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TOSHIBA AIRCONDITIONING
Advancing the *eco*-evolution

Controls 2015.v1

LOCAL CONTROLLERS

TOSHIBA offer different control solution to meet users and designer expectations. From local individual control and settings to computer based TCC link network, all indoor units can be programmed and set to suit the operational needs. Remote control systems offer a wide range of features including schedule timers, diagnostic functions, power meter, input output signal only to name a few.

TOSHIBA offer a number of Local Control products that can be used to control a single Indoor Unit, or group of up to 8 Indoor Units, from a position adjacent to that Indoor Unit or group. It is possible to install these Local Controllers up to 500m* from the connected Indoor Unit which allows greater flexibility when designing the installation. This also provides the opportunity to install the Local Controller in an area removed from the connected Indoor Unit, for example, common use areas where the Indoor Unit operation should not be changed by local users but may need to be monitored by a site engineer from a Control Room.

There are two different types of Local Remote Controller currently available from Toshiba, these are: the Wired Remote Controller which is the standard local control device suitable for most applications, and the Wireless Remote Controller which consists of a universal Handset that can be purchased with a choice of 4 different Wireless Receiver Units that are specifically designed to suit different Indoor Unit model types.

The Local network

There are three different methods that can be used to connect the Local Control Device to the Indoor Unit, or group of Indoor Units.

1 to 1 connection

This method is for the connection of a single Wired Remote Controller, or Wireless Receiver Unit, to a single Indoor Unit.

Group connection

This method enables the connection of up to 8 Indoor Units to a single Wired Remote Controller, or Wireless Receiver Unit. In this configuration, up to 8 Indoor Units can be controlled simultaneously (all Indoor Units follow the same setting parameters) from a single Local Control Device.

Multiple controller connection

This method enables the connection of up to 2 Local Control Devices (Wireless Receiver Unit or Wired Controller) to a single Indoor Unit, or a group of up to 8 Indoor Units. In this configuration, Main/Sub settings must be configured for each of the connected Local Control Devices.

Connected to indoor unit
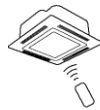
Wireless controller

Connected to indoor unit
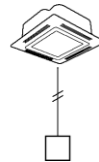
Simple remote controller

Connected to indoor units
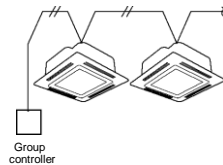
Group controller

Connected to indoor units
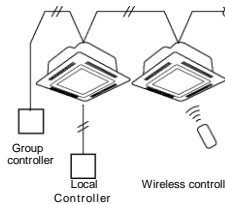
Group controller

Local Controller

Wireless controller

*Distances may vary depending on models and installation layout

CONTROLLER CONNECTION

1 to 1 CONNECTION
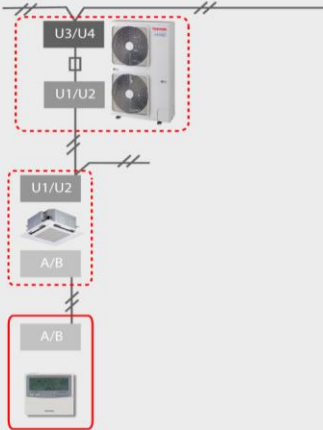
GROUP CONNECTION
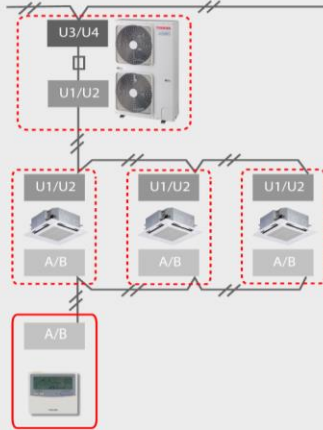
MULTIPLE CONTROLLER CONNECTION

SINGLE INDOOR UNIT
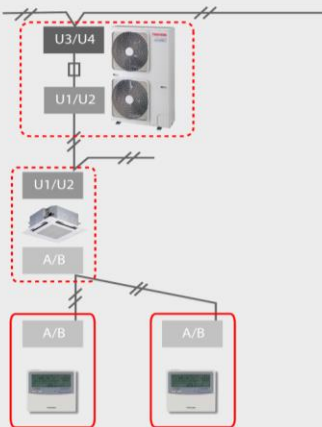
GROUP OF INDOOR UNITS
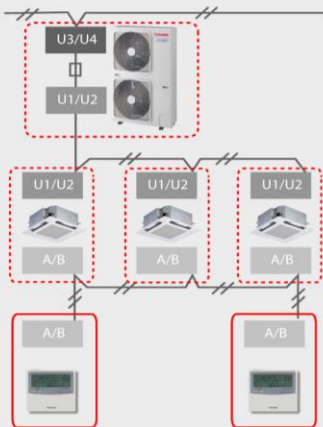
WIRED REMOTE CONTROLLERS

Toshiba's Wired Local Controller solution can be connected to a single unit or a local network up to 8 units and are available in three different models to suit all application, from a simplified device for Hotel Room applications to an advanced device with built in 7-day Schedule Functions. They can also be installed to adapt to the needs of the user.

Save Energy*

This unique feature can be activated by a single button press on the Local Remote Controller and can be used capacity of the Unit in order to reduce its Energy Consumption. Configurable item in 1% Intervals from 100% capacity down to 50% for *Wired Remote Controllers and stepped from 100% down to 75% and 50% for *Infrared Remote Controllers. This function can help to increase the Energy Efficiency of a Building and to reduce its Operating costs.

Temperature Limits

The Local Controller can also limit the temperature range to avoid excessive heating or cooling.

Frost Protection Feature*

The frost protection feature can be used to reduce the set temperature to 8°C in heating mode (protects building fabric with indoor temperature operation range 5°C to 13°C) and is set with the simple button press on the *Local Remote Controller.

* Feature available on specific models and unit combinations only.

| TCB-EXS21TLE | RBC-AMT32E | RBC-AMS41E | RBC-AS41E | Wireless Handset | RBC-AMS51E-ES |

RBC-AMT32E

Standard Remote Controller – Full Control including service functions

This is the Standard Local Controller and is suitable for all light-commercial and business applications (excludes DI Flexi Indoor Unit).

It can be connected to a single Indoor Unit for control of that Unit, or to a group of up to 8 Indoor Units for simultaneous control of those Units (Indoor Units will operate as one).

This Controller can be used to set all controllable parameters of the connected Indoor Unit(s) and shows the current settings of that Unit in an easy to read display, including an intelligent hexadecimal check code.

In addition to these control function, the RBC-AMT32E can also be used for service functions and has the ability to monitor real time system parameters and sensor data.

Features

- Room Temperature Sensor in controller body
- Energy Saving mode*
- Frost Protection mode*
- Countdown Timer
- External Ventilation control (allows the control of an external fan)
- Ceiling Height Compensation settings
- Individual Louver settings*
- Can be used to monitor various sensor readings and system data throughout the connected system
- Self-diagnosis function using the button "check" to display status code
- Can be used to make Indoor Unit Configuration settings & System Address Setup (DN Codes)

MAIN FUNCTIONS

FUNCTION	SETTING	MONITOR
On/Off	✓	✓
Mode	Auto, Heat, Cool, Dry, Fan Only	✓
Set Point	18-29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver	Swing, Fix	✓
Filter Display	Reset	✓
Fault Code	Reset	Hexadecimal fault code
Scheduled Tasks	Scheduled Timer Required	

* Feature available on specific models and unit combinations only

RBC-AS41E2

Simplified Remote Controller – Ideal for Hotel and base use applications (No service function available)

This is a simplified version of the RBC-AMT32E Local Controller and is suitable for use with all VRF, DI and SDI systems.

This Controller can be connected to a single Indoor Unit or a group of up to 8 Indoor Units and is used to set and display the operating parameters of the connected Indoor Unit, including fault codes.

The reduced function display and simplified button layout make this controller the ideal solution for applications where the Indoor Unit will be controlled by untrained staff or non-technical users, such as in Hotel Rooms or Offices.

Features
* Ideal for hotel and basic use application
* Compatible with all DI, SDI and VRF Indoor units
* Simple & Stylish design
* 0.5 degree set point design
* Screw type terminal
* Set louver and swing

1	**Fan Speed Button**
2	**Operation Mode Button**
3	**Swing/Air direction Button:** The flap angle is changed
4	**Temperature Setup button:** Every pushing ▲ button, temperature rises by 0.5ºC. Every pushing ▼ button, temperature decreases by 0.5ºC
5	**Start/Stop Button**
6	**Check Button** (Used in servicing) Do not use this button usually
7	**Remote control temperature sensor u**sually controlled by the indoor unit sensor, it can be changed to the remote controller.
8	**Selected Mode Displays (Heat pump type):** Any one of Auto, Heat, Cool Dry or Fan Only displayed.
9	**Selected mode Displays (Cooling only type):** Any one of Cool, Dry or Fan Only is displayed
10	**TEST is displayed during Test Run**
11	⚠ **Check** is displayed when the protective device worked or trouble occurred.
12	**Symbol** is displayed during the operation: If the remote controller setting is prohibited by the central remote controller, flashes when [Start/Stop], [Operation Select] or [Temp.Setup] button is pushed and change is not accepted.
13	**Setup temperature** is displayed
14	**Warning** code is displayed when a trouble occurred
15	**Selected fan speed,** Auto, High, Medium or Low displays
16	Symbol is displayed when the remote controller sensor is used

Controller Display (full illustration)

MAIN FUNCTIONS

FUNCTION	SETTING	MONITOR
ON/OFF	✓	✓
Mode	Auto, Heat, Cool, Dry, Fan Only	✓
Set Point	18-29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver	Swing, Fix	✓
Filter Display	-	-
Fault Code	Reset	Hexadecimal fault code
Scheduled Tasks	Not Available	Not Available

RBC-AMS41E

The RBC-AMS41E controller is based on the RBC-AMT32E but has the additional control provided from a built in 7-Day Timer making it an ideal solution for any light commercial or business application that requires schedule timer operations or night set-back control.

The 7-day Timer Function built in to this controller can be used to set multiple Unit parameters and can control:

- Operation ON/OFF
- Operation Mode
- Set Temperature
- Energy Saving Function*
- Frost Protection Function*
- Programmable Button Restrictions.

* Feature available on specific models and unit combinations only

Like the RBC-AMT32E, this controller also provides feedback of current Indoor Unit settings, hexadecimal check code display, and service functions for monitoring real time system data.

Features

- Energy Saving mode*
- Frost Protection mode*
- Weekly Timer Function with multiple programmable operations
- Weekly Timer Mode also enables Nigh Setback Operations
- Countdown Timer
- External Ventilation control (allow the control of an external fan)
- Individual Louver settings*

*Specific Unit Combinations only

MAIN FUNCTIONS

FUNCTION	SETTING	MONITOR	TIMER
ON/OFF	✓	✓	✓
Mode	Auto, Heat, Cool, Dry, Fan Only	✓	✓
Set Point	18-29 °C	✓	✓
Fan Speed	Auto, Low, Medium, High	✓	-
Louver	Swing, Fix	✓	
Filter Display	Reset	✓	-
Fault Code	Reset	Hexadecimal fault code	-
Scheduled Tasks	Built in 7-Day timer with multiple setting features		

RBC-AMS41E

Controller Display (full illustration)
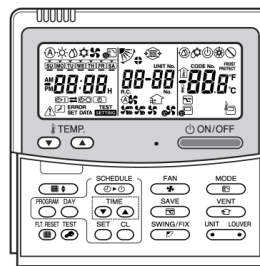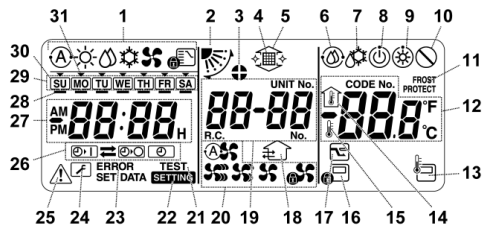
1	**Operation mode display:** This indicates the mode of operation which is currently selected
2	**Air Direction:** This indicates the air direction which has been selected
3	**Fix louvers:** This appears when the louvers are fixed *It also appears when the remote controller function has been selected
4	**Filter:** This appears when it is time to inspect the filter
5	**Grille up/down:** This appears when the grille is going up or going down
6	**Self-cleaning operation:** This appears while self-cleaning is underway

RBC-AMS41E

Function buttons area
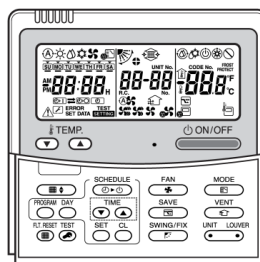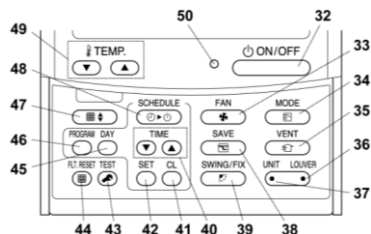
| 7	**Defrosting:** This appears while defrosting is underway during a heating operation
8	**Ready:** This display appears on some models
9	**Heating ready (indoor fan stops while this is displayed):** This appears before a heating operation starts or corresponding function
10	**No function:** This appears when a button is pushed but there is no corresponding function
11	**FROST PROTECT operation:** This appears during a frost protection operation
12	**Numeric display:** This displays the numeric value of the temperature, the numerical order of the trouble history events or the code numbers when the functions are set
13	**Remote control sensor:** This appears when the remote control sensor is used
14	**Indoor temperature:** This appears when the intake temperature is displayed on the numeric display
15	**Set temperature:** This appears when the set temperature is displayed on the numeric display
16	**Central control:** This appears when key operation limits are being enforced by the central controller or other unit or when key operation limits have been set in the program for the scheduled operation currently being executed
17	**Save operation:** This appears while a save operation is being set or executed
18	**Ventilation operation:** This appears while the ventilation fan is operating
19	**Numeric display:** The numbers of the indoor units or number s of the scheduled operation programs are displayed here
20	**Air speed display:** This indicates the selected air speed
21	**TEST:** This appears while a test run operation is being performed
22	**SETTING:** This appears when the clock time, a program or the timer is being set
23	**ERROR:** This appears when there is an error in the program setting input
24	**Servicing:** This appears during servicing
25	**Inspect:** This appears when trouble has occurred
26	**Timer function display:** This indicates the function whose operation has been scheduled when a scheduled operation or timer operation has been set
27	**Numeric display:** This indicates the present clock time, program operation time or timer execution time
28	**Operation reservation** _ This appears for the days of the week on which programs have been set
29	**Days of the week display**
30	**Special holiday:** This appears for a day of the week which has been set as a special holiday
31	**Day arrow** ▼This indicates the current day of the week or day on which a program is set
32	**ON/OFF Button -** Shortly after this button is pushed, operation starts, and operation stops shortly after the button is pushed again.
33	**FAN Button -** Use this to select the desired air speed mode.
34	**MODE Button -** Use this to select the desired operation mode.
35	**VENT Button -** Use this when a ventilation fan or other unit, purchased on the market, has been connected.
36	**LOUVER Button -** Use this to select the louvers when setting the air direction for each louver or when fixing the louvers in place.
37	**UNIT Button -** Use this to select the indoor unit to be operated when operating a multiple number of indoor units using one remote controller.
38	**SAVE Button -** Use this when performing save operations.
39	**SWING/FIX Button -** Use this to select the desired air direction or swing operation.
40	**TIME Buttons -** Use this to set the clock or adjust the time when the operating time is set.
41	**CL Button -** Use this when clearing the setting of the program (for a scheduled operation or timer operation) which is being set.
42	**SET Button -** Use this when entering the settings of the program (for a scheduled operation or timer operation) which is being set.

RBC-AMS41E

Function buttons area
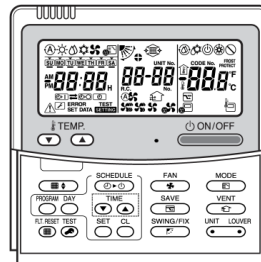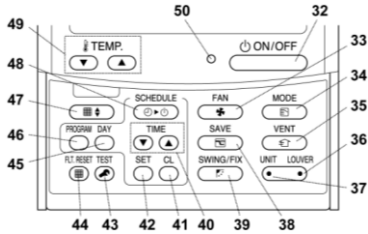
43	**TEST Button -** Use this for servicing. * This button is not normally used.
44	**FLT-RESET Button -** Use this to reset (extinguish) the filter display.
45	**DAY Button -** Use this to select the targeted day of the week when setting the clock or setting a program.
46	**PROGRAM Button -** Use this when starting and ending the program settings for scheduled operations.
47	**Grille Button -** Use this to raise or lower the grille.
48	**SCHEDULE BUTTON -** Use this when executing or releasing scheduled operations or when selecting ON or OFF for timer operations.
49	**TEMP Buttons -** Push ▼ and ▲ to set the temperature to the desired value. * These buttons are also used to raise or lower the grille when the grille function is used.
50	**ON Lamp -** This lights during operation. It blinks when trouble has occurred or when a protection operation is performed.

RBC-AMS51E-ES

The 7-day Timer Function built in to this controller can be used
to set multiple Unit parameters and can control:

- Operation ON/OFF
- Operation Mode
- Set Temperature
- Energy Saving Function*
- Frost Protection Function*
- Programmable Button Restrictions.
* Feature available on specific models and unit combinations only

Like the RBC-AMT32E, this controller also provides feedback of current Indoor Unit settings, hexadecimal check code display, and service functions for monitoring real time system data.

Features
- Extended energy save mode *
- Frost Protection mode*
- Weekly Timer Function with multiple programmable operations
- Weekly Timer Mode also enables Nigh Setback Operations
- Countdown Timer
- External Ventilation control (allow the control of an external fan)
- Individual Louver settings*
- Illuminated display
- Temperature setting in 0.5 °C steps

*Specific Unit Combinations only

MAIN FUNCTIONS

FUNCTION	SETTING	MONITOR	TIMER
ON/OFF	✓	✓	✓
Mode	Auto, Heat, Cool, Dry, Fan Only	✓	✓
Set Point	18-29 °C	✓	✓
Fan Speed	Auto, Low, Medium, High	✓	-
Louver	Swing, Fix	✓	
Filter Display	Reset	✓	-
Fault Code	Reset	Hexadecimal fault code	-
Scheduled Tasks	Built in 7-Day timer with multiple setting features		

RBC-AMS51E-ES

Functions Buttons

- **5**
- **6**
- **1** The button LED lights while the air conditioning unit is running
- **8**
- **4**
- **7**
- Model name label
- **2**
- **3**
- Temperature Sensor
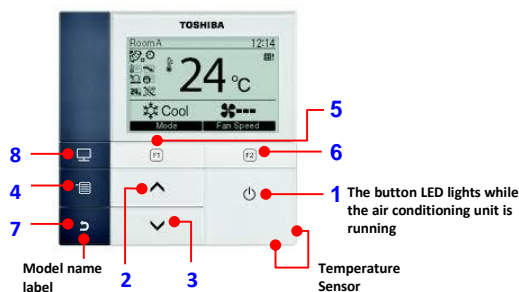
RBC-AMS51E-ES Function Buttons

1	⏻	**ON/OFF** button
2	⌃	button during normal operation: adjusts the temperature. On the menu screen, selects a menu item
3	⌄	button during normal operation: adjusts the temperature. On the menu screen, selects a menu item.
4	▤	button displays the menu screen
5	F1	button varies its function according to the setting screen
6	F2	button varies its function according to the setting screen
7	↰	button functions as indicated on the screen, such as returning to the previous menu screen
8	🖵	button displays the monitoring screen
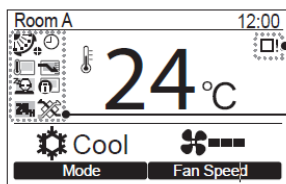
Icons appear on the screen when the detailed display mode is selected.

RBC-AMS51E-ES Detailed Display Mode

	Shows the Energy saving operation is activated
	Shows the Remote controller sensor is activated
	Shows the Night operation is activated
	Shows the Central control device prohibits the use of the remote controller
	Shows a Timer function is activated
	Shows the Louver lock is activated
	Shows the Setting of the louver
	Shows the Filter needs to be cleaned

CONFIGURATION USING REMOTE CONTROLLER

To assist service engineers working on Toshiba Air Conditioning equipment, there is a large amount of data available via the standard remote controller RBC-AMT32E or the RBC-AMS41E. This data is not available via the Infra-Red remote or the RBC-AS41E Simplified Remote Controller. Accessing the data is a simple process of pressing a sequence of buttons on the remote controller.

Configuration Menu

In this case, after confirming which indoor unit is connected to the remote controller and that the air conditioner is in the OFF state, you set the central addresses one at a time.

