ buttons, specify CODE No. [**14**].
   (CODE No. [**14**]: Group address).
2. Using timer time ▼ ▲ buttons, change the setup data from [**0001**] to [**0002**].
   (Setup data [Header unit: **0001**] [Follower unit: **0002**])
3. Push SET button.
   In this time, the setup finishes when display changes from flashing to lighting.

Indoor unit No. before setup change is displayed



Procedure 6

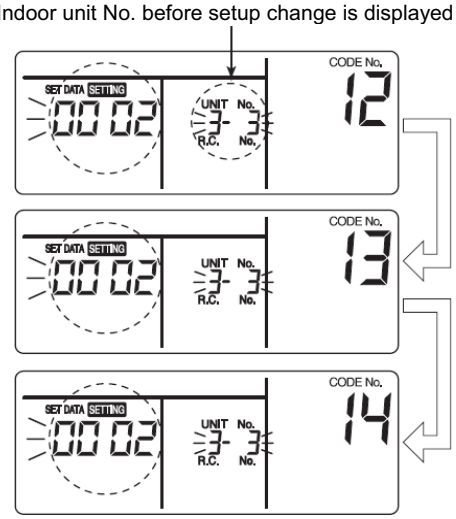
If there is other indoor unit to be changed, repeat procedure **2** to **5** to change the setup.

When the above setup has finished, push UNIT LOUVER to select the indoor unit No. before change of setup, specify CODE No. [**12**], [**13**], [**14**] in order with temp. setup ▼ ▲ buttons, and then check the changed contents.

Address change check before change:
[**3**-**3**-**1**] → After change [**2**-**2**-**2**].

Pushing CL button clears the contents of which setup was changed.
(In this case, procedure from **2** is repeated).

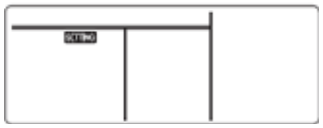
Indoor unit No. before setup change is displayed



Procedure 7

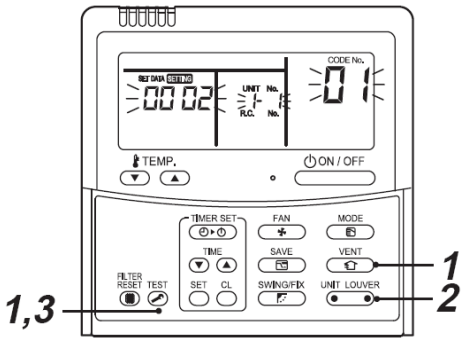
After check of the changed contents, push TEST button, the display disappears and the status becomes the usual stop status. (When pushing TEST button the operation from the remote controller is not accepted for approx. 1 minute).

- If the operation from the remote controller is not accepted even 1 minute or more passed after pushing TEST button, it is considered that the address setup is incorrect.
  In this case, the automatic address must be set again set up.
  Therefore repeat procedure of the setup change from procedure **1.**



<u>To recognize the position of the corresponding indoor unit though the indoor unit No. is known.</u>

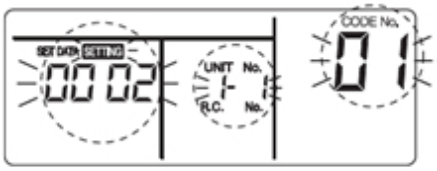
Check the position during operation stop.
(Be sure to stop operation of the set).



Procedure 1

Push simultaneously TEST + VENT buttons for 4 seconds or more.
After a while, the display part flashes and the display appears as shown below.
In this time, the position can be checked because fan of the indoor unit operate.

- For the group control, the indoor unit No. is displayed as [ALL] and fans of all the indoor units in the group control operate.
  Check the display CODE No. is [**01**].
- When the CODE No. is other than [**01**], push TEST button to erase the display and repeat procedure from the first step.
  (After pushing TEST button, operation of the remote controller is not accepted for approx. 1 minute).



(* Display changes according to the model No. of indoor unit.)