If the system has not got a remote controller, connect a remote controller to the system temporarily, and then follow this procedure: -

NOTE.

The indoor unit addresses must already have been set before performing zone registration.

1. Press ⊘ , ◯ , ◯ buttons at the same time for more than 4 seconds.

2. Do NOT press ⊂⚬⊃ button

3. In this mode the Unit No. CODE and SET DATA No. and TEST **SETTING** are displayed (indications flash on the display).
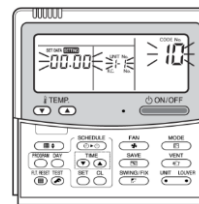
NOTE

4. In case of group control "ALL" instead of "UNIT No" will flash on the display.

   Select the main indoor unit address by pressing the ⊂⚬⊃ button once.

5. Set CODE DN03 using the ▼ ▲ buttons.

NOTE

The CODE DN03 must be selected to perform zone registration using the remote controller.

6. Set the Central Address, which you want to assign to the indoor unit address using ▼ ▲ buttons according to the zone registration table.

7. Press the ◯ button. The CODE No. and the Central address changes from flashing to ON state. If you make a mistake, then press the ⊘ button and reset the central address.

8. Set CODE No. to 12 using the ▼ ▲ buttons.

9. Set the Outdoor unit address which you want to assign to the system using the ▼ ▲ buttons (each outdoor unit will require a unique address between 1 and 30).

10. Press the ◯ button

11. When all address Zone(s) and System(s) have been set press ⊘ the remote controller's display will CLEAR, with **SETTING** flashing, once **SETTING** has cleared the system has been configured.

Example above:
Indoor Unit Address:
1-8
Central Address:
17 (ZONE 2, GROUP 1)
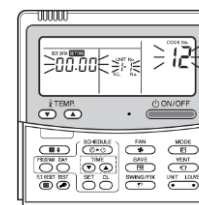
CONFIGURABLE ITEMS

A number of items are configurable by the wired controller. If an indoor unit is without a wired controller then the unit requires configuration, it may be temporarily connected for the procedure to be undertaken. In order to access the menu

RBC-AMT32E/RBC-AMS41-E   Press (TEST) + (SET) + (CL) buttons at the same time for more than 4 seconds

RBC-AMS51E-ES   Press and hold the [▣ MENU] button & [∨ ∨] button at the same time for more than 4 seconds to display "**Field setting menu**"

EXAMPLES of COMMON CONFIGURABLE OPTIONS

ITEM	DESCRIPTION		VALUE	DEFAULT
01	Filter alarm time	Filter sign displayed after selected time has elapsed – or by external pressure switch (CN70)	0000: Inactive 0001: 150 H 0002: 250 H 0003: 500 H 0004: 1000 H 0005: External switch	0004
02	Dirty environment	Allows filter alarm time to be halved if used in a dirty environment	0000: Standard 0001: Dirty	0000
03	Network address	When under network control.	0099: Unset 0001 to 0064 available	0099
04	Priority Setting for Remote Controller	0 = Normal 1= Priority (This remote has priority of mode setting	0000 = Standard 0001 = Priority	0000
06	Stratification control	Increases effective return air temperature setting in heating mode (0 to 10 K)	0000 to 0010	0002; +2ºC Floor type 0000; 0ºC
0C	Preheat	Preheat indication on display	0000 = available 0001 = unavailable	0000
0d	Auto mode	Enable or disable Auto mode	0000 = available 0001 = unavailable	0000 except SMMS
0E	SHRMi only	Used when multiple indoor units are served via a single FS box	0000 = normal 0001 = multiple units	0000
0F	Heat Mode	Enable or disable Heat Mode	0000 = available 0001 = unavailable	0000
10	Indoor unit model	Must be set when replacing indoor printed circuit board	0000: 1 way cassette (s models) 0001: 4 way cassette 0002: 2 way cassette 0003: 1 way cassette (y models) 0004: duct (standard) 0005: slim duct 0006: duct (high static) 0007: ceiling 0008: hi wall 0010: console 0011: concealed floor 0014: 4 way cassette (600 x 600) 0013: tall cabinet 0016: fresh air intake 0050: air to air heat exchanger	
11	Indoor unit capacity	0000 will generate a (L09) fault	MM RAV MM RAV 0004=005* 0012= 027* 80* 0001=007* 0013= 030* 0003=009* 30* 0015= 036* 110 0005=012* 0017= 048* 140 0006= 40* 0018= 056* 160 0007=015* 0021= 072* 224 0009=018* 56* 0023= 096* 280 0011=024* Air to air heat exchanger Type 0001= 150m³/h 0002= 250m³/h 0003= 350m³/h 0004= 500m³/h 0005= 650m³/h 0006= 800m³/h 0007= 1000m³/h	
12	System number	DI/SDI indoor and outdoor units are automatically addressed, this value may be set manually but it must be done via the wired controller – on an individual basis. Settings are 0001 to 0030	0001: outdoor unit 1 0002: outdoor unit 2	0099
13	Indoor unit number	Indoor units connected to a common outdoor unit (e.g. twinned indoor units) will have the same system number - settings are 0001 to 0064. Automatically allocated – but may be manually overridden.	0001: indoor unit 1 0002: indoor unit 2	0099
14	Group master/slave	Allows selection of master indoor unit within group. Automatically allocated but may be manually overridden.	0000: single indoor unit 0001: group master 0002: group slave	0099
15	Temperature Sensor	Compensation for missing temperature sensor (split systems ONLY) other settings produce F03 fault code	0022	0022
16	Indoor Fan	Indoor fan speed selection. Binary addition.	0015 = all speeds available 1 = auto; 2 = low; 4 = medium; 8 = high	0015 except high static 0008
17	Set point shift	Cooling temperature set point shift. (shifted by 1 to 10 k)	0000 = no shift, 0001 = 1 k shift 0010 = 10 k shift	0000
19	Louver functions	None, swing only, swing and auto (where applicable)	0000: disabled, 0001: swing only 0004: all options	
1b	Compressor on time	Compressor minimum on time 0 = 5 minutes 1 = 4 minutes	0000: 0 – 5 min 0001: 1 - 4 min.	0000
1E	Dead band - auto	Changeover sensitivity in automatic mode. 1 to 10 k adjustable	0000: 0 K, 0010: 10 K	0003
1F	Max. Setting	Cooling mode maximum temperature setting (18 – 29)	0018 = 18º C 0020 = 20 º C 0029 = 29 º C	29 º C
20	Min. Setting	Cooling mode minimum temperature setting (18 – 29)	0018 = 18º C 0020 = 20 º C 0029 = 29 º C	18 º C
21	Max. Setting	Heating mode maximum temperature setting (18 – 29)	0018 = 18º C 0020 = 20 º C 0029 = 29 º C	29 º C
22	Min. Setting	Heating mode minimum temperature setting (18 – 29)	0018 = 18º C 0020 = 20 º C 0029 = 29 º C	18 º C

EXAMPLES of COMMON CONFIGURABLE OPTIONS

ITEM	DESCRIPTION	VALUE	DEFAULT	ITEM
23	Max. Setting	Dry mode maximum temperature setting (18 – 29)	0018 = 18º C 0020 = 20 º C 0029 = 29 º C	29 º C
24	Min. Setting	Dry mode minimum temperature setting (18 – 29)	0018 = 18º C 0020 = 20 º C 0029 = 29 º C	18 º C
25	Max. Setting	Auto mode maximum temperature setting (18 – 29)	0018 = 18º C 0020 = 20 º C 0029 = 29 º C	29 º C
26	Min. Setting	Auto mode minimum temperature setting (18 – 29)	0018 = 18º C 0020 = 20 º C 0029 = 29 º C	18 º C
28	Auto restart	Enable or disable	0000: disabled, 0001: enabled	0000
29	Humidifier condition	Operating condition of humidifier	0000: Usual 0001: Condition ignored	0000
2A	CN70	Selection of optional error input (CN70)	0000: Filter input 0001: Alarm input, 0002: None	0002
2d	Modes available	Binary addition of modes available. Split systems 0000, will fault the system	0015 = all modes 1 = fan; 2 = cool; 4 = dry 8 = heat	0015
2E	External On / Off control	Making or breaking terminals 1 and 2 of CN61 (indoor PCB) External switching option, remove jumper 01 master indoor PCB allows continuous contact switch- link 01 in place; pulse switch required	0000 = group starts when made stops when open 0001 = enable when made, disable when open	0000
31	External fan control	Through remote controller and CN32 indoor PCB	0000 = disable, 0001 = enabled	0000
32	Sensor location	Return air/room sensor OR in local controller	0000: return air sensor 0001: remote sensor	0000
33	Unit of temperature	Celsius or Fahrenheit	000 = Celsius, 0001 = Fahrenheit	0000
36	Remote controller	Temperature display	0000: temperature setting 0001: temperature room sensing	0000
40	Drain pump	Drain pump control	0000: None 0001: Pump ON 0002: None 0003: Pump OFF	0003
45	Anti-smudge	4 way cassette anti smudge effect via louver position	0000 = enabled, 0001 = disabled	0000

ITEM	DESCRIPTION		VALUE			DEFAULT	ITEM
5d	**1-Way Cassette**			AP015, 018	AP024	0000	
	Airflow correction Ceiling height (m)			3.5 4.0 4.2	3.8 4.0 4.2	0000 0001 0003	0000
	2-Way Cassette			AP007 to AP030	AP36 to AP056	0000	
	Airflow correction Ceiling height (m)			2.7 3.2 3.8	2.7 3.0 3.5	0000 0001 0003	0000

4-Way Cassette

	-			RAV56*			RAV80*			RAV110*-160*		
	AP005 to AP012			AP015 to AP018			AP024 to AP030			AP036 to AP056		
	4-way	3-way	2-way	4-way	3-way	2-way	4-way	3-way	2-way	4-way	3-way	2-way
Airflow correction Ceiling height (m)	2.7 - -	2.8 - -	3.0 - -	2.8 3.2 3.5	3.2 3.5 3.8	3.5 3.8 -	3.0 3.3 3.6	3.3 3.5 3.8	3.6 3.8 -	3.9 4.2 4.5	4.2 4.4 4.6	4.5 4.6 -

Default: 0000 / 0001 / 0003   ITEM: 0000

4-Way Compact Cassette

	-	RAV40*	RAV56*	DEFAULT	ITEM
	AP007 to AP012	AP015	AP018		
Airflow correction Ceiling height (m)	2.7 - -	2.9 3.2 3.5	3.2 3.4 3.5	0000 0002 0003	0000

Slim Ducted

	-	RAV40*-56*		DEFAULT	ITEM
	AP0054	AP0074 to AP0184	AP0244 to AP0274		
Airflow correction External static pressure	10 Pa 20 Pa 35 Pa 50 Pa	10 Pa 20 Pa 35 Pa 50 Pa	10 Pa 20 Pa 35 Pa 50 Pa	0000 0001 0003 0006	0000

Standard Ducted

	RAV40*-56*	RAV80*	RAV110*-160*	DEFAULT	ITEM
	AP007 to AP018	AP024 to AP030	AP036 to AP058		
Airflow correction External static pressure	30 Pa 40 Pa 50 Pa 65 Pa 80 Pa 100 Pa 120 Pa	30 Pa 40 Pa 50 Pa 65 Pa 80 Pa 100 Pa 120 Pa	30 Pa 40 Pa 50 Pa 65 Pa 80 Pa 100 Pa 120 Pa	0001 0000 0003 0002 0004 0005 0006	RAV40* 0001 RAV-80* 0001 RAV110* 0003 RAV140* 0003 RAV160* 0003 AP007_018 0001 AP024_030 0000 AP036_058 0003

| ITEM	DESCRIPTION	VALUE	DEFAULT	ITEM
60	Timer lock	Locks timer in wired local controller – maintaining last setting	0000: unlocked, 0001: locked	0000
62	Anti-smudge	4 way cassette – ant smudge via fan speed (Coanda effect)		0001
69	Louver	Louver restriction when cooling	0000 = restricted to horizontal positions 0001 = full range of movement	0000
8b	Heating Correction	Heating output reduction split systems only	0000: None, 0001: Correction	0000
8C	Forced Defrost	Run group in HEAT mode after setting defrost is conducted automatically. Value is reset automatically back to 0000	0000 = disabled	0000
A0	Fan & Pump	Fan and pump operation during oil retrieval mode (VRF cassettes ONLY)	0000 = fan off, pump on 0003 = fan on, pump on	0003
C2	Energy save	Outdoor unit energy demand 1% increments 50 to 100%	0050 ~ 0100	0075
CE	Replace indoor PCB	4-Way cassette unit capacity code	0000 = disable 0006: RAV40* 0009: RAV56* 0012: RAV80* 0015: RAV110* 0017: RAV140* 0018: RAV160*	0000
D3	Self clean operation	Self clean dry operation	0000 = disable 0001 = enable	0001
F1 F2 F3 F4	Louvre lock Flap 1 Louvre lock Flap 2 Louvre lock Flap 3 Louvre lock Flap 4	4-Way cassette 5 fixed positions	0000 Full swing 0001 Fixed position 1 0002 Fixed position 2 0003 Fixed position 3 0004 Fixed position 4 0005 Fixed position 5	0000

TOSHIBA Leading Innovation >>>

FAULT CODE GUIDE

1. Current fault codes are displayed automatically on the left of the remote controller, (Four figure display in Black) fault code history can be accessed by pressing (TEST) + (SET) together at the same time for more than 4 seconds.

2. To scroll through the faults use the (▼)(▲) buttons.

3. Pushing (TEST) button returns the display to usual display.

Each controller will hold four fault codes per unit controlled, the first displayed fault code is the newest and the fourth is the oldest.

To gain more information on the fault codes go to: -
website http://toshiba-aircon.co.uk/
download Apps for Android/IOS phones
use fault code text service 07624 803 017
refer to the Technical HandBook for fault code diagnosis and descriptions

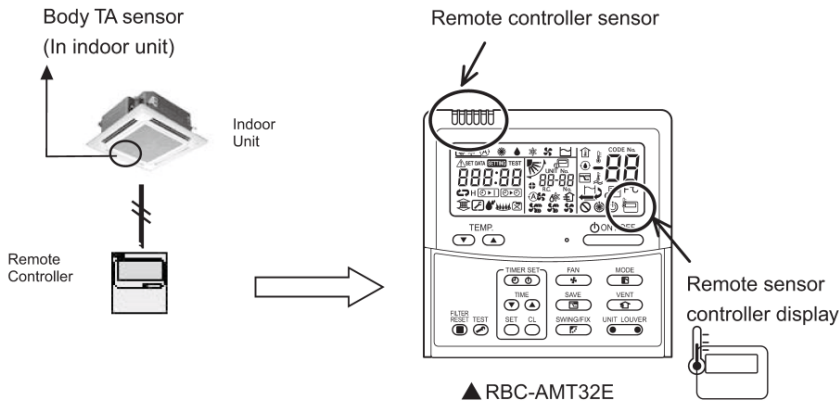You can also contact the technical helpline on 0870 843 0333
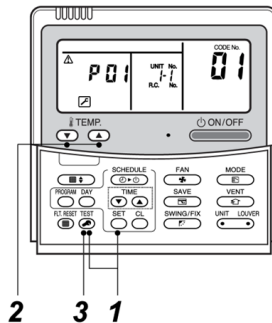
EXAMPLES of FAULT CODES WITH DESCRIPTIONS

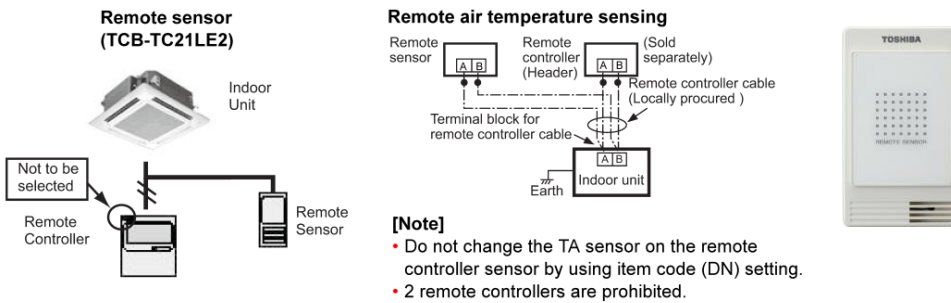| CHECK CODE	DESCRIPTION OF ERROR
E01	Signals cannot be received from indoor unit; master remote controller has not been set (including two remote controller control).
E02	Signals cannot be transmitted to indoor unit.
E03	Communication from remote controller or network adaptor has been lost (so has central control communication).
E04	Signals are not being received from outdoor unit.
E08	Indoor unit detects address identical to its own.
E09	Both remote controllers have been set as master remote controller in two remote controller control (alarm and shutdown for header unit and continued operation for follower unit)
E10	MCU communication between main controller and motor microcontroller is faulty.
E18	Periodic communication between indoor header and follower units cannot be maintained.
F1	Heat exchanger temperature sensor (TCJ) has been open/short-circuited.
F2	Heat exchanger temperature sensor (TC2) has been open/short-circuited.
F3	Heat exchanger temperature sensor (TC1) has been open/short-circuited.
F10	Ambient temperature sensor (TA) has been open/ short-circuited.
F11	Discharge temperature sensor (TF) has been open/ short-circuited.
F13	Temperature sensor built into indoor IGBT (TH) has been open/short-circuited.
F17	Open/Short of outside air suction temperature sensor (TOA) was detected.
F18	Open/Short of indoor air suction temperature sensor (TRA) was detected.
F29	Indoor EEPROM is abnormal (some other error may be detected).
H01	Inverter current (IDC) detection circuit detects overcurrent.
H02	Compressor lockup is detected
H03	Abnormal current is detected while inverter compressor is turned off.
L03	There is more than one header unit in group.
L07	There is at least one stand-alone indoor unit to which group control cable is connected.
L08	Address setting has not been performed for one or more indoor units (also detected at outdoor unit end).
L09	Capacity setting has not been performed for indoor unit.
L20	There is duplication in central control address setting.
L30	Unit shutdown has been caused by external error input (CN80).
P01	Indoor AC fan error is detected (activation of fan motor thermal relay).
P04	High-pressure SW is activated.
P07	Temperature sensor built into IGBT (TH) detects overheating.
P10	Float switch has been activated.
P12	Indoor DC fan error (e.g. overcurrent or lock-up) is detected.
P22	Outdoor fan IPDU detects error.
P26	Short-circuit protection for compressor motor driver circuit components is activated (momentary overcurrent).
P29	Compressor motor position detection error is detected.
P31	Follower unit cannot be operated due to header unit alarm (E03/L03/L07/L08).

TEMPERATURE SENSING

Both infrared and wired controllers are able to supply a temperature value to the indoor unit. This may be more representative than the standard return air sensor fitted to the indoor unit but is not available from sub controllers of either type.
To set the room sensor:

- Infrared controller press MAIN SENSOR (in the event that the infrared controller loses contact with the indoor unit, return air temperature sensing will automatically resume)
- Wired controller (set from configuration menu DN Code 32)

Body TA sensor
(In indoor unit)

Remote controller sensor

Indoor Unit

Remote Controller

Remote sensor controller display

▲ RBC-AMT32E

- A further option for remote sensing is available, the remote sensor.

Remote sensor
(TCB-TC21LE2)

Indoor Unit

Not to be selected

Remote Controller

Remote Sensor

Remote air temperature sensing

Remote sensor

Remote controller (Header)

(Sold separately)

Remote controller cable (Locally procured)

Terminal block for remote controller cable

Earth   Indoor unit

[Note]
• Do not change the TA sensor on the remote controller sensor by using item code (DN) setting.
• 2 remote controllers are prohibited.

This is connected to terminals A+B whether or not a wired controller is used. The indoor unit must be set to use the standard return air sensor however this sensor automatically takes control of the system. This value is used to provide control to all indoor units within a group.

Select the Room Temperature Sensor

Two room temperature sensors are installed: one in the indoor unit; the other in the remote controller.
Only one sensor (usually the indoor unit's) can be active at any one time.

To select the sensor in the remote controller, perform the following steps.

1. Press ⊘ temperature setup button ▼ ▲ for more than 4 seconds.
   The unit number displayed for the first time is the indoor unit address of the master unit in the group control. Do not press the ⊡ button.
2. Set CODE No. to 32 using the ▼ ▲ buttons.
3. Use the ▼ ▲ buttons to adjust the value from 0000 to 0001
4. Press the ◯ button to confirm change
5. Press the ⊘ button to exit menu
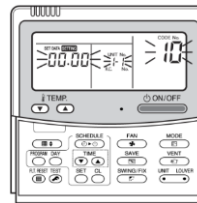
The status returns to the operation stop status and ▭ is displayed in the LCD.