Procedure 2

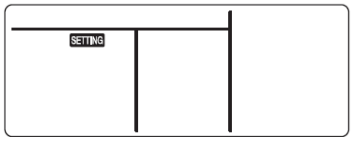
In the group control, every pushing UNIT LOUVER button, the indoor No. in the group control is displayed in order.
In this time, the position of the indoor unit can be confirmed because the only fan of the selected indoor unit operate.
(For a group control, No. of the firstly displayed indoor unit becomes the header unit).

Procedure 3

After confirmation, push TEST button to return the mode to the usual mode.

When pushing the TEST button, the display disappears and the status becomes the usual stop status.

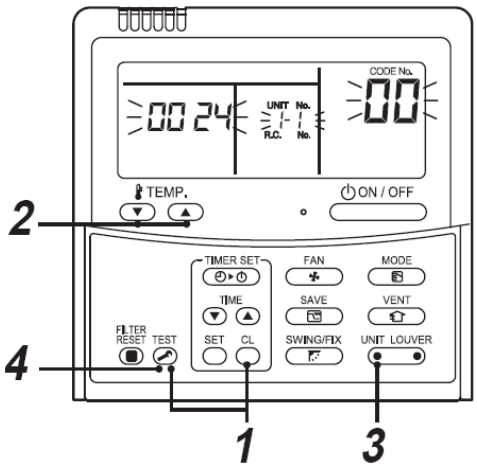
(When pushing TEST button the operation from the remote controller is not accepted for approx. 1 minute).



■ Remote controller switch monitoring function

This function is available to call the service monitor mode from the remote controller during a test run to acquire temperatures of sensors of the remote controller, indoor unit and outdoor unit.

1. Push CL and TEST buttons simultaneously for at least 4 seconds to call the service monitor mode.
   The service monitor indicator lights up and the header indoor unit number is displayed first. CODE No. 00 is also displayed.
2. Pushing TEMP. ▼ ▲ buttons, select the number of sensor, etc. (CODE No.) to be monitored (see the following table).
3. Pushing UNIT LOUVER (left side of button), select an indoor unit in the group to be monitored. The sensor temperatures of indoor units and their outdoor unit in the control group are displayed.
4. Push TEST button to return to the normal display.



Indoor Unit Data	
CODE No.	**Data Name**
01	Room temperature (remote controller)
02	Indoor unit intake air temperature (TA)
03	Indoor unit heat exchanger (coil) temperature (TCJ)
04	Indoor unit heat exchanger (coil) temperature (TC)
F3	Indoor unit fan cumulative operating hours (x1 h)

Outdoor Unit Data	
CODE No.	**Data Name**
60	Outdoor unit heat exchanger (coil) temperature (TE)
61	Outside air temperature (TO)
62	Compressor discharge temperature (TD)
63	Compressor suction temperature (TS)
64	—
65	Heatsink temperature (THS)
6A	Operating current (x1/10)
F1	Compressor cumulative operating hours (x100h)

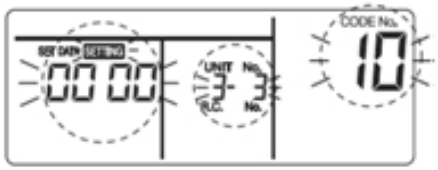
■ How to set up 8°C operation (In case the outdoor unit uses a Super Digital Inverter 4 series only)

Preheating operation can be set for cold regions where room temperature drops to below zero.

Procedure 1

Push simultaneously SET + CL + TEST buttons for 4 seconds or more when the air conditioner is not working.
After a while, the display part flashes as shown below. Check the displayed CODE No. [**10**].

- When the CODE No. is other than [**10**], push TEST button to erase the display and repeat procedure from the first step.
  (After pushing TEST button, operation of the remote controller is not accepted for approx. 1 minute).



(* Display changes according to the model No. of indoor unit.)

Procedure 2

Every pushing UNIT LOUVER button, the indoor unit No. in the group control is displayed in order. Select the indoor unit of which setup is changed. In this time, the position of the indoor unit of which setup is changed can be confirmed because fan of the selected indoor unit operate.

Procedure 3

Using TEMP. setup ▼ ▲ buttons, specify CODE NO. [**d1**].

Procedure 4

Using timer time ▼ ▲ buttons, select SET DATA [**0001**].

Setup data	8°C operating setting
0000	None (Factory Shipping)
0001	8°C Operation setting

Procedure 5

Push SET button.
In this time, the setup finishes when the display changes from flashing to lighting.

Procedure 6

Push TEST button (setup is determined).
When pushing TEST button, the display disappears and the status becomes the usual stop status.
(When pushing TEST button the operation from the remote controller is not accepted for approx. 1 minute).

6 TEST RUN

■ Before test run

- Before turning on the power supply, carry out the following procedure.
  1) Using 500V-Megger, check that the resistance of 1MΩ or more exists between the terminal block of the power supply and the earth (grounding).
     If resistance of less than 1MΩ is detected, do not run the unit.
  2) Check the valve of the outdoor unit being opened fully.

- To protect the compressor at activation time, leave power-ON for 12 hours or more before operating.

■ How to execute a test run

Using the remote controller, operate the unit as usual.

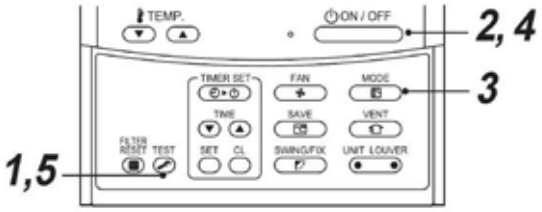
A forced test run can be executed in the following procedure even if the operation stops by thermo-OFF.

In order to prevent a serial operation, the forced test run is released after 60 minutes have passed and returns to the usual operation.

⚠ CAUTION

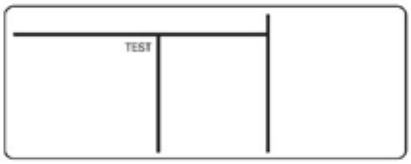
- Do not use the forced test run for cases other than the test run because it applies excessive load to the devices.

In case of wired remote controller.



Procedure 1

Keep TEST button pushed for 4 seconds or more.
[TEST] is displayed on the display part and the selection of mode in the test mode is permitted.



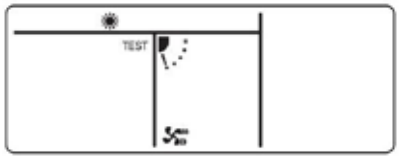
Procedure 2

Push ON / OFF button.

Procedure 3

Using MODE button, select the operation mode, [❄ COOL] or [☀ HEAT].

- Do not run the air conditioner in a mode other than [❄ COOL] or [☀ HEAT].
- The temperature controlling function does not work during test run.
- The detection of errors is performed as usual.

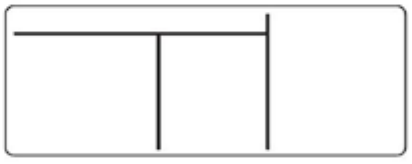


Procedure 4

After the test run, push ON / OFF button to stop a test run.
(Display part is same as procedure **1**).

Procedure 5

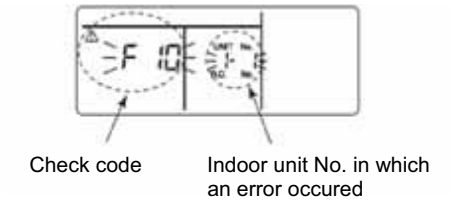
Push TEST check button to cancel (release from) the test run mode.
([TEST] disappears on the display and the status returns to normal).