Press ▬▬▬ button to restart the operation

INFRARED REMOTE CONTROL

TOSHIBA's Wireless Controllers provide an ideal solution for any installation where an exceptionally neat and professional finish is required, or where it is not possible to install a wired remote controller.

Easy to use compact button layout in modern design standard control buttons are visible with additional control buttons hidden under a sliding screen. An integral temperature sensor is included that can be used in place of the return air temperature sensor in the Indoor Unit.
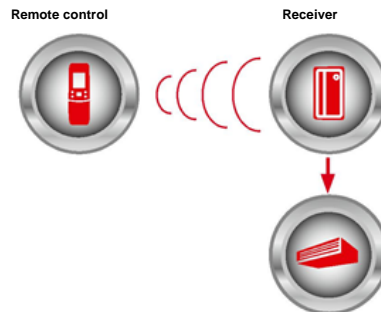
- Setting the operating mode: Cooling, Heating, Automatic and Fan only
- Set temperature and fan speed
- Control louvers
- Energy Saving Mode: Energy saving function for night operation with reduced fan speed and unit shut off after 1, 3, 5 or 9 hours.
- Silent Mode: the indoor unit can operate at extra low speed with very low noise level.

To achieve the high standards of finish required, TOSHIBA have produced a series of different receiver units designs for installation on specific indoor unit models.

TCB-AX32E2

Receiver kit for the installation on the wall or ceiling.

- To be used with: DI / SDI and VRF indoor units except ducted type models high static pressure and fresh air intake.

Remote control   Receiver

MODE

FAN

▲ TEMP ▼

QUIET

Reduction of fan speed to a super low level in order to lower sound pressure level by an additional 3 dB(A)

SWING

Oscillating movement of the louver

HI POWER

Extra strong air flow for quick cooling

TIMER ON

Activation of timer

TIMER CLR

Clear settings of the timer

COMFORT SLEEP

Automatically turn off the unit in 1, 3, 5 or 9 hours after setting; when operated an increase of temperature by 2°C maximum is performed for comfort.

FIX

Fix positioning of the louver

TIMER OFF

Deactivation of timer

TIMER SET

Save timer settings

HANDSET MAIN FUNCTIONS

FUNCTION	CONTROL	MONITOR
Operation ON/OFF setting	✓	✓
Operation mode setting	Auto, Heat, Cool, Dry, Fan Only	✓
Set temperature	18-29 °C	✓
Fan speed setting	Auto, Low, Medium, High	✓
Louver setting	Swing, Fix	✓
Fault code indication	Reset	Flash LED on receiver unit
Schedule functions	Countdown timer with on, off & repeat off settings	

RBC-AX33CE

Receiver kit to be installed directly in the frame of the indoor unit.

- To be used with: VRF ceiling models and VRF 1-way cassette

RBC-AX32U(W)-E

Receiver kit to be installed directly in the frame of the indoor unit.

- To be used with: DI / S-DI and VRF 4-way standard cassette

- RBC-AX32U(W)-E for standard panel RBC-U31PGP(W)-E with wide air flow

- RBC-AX32U(WS)-E for optional panel RBC-U31PGSP(W)-E with direct air flow

RBC-AX23UW(W)-E

Receiver kit to be installed directly in the frame of the indoor unit:

- To be used with: VRF 2-way-cassette

STANDARD & ADVANCED CENTRAL CONTROLLERS

The TCC-Link Central Control Network is used for communication from the Outdoor Unit to Indoor Units in VRF systems, and for connection of TOSHIBA's Central Control devices to the Air Conditioner product.

- U1/U2 connection - used for Outdoor to Indoor Unit connection.

- U3/U4 connection - used for Outdoor Unit to Outdoor Unit connection when multiple refrigerant circuits are connected to the same TCC-Link Network.

- NOTE: Increased Installation Flexibility is achieved as the TCC-Link allows Central Control Devices to be connected to either the Indoor Unit side (U1/U2) or the Outdoor Unit side (U3/U4).

CONTROLLER CONNECTION
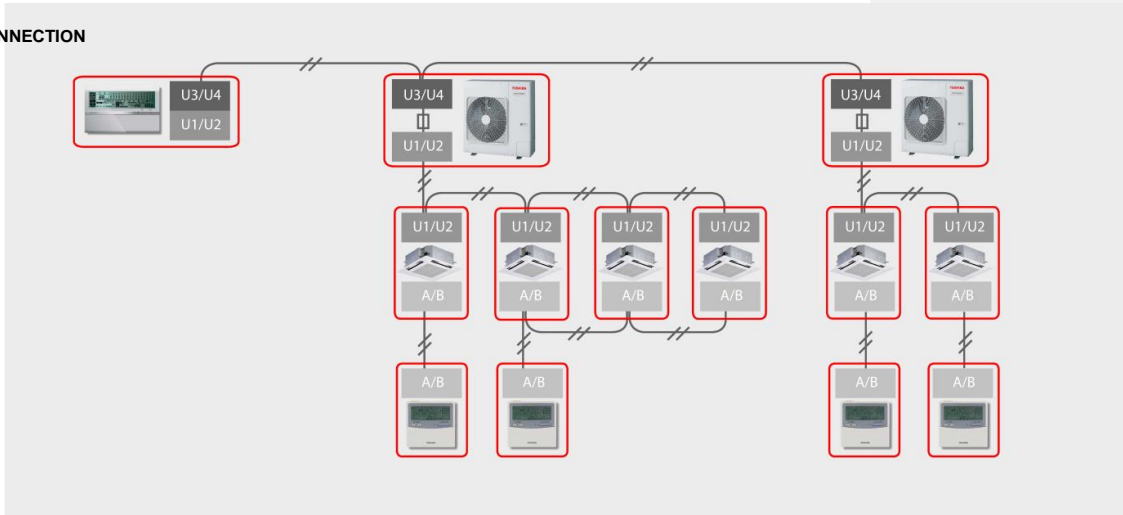
CONTROL WIRING SPECIFICATION

CONNECTION DEVICES	TYPE	CORES	SIZE	LENGTH	POLARITY	OTHERS
Indoor to Outdoor Units	Shield wire	2	$1.5mm^2$ (min.$1.25mm^2$)	Max 1000m	Non Polarity	Procured locally
Central Control Devices			$2.5mm^2$ (min.$2.00mm^2$)	Max 2000m		

Maximum connectable Indoor Units: 64*

Maximum Connectable Outdoor Systems: 16

*ALL Indoor Units in a group MUST be counted in total number in the case of VRF systems. In case of DI/SDI systems, follower units in a group are not counted in the total Indoor Unit quantity. This means that up to 64 groups of 8 DI/SDI Units can be connected (total 512 Indoor Units)

SCHEDULE TIMER SOLUTIONS

TCB-EXS21TLE

The TCB-EXS21TLE is a Schedule Timer device for use with DI, SDI and VRF equipment (Excludes DI Flexi) and has two modes of operation.

The Schedule Timer is an advanced control device that can be used to control Indoor Unit parameters based on a timed schedule, and has two possible modes of operation to choose from, these are:

Weekly Timer Mode
The timer is connected to an Indoor Unit via a Local or Central Remote Controller.

Schedule Timer Mode
If the Timer is connected directly to the TCC Link Central Control network and can set Timer Functions for up to 64 Indoor Units in up to 8 programmable control groups.

The Schedule Holiday Function
Operations programmed for a specific day of the week can be temporarily disabled using the holiday setting. Once over or disabled the program is resumed.

WEEKLY TIMER MODE
In this mode, the Schedule Timer is connected to a local or Central Control device to provide Simultaneous On/Off operation, based on timer programs for all connected Indoor Units

Features
- Up to 3 On/Off Cycles can be programmed per day

SCHEDULE TIMER MODE
In this mode, the Schedule Timer is connected directly to the TCC-Link Central Control Network and can control operation On/Off and On/Off Permit/Prohibit functions for up to 64 Indoor Units based on Control Group settings.

Features
- Up to 8 Programmable Control Group Settings for Indoor Unit connection

- **TCB-SC642TLE2** allows for additional Local Controller permit/prohibit Functions to be set/reset based on Timer Input
- Timer Functions can be switched On/Off without the need to delete the programmed operations
- Holiday Settings available
- Day Copy Function

- Up to 64 Indoor Units can be programmed into each Control Group
- Indoor Units can be programmed into multiple Control Groups
- Up to 6 programmable operations per day
- Holiday & Day Copy functions available
- Programmable Permit/Prohibit functions

Schedule Timer Group Settings

When used in Schedule Timer mode, this device has the option of setting Control Groups (similar to the Zone settings available on the TCB-SC642TLE2 64-Way Central Remote Controller device) in two different ways, Fixed Groups and Manual Groups.

When Manual setting is used there are up to 8 programmable Groups that can contain up to 64 Indoor Units in each group. An Indoor Unit can be programmed in to more than 1 group.

When fixed setting is used, the Central Control Addresses are automatically set for each control group.

Permit/Prohibit Operation selection
There are 8 different Permit/Prohibit patterns available for restriction of Local Remote Controller functions, these are
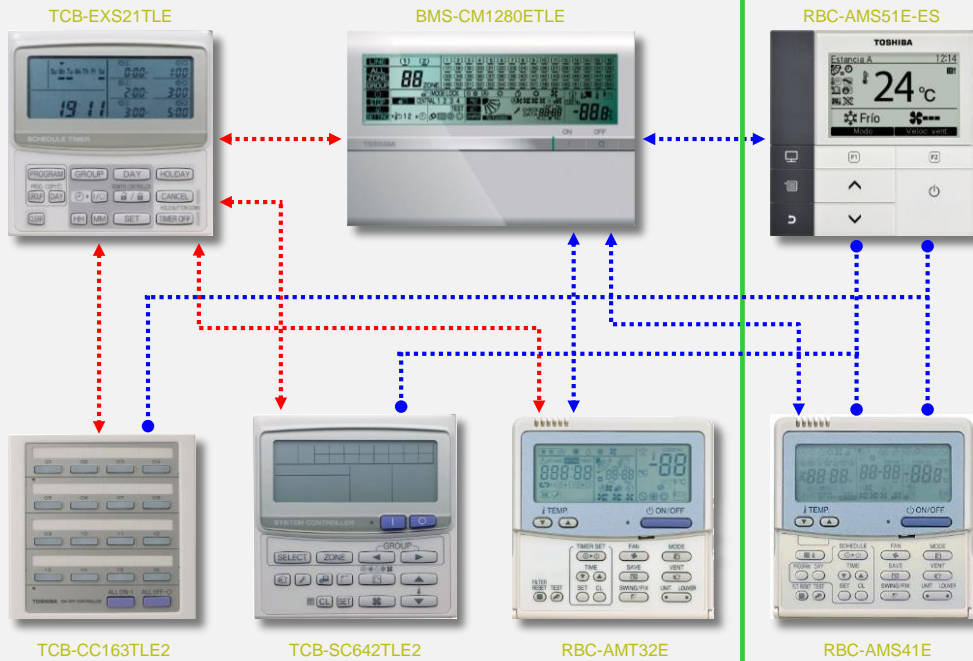
PERMIT/PROHIBIT OPERATIONS

MODE	REMOTE CONTROL DISABLED ITEMS	64-WAY CENTRAL CONTROLLER INDICATION
0	Enable/Disable Not Used	No Indication
1	ON/OFF	Central 1
2	Operation Mode	Central 4
3	Operation Mode & ON/OFF	Central
4	Temp. Setting	Central
5	Temp. Setting & ON/OFF	Central
6	Temp. Setting & ON/OFF	Central 3
7	Temp. Setting & ON/OFF & Mode	Central

CONNECTABLE CONTROLLERS

LOCAL REMOTE CONTROLLERS	CENTRAL REMOTE CONTROLLERS
RBC-AMT32E - Standard Control	BMS-CM1280ETLE - Compliant Manager
RBC-AMS41E - Built in Timer	TCB-SC642TLE2 - Central Remote Controller
RBC-AMS51E-ES - Lite Vision	TCB-CC163TLE2 - 16 way On/Off Controller

Scheduled Timer   Local Timer

TCB-EXS21TLE   BMS-CM1280ETLE   RBC-AMS51E-ES

TCB-CC163TLE2   TCB-SC642TLE2   RBC-AMT32E   RBC-AMS41E

A PROGRAM button   **E** HOLIDAY button
B PROGRAM COPY buttons   **F** CANCEL button
C CLEAR button   **G** TIMER button

D SETTING buttons
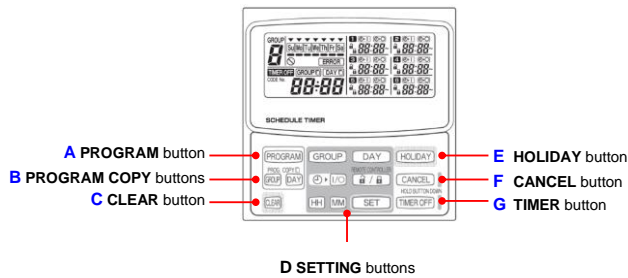
Scheduled Timer Buttons

A	PROGRAM	button	Use to start setting programs and to enter program settings
B	PROG. COPY GROUP DAY	buttons	Use to copy programs to groups or specific days in a schedule.
C	CLEAR	button	Press to clear the settings of the currently displayed program. • The current program is not cleared unless the PROGRAM button is pressed after pressing the CLEAR button.

Use to make program settings and to set the present time

D	GROUP	button	Press to set groups for programmed operation
	DAY	button	Press to set today's day and days of programmed operation
	HH MM	button	Press to set the present time and times used in programmed operation
	⏱▸I/O	button	Use to start/stop indoor units via the timer
	REMOTE CONTROLLER 🔓/🔒	button	Use to enable/disable remote controller operation via the timer
	SET	button	Use to set programmed operation trigger time • Program settings are not entered unless the PROGRAM button is pressed at the end of setting operations
E	HOLIDAY	button	Press to set cancel holidays during a scheduled week of operation.
F	CANCEL	button	Press to cancel the current program setting operation, copying operation or holiday setting operation. When the CANCEL button is held down for 2 seconds, the current settings operation or copying operation is cancelled and the normal display returns
G	TIMER OFF	button	Press to turn the timer OFF when timer operation will not be used for a long period of time. When this button is held down for 2 seconds, TIMER OFF appears on the display. Programs cannot be run until the button is again held down for 2 seconds.

A B C D   E

F
Controller Display (full illustration)   G
H

A   J
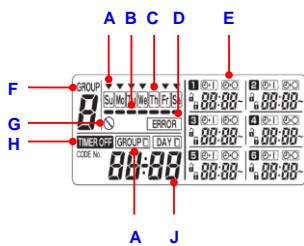
Display Functions

A	Today's Day of The Week	Indicates today's day of the week
B	Program Schedule Indication	Appears under days that are scheduled for program operation
C	Holiday Schedule Indication	Appears around scheduled holidays
D	Error Indication	Displayed when a mistake is made during timer setting
E	Timer Program	Displays set timer programs, also indicates the copy source/destination during group program copying
F	Group No.	Up to 8 groups can be selected and displayed
G	⊘ (Disabled Feature) Indication	Displayed if the selected feature was disabled during installation
H	Timer Off Indication	Displayed when the timer has turned OFF
I	Copy Mode Indication	Displayed when copying a program into a group or day of the schedule
J	Present Time	Displays the present time on a 24-hour clock. Also, displays settings in the various setting modes.

TCB-CC163TLE2 16 WAY ON/OFF CONTROLLER

The TCB-CC163TLE2 is a 16-Way On/Off Controller for use with DI, SDI and VRF equipment (Excludes DI Flexi). It is a simplified Central Control device that can be connected to up to 16 Indoor Units via the TCC-Link Central Control Network to provide simple "1 touch" On/Off control for those connected Indoor Units.

This Controller can be installed on any of the four fixed zone addresses by changing Dip Switch Settings

Features

- Can be connected to up to 16 Indoor Units and 16 refrigerant Systems on the TCC-Link Central Control Network.
- Schedule Timer can be connected to enable 7-day Timer Functions for all connected Indoor Units.
- Zone setting available for selection of Control Zone 1, 2, 3 or 4.
- Simple "1 Touch" Control for Easy operation of individual Indoor Units On/Off Command plus "1 Touch" for all Indoor Units On and All Indoor Units off Command.
- Main/Sub settings on device allow multiple Controllers to be installed on the same TCC-Link Central Control Network.
- Central Controller can be installed to the TCC-Link Network on the Indoor or Outdoor side.
- External Input/Output connections for On/Off Control and Operation/Alarm Status output
- Simple and Easy to use/monitor Indoor Units ON/OFF function and error output is ideal for Reception use in Hotels or Office buildings.
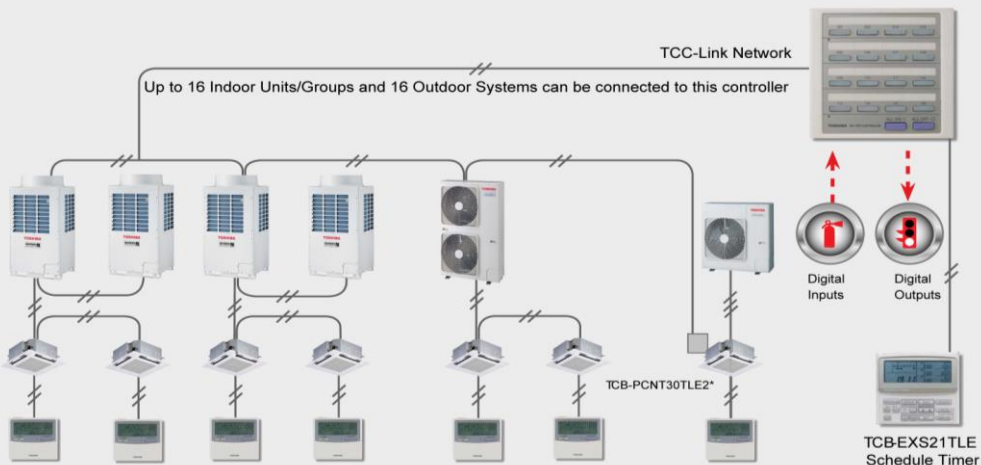
Zone Address Selection

This controller can be installed on the TCC-Link Central Control Network for control over a specified zone on that network.

Group Inhibit Selection

Up to 5 settings available to select which connected indoor units are controlled by the ALL on, and the ALL off buttons on the controller.

Alarm Indication

Whenever an alarm signal is received, the button of the corresponding Indoor Unit flashes.

TCC-Link Network

Up to 16 Indoor Units/Groups and 16 Outdoor Systems can be connected to this controller

TCB-PCNT30TLE2*

Digital Inputs

Digital Outputs

TCB-EXS21TLE Schedule Timer

* TCC-Link Adaptor for Digital/Super Digital Indoor Unit

ON-OFF Controller Buttons

A	ON/OFF	button	Press this to start up or stop individual air conditioner
B	ALL ON•I	button	Press this to start up all the air conditioners at the same time The Indoor units which can be operated by the ON-OFF controller now start operating in sequence at intervals of 1 to 2 seconds
C	ALL OFF•0	button	Press this to stop all the air conditioners at the same time

A **ON/OFF** button

B **All ON** button

C **All OFF** button
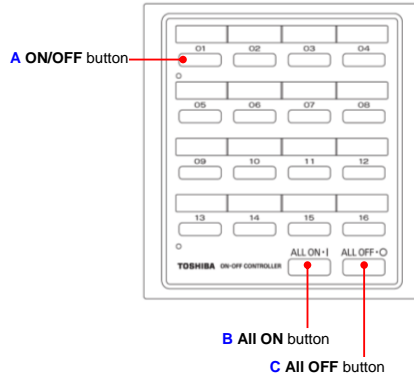
Basic Wiring

Connect the communication wires to the system interconnection wires or central control wiring.
Use the following as the control wiring:
• Total wire length of less than 1000 meters: Shield wire 1.5mm2
• Total wire length of less than 2000 meters: Shield wire 2.0mm2
The total wire length is obtained by adding the lengths of the system interconnection wiring to the lengths of the central control wiring.

⚠ Do not run the control wiring inside the same electrical wire conduits as the power cables.
For the communication wires, use control wires that visually identify them as being different from either the remote controller wires or the power cables.

⚠ (Incorrect wiring will damage the equipment.)
Connect the power cable of the ON-OFF controller to the AC 230V power source.
Connect the wires in such a way that none of the wires will be connected incorrectly.
Connect the control wiring of the air conditioners shown which is the wiring method when central control is used.
The maximum number of air conditioners that can be connected in one central control system is:
64 indoor units and 16 outdoor units (Header units).
With VRF system:
The ON-OFF controller can connect two units (main and sub) to each zone.