7 TROUBLE SHOOTING

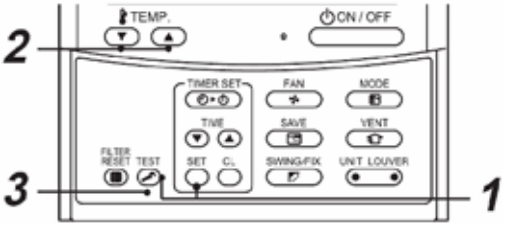
■ Confirmation and check

When a trouble occurred in the air conditioner, the check code and the indoor unit No. appear on the display part of the remote controller.
The check code is only displayed during the operation.
If the display disappears, operate the air conditioner according to the following “Confirmation of error history” for confirmation.



■ Confirmation of error history

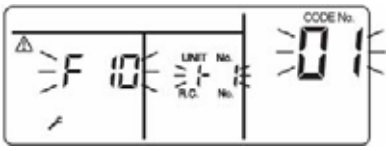
When a trouble occurred on the air conditioner, the trouble can be confirmed with the following procedure. (The trouble history is stored up to 4 troubles.)
The history can be confirmed from both operating status and stop status.



Procedure 1

When pushing SET and TEST buttons at the same time for 4 seconds or more, the following display appears.
If [service check] is displayed, the mode enters in the trouble history mode.

- [**01**: Order of trouble history] is displayed in CODE No. window.
- [Check code] is displayed in CHECK window.
- [Indoor unit address in which an error occurred] is displayed in Unit No.



Procedure 2

Every pushing of “TEMP.” ▼ ▲ button used to set temperature, the trouble history stored in memory is displayed in order.
The numbers in CODE No. indicate CODE No. [**01**] (latest) → [**04**] (oldest).

REQUIREMENT

Do not push CL button because all of trouble history of the indoor unit will be deleted.

Procedure 3

After confirmation, push TEST button to return to the usual display.

▼ Common Check Codes

L09 **Indoor unit Power Code incorrect**
Check the settings of DN Code 11 (see “DX Interface Configuration”).

L30 **Fan Motor operation monitor**
Check the operation monitoring of the fan at terminals 3 / 4. If this contact is “CLOSED”, the error message “L30” is generated.

P10 **Safety contact error**
Check the contact at terminals 9 / 10. If the contact is “OPEN”, the error message “P10” is generated. If this contact is not used, a bridge connection should be installed on the terminals 9 / 10.