Basic wiring diagram
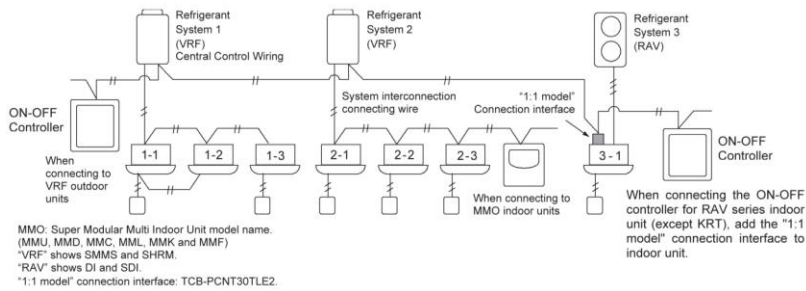
• When connecting to VRF outdoor units, make the connection to the central control wiring using U3 and U4 terminals
• When connecting to MMO indoor units, make the connection to the system interconnection wire using U1 and U2 terminals
• When connecting to a RAV air conditioner, make the connection using U3 and U4 terminals
• The "1:1 model" connection interface TCB-PCNT30TLE2 is required for the RAV air conditioner except KRT series (fitted as standard)
• A general-purpose unit control interface is required with some air conditioner model

Setting Dip Switches for TCB-SC163TLE2

Main/sub selection switch
OFF: Central controller operates as main controller.
ON: Central controller operates as sub-controller.

ALL/ZONE mode selection switch
ALL mode:
All indoor units can be controlled by the central controller.
ZONE 1, 2, 3, 4 mode:
Indoor units in one of zone's 1, 2, 3, or 4 can be controlled by the central controller. All indoor units cannot be set.

	2	3	4	5
ALL mode	OFF	OFF		OFF
ZONE 1 mode	OFF	OFF		ON
ZONE 2 mode	ON	OFF	OFF	ON
ZONE 3 mode	OFF	ON		ON
ZONE 4 mode	ON	ON		ON

Central control/Remote control mode selection switch
OFF: Central control mode.
Individual setting by remote controller can be inhibited by the central controller.

ON: Remote control mode.
Setting by central controller is inhibited by other central control devices.

Central control Main/Sub selection switch
(OFF: Main, ON: Sub)
① When only one central controller is used, set the switch to OFF position.
② When multiple central controllers are used, set only one central controller to the OFF position and the others to the ON position.
ALL mode central controller to be set at the OFF position. (recommended)

(Central control) button operation switch
OFF: (Central control) button operation is permitted.
ON : button operation is inhibited.

Schedule timer input switches
Central controller operation can be set when the Schedule timer activates (ON/OFF).

Central controller operation		Switch No.		
Timer OFF → ON	Timer ON → OFF	1	2	3
① All ON	All OFF	OFF	OFF	OFF
② No change	All OFF	ON	OFF	OFF
③ Individual control of all indoor units to be permitted	All indoor units to be 1 [*1]	OFF	ON	OFF
④ Ditto	All OFF and all indoor units to be 1 [*1]	ON	ON	OFF
⑤ Ditto	All indoor units to be 2 [*2]	OFF	OFF	ON
⑥ Ditto	All OFF and all indoor units to be 2 [*2]	ON	OFF	ON

In case of Remote control mode, use ① or ②.
In case of ZONE 1, 2, 3, 4 mode, ALL, means all indoor units are of ZONE's 1, 2, 3, 4.
[*1]: 1 (Central control 1) means ON/OFF operation cannot execute by the remote controller.
[*2]: 2 (Central control 2) means ON/OFF, MODE change. Temp. setting cannot be executed by the remote controller.

Auxiliary switch
Must be set to OFF position.

Beep tone switch
OFF: Beep tone when each button is pushed.
ON: No tone when each button is pushed.

⊙ Indication switch
Normally set to the OFF position.
When set to the ON position, ⊙ indication is not displayed on the LCD of the central controller.

*All switches are set at the OFF position at the factory.

TCB-SC642TLE2 STANDARD CENTRAL CONTROLLER

The TCB-SC642TLE2 64-Way Central Controller is TOSHIBA's standard central control device for use with DI, SDI and VRF equipment (Excludes DI Flexi) and can be connected to up to 64 Indoor Units for individual, Zone and All Unit Control.

In addition to the standard control function, this Central Controller provides 4 levels of Local Controller Permit, Prohibit functions that can be used to restrict the available operations from a Local Controller.
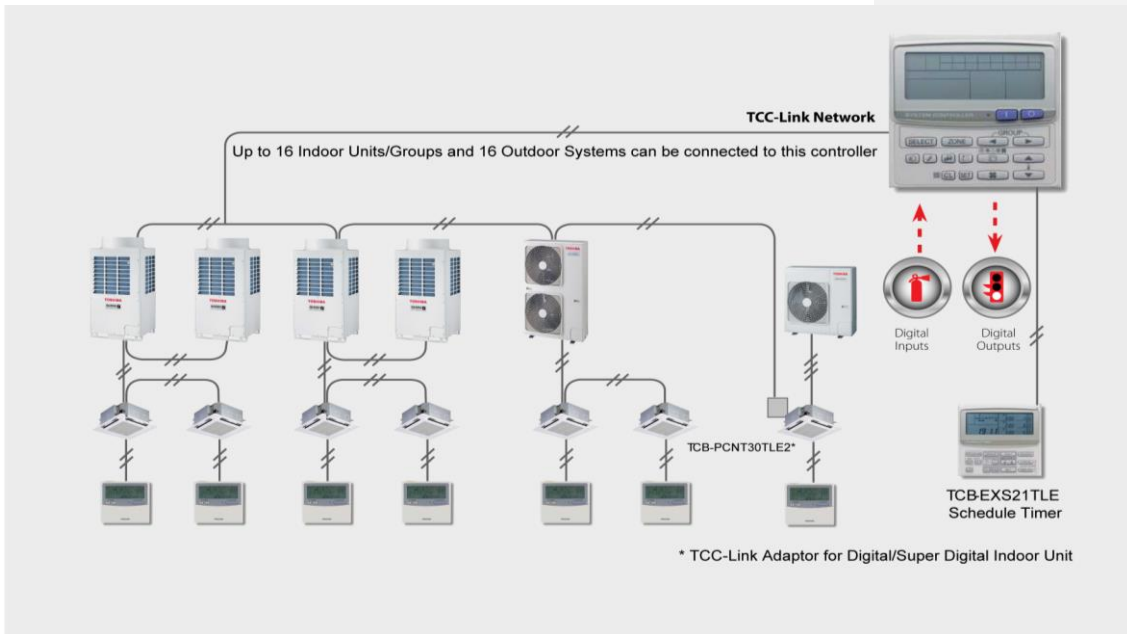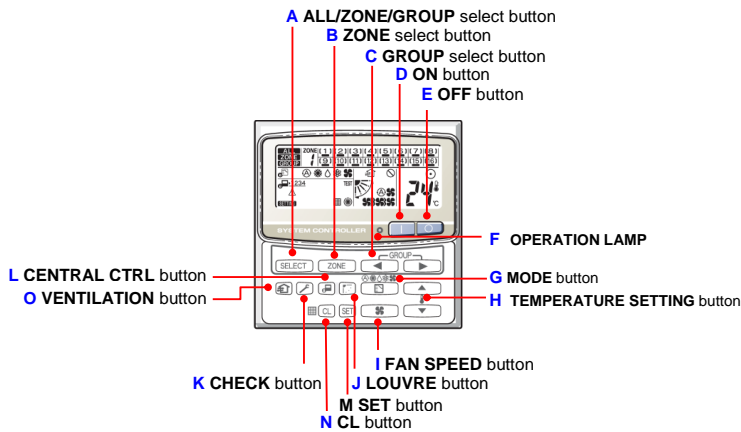
Features

- Can be connected to up to 64 Indoor Units and 16 Refrigerant Systems on the TCC-Link Central Control Network
- Schedule Timer can be connected for 7-day Timer functions with selectable control characteristics (Manage operations when Timer On/Off is signal is received)
- 4-Zone Controllable classification (4 Fixed Zones with possible setting to enable/disable control from Central Controller)
- 4-Pattern permit/prohibit control for restriction of Local Remote Controller setting functions
- Up to 10 Central Controllers can be connected to a single TCC-Link Line Network for control of Indoor Units.
- External Digital Input/Output connections for On/Off control and Operation and Alarm Status output.
- Control of Indoor Units can be carried out separately, as all Units in a Zone, or as all units connected to the Central Controller.
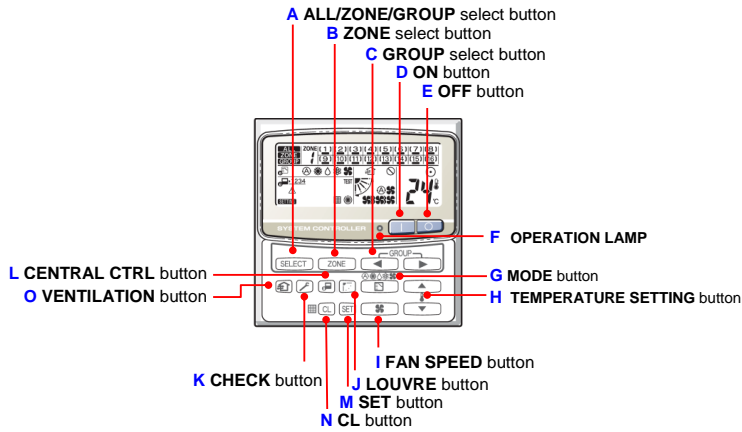- External Vent Control button available

MAIN FUNCTIONS

FUNCTION	SETTING	MONITOR
On/Off	✓	✓
Mode	Auto, Heat, Cool, Dry, Fan Only	✓
Set Point	18-29oC	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver	Swing, Fix	✓
Filter Display	Reset	✓
Fault Code	Reset	Hexadecimal fault code
Scheduled Tasks	Additional Schedule Timer Required	
Permit/Prohibit Local Control Functions	4-Pattern Permit/Prohibit Settings	✓

TCC-Link Network

Up to 16 Indoor Units/Groups and 16 Outdoor Systems can be connected to this controller

Digital Inputs

Digital Outputs

TCB-PCNT30TLE2*

TCB-EXS21TLE Schedule Timer

* TCC-Link Adaptor for Digital/Super Digital Indoor Unit

A **ALL/ZONE/GROUP** select button
B **ZONE** select button
C **GROUP** select button
D **ON** button
E **OFF** button

F **OPERATION LAMP**

L **CENTRAL CTRL** button
O **VENTILATION** button

G **MODE** button
H **TEMPERATURE SETTING** button

I **FAN SPEED** button
K **CHECK** button
J **LOUVRE** button
M **SET** button
N **CL** button

TCB-SC642TLE2 Standard Central Controller Function Buttons

A	SELECT button		Use this button to select one of the following
	ALL		Used for turning all the air conditioners on and off
	ZONE		Used for turning all the air conditioners of each zone on and off
	GROUP	NOTE	Used for turning all the air conditioners of each group on and off. A maximum of four zones and 16 groups (units) in a zone can be set
B	ZONE button		Use this button to select a zone (1 to 4) to operate individually
C	buttons		Use these buttons to select a group (1 to 16) to operate individually
D	button		This button is for turning the selected air conditioner ON
E	button		This button is for turning the selected air conditioner OFF
F	Operation Lamp		This lamp lights when the unit is turned on
G	button	NOTE	Use this button to select one of the following five operations. When the indication is displayed, you cannot change the mode. To change the mode, turn power off at units, then select the mode again
	AUTO		Used to automatically set cooling or heating operation. Some models are not provided with a mode for automatically setting the cooling or heating operation
	HEAT		Used for normal heating operation
	DRY		Used for dehumidifying without changing the room temperature
	COOL		Used for normal cooling operation
	FAN		Used to run the fan only, without heating or cooling operation
H	buttons		Press this button to increase or decrease the temperature setting
I	button		Press this button to change the fan speed setting
	AUTO		The air conditioner automatically decides the fan speed
	HIGH		High fan speed
	MEDIUM		Medium fan speed
	LOW		Low fan speed
J	button		Use this button to make the airflow direction sweep up and down automatically. Press the button several times until the free flow symbol appears on the display. Use this button to set the airflow direction to a specific angle. The airflow direction is displayed on the remote control unit

Operation mode	Number of airflow direction settings
COOL or DRY	3
HEAT or FAN	5
AUTO COOL	3
AUTO HEAT	5

NOTES
- In the cool mode and dry mode, when the louvres are set in a downward position, condensation may form and drip around the vent
- Do not move louvres with your hands
- This function is available only for 4-Way air discharge cassette type and Under ceiling type
- The louvre setting can be performed only for units that have no remote controllers
- In the ALL or ZONE mode, no louver setting can be performed. If necessary you should select the GROUP mode and use the button

A **ALL/ZONE/GROUP** select button
B **ZONE** select button
C **GROUP** select button
D **ON** button
E **OFF** button

F **OPERATION LAMP**

L **CENTRAL CTRL** button
O **VENTILATION** button

G **MODE** button
H **TEMPERATURE SETTING** button

I **FAN SPEED** button
J **LOUVRE** button
K **CHECK** button
M **SET** button
N **CL** button

TCB-SC642TLE2 Standard Central Controller Function Buttons

K	⌆	button	This button is used only when servicing the air conditioner Do not use the CHECK button for normal operation
L	⌨	button	Use this button to inhibit individual operation by remote controller as follows Individual ON/OFF operation is inhibited Individual ON/OFF, MODE and Temperature setting operation is inhibited Individual MODE and Temperature setting operation is inhibited Individual MODE operation is inhibited No indication Central control is cleared (Individual operation
M	SET	button NOTE	This button is used for setting indoor unit's address when installing the air conditioner Do not use the SET button for normal operation
N	CL	button	Use this button to reset the filter sign The air conditioner has the timer for the filter and informs you when the filter needs cleaning
O	⌂	button	Use this button when a Ventilation Fan or unit is installed Pressing this button turns the Ventilation Fan ON/OFF Switching OFF the air conditioner will switch OFF the Ventilation Fan. When the Ventilation Fan is in operation ⊟ will appear in the display. If the symbol does not displayed when pressing the Ventilation button no Ventilation Fan(s) or Unit(s) is installed

Controller Display (full illustration)
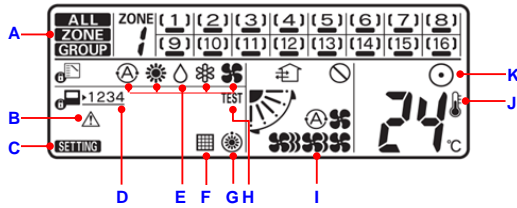
TCB-SC642TLE2 Standard Central Controller Display Mode

A	The currently selected mode ALL, ZONE or GROUP, zone NUMBER and GROUP number are displayed GROUP number display (no figure: no number registered) GROUP state display [ ]: registered group, FLASHING: currently selected group GROUP number display (no figure: no number registered) [5] GROUP state display ([ ]: registered group, ⚙: currently selected group) Operation state display (— : on, no sign: off, ⚙ : alarm)
B	This indication appears only when an abnormality occurs within a unit
C	When turning on the power switch of the central controller, **SETTING** sign blinks for a few minutes, While blinking; any controls using the central controller are inhibited. This is because the central controller is verifying connected groups
D	The currently selected central control mode 1, 2, 3 and 4 is displayed
E	The currently selected operation mode is displayed
F	This indication appears when the filter needs cleaning
G	When the unit is in the heating standby mode, the indicator appears
H	This indication appears while a test run is underway
I	The currently selected FAN SPEED, Airflow Direction and SWEEP settings are displayed
J	This indication appears when the temperature is set

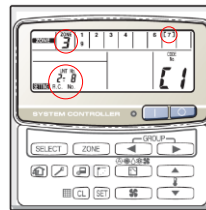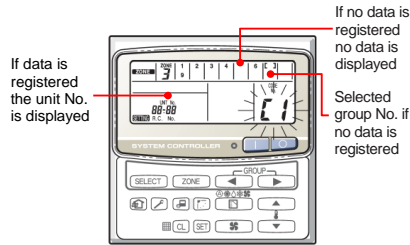| K	Lights when any of the air conditioners under the central control is operating; turns OFF when none of the air conditioners under the central control is operating. Blinks when any conditioner is operating under abnormal conditions and its protection functionality is working

Zone Control

Central Remote Controller TCB-SC642TLE2

Max. 16 units per one zone

Up to 4 Zones

Zone 1
(Central control address 1~16 only)

Zone 2
(Central control address 17~32 only)

Zone 3
(Central control address 33~48 only)

Zone 4
(Central control address 49~64 only)
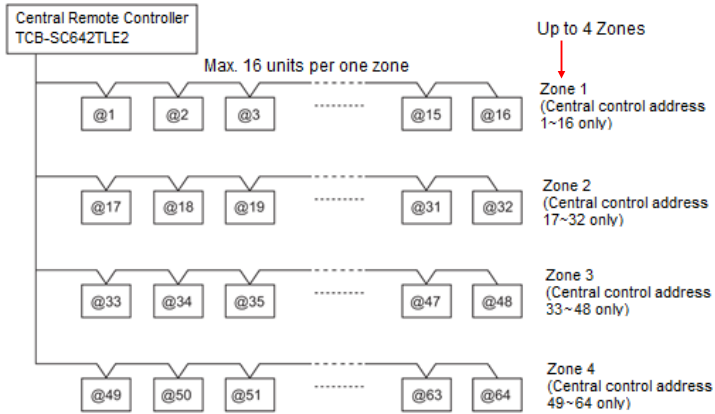
Zone registration using the central controller (TCB-SC642TLE2)

This setting method is not supported by the RAV models

Manually set all the Central addresses using the central controller

1. Press [🔧] and [ZONE] buttons at the same time for more than 4 seconds **SETTING** and Item CODE No. C1 will flash

2. After confirming that Item CODE No. C1 is displayed, press the [SET] button once in this mode, a change to settings can be made

3. Select the zone and group No. which you want to set with the [ZONE] and [◄] [►] GROUP buttons. If already set press the [CL] buttons

4. Set the unit No. (Indoor unit address) with the [🔲] and [🔲] buttons according to the zone registration table

   Refrigerant Circuit No. .... [🔲] button

   Indoor unit No. .... [🔲] button

5. Press the [SET] button

   GROUP No. turns ON and UNIT No. (Indoor unit address) changes from flashing to ON state. UNIT No. is registered to the selected ZONE No. and GROUP No. If you make a mistake, then press the [CL] button and reselect the **ZONE**, **GROUP** and 88-88

6. Register the other 88-88 in the same way by following the steps 3 to 5

7. Finally, complete the registration by pressing the [🔧] button **SETTING** will flash for a few minutes and then turn OFF

If data is registered the unit No. is displayed

If no data is registered no data is displayed

Selected group No. if no data is registered

Example above:
Zone 3, group No. 7 Unit No. (indoor unit address) Line Address : 2 Indoor Unit Address : 8 Unit No. 2-8 is registered to zone 3-group 7

**Automatic zone registration using the central controller (TCB-SC642TLE2)**

1. Press 🔧 and ⟨ ZONE ⟩ buttons at the same time for more than 4 seconds
   SETTING and Item CODE No. C1 will flash

2. Select CODE. No C2 by pressing ↕ button and press the ⟨SET⟩ button
   C2 changes from flashing to ON state and automatic zone registration will start

3. Registered **GROUP** No. will be removed for all units

4. Central address will be assigned from the small indoor unit address to a
   singular group one in numerical order automatically.
   Finishing automatic zone registration **SETTING** changes from flashing to OFF

5. If an error occurs, the check symbol ⚠ starts flashing and zone registration
   finishes at this time. Press the ⟨CL⟩ button

6. Finally, complete automatic zone registration mode by pressing the 🔧 button
   SETTING flashes for a few minutes and will then turn OFF

Checking from the central controller for duplication of the central address
Central Address Duplication Error Check: C3 (TCB-SC642TLE2)

This checking method is not supported by the RAV models. For further details
refer to the instructions of the TCC-LINK adaptor.

1. Press 🔧 and ⟨ ZONE ⟩ buttons at the same time for more than 4 seconds
   SETTING and Item CODE No. C1 will flash

2. Select CODE. No C3 by pressing ↕ button and press the ⟨SET⟩ button
   CODE No. C3 lights and **SETTING** flashes. The central address duplication
   error check now starts

3. The address of all outdoor units is checked in sequence starting with outdoor
   unit system 1. The check is completed when CODE No. C3 flashes and
   SETTING goes OFF

4. If any duplication is discovered among the central addresses, the **GROUP** No.
   will flash

5. Press the ↕ button to select CODE No. C1 and press the ⟨SET⟩ button
   Set the correct central address using the wired remote controller or the central
   controller

6. Press the 🔧 button to complete the procedure. **SETTING** flashes for
   several minutes, the initial setting is automatically established and the
   procedure is completed
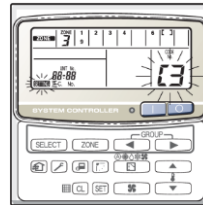
**Outdoor Unit Address Setting using Dip Switches**

When setting up a central remote controller which includes more than one outdoor system, each outdoor system must have a system address set. The factory setting is System Address 1.