■ Check codes and parts to be checked

Indication	Main defective parts	Judging device	Parts to be checked / error description	Air conditioner status
E01	No header remote controller	Remote controller	Incorrect remote controller setting --- The header remote controller has not been set (including two remote controllers).	*
	Remote controller communication error		No signal can be received from the indoor unit.	
E02	Remote controller transmission error	Remote controller	Indoor/outdoor connecting wires, indoor P.C. board, remote controller ---No signal can be sent to the indoor unit.	*
E03	Indoor unit-remote controller regular communication error	Indoor	Remote controller, network adapter, indoor P.C. board --- No data is received from the remote controller or network adapter.	Auto-reset
E04	Indoor unit-outdoor unit serial communication error	Indoor	Indoor/outdoor connecting wires, indoor P.C. board, outdoor P.C. board --- Serial communication error between indoor unit and outdoor unit	Auto-reset
	IPDU-CDB communication error			
E08	Duplicated indoor addresses ★	Indoor	Indoor address setting error --- The same address as the self-address was detected.	Auto-reset
E09	Duplicated header remote controllers	Remote controller	Remote controller address setting error ---Two remote controllers are set as header in the double-remote controller control.	*
			(* The header indoor unit stops raising alarm and follower indoor units continue to operate.)	
E10	CPU-CPU communication error	Indoor	Indoor P.C. board --- Communication error between main MCU and motor microcomputer MCU	Auto-reset
E18	Header indoor unit-indoor follower unit regular communication error	Indoor	Indoor P.C. board --- Regular communication is not possible between header and follower indoor units or between twin header (main) and follower (sub) units.	Auto-reset
E31	IPDU communication error	Outdoor	Communication error between IPDU and CDB	Entire stop
F01	Indoor unit heat exchanger sensor (TCJ) error	Indoor	Heat exchanger sensor (TCJ) , indoor P.C. board --- Open-circuit or short-circuit of the heat exchanger sensor (TCJ) was detected.	Auto-reset
F02	Indoor unit heat exchanger sensor (TC) error	Indoor	Heat exchanger sensor (TC), indoor P.C. board --- Open-circuit or short-circuit of the heat exchanger sensor (TC) was detected.	Auto-reset
F04	Outdoor unit discharge temp. sensor (TD) error	Outdoor	Outdoor temp. sensor (TD), outdoor P.C. board --- Open-circuit or short-circuit of the discharge temp. sensor was detected.	Entire stop
F06	Outdoor unit temp. sensor (TE/TS) error	Outdoor	Outdoor temp. sensors (TE/TS), outdoor P.C. board --- Open-circuit or short-circuit of the heat exchanger temp. sensor was detected.	Entire stop
F07	TL sensor error	Outdoor	TL sensor may be displaced, disconnected or short-circuited.	Entire stop
F08	Outdoor unit outside air temp. sensor error	Outdoor	Outdoor temp. sensor (TO), outdoor P.C. board --- Open-circuit or short-circuit of the outdoor air temp. sensor was detected.	Operation continued
F10	Indoor unit room temp. sensor (TA) error	Indoor	Room temp. sensor (TA), indoor P.C. board --- Open-circuit or short-circuit of the room temp. sensor (TA) was detected.	Auto-reset
F12	TS (1) sensor error	Outdoor	TS (1) sensor may be displaced, disconnected or short-circuited.	Entire stop
F13	Heat sink sensor error	Outdoor	Abnormal temperature was detected by the temp. sensor of the IGBT heat sink.	Entire stop
F15	Temp. sensor connection error	Outdoor	Temp. sensor (TE/TS) may be connected incorrectly.	Entire stop
F29	Indoor unit, other P.C. board error	Indoor	Indoor P.C. board --- EEPROM error	Auto-reset
F31	Outdoor unit P.C. board	Outdoor	Outdoor P.C. board ---- In the case of EEPROM error.	Entire stop
H01	Outdoor unit compressor breakdown	Outdoor	Current detect circuit, power voltage --- Minimum frequency was reached in the current releasing control or short-circuit current (Idc) after direct excitation was detected	Entire stop
H02	Outdoor unit compressor lock	Outdoor	Compressor circuit --- Compressor lock was detected.	Entire stop
H03	Outdoor unit current detect circuit error	Outdoor	Current detect circuit, outdoor unit P.C. board --- Abnormal current was detected in AC-CT or a phase loss was detected.	Entire stop
H04	Case thermostat operation (1)	Outdoor	Malfunction of the case thermostat	Entire stop

Indication	Main defective parts	Judging device	Parts to be checked / error description	Air conditioner status
H06	Outdoor unit low-pressure system error	Outdoor	Current, high-pressure switch circuit, outdoor P.C. board --- Ps pressure sensor error was detected or low-pressure protective operation was activated.	Entire stop
L03	Duplicated header indoor units ★	Indoor	Indoor address setting error --- There are two or more header units in the group.	Entire stop
L07	Group line in individual indoor unit ★	Indoor	Indoor address setting error --- There is at least one group-connected indoor unit among individual indoor units.	Entire stop
L08	Indoor group address not set ★	Indoor	Indoor address setting error --- Indoor address group has not been set.	Entire stop
L09	Indoor power level not set	Indoor	Indoor power level has not been set.	Entire stop
L10	Outdoor unit P.C. board	Outdoor	In the case of outdoor P.C. board setting error jumper wire (for service)	Entire stop
L20	LAN communication error	Network adapter central control	Address setting, central control remote controller, network adapter --- Duplication of address in central control communication	Auto-reset
L29	Other outdoor unit error	Outdoor	Other outdoor unit error	Entire stop
			1) Communication error between IPDU MCU and CDB MCU	Entire stop
			2) Abnormal temperature was detected by the heat sink temp. sensor in IGBT.	
L30	Abnormal external input into indoor unit (interlock)	Indoor	External devices, outdoor unit P.C. board --- Abnormal stop due to incorrect external input into CN80	Entire stop
L31	Phase sequence error, etc.	Outdoor	Power supply phase sequence, outdoor unit P.C. board --- Abnormal phase sequence of the 3-phase power supply	Operation continued (thermostat OFF)
P01	Indoor unit fan error	Indoor	Indoor fan motor, indoor P.C. board --- Indoor AC fan error (fan motor thermal relay activated) was detected.	Entire stop
P03	Outdoor unit discharge temp. error	Outdoor	An error was detected in the discharge temp. releasing control.	Entire stop
P04	Outdoor unit high-pressure system error	Outdoor	High-pressure switch --- The IOL was activated or an error was detected in the high-pressure releasing control using the TE.	Entire stop
P05	Open phase detected	Outdoor	The power cable may be connected incorrectly. Check open phase and voltages of the power supply.	Entire stop
P07	Heat sink overheat	Outdoor	Abnormal temperature was detected by the temp. sensor of the IGBT heat sink.	Entire stop
P10	Indoor unit water overflow detected	Indoor	Drain pipe, clogging of drainage, float switch circuit, indoor P.C. board --- Drainage is out of order or the float switch was activated.	Entire stop
P15	Gas leakage detected	Outdoor	There may be gas leakage from the pipe or connecting part. Check for gas leakage.	Entire stop
P19	4-way valve error	Outdoor (Indoor)	4-way valve, indoor temp. sensors (TC/TCJ) --- An error was detected due to temperature drop of the indoor unit heat exchanger sensor when heating.	Auto-reset (Auto-reset)
P20	High-pressure protective operation	Outdoor	High-pressure protection.	Entire stop
P22	Outdoor unit fan error	Outdoor	Outdoor unit fan motor, outdoor unit P.C. board --- An error (overcurrent, locking, etc.) was detected in the outdoor unit fan drive circuit.	Entire stop
P26	Outdoor unit inverter Idc activated	Outdoor	IGBT, outdoor unit P.C. board, inverter wiring, compressor --- Short-circuit protection for compressor drive circuit devices (G-Tr/IGBT) was activated.	Entire stop
P29	Outdoor unit position error	Outdoor	Outdoor unit P.C. board, high-pressure switch ---Compressor motor position error was detected.	Entire stop
P31	Other indoor unit error	Indoor	Another indoor unit in the group is raising an alarm.	Entire stop
			E03/L07/L03/L08 alarm check locations and error description.	Auto-reset

★ The air conditioner automatically enters the auto-address setting mode.

8 OPTIONAL PARTS

▼ Remote controllers

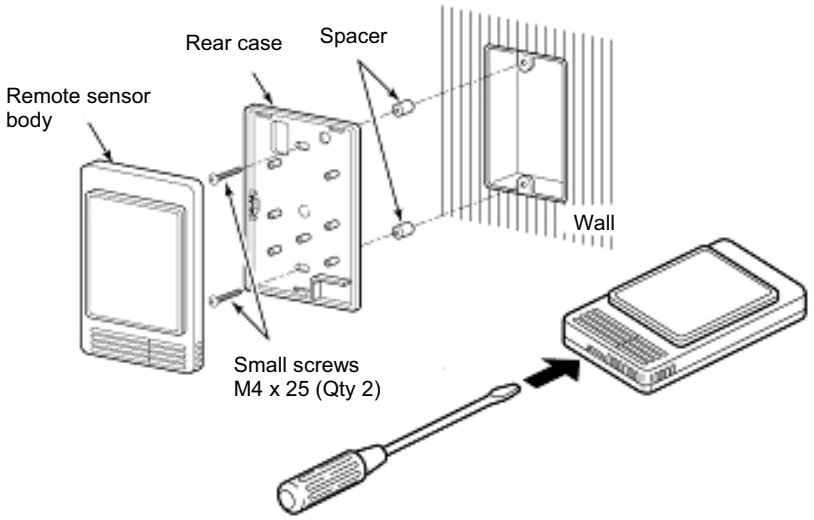
RBC-AMT32E	Wired remote controller (recommended for LC DX Interface)
TCB-EXS21TLE	Schedule and Weekly Timer accessory
RBC-AS21E2	Simplified wired remote controller for domestic and hotel application
RBC-AMS41E	Wired remote controller with weekly timer
RBC-AMS51E	Lite-Vision plus remote controller
TCB-AX32E2	Wireless remote controller and receiver