Additional systems may be addressed up to a maximum system number of 28. This is achieved by using "Dip Switches" SW13 & 14 as detailed in the following table

System Address	SW13				SW14			
	1	2	3	4	1	2	3	4
1				OFF	OFF	OFF	OFF	OFF
2				OFF	ON	OFF	OFF	OFF
3				OFF	OFF	ON	OFF	OFF
4				OFF	ON	ON	OFF	OFF
5				OFF	OFF	OFF	ON	OFF
6				OFF	ON	OFF	ON	OFF
7				OFF	OFF	ON	ON	OFF
8				OFF	ON	ON	ON	OFF
9				OFF	OFF	OFF	OFF	ON
10				OFF	ON	OFF	OFF	ON
11				OFF	OFF	ON	OFF	ON
12				OFF	ON	ON	OFF	ON
13				OFF	OFF	OFF	ON	ON
14				OFF	ON	OFF	ON	ON
15				OFF	OFF	ON	ON	ON
16				OFF	ON	ON	ON	ON
17				ON	OFF	OFF	OFF	OFF
18				ON	ON	OFF	OFF	OFF
19				ON	OFF	ON	OFF	OFF
20				ON	ON	ON	OFF	OFF
21				ON	OFF	OFF	ON	OFF
22				ON	ON	OFF	ON	OFF
23				ON	OFF	ON	ON	OFF
24				ON	ON	ON	ON	OFF
25				ON	OFF	OFF	OFF	ON
26				ON	ON	OFF	OFF	ON
27				ON	OFF	ON	OFF	ON
28				ON	ON	ON	OFF	ON

BMS-SM1280ETLE Advanced Centralized Controller

ENERGY MONITORING and REPORT creation functions available.
Capable of controlling up to 128 INDOOR UNITS.
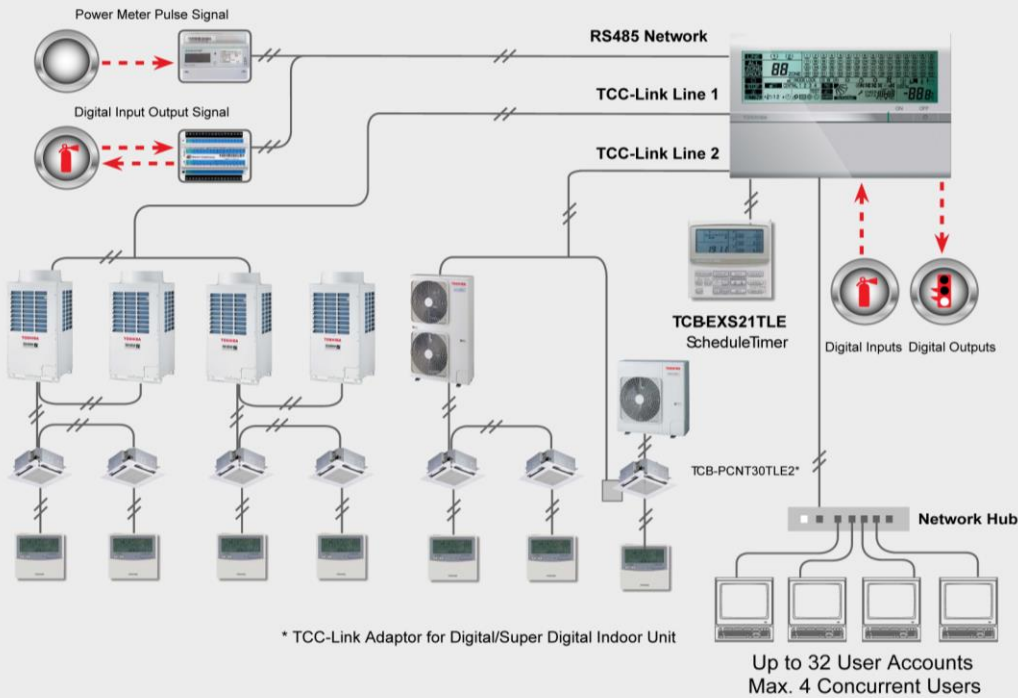
Features

- Advanced Zone Configuration available (up to 64 programmable Zones)
- External Input for Simultaneous Indoor Unit On/Off Control and external Alarm Input
- External Output for Operation Status and Alarm Status
- 4-Pattern Permit/Prohibit Functions
- Schedule Timer can be connected for 7-Day Timer Functions
- Return Back Function Available
- Can be connected to a single PC or LAN to allow advanced control functions from a Multi-Language Web Browser Display Screen*
- Energy Monitoring and report creation functions available
- Advanced operation & master schedules can be set on a calendar
- Additional Digital I/O Device Available
- Thin profile controller and separate power supply unit enables easy installation.

BMS-SM1280ETLE Smart Manager with Data Analyser

The smart manager is a product that is capable of controlling 128 indoor units from a single location. The device has the facility to set all of the operating parameters for individual or zoned indoor units, whether they are VRF or individual split systems. It is also capable of displaying individual fault codes for any units on the network.

The smart manager can be remotely connected to via a PC and all functions can be controlled via Internet Explorer. This controller can also be linked to energy monitoring relay interfaces for the collection of data for energy billing. The controller can also be linked to the digital input/output module for the interface to other systems.

The smart manager has some advanced functions different users can be configured to give restricted access. The controller has an advanced time clocking function to give the building owner flexibility. The controller has a return back function, which returns the units setting to a predetermined setting after an amount of time. All of those functions are accessed via the Web Interface.

Multiple Indoor Unit control
Multiple Indoor Units can be set based on:
- All Indoor Units in the TCC-Link Line
- All Units in the Zone
- Single Indoor Unit/Group

In addition to these, Dip Switches settings can be set to allow the Compliant Manager to Control ALL connected Indoor Units together.

Energy Saving Function*
This feature manages the total capacity of the connected system to reduce energy consumption.

External Ventilation Control
Allow the control of an External fan or other equipment via a 12VDC output

Return Back Function
This operation used to automatically return the set temperature back to pre-set value at a pre-set time.
It will activate after the pre-set time whenever the current temperature is different from the pre-set temperature (lower in cooling mode, higher in heating mode)

Address Settings and Test Mode
Central Control address settings can be either manually or automatically set using this Controller. The smart manager can also be used to run a test operation on all connected Units.

Advanced Zone Configuration
This allows each Indoor Unit in the system to be programmed into 1 of up to 64 possible zones. These Indoor Units can then be controlled in terms of
- Each Indoor Unit Individually
- All Indoor Units in a Zone
- All Indoor Units in a TCC-Link
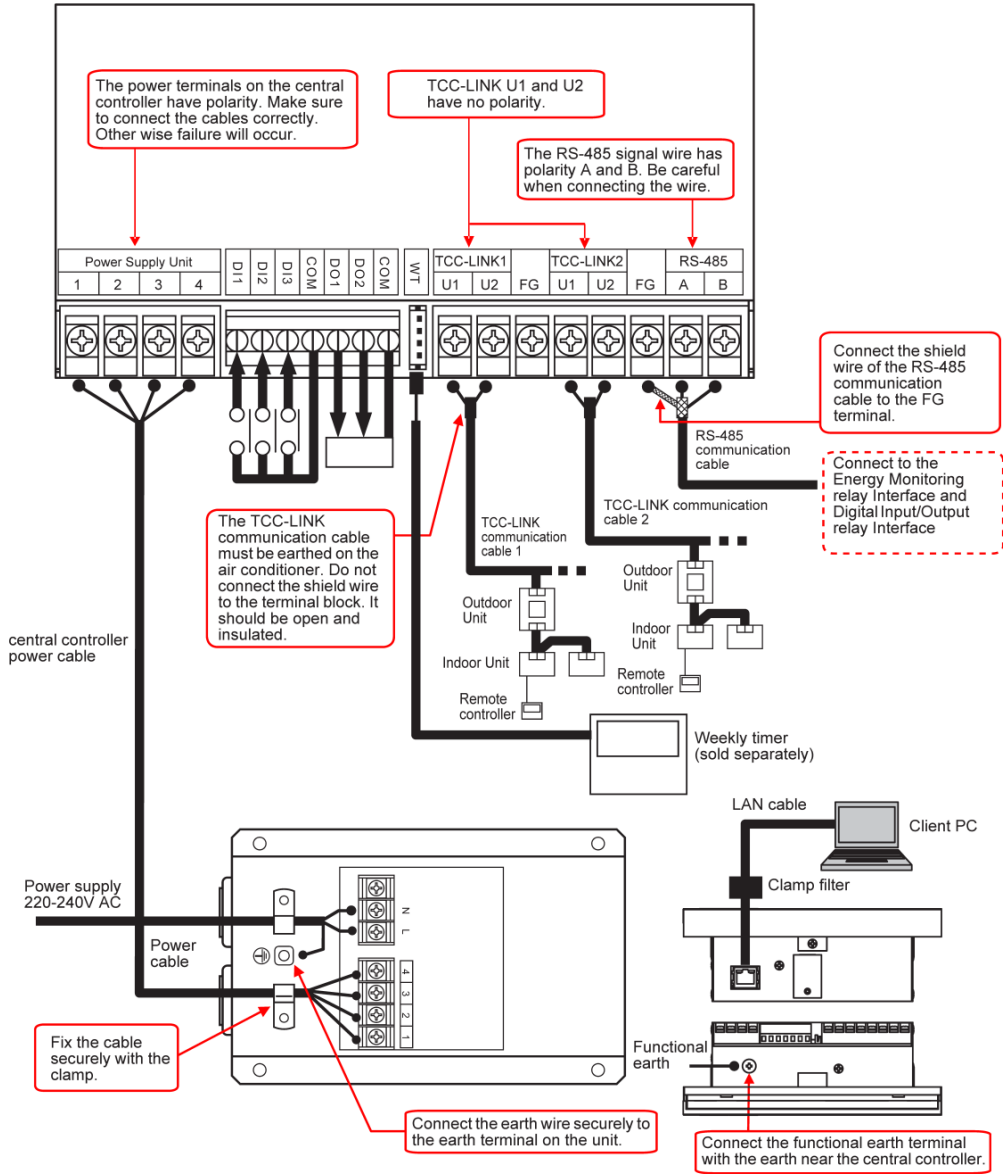- And a special setting for all Indoor Units in both TCC-Link Networks

MAIN FUNCTIONS

FUNCTION	SETTING	MONITOR
ON/OFF	✓	✓
Mode	Auto, Heat, Cool, Dry, Fan Only	✓
Set Point	18-29°C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver	Swing, Fix	✓
Filter Display	Reset	✓
Fault Code	Reset	Hexadecimal fault code with Unit Number
Scheduled Tasks	Advanced Timer Available from Web Browser	✓

SYSTEM PARAMETERS

ITEM	SPECIFICATIONS
Operating System	Windows XP with SP3 or later, Windows Vista, Windows 7
Office	Office 2003, Office 2007, Office 2010

Connection of Cables BMS-SM1280ETLE

Connect power cables, communication cables, and earth wires to the specified terminals on the terminal block

The power terminals on the central controller have polarity. Make sure to connect the cables correctly. Other wise failure will occur.

TCC-LINK U1 and U2 have no polarity.

The RS-485 signal wire has polarity A and B. Be careful when connecting the wire.

Power Supply Unit				DI1	DI2	DI3	COM	DO1	DO2	COM	WT	TCC-LINK1			TCC-LINK2			RS-485	
1	2	3	4									U1	U2	FG	U1	U2	FG	A	B

Connect the shield wire of the RS-485 communication cable to the FG terminal.

RS-485 communication cable

Connect to the Energy Monitoring relay Interface and Digital Input/Output relay Interface

The TCC-LINK communication cable must be earthed on the air conditioner. Do not connect the shield wire to the terminal block. It should be open and insulated.

TCC-LINK communication cable 1

TCC-LINK communication cable 2

Outdoor Unit

Indoor Unit

Remote controller

Outdoor Unit

Indoor Unit

Remote controller

central controller power cable

Weekly timer (sold separately)

LAN cable

Client PC

Clamp filter

Power supply 220-240V AC

Power cable

N L

4 3 2 1

Fix the cable securely with the clamp.

Functional earth

Connect the earth wire securely to the earth terminal on the unit.

Connect the functional earth terminal with the earth near the central controller.

ADDITIONAL DEVICES

BMS-IFWH5E ENERGY MONITORING RELAY INTERFACE

The energy monitoring Relay Interface connects to the RS485 Network and provides a means of interface to the pulse power meters. Up to eight power meters can be connected to each Relay Interface.

Digital Input Output Interface BMS-IFDD02E2

The D/I module connects to the RS485 network and provides 8 inputs and 4 outputs, which could be used to interface a fire alarm or a room occupancy sensor. The D/I module output could be used as a means of remote fault indication to another system.

Power Meter Locally Procured
Switching HUB and LAN cable Locally Procured
PC for Web Browser Control & Energy Monitoring Functions Locally Procured
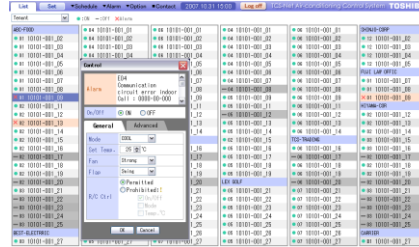
Web Browser Control Software
Layout can be selected in terms of Area Name, Floor Name or Tenant Name.

Features
- List view available:
  Displays all Indoor Units from one Screen
- Set view available:
  Show Basic Indoor Unit settings on main screen
- Advanced Operation and Master schedule functions available
- Up to 4 concurrent users can be connected
- Up to 32 User accounts can be programmed with different levels of access (at least 1 must be administrator level)
- Error Code history
- Web browser control screen is available in multiple languages
- Energy monitoring and report creation functions available (includes option for up to 2 separate billing periods in a day)
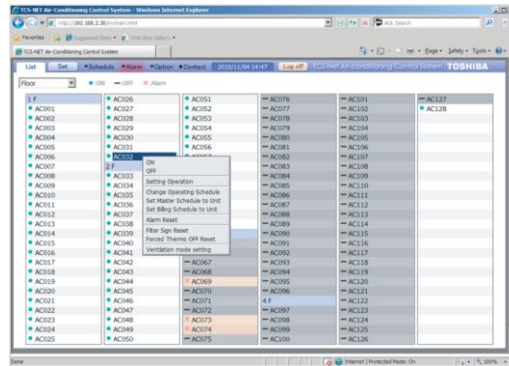
Connection Diagram BMS-IFWH5E

Red / Yellow
Orange A — B Brown

Crimp 3 wires with a closed end wire joint.

SG B A FG U2 U1 TCC-LINK
RS-485
SW5

N L

TCS-NET RELAY INTERFACE

Power supply

TOUCH SCREEN CONTROLLER

Red/Orange
Brown/Yellow

Connect the shield wire of the two wires

The RS-485 communication cable has polarity A and B. Be careful when connecting the wire.

SG A B

Power meter 1 — DI1
Power meter 2 — DI2
Power meter 3 — DI3
Power meter 4 — DI4
Power meter 5 — DI5
Power meter 6 — DI6
Power meter 7 — DI7
Power meter 8 — DI8

SW7   SW1 ④

The RS-485 communication cable must be earthed on TCS-NET Relay Interface or central controller. It does not have to be earthed on Energy Monitoring Relay Interface.

Power supply   L N

The RS-485 communication cable has polarity A and B. Be careful when connecting the wire.

SG A B

Power meter 1 — DI1
Power meter 2 — DI2
Power meter 3 — DI3
Power meter 4 — DI4
Power meter 5 — DI5
Power meter 6 — DI6
Power meter 7 — DI7
Power meter 8 — DI8

SW7   SW1 ①

Set the RS-485 terminator resistor on a TCS-NET Relay Interface.
Set SW7 as "120 ohm" on a Energy Monitoring Relay Interface with address SW1=1, when the Energy Monitoring Relay Interface is used in a system without TCS-NET Relay Interface. Set SW7 as "Open" on the other interfaces.

Power supply   L N

Set the Energy Monitoring Relay Interface address with SW1. Assign 1 to 4 to each address to avoid duplication. You can set the Energy Monitoring Relay Interface address independently from the TCS-NET Relay Interface address or the Digital Input/ Output Relay Interface address.
CAUTION: The SW1 setting is read when the power is turned on. Push the reset switch (SW6) after changing the address.

TOSHIBA Leading Innovation »»»

BMS-SM1280ETLE CONTROLLER FUNCTIONS

Function Buttons

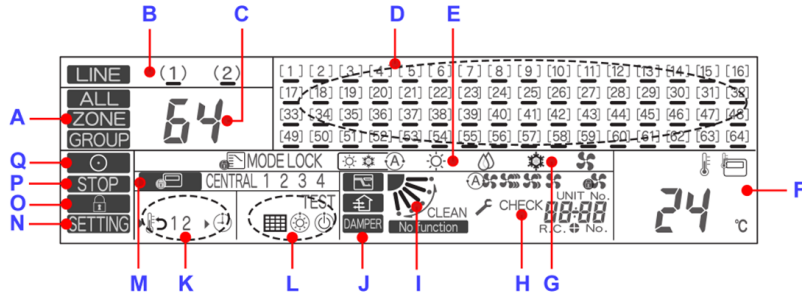|			
A	LINE button	LINE	Switches line 1 (display 1), line 2 (display 2)
B	ALL/ZONE/GROUP button	ALL/ZONE/GROUP	Switches ALL, ZONE, and GROUP. **ALL** : Selects all groups on the selected line simultaneously. **ZONE** : Selects all groups in the specified zone. **GROUP** : Selects a group. • Group 1 to 64 connected to the same line can configure zones. • Groups connected to different lines cannot be specified for the same zone. • This remote controller can control up to 2 lines, 128 zones, and 128 groups.
C	ZONE button	ZONE	▲ : Increments the zone number. ▼ : Decrements the zone number. * There are up to 64 zones per line (128 zones in total).
D	GROUP button	GROUP	▲ : Increments the group number. ▼ : Decrements the group number. * There are up to 64 groups per line (128 groups in total).
E	MODE button	MODE	Switches operation mode. (* Selectable operation modes vary depending on models.) AUTO: ☼ ✿ (A) Automatically switches heating operation and cooling operation alternately. HEAT: ☼ Performs heating operation. DRY: ◊ Performs dehumidifying operation. COOL: ✿ Performs cooling operation. FAN: ❖ Performs FAN operation. * When MODE LOCK lights, operation mode is fixed to COOL or HEAT by the remote control system.
F	FAN button	FAN	Switches air volume. (* Selectable air volume levels vary depending on models.) AUTO: (A)❖ Air volume is automatically switched by the indoor unit. HEAT: ❖ Large air volume (Fan speed: High) MED.: ❖ Medium air volume (Fan speed: Medium) LOW: ❖ Small air volume (Fan speed: Low) * While ❖ is displayed, air volume is fixed and cannot be selected.
G	Run lamp		Indicates the operating status of the selected group. OFF: The selected group is not operating. ON: The selected group is operating. Flashing: When an error occurs or the protective device is activated
H	ON button	ON	Starts operation.
I	OFF button	OFF	Stops operation.
J	SET TEMP. button	SET TEMP.	▲ Increases the set temperature. ▼ Decreases the set temperature.
K	RESET button		Used to reset settings. (Do not usually use this button.)

K	RESET button		Used to reset settings. (Do not usually use this button.)
L	SWING/FIX button	SWING/FIX	Switches the auto-swing mode and louver direction when no remote controller is used. * This button is disabled in the ALL or ZONE mode.
M	VENT button	VENT	Used when a commercially available ventilation fan is connected. Pressing this button runs or stops the connected ventilation fan. When operation of air conditioners is started or stopped, the ventilation fan is also started or stopped at the same time. (While the ventilation fan is running, ▣ is displayed on the display.) * When No function appears on the display when the VENT button is pressed, no ventilation fan is connected. * This button is used to operate and stop the damper when a heat exchange ventilators is connected.
N	SAVE button	SAVE	Drives the air conditioner into the power saving mode. * When No function appears on the display, the power saving mode is not available for the air conditioner.
O	CENTRAL button	CENTRAL	Switches CENTRAL 1 to CENTRAL 4 in the central control mode. No indication: Central control is cleared (individual operation) * This button is disabled in the remote controller mode. Individual: Controls with the remote controller are possible. CENTRAL 1: Disables operation start/stop using the remote controller. CENTRAL 2: Disables operation start/stop, operation mode switching, and temperature setting using the remote controller. CENTRAL 3: Disables operation mode switching and temperature setting using the remote controller. CENTRAL 4: Disables operation mode switching using the remote controller.
P	CL button	CL	Erases the filter mark on the display. This button is also used for the initial settings.
Q	SET button	SET	Used for service or special operations. (Do not usually use these buttons.)
R	CHECK button	CHECK	
S	ITEM button	ITEM SELECT	Used for enable/disable settings for return-back operation* and timer operation. ITEM ○ : Selects an item to be set sequentially. (The selected item and the ▶ mark light.)
T	SELECT button	ITEM SELECT	SELECT ○ : Enables or disables the selected item. * Selectable items may vary depending on models.

[Return-back operation]
The return-back operation is a function to return the temperature automatically to the set temperature in a predetermined time period if a temperature lower than the specified temperature (for cooling) or higher than the specified temperature (for heating) is set on the remote controller. (For details, refer to the Installation Manual.)
For the details of power saving mode, refer to the Owner's Manual of the air conditioner.

Controller Display (full illustration)

A	ALL/ZONE/GROUP	**ALL**, **ZONE**, or **GROUP** is displayed.
B	Line number	**LINE** ⁝(1)⁝ ← When a line is selected, the ( ) mark of the selected line number flashes. The number lights up when any controllable unit is detected on the line. **LINE** (1) ⁝(2)⁝ ← When both line 1 and line 2 are selected, the line of the flashing ( ) mark is displayed. The underline lights when there is at least one operating air conditioner on the line. The underline flashes when an alarm occurs.
C	Zone number	The selected line number, zone number or group number is displayed. **ALL** 1.2 **ZONE** 1~64 **GROUP** 1~64
D	Group number	Connected groups are automatically recognized and displayed. When a group is specified with the GROUP ▲ ▼ button, it is displayed like ⁝[ ]⁝ ⁝[ ]⁝ Flashing: Shows the group whose settings are displayed on the panel. [ ] Lighting: Shows selected groups. 3̲ Underline: Shows that the group is operating. 3̲ The underline flashes when an alarm occurs.
E	Operation mode	The current operation mode is displayed. AUTO: ☼ ❀ (A) HEAT: ☼ DRY: ◊ COOL: ❀ FAN: ❆ * When **MODE LOCK** lights when the MODE button is pressed, switching of HEAT and COOL operation mode is disabled.
F	Temperature	The set temperature is displayed.
G	Air volume	One of AUTO (A)❆, HEAT ❆, MED. ❆, LOW ❆, or FIXED ❆ is displayed.
H	Check code	When the selected air conditioner is abnormal, its unit number and the check code are displayed.
I	Louver position/swing	Louver position or louver swinging is displayed. (When no remote controller is used.)
J	Functions (1)	: Lights when the power saving mode is activated. : Lights when a ventilation fan is running. **No function** : Lights when the VENT or SAVE button is pressed though the function is not provided.
K	Functions (2)	↻1 : Displayed when functions of schedule (*) and return-back operation enabled activated. ↻ 2 * (A separately sold weekly timer is required.) ⊕
L	Functions (3)	▦ : Indicates that filters should be replaced. TEST : Indicates that a test run is being executed. ⊙ : Displayed when the air conditioner cannot operate with the selected operation mode (when heating and cooling modes are mixed in the multi-indoor unit control system). ❀ : Displayed at the beginning of heating operation or during defrosting operation. While this mark is displayed, the indoor fan stops.

M	Central control	CENTRAL 1 2 3 4 : The selected operation prohibited setting (CENTRAL 1, 2, 3, or 4) is displayed in the central control mode. : Displayed when the central control system is controlling. When the ON , OFF , MODE , or SET TEMP. ▲ ▼ button is pressed with remote controller operation disabled by the central control system, flashes and no setting change is accepted.
N	SETTING	Flashes for several minutes when the power switch is turned on. While this mark is flashing, no setting is enabled because the Smart Manager is recognizing connected groups.
O	("Controller Prohibition" mark)	Lights while the controller prohibition function is activated. (While this mark is lighting, no operation is enabled.) * Pressing the CHECK , SET , and LINE buttons simultaneously switches controller prohibition ON/OFF.
P	STOP	Lights in the emergency stop state due to an alarm signal input. (Ex. fire alarm)
Q	("Operating" mark)	Lights when at least one controlled air conditioner is operating. Flashes when at least one air conditioner is abnormal or the protective device is activated.

BUILDING MANAGEMENT SOLUTIONS

Toshiba offer a range of control interfaces that can be used to integrate the control of our Air Conditioner Products into local Building Management Systems.

Our Building Management controls currently offer easy integration with the following protocols:

- **LonWorks®**
- **Modbus**
- **BACnet**
- **Other systems using discrete digital or analogue input/output**

A Building Management System (BMS) is a computer based control scheme that is installed in buildings to control and monitor for example mechanical and electrical equipment, ventilation, lighting, power, fire alarm and security systems for a building.

The core function of most BMS systems is to manage the environment within a building and can be used to control heating, cooling and manage systems that distribute treated air in the building.

LonWorks®

What is LonWorks® ?

LonWorks® is a control system platform built on the LonTalk communications Protocol created by the Echelon Corporation and is used for the networking of equipment over media such as Twisted Pair, Power lines, fibre optics and Radio Frequency.

The LonWorks® platform has been adopted as the basis for product and service offers in many different industries including the Building Industry where it is widely used for control of Lighting and HVAC systems.
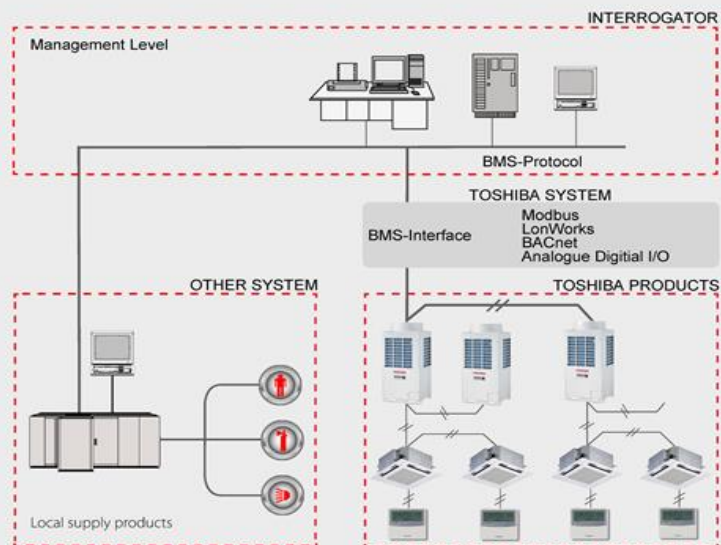
What is Modbus?

Modbus is a serial communications protocol that was first published in 1979 for use with programmable logic controllers, and has now become the most commonly available means of connecting industrial electronic devices to a computer control system.

There are many different versions of Modbus currently used in building management systems including Modbus RTU, Modbus ASCII and Modbus TCP.

What is BACnet®?

BACnet® is a communications protocol for building automation and control networks. It is an ASHRAE, ANSI and ISO standard protocol. BACnet® was designed to allow communication of building automation and control systems for application such as heating, ventilation air conditioning control, lighting control, access control, and fire detection systems and their associated equipment. The BACnet® protocol provides mechanisms for computerised building automation devices to exchange information, regardless of the particular building service they perform.

BUILDING MANAGEMENT SCHEME

INTERROGATOR

Management Level

BMS-Protocol

TOSHIBA SYSTEM

BMS-Interface
Modbus
LonWorks
BACnet
Analogue Digitial I/O

OTHER SYSTEM

TOSHIBA PRODUCTS

Local supply products

BMS interface products are not compatible wih each other across protocols. Only one protocol can be used per installation

TCB-IFLN642TLE LONWORKS® INTERFACE

The Toshiba LonWorks® Interface is 100% LonMark Compliant and is designed to connect to the Toshiba Air Conditioning system to a LonWorks® Building Management Control System.

This interface connects directly to the Toshiba TCC-Link Central Control Network on the Air Conditioner side and can be wired on the Indoor or Outdoor Unit side depending on preference. The interface is then connected to the LonWorks® Building Management Control system where it provides 28 Network variables for the sending of Control Commands and Receiving Unit information

Multiple Toshiba LonWorks® interfaces can be connected to a single TCC-Link Network and addressed using simple switches provided on the device. This is to enable ease of installation, especially in buildings with separate areas, where one interface may be used for each area/floor.

The LonWorks® gateway is a device that allows the Toshiba indoor units to be connected to a LonWorks® based BMS. The gateway uses all standard network variables contained in individual blocks for each indoor unit. The gateway can communicate with up to 64 indoor units on a U1/U2 Network. The device is used to connect to a LonWorks® Network, which many BMS companies are able to communicate with, (open network protocol).

All of the data for each indoor unit is available on the LonWorks® Network; there are twenty-nine standard network variables for each indoor unit, all of which are available on the gateway.

Each Toshiba LonWorks® Interface can be connected to up to 64 Indoor units on the TCC-Link Central Control Network.
Up to 16 refrigerant systems can be connected to each LonWorks® device on a single TCC-Link Network
Up to 10 TCB-IFLN640TLE Interfaces can be connected to a single TCC-Link Network.
The use of multiple TCB-IFLN640TLE devices per TCC-Link Network allows for increased flexibility of installation.

LonWorks® Gateway TCB-IFLN640TLE2
The gateway connects to the air conditioner network via the U1 & U2 connections, with a maximum of 64 indoor units served. The gateway requires a 240V 3 A mains supply

Features
- Maximum 64 Indoor Units/Groups and 16 Outdoor Systems can be connected to a single LonWorks® Interface.
- Network adaptor TCB-PCNT30TLE2 required (1 per Master Indoor unit) for connection of DI/SDI Indoor Units
- Maximum 10 I/F can be used per TCC-Link Network
- RBC-WP1-PE LonWorks® Control software also available from TOSHIBA

The Lonworks Interface can also be used to provide Energy Monitoring and billing functions when used in conjunction with Toshiba's RBC-WP1-PE - Interactive Intelligence building management software and the RBC-EM1-PE - Lonworks Power Meter product.

MAIN FUNCTIONS

FUNCTION	COMMAND INPUT	STATUS OUTPUT
ON/OFF Status	✓	✓
Operation Mode	Auto, Heat, Cool, Dry, Fan Only	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver	Swing, Fix	✓
Set Temperature	18-29ºC	✓
Room Temperature	✗	✓
Permit/Prohibit of Local Operation	ON/OFF, Mode, Set Temp, Fan Speed, Louver	✓
Error Status	Reset	✓
Error Code	Reset	✓

SPECIFICATION INDOOR INTERFACE
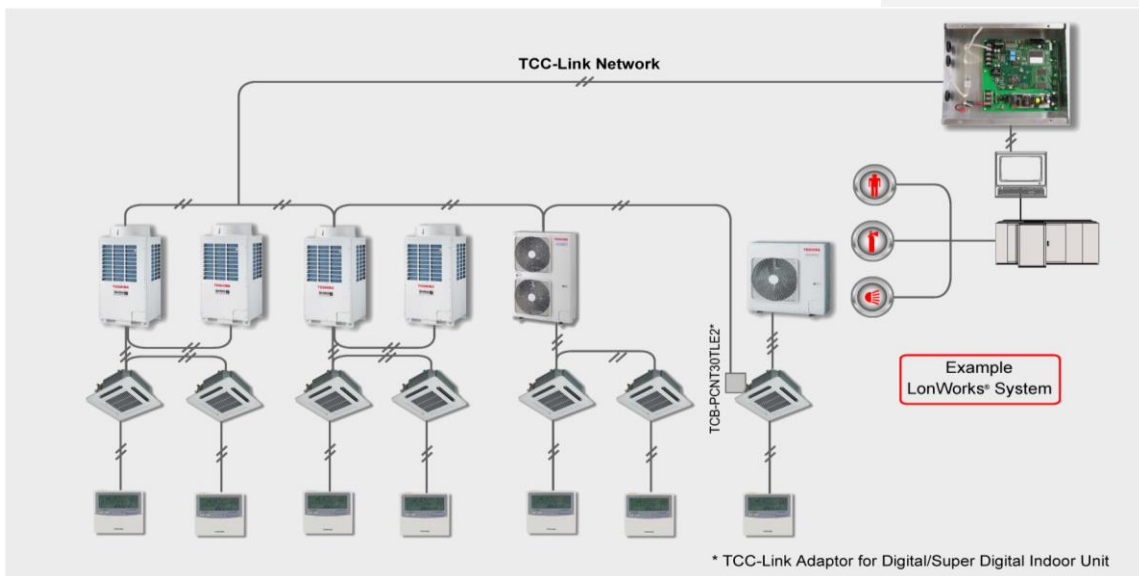
Name	LN Interface
Model	TCB-IFL642TLE
Chassis material	Galvanized sheet metal 0.8 t (no coating)
Power Supply	220-240V AC, 50/60Hz
Power Consumption	10.5 watts
Number of Connectable Indoor Units	64
Operating Temperature / Humidity	0 to 40ºC / 20 to 90%
Storage Temperature	-20 to 60ºC (no condensation)
Dimensions H X W X D	66 x 246 x 193 mm
Weight	1.35 kg

CONNECTION COMPONENTS FOR LONWORKS

| MINIMUM EQUIPMENT REQUIRED FOR LONWORKS® CONTROL SYSTEM	SOURCE
LonWorks® Interface TCB-IFLN642TLE	TOSHIBA
LonWorks® Control System	TOSHIBA or other local supply
LonWorks® Network Card for PC Control	TOSHIBA or other local supply

SPECIFICATION FOR CONNECTION CABLES

NO.	LINE	DESCRIPTION		
1	For TCC-LINK	Type	2-core shield wires	
		Wire size and max. length	$1.5\ mm^2$ 1000m max. (min. 1.25 mm^2) $2.5\ mm^2$ 2000m max. (min. 2.00 mm^2)	(total length including air conditioner area)
2	For LonWorks®	Type	Twisted pair shield cable	(dedicated cable or equivalent)
		Wire size	0.65 mm × 1P	
		Length	Free topology: 500m max. Bus topology: 1000m max.	(total length)
3	For Power	Type	H07 RN-F or 245IEC66	
		Wire size	0.75mm^2, 50 m max.	

TCC-Link Network

TCB-PCNT30TLE2*

Example LonWorks® System

* TCC-Link Adaptor for Digital/Super Digital Indoor Unit

Installation Method and Orientation

There are five installation methods as shown in the figure: surface mount and wall mount.
Do not install the unit in any other orientation. Use the supplied screws.

.

100mm

100mm
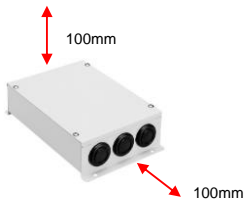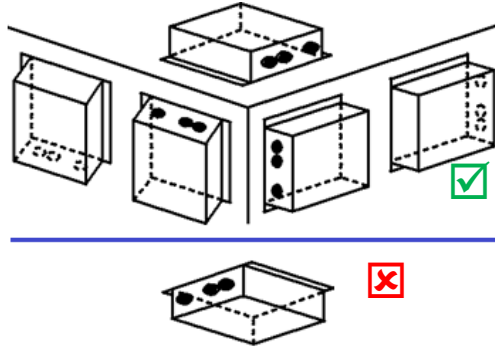
Installation & Maintenance Space

A side space for connecting through cable inlets and an upper space for maintenance must be reserved before installation.
The other sides can be adjacent to surrounding objects

Terminator resistor setting

TCC-LINK terminator resistor
The TCC-LINK terminator resistor is set on the air conditioner side.

LON terminator resistor
The LON terminator resistor is set on the upper LonWorks® system side.

Shield Grounding of Communication Cables

TCC-LINK communication cable
Do not connect the shield wire to the terminal block. It should be open and insulated. The TCC-LINK communication cable must be earthed on the air conditioner.

LonWorks® communication cable
Do not connect the shield wire to the terminal block. It should be open and insulated. Connect the shield wire of the LONWORKS communication cable to the earth on the upper system side.

TCC-LINK & LONWORKS® COMMUNICATION

Building management system (by other company)

(Other company's system)

Do not connect the shield wire to the terminal block

The TCC-LINK terminator resistor is set on the air conditioner side. Set SW5 to OFF.

Set (maximum -1) of the indoor unit central control address with SW1 and SW2 in hexadecimal number.

TCC-LINK main bus

TCC-LINK U2 U1

FG

LON

SW5

SW1 SW2

Do not connect the shield wire to the terminal block

The LON terminator resistor is set on the upper LONWORKS® system side. Do not set it here.

Power supply 220 - 240 VAC

N L

LN interface

VRF Outdoor unit

VRF Outdoor unit

Indoor unit

Indoor unit

Indoor unit

Remote controller

Remote controller

Central remote controller

RAV DI/SDI Indoor Accessory TCB-PCNT30TLE2*

RAV SM Indoor Unit

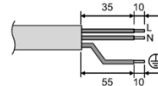* TCC-Link Adaptor for Digital/Super Digital Indoor Unit

Connection of P

Connection of Power Cables, Communication Cables and Earth Wires

Connect power cables, communication cables, and earth wires to the specified terminals on the terminal block.

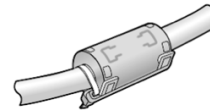Length of stripped communication cable
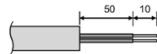
Length of stripped power cable

Attach the provided Clamp filter to the communication cable.
- Attach the Clamp filters to the LONWORKS communication cable as shown right. Fix them to the communication cables with cable ties.
- Attach the Clamp filters as close as possible to the LN interface unit.

The TCC-LINK communication cable must be earthed on the air conditioner. Do not connect the shield wire to the terminal block. It should be open and insulated.

Connect the shield wire of the LONWORKS communication cable to the earth on the upper system side. Do not connect the shield wire to the terminal block. It should be open and insulated.

Air conditioner

LONWORKS® system
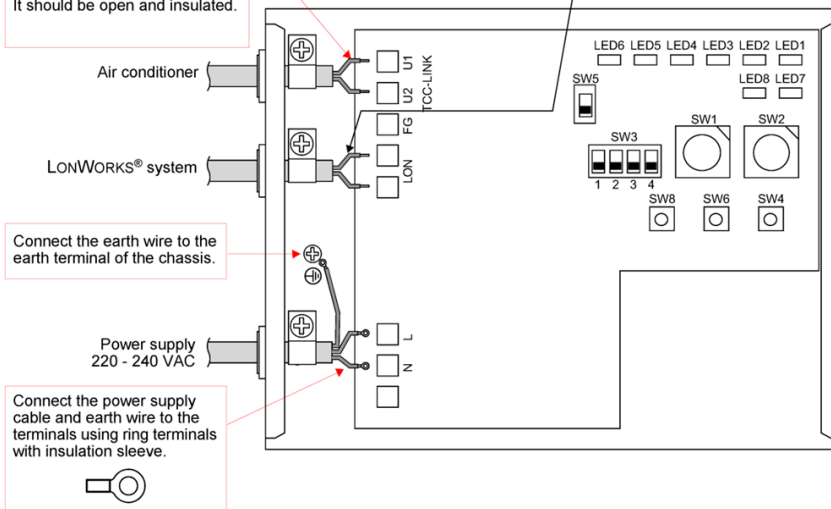
Connect the earth wire to the earth terminal of the chassis.

Power supply 220 - 240 VAC

Connect the power supply cable and earth wire to the terminals using ring terminals with insulation sleeve.

LED6 LED5 LED4 LED3 LED2 LED1
LED8 LED7
SW5
SW1 SW2
SW3
1 2 3 4
SW8 SW6 SW4

Requirement

Disconnect the appliance from the main power supply.
This appliance must be connected to the main power supply by a circuit breaker or switch with a contact separation of at least 3mm.
The TCC-LINK communication cable and the LonWorks® communication cable have no polarity.

SETTING

The following settings are necessary to use the Link Network interface.

TCC-LINK

- SW1/SW2 Set the number of indoor units to be connected.
  Set the maximum of the indoor unit central control address according to the table below. The factory default is "3F" (64 units connected).

REQUIREMENT

The set data is read only when the power is turned on.
When changing the SW1/SW2 setting, push the reset switch SW6 after setting.

- Set the indoor unit central control address from 1 to 64 consecutively.
  This means that the maximum of the central control address equals the number of connected indoor units.
  However, if an address is omitted, the maximum of the central control address differs from the number of connected indoor units. In this case, set the maximum of the central control address according to the table below.