RBC-AMT32E TCB-EXS21TLE RBC-AS21E2 RBC-AMS41E RBC-AMS51E TCB-AX32E2

▼ TCB-TC21LE2 Remote Temperature Sensor

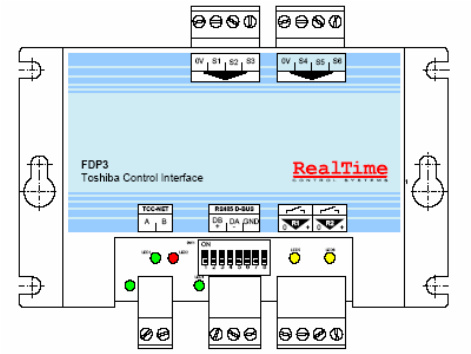
The Optional remote room temperature sensor uses the A/B Bus. It is connected to terminals A and B on the LC DX Interface. It is recommended where there is a High Ceiling, the TA sensor may not represent the temperature experienced by the occupants.



▼ RBC-FDP3-PE

This is a monitoring and control interface for Toshiba VRF and Split ranges of air-conditioners. The interface is compatible with all units that have a TCC-NET A,B remote controller network connection. No other network adaptor cards are required even for split A/C units:-

HARDWIRED CONTROL
Unit control can be achieved through resistance inputs using potentiometer and volt-free contact inputs.
BMS INTEGRATION
Unit control can be achieved through 1-10V voltage inputs integrated with BMS control outputs.
REMOTE CONTROLLER
Facility to individually lock and remote controller buttons associated with unit control.
RUN/FAULT Outputs
Readback of all indoor and outdoor unit fault codes and unit run status.
DUTY/STANDBY
Run/standby rotation with run on fault and programmable rotation period.
MODBUS
RS485 Modbus Control and Monitoring Functions.
CE APPROVED
The unit is fully approved for sale in Europe.



For full details see the RBC-FDP3-PE installation instructions.

9 DECLARATION OF CONFORMITY

DECLARATION OF CONFORMITY

Manufacturer: Sarum Electronics Limited
Clump Farm Industrial Estate
Higher Shaftesbury Road
Blandford
DORSET
DT11 7TD.
United Kingdom

According to the guidelines of the electromagnetic compatibility directive (2004/108/EC) and the low voltage directive (2006/95/EC) we declare that the product described below:

Generic Denomination: Air Conditioner

Model/type: RAV-DXC010

Commercial name: Light Commercial System DX Interface

Complies with the provisions of the following harmonized standard:
EN 50366: 2003 / A1: 2006
EN 55014-1: 2006
EN 55014-2: 1997 / A1: 2001 (category IV)
EN 61000-3-2 :2006, EN 61000-3-3 : 1995 / A1 : 2001 / A2 : 2005
EN 61000-3-11 : 2000, EN 61000-3-12 : 2005
EN378-2 : 2008
IEC 60335-2-40 : 2002 + A1 + A2 WITH
IEC 60335-1 :2001 + A1 + A2

Note: This declaration becomes invalid if technical or operational modifications are introduced without the manufacturer's consent.