Note:

The system works normally when the set value is larger than the maximum.
However, it will result in communication loss.
Indoor unit central control address and SW1/SW2 setting

Indoor Unit Central Control Address	SW1	SW2	Indoor Unit Central Control Address	SW1	SW2	Indoor Unit Central Control Address	SW1	SW2	Indoor Unit Central Control Address	SW1	SW2
1	0	0	17	1	0	33	2	0	49	3	0
2	0	1	18	1	1	34	2	1	50	3	1
3	0	2	19	1	2	35	2	2	51	3	2
4	0	3	20	1	3	36	2	3	52	3	3
5	0	4	21	1	4	37	2	4	53	3	4
6	0	5	22	1	5	38	2	5	54	3	5
7	0	6	23	1	6	39	2	6	55	3	6
8	0	7	24	1	7	40	2	7	56	3	7
9	0	8	25	1	8	41	2	8	57	3	8
10	0	9	26	1	9	42	2	9	58	3	9
11	0	A	27	1	A	43	2	A	59	3	A
12	0	B	28	1	B	44	2	B	60	3	B
13	0	C	29	1	C	45	2	C	61	3	C
14	0	D	30	1	D	46	2	D	62	3	D
15	0	E	31	1	E	47	2	E	63	3	E
16	0	F	32	1	F	48	2	F	64	3	F

- SW3 Test switch (not used for normal operation, all OFF)
- SW4 Test switch (not used for normal operation)
- SW5 Used to set TCC-LINK terminator resistor.
  The TCC-LINK terminator resistor is set on the air conditioner side, and is not set here.
  Set SW5 to "Open".
- SW6 Reset switch
  When changing the setting of the number of connected indoor units with SW1 and SW2, push this reset switch after setting to read the set value.

SW5 TCC-LINK terminator resistor select switch

ON	ON
100 ohm	Open
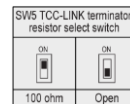
RBC-WP1 PE INTERACTIVE INTELLIGENCE

Front-end software package that controls all aspects of the air conditioning systems Software is installed on a PC.
The software allows all of the units operating parameters to be adjusted from the one PC.
The software can be accessed remotely either by telephone or via the internet
The software can log data and provide graphical representation of data operation

The Interactive Intelligence software tool is a Building Management control software designed for use on the LonWorks Network protocol and can not only be used to control Toshiba Air Conditioner systems, but also any building systems (i.e. Lighting, security, etc…)

The RBC-WP1-PE is a front-end software package that controls all aspects of the air conditioning systems installed on a site. The software is installed on a PC, which then connects to a TCB-IFLN642TLE2 LonWorks gateway for connection to the indoor units. The software allows all of the units operating parameters to be adjusted from the one PC. It allows faults to be reported and re-transmitted via email, fax or text message. The software can be accessed remotely either by telephone or via Internet. The software can log data and provide graphical representation of data. It has a schedule built-in for time control and it can also be used to reset set points or modes of operation.

Customisation
The software is very flexible, it allows for a fully adaptable graphical representation of the building to be included.

Frost Protection
The software has the ability to sample the air temperature from an individual or a selection of indoor units. Then, based on this data, operate the air conditioning to give frost and fabric protection to the building

Energy Monitoring
The energy monitoring software can be included to calculate the running costs of the individual units. This data can then be provided in structured bills for the building tenants. This data is calculated from the demand given from the indoor units and the power consumed by the system. The RBC-EM1-PE power meter is required for this function.

Control of other devices
We have a simple Digital Input/Output module that we use to control other plant systems. For example, we could enable boilers or other air-handling units. The module can accept inputs also; examples would be an input from a fire alarm where the air conditioners are shutdown or an input to switch on the air conditioners from an external source. The RBC-DI1 module is required for this function

Features
- Connection to R410A equipment using TCB-IFLN642TLE
- Connection to R407C equipment using RBC-WG1-PE
- Remote access available using RBC-IK1-PE
- Connect up to 1024 Indoor Units
- 3 Levels of control schematic automatically created during commissioning
- Schematics can be fully customised to suit the site (building schematics from AutoCAD can be uploaded)
- Advanced scheduling and alarm retransmission via email
- Energy monitoring and report creation functions available
- Integration with other site equipment using RBC-DI1-PE Digital Input/Output device
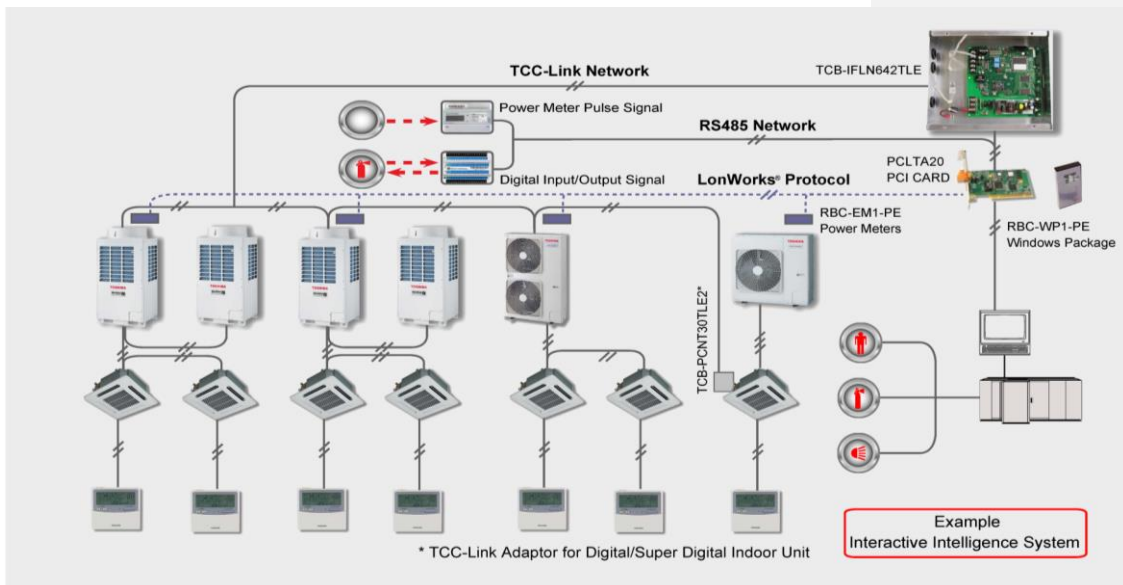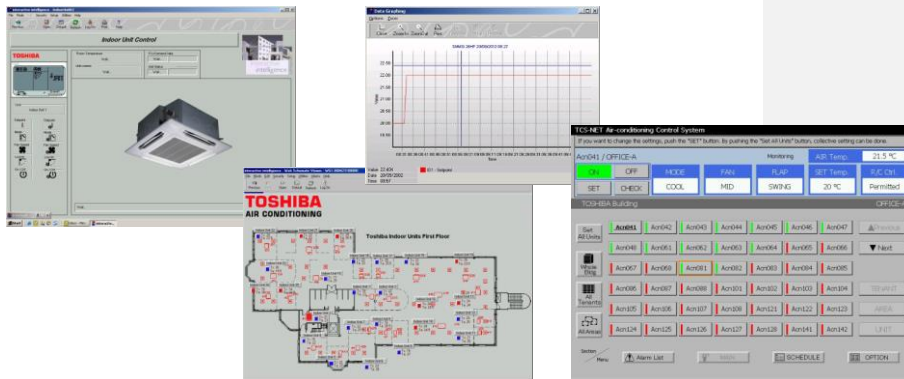
MAIN FUNCTIONS

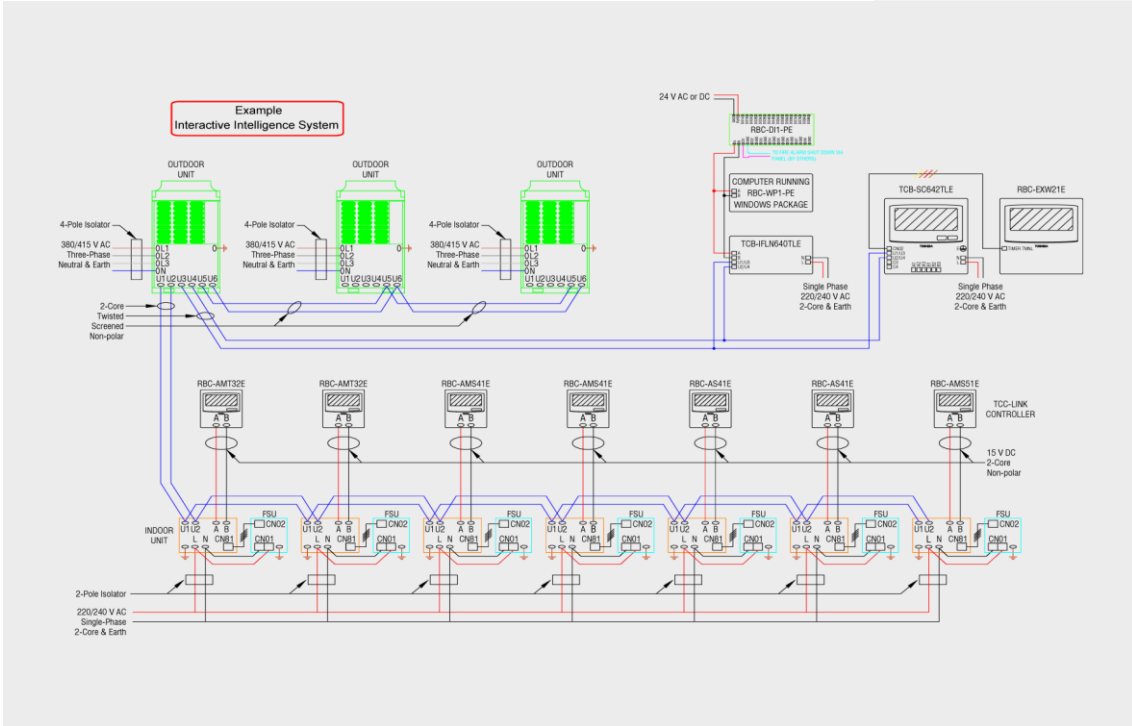| FUNCTION	CONTROL	MONITOR	PERMIT/PROHIBIT
Operation ON/OFF	✓	✓	✓
Operation Mode	✓	✓	✓
Temperature Setting	✓	✓	✓
Fan Speed Setting	✓	✓	✓
Louver Setting	✓	✓	✓
Filter Dirty Indication	✗	✓	✗
Fault Signal	Automatically Resets and fault is stored in alarm history database	✓	✗

Limits
The Window package can control up to 1024 indoor units connected through the LonWorks gateways (one gateway required per 64 indoor units)

CONNECTION COMPONENTS FOR INTERACTIVE INTELLIGENCE

MODEL	DESCRIPTION	FUNCTION
RBC-WP1-PE	Windows Package Interactive Intelligence Control Software Kit	Interactive Intelligence Control Software installation CD. Interactive Intelligence Owner's Manual and PCLTA20 PCI Card for LonWorks network connection. Interactive intelligence software requires TCBIFLN642TLE Lonworks Gateway
TCB-IFLN642TLE	LonWorks Interface for TCC-Link Network	Relay Interface for connection of LonWorks Protocol BMS to Toshiba TCC-Link Central Control Network. Maximum 64 Indoor Units per Interface, 16 refrigerant systems per Interface.
RBC-IK1-PE	Internet Kit	Internet kit to allow 5 users to connect to the windows package via Internet explorer
RBC-DI1-PE	Digital Input/Output Interface	Interface to allow the connection of external equipment to the windows package 8 digital inputs/8 digital outputs
RBC-EM1-PE	Energy Monitoring Kit	Power meter pulse signal and transformers to be used with the Windows Package and Touch Screen

Example
Interactive Intelligence System

* TCC-Link Adaptor for Digital/Super Digital Indoor Unit

TYPICAL WIRING SCHEMATIC

The Windows Package (RBC-WP1-PE) connects to a LonWorks gateway via the AB network. The A+B network is connected via a two part screw terminal connector. The recommended cable is a 2-Core Screened 1.5mm^2. The connector is mounted on a full height PCI card that is fitted to the PC.

PC Specification (Minimum Requirement)
Toshiba does not provide the PC. The minimum requirements for this PC to run the Toshiba Windows Package are:

P4 2GHz or Equivalent
20G HDD
512 RAM
Separate Video Card
Full size case to accept a standard size PCI Card

The system requires it to have a 32 bit operating system. This is important otherwise recovery disks will need to be ordered to restore system to 32 bit system.

RBC-DI1-PE DIGITAL INPUT/OUTPUT INTERFACE

The RBC-DI1 is a module that connects to the LonWorks network that links back to the Interactive Intelligence software running on the PC in the building. The I/O is monitored and controlled by a Neuron™ 3150™ Chip with Free topology communication over a LonWorks® network. The module has 8 digital inputs and eight relay outputs. These inputs can be used to control external plant or except inputs from other plant. The application of this module is very versatile as it is an interface to other equipment. If an input is made to the module Interactive Intelligence can act on the input and perform an operation i.e. enable units in specific modes, indicate status of external plant on the PC etc. The relay outputs can also enable external plant in conjunction with the AC or plant which is independent. The I/O has a wide operating temperature range, -20 to 70°C. The I/O controller is protected from reverse power supply input wiring, over-voltages, transients, and other common events that can damage unprotected inputs and outputs

Examples of use of the Inputs
* Fire Alarm Shutdown
* Extend Unit Operation for a fixed time
* Hotel key card unit set back

Examples of use for the Outputs
* Enable air handling plant
* Toshiba VN unit control
* Lighting control
* Fault Output

Dimensions (W x H x D)
105mm x 111mm x 58mm

Connection/Installation Procedure
The module is connected to the LonWorks network that links the components to the Interactive Intelligence software. The device requires a 24Vac 0.5A supply this is normally derived from a panel-mounted transformer. The enclosure snaps right onto a 35mm DIN-rail for quick and easy mounting. Its spring-loaded latching mechanism makes it easy to remove. The device should be housed in a suitable enclosure. The device has eight inputs; these are volt free and could be connected to a contact closure. This input can be used within Interactive Intelligence. The eight outputs are relay contact closures and the contacts are rated at 24V 0.5A resistive load.

Limitations
Each device requires a power supply
Each device has a limit of eight inputs and eight outputs.

INTERFACE SPECIFICATION

General		**Inputs**	
Communication:	LONTALKTM Protocol	Number:	8
Transceiver:	FTT-10, Free Topology	Digital:	Dry Contact, Open-Collector Protection
Processor:	Neuron 3150 @ 10 MHz	Circuitry:	Transient Over voltage, ESD
Memory:	64K bytes FLASH	**Outputs**	
	2K bytes SRAM (Neuron)	Number:	8
	0.5K bytes EEPROM (Neuron)	Type:	Relay 1.0 A @ 24 VAC, Voltage Sourcing
Power		Protection Circuitry:	ESD
Nominal Input Voltage:	24 VA C /VDC	**Enclosure**	
Input Voltage Range:	21-28 VAC or 21-39 VDC	Dimensions:	L 105 x W 86 x H 58 mm
Maximum Consumption:	4 VA, does not include Relay Loading	Cover:	Lexan 940, UL94-V0 rated
Environmental		Base:	Noryl VO1550, UL94-V0 rated
Operating Temperature:	-20 °C to +70 °C		
Relative Humidity:	5% to 95% (non-condensing)		

Example of Controls Network

Dimensions
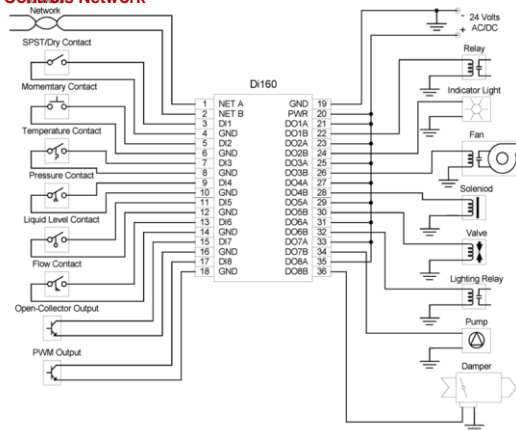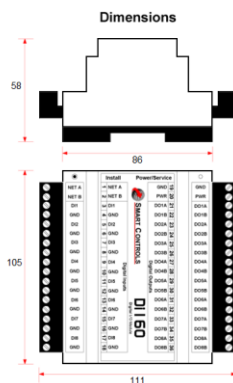
RBC-EM1-PE WINDOWS ENERGY MONITORING

The RBC-EM1-PE Energy Monitoring kit includes a LonWorks compatible power meter and 3 current transformers, on for each electrical phase. All of these components must be mounted in a suitable enclosure. The power meters connect directly to the windows package. The installed components allow for the total power consumption data to be divided between the indoor units and can be included on individual tenant bills. A power meter is required for each refrigerant circuit.

Connections

The power meter connects to the PC and LonWorks gateway via the AB network the recommended cable is 2-Core Screened $1.5mm^2$. The current transformers connect to the power meters by a $1.5mm^2$ cable. The power meter requires a reference voltage from each phase the power meter should be protected by a circuit breaker. The supply to the outdoor unit should pass through the centre of the current transformer.

Limits

One power meter kit for each refrigerant circuit (a closed loop system including all outdoor units and indoor units on the same circuit)

Dimensions (W x H x D)

Power meter: 125.5mm x 90mm x 75mm
Current Transformer: 45mm x 49mm x 70mm

Ambient Conditions

Operating temperature range	−25 ... +55° C
Storage temperature range	−25 ... +70° C
Relative Humidity	< 75% annual average
Elevation	to 2000 m
Deployment	indoors

Mechanical Data

Housing		
Material	Lexan polycarbonate per UL94 V0	
Dimensions	Height	≤ 90 mm
	Overall depth	≤ 75 mm
	Width	$125.5^{+0.5}$ mm
Weight	< 0.5 kg	
Installation	Top-hat rail per DIN EN 50022 or wall mounting	
Protection	IP 51 (dust protection, vertically dripping water)	
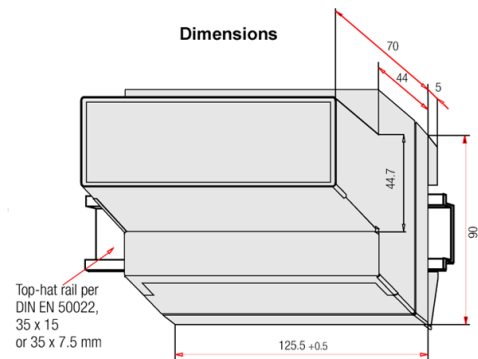
Terminal Connections

Self-locking screw terminals are utilized, and are protected with a tamper-proof terminal cover as a standard feature.

Terminals	
Current input	≤ 16 square mm without wire end ferrule
Voltage input	≤ 2.5 square mm with wire end ferrule ≤ 2 x 1.5 square mm without wire end ferrule
S0 pulse input / LON	≤ 2.5 square mm with wire end ferrule ≤ 2 x 1.5 square mm without wire end ferrule
Protection	IP 20 (Protection against entry of foreign objects ≥ 12.5 mm dia. without protection against the penetration of water)

Terminal Circuit Diagrams

4-wire AC system, any load

Dimensions

Top-hat rail per DIN EN 50022, 35 x 15 or 35 x 7.5 mm
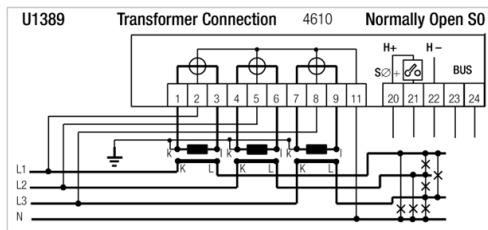
Transformer Dimensions

Ø Internal Diameter 24mm
Busbar 30x10mm, 20x20mm
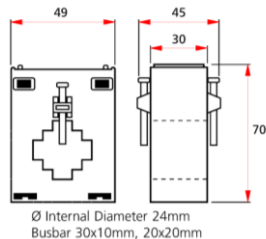
BLACK PEAR CONTROLLER

RBC-BPB1   BACnet®
RBC-BPM1   Modbus
RBC-BPT1   Trend

BLACK PEAR

Description

The **BLACK PEAR** Toshiba HVAC controller is the most versatile on the market, connecting directly to the 2-wire HVAC bus. The integrated LCD display provides an engineer's interface for local control, removing the need for a central controller and separate interface. The result saves time, space and commissioning is made simple with free USB based configuration software. The units will operate on systems with or without a central controller and supports Modbus, BACnet or Trend protocols. The device is easily configured to communicate with units in the same way that a standard central controller communicates with connected units. When the controller is powered it scans the entire network for all connected indoor units. The keypad controller can be used to operate all indoor units. This feature is very useful in the event of a BMS failure in providing and enabling continuous communication. The controller can be configured by a PC to interface to group units and name zones.