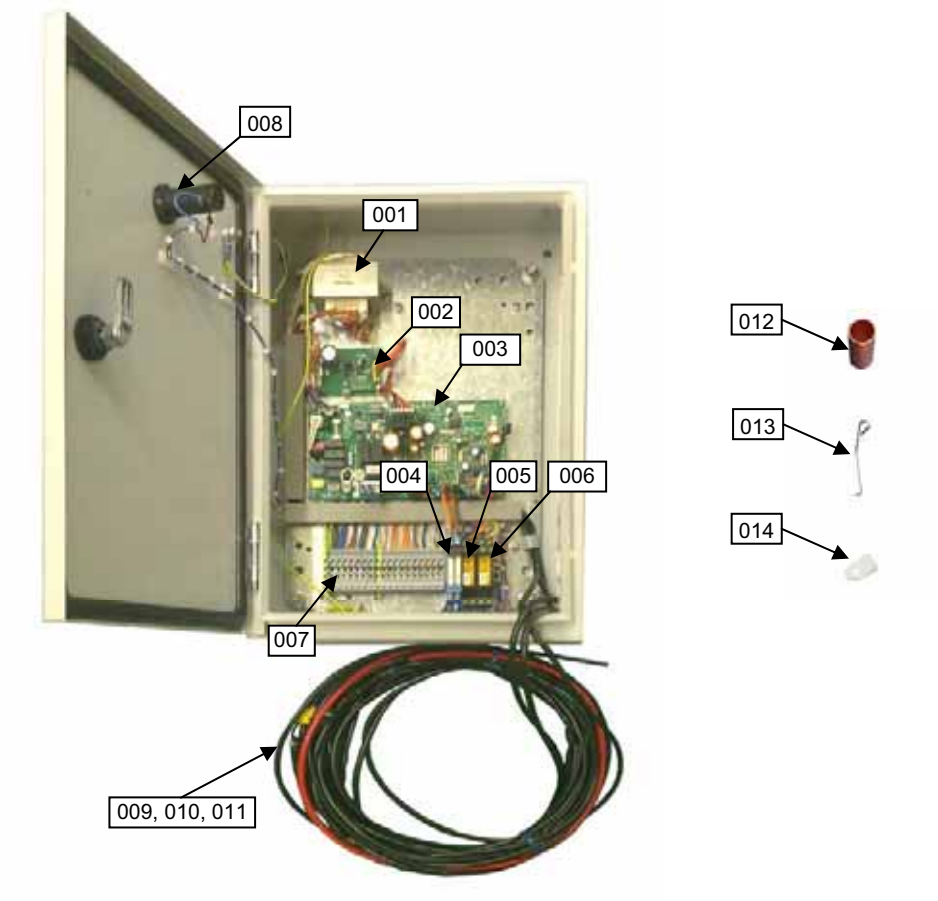
Signature:



Name: Steve Bishopp
Position: Managing Director
Date: 29-Sept-2011
Place Issued: United Kingdom

10 SERVICE PARTS

LC DX Interface - RAV-DXC010



Location No.	Part No.	Description	Qty
001	43158187	Transformer	1
002	4316V247	Sub PCB MCC-1520-01	1
003	4316V418	Control PCB MCC-1403-05	1
004	43DX0004	KP1/KP2 Relay & Base	2
005	43DX0002	KP3 Relay (R2-230A)	1
	43DX0003	KP3 Relay Base (R2-T)	1
006	43DX0002	KP4 Relay (R2-230A)	1
	43DX0003	KP4 Relay Base (R2-T)	1
007	43DX0005	Electrical Terminal (Grey)	15
	43DX0007	Electrical Terminal (Grn. / Yel. - Earth)	2
008	43DX0008	White Indicator Lamp (AD56LT-W)	1
009	43050426	TA Sensor	1
010	43050425	TC Sensor	1
011	43050425	TCJ Sensor	1
012	43DX0012	Sensor Holder	2
013	43019904	Fix Plate Sensor	2
014	43A63001	P-Clip (TA)	1

Toshiba Carrier (UK) Ltd
Porsham Close
Belliver Industrial Estate
Plymouth
Devon
United Kingdom
PL6 7DB

☎ +44 (0) 1752 753200
🖷 +44 (0) 1752 753222

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