Features

- BACnet I/P*
- Modbus RTU or IP*
- TREND Via and Outstation*
- Maximum 64 Indoor Units/Groups and 16 Outdoor systems can be connected
- TCB-PCNT30TLE2 Network adaptor required for connection of DI/SDI to BACnet® System
  *Dependent on controller type (not interchangeable)

MAIN FUNCTIONS

FUNCTION	COMMAND INPUT	STATUS OUTPUT
ON/OFF Status	✓	✓
Operation Mode	Auto, Heat, Cool, Dry, Fan Only	✓
Fan Speed	Stop, Auto, Ultra-low, Low, Medium, High	✓
Louver	Swing, Fix	✓
Set Temperature	18-29ºC	✓
Room Temperature	✓	✓
Permit/Prohibit of Local Operation	ON/OFF, Mode, Set temp	✓
Error Status	Reset	✓
Error Code	Reset	✓

Limits

The device is limited to standard network restrictions applied to the TCC- link network with a maximum indoor unit count of 64 indoor units.

CONNECTION COMPONENTS FOR BACNET®

MINIMUM EQUIPMENT REQUIRED FOR BACNET® CONTROL SYSTEM	SOURCE
Black Pear RBC-BPB1 BACnet® Controller	TOSHIBA
TCS-Net Relay Interface TCB-PCNT30TLE2	TOSHIBA
BACnet® Control System	Local Supply

CONNECTION COMPONENTS FOR MODBUS

MINIMUM EQUIPMENT REQUIRED FOR MODBUS CONTROL SYSTEM	SOURCE
Black Pear RBC-BPM1 Modbus Controller	TOSHIBA
TCS-Net Relay Interface TCB-PCNT30TLE2	TOSHIBA
Modbus Master Device	Local supply
Upper Side Modbus Graphic Control System	Local supply

CONNECTION COMPONENTS FOR TREND

| MINIMUM EQUIPMENT REQUIRED FOR TREND CONTROL SYSTEM	SOURCE
Black Pear RBC-BPT1 Trend Controller	TOSHIBA
TCS-Net Relay Interface TCB-PCNT30TLE2	TOSHIBA
Trend IQ3/4 outstation with spare memory	Local supply

SPECIFICATION INDOOR INTERFACE

Protocols supported	BACnet I/P Modbus RTU or IP TREND via an Outstation
Chassis material	Painted metal
Power Supply	24V AC 5VA
Number of Connectable Indoor Units	64
Operating Temperature / Humidity	0 to 40ºC / 10 to 90%
Storage Temperature	-20 to 60ºC (no condensation)
Dimensions H X W X D	118 x 211 x 38 mm
Communications Platforms	RS232, RS485, 2-wire Network Bus
Backlit Graphic Display	62mm x 62mm with 6 navigational buttons
Air Conditioner Connection	2-wire T1 & T2 communication bus
TCC Link	U3 / U4

NO.	LINE	DESCRIPTION		
1	For TCC-LINK	Type	2-core shield wires	
		Wire size and max. length	$1.5\ mm^2$ 1000m max. (min. 1.25 mm^2) $2.5\ mm^2$ 2000m max. (min. 2.00 mm^2)	(total length including air conditioner area)
2	For RS-485	Type	2-core shield wires	(dedicated cable or equivalent)
		Wire size and max. length	$1.5\ mm^2$ 500m max. (min. 1.25 mm^2)	(total length)
3	For Power	Type	H07 RN-F or 245IEC66	
		Wire size	0.75mm², 50 m max.	

* TCC-Link Adaptor for Digital/Super Digital Indoor Unit

Addressing Configuration
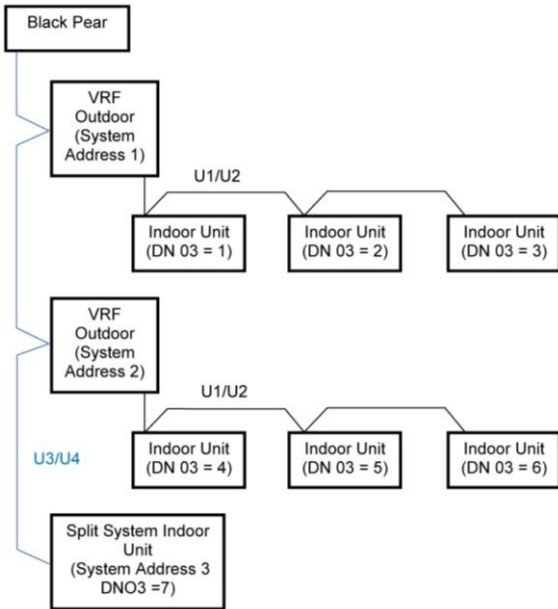
User Interface

⏻	Power LED
	Navigation Buttons
✓	Enter/Accept Button
◄◄	Back/Cancel Button
	HVAC Network LED Flashes on a valid incoming message
	BMS Network LED Flashes on a valid incoming message

Screen Hierarchy

Main Menu
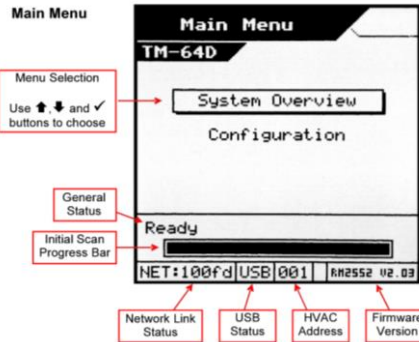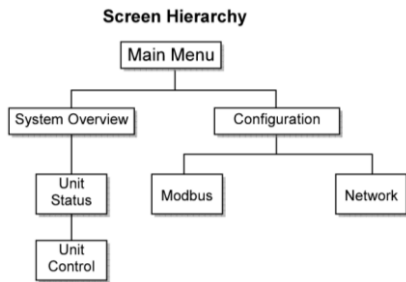
General Status	Waiting...	The Black Pear has been restarted and is preparing to start scanning the HVAC network.
	Searching...	The Black Pear is performing an initial scan to determine which unit addresses are active on the HVAC network. The progress bar shows how much of the scan has been performed.
	Ready	The initial scan is complete.
Network Link Status	N/C	Not connected.
	???	Auto-negotiation in progress.
	10hd	10Mb half duplex
	10fd	10Mb full duplex
	100hd	100Mb half duplex
	100fd	100Mb full duplex
USB Status	<blank>	Not connected
	USB	Connected
HVAC Address	0	Fixed address when the Black Pear is acting as the central controller.
	1 to 127	User configured address when a central controller is already present on the system.

System Overview

Displays an 8 by 8 grid showing the address of any unit discovered by the Black Pear, in the address range 1 to 64.
Pressing the ◀◀ key will return to the Main Menu screen.
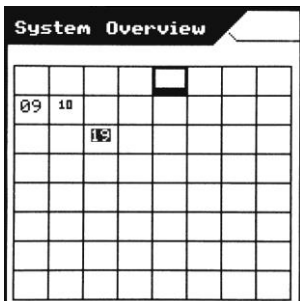
(empty cursor cell)	Selection Cursor. Controlled using the navigation buttons. Pressing ✓ on a numbered cell will display the unit status screen.
09	A large number is a 'Group Master'.
10	A small number is a 'Slave Unit'.
19	An inverted number indicates the unit is ON.
19	A flashing number indicates the unit is in error.

System Overview grid showing 09, 10, and 19.

Unit Status Screen

```
09 Unit009              Master
   Group 09

   Return Air   +25°C
   Error Code   8000 [OK ]

   Operation    Off
   Setpoint     24°C
   Mode         Cool
   Fan Speed    Medium
   Air Direction 22.5°
```
Group Master Status Screen
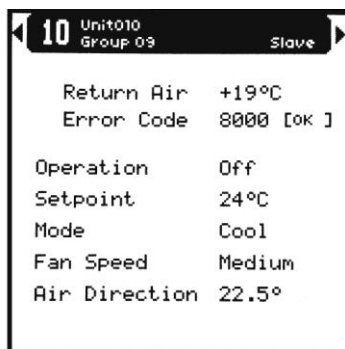
```
10 Unit010              Slave
   Group 09

   Return Air   +19°C
   Error Code   8000 [OK ]

   Operation    Off
   Setpoint     24°C
   Mode         Cool
   Fan Speed    Medium
   Air Direction 22.5°
```
Slave Unit Status Screen

This screen shows the status of a single fan coil.

Pressing the ← or → key cycles backward and forward through all available fan coils.
The ◀◀ key will return to the System Overview screen.
Only a 'Group Master' will show a cursor to allow the current settings to be altered.
Use the ⬆ ⬇ and ✓ keys to select a setting to be changed.
The appropriate parameter setting window will be displayed.
Use the ⬇ ⬆ keys to choose a new setting, ✓ to accept the change or ◀◀ to cancel the change.

TOSHIBA Leading Innovation >>>

Dimensions and Connections

Available fixing points

202mm

190mm

118mm

38mm

211mm
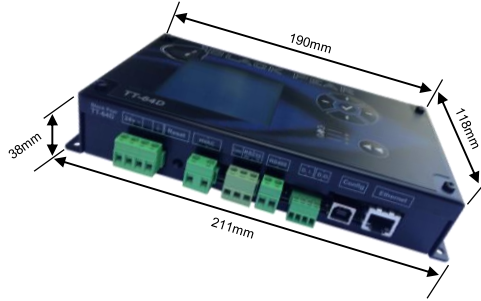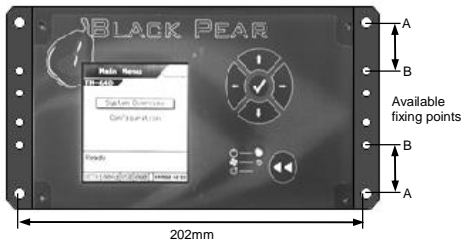
Holes marked 'A' should be used to mount the controller on a back panel
Holes marked 'B' can be used to attach the supplied DIN rail clips

Parts Supplied with Controller
- USB Cable
- Cat 5 Straight Through Ethernet Cable
- DIN Rail Clips & Screws

Power Supply   Reset   A/C 2-wire bus   RS232   RS485   Digital in/Out   USB   Ethernet

24v AC
N/C
COM
RS232RX
RS232TX
RS485 (+ or B)
RS485 (- or A)
COM
Digital Out
Digital in
Ethernet
Configure
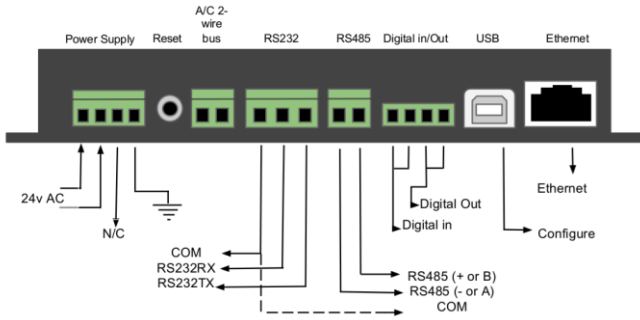
TOUCH SCREEN CONTROLLER

Description

Our latest generation Toshiba Touch Screen Controller provides a modern compact approach to management control technology utilising easy to use Icons and simple intuitive navigation to deliver sophisticated strategies that provide precise control and data analysis.

The Toshiba Touch Screen Controller is simple to install and configure and offers three levels of operation, general user, building manager and engineering, all password protectable. The Toshiba Touch Screen controller features a built-in web browser interface, air conditioning status, unit enable and disable, time and alarm management control and fault indication.

Features

- Built in Web Browser
- Back-up and Restore
- Customisable appearance
- Multi-language preference
- Alarm Settings
- Unit setup, status and inhibit
- Programmable time and date events
- Maximum 64 Indoor Units/Groups and 16 Outdoor systems can be connected
- TCB-PCNT30TLE2 Network adaptor required for connection of DI/SDI to provide TCC Link Connection
  *Dependent on controller type (not interchangeable)

MAIN FUNCTIONS

FUNCTION	COMMAND INPUT	STATUS OUTPUT
ON/OFF Status	✓	✓
Operation Mode	Auto, Heat, Cool, Dry, Fan Only	✓
Fan Speed	Stop, Auto, Ultra-low, Low, Medium, High	✓
Louver	Horizontal, Vertical, Swing	✓
Set Temperature	18-29°C	✓
Room Temperature	✓	✓
Permit/Prohibit of Local Operation	ON/OFF, Mode, Set temp, fan speed, louver	✓
Error Status	Reset	✓
Error Code	Reset	✓

Limits

The device is limited to standard network restrictions applied to the TCC- link network with a maximum indoor unit count of 64 indoor units.

SPECIFICATION TOUCH SCREEN CONTROLLER

Chassis material	Aluminium / Steel
Power Supply	230V AC 5VA
Number of Connectable Indoor Units	64
Operating Temperature / Humidity	0 to 40°C / 10 to 90%
Storage Temperature	-20 to 60°C (no condensation)
Dimensions H X W X D	120 x 200 x 40 mm
Communications Platforms	USB 2.0, RS485, 2-wire Network Bus and Network Connection
Graphic Display	7" Capacitive Touch Screen
Air Conditioner Connection TCC Link	2-wire U3 / U4 communication bus
Digital signals	4x Digital input , 4x relay output

NO.	LINE	DESCRIPTION		
1	For TCC-LINK	Type	2-core shield wires	
		Wire size and max. length	$1.5\ mm^2$ 1000m max. (min. 1.25 mm^2) $2.5\ mm^2$ 2000m max. (min. 2.00 mm^2)	(total length including air conditioner area)
2	For RS-485	Type	2-core shield wires	(dedicated cable or equivalent)
		Wire size and max. length	$1.5\ mm^2$ 500m max. (min. 1.25 mm^2)	(total length)
3	For Power	Type	H07 RN-F or 245IEC66	
		Wire size	0.75mm^2, 50 m max.	

INTESIS WIFI NETWORK CONTROLLERS

IntesisHome® Universal IS-IR-WiFi for Residential indoor models operating with infra-red remote controllers and TC-RO-WiFi-1 for Light Commercial and VRF indoor models connected to A + B terminals for RAV and VRF products to enable control through the Internet using a PC, Tablet or Smartphone.

IntesisHome® IS-IR-WIFI-1

Features
- Control your air conditioner from anywhere with your Smartphone, Tablet or Computer
- IS-IR-WiFi-1 compatible with most Residential systems with wireless remote controller
- TO-RC-WiFi-1 compatible with most VRF/DI/SDI systems using A + B wired connections
- Control and monitor: On/Off, Mode, Set Temp., Room Temp., Fan Speed & Louvre (limited)
- Power supply includes UK adapter
- Easy to install: Wall or desktop mounted
- Attractive design
- ON/OFF status and mode indicated by LED light
- Automatic firmware updates
- Learning Mode to identify your particular system automatically

IntesisHome® TO-RC-WIFI-1

Limits
- The Louvre Function does not support the Fix Position setting of the Louvre (Auto and Swing is Supported).
- Please do not use the Built-in Timer in the Toshiba Remote Controller and the Scheduling Function in the IntesisHome Apps/Web at the same time. It must be strictly one or the other.
- The TO-RC-WiFi-1 is not compatible with the RBC-AMS51E-ES remote controller.

TECHNICAL SPECIFICATION

	IntesisHome® IS-IR-WIFI-1	IntesisHome® TO-RC-WIFI-1
Enclosure	ABS (V-0, 5VB) 2.1 mm thickness PC (V-2) 1 mm thickness	ABS (UL 94 HB). 2,5 mm thickness
Dimensions	81 x 78 x 28 mm	70 x 108 x 28 mm
Weight	76 g	80g
Colour	White	White
Power supply	5VDC 0.2 A NEC Class 2 or Limited Power Source (LPS) and SELV rated Power supply	12V, 55mA typical doesn't require external power supply (supplied by the AC Unit)
Mounting	Wall	Wall
LED indicators	1 x Device status	1 x Device status
Operating Temperature	From 0°C to 40°C	From 0°C to 40°C
Operating humidity	<93% HR, no condensation	<93% HR, no condensation
Stock humidity	<93% HR, no condensation	<93% HR, no condensation
RoHS conformity	Compliant with RoHS directive (2002/95/CE).	Compliant with RoHS directive (2002/95/CE).
Certifications	CE conformity to EMC directive (2004/108/EC) and Low-voltage directive (2006/95/EC) • EN 60950-1 • EN 301489-1 v1.8.1 • EN 301489-17 v2.1.1 • EN 300328	CE conformity to EMC directive (2004/108/EC) and Low-voltage directive (2006/95/EC) • EN 60950-1 • EN 301489-1 v1.8.1 • EN 301489-17 v2.1.1

TCB-PCMO4E EXTERNAL MASTER ON/OFF

This is an application control PC Board that can be connected to a VRF Outdoor Unit in order to provide one of up to four available functions, these are:

- Snowfall Fan Control
- External Master On/Off Control
- Night Operation Control
- Operation Mode Selection Control

Snowfall Fan Control

This can be used to activate the Outdoor Unit fan based on an external input in order to prevent damage to the Outdoor Unit fan motor due to blockage/freezing. The PCB plugs into CN508 and when a contact is made between common and cool the outdoor fan is enabled to remove any snow from the condenser.

SNOWFALL FAN CONTROL		
Terminal	**Input Signal**	**Operation**
Cooling (SW1)	Contact made	Night time operational
	No contact	Normal Operation
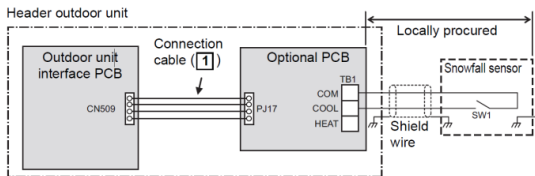
External Master On/Off Control

This function can be used to turn on, and turn off all indoor units connected in the system simultaneously based on an external input. This is very useful control, for example, when considering fire alarm inputs into a system. Indoor units connected to the outdoor unit can be batch-operated or batch-stopped by connected to the interface PCB of those outdoor units. The unit is connected onto the outdoor unit and connected to CM512. When a contact is made between common and cool, all the units in that system will start in their previous mode of operation. When the contact is made between common and heat the connected units will stop.

EXTERNAL MASTER ON/OFF CONTROL		
Terminal	**Input Signal**	**Operation**
COOL (SW1)	Contact made between Common & Cool	Batch operates indoor units
HEAT (SW2)	Contact made between Common & Heat	Batch-stops indoor units
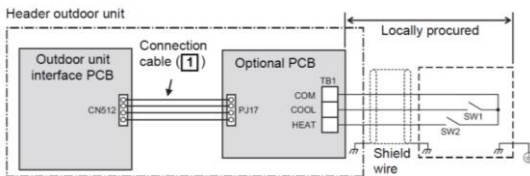
Night Operation Control

This can be used to reduce the sound of the Outdoor unit based on an external input and it works by reducing the compressor frequency and fan speed. When active, the night operation control will also reduce the available capacity of the outdoor unit. The PCB plugs into CN508, when a contact is made between common and cool the night operation is activated. This limits the compressor and outdoor fan speed. The noise level will be reduced to 50dBA at 1M (free field).

NIGHT OPERATION CONTROL		
Terminal	**Input Signal**	**Operation**
Cooling (SW1)	Contact made	Snowfall fan control (Fan in outdoor unit operates)
	No contact	Normal operation
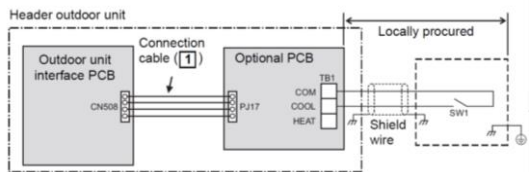
Operation Mode Selection Control

This can be used to specify the mode setting of all connected indoor units based on an external input. The operation mode selection control can be used with SMMS, SMMS-I, SHRM and MiNi0SMMS Outdoor Units. The method of connection of the TCB-PCMO4E to an Outdoor unit will depend on the required operation function. The PCB plugs into CN150 when no inputs are present to the PCB the indoor units can independently control their mode. If a contact is made between common and cool the indoor units will be locked in cooling, and a mode locked will be displayed on any remote controller. If the contact is made between common and heat the indoor units are locked in that mode. Each function has a separate CN connector on the outdoor interface PC Board. The PCB is then connected to a switch or relay contact to activate the PCB as required.

OPERATION MODE SELECTION CONTROL		
Input Signal		**Operation: Selected operation mode**
Cooling (SW1)	**Heating (SW2)**	
ON	OFF	Cooling operation only allowed
OFF	ON	Heating operation only allowed
OFF	OFF	Normal operation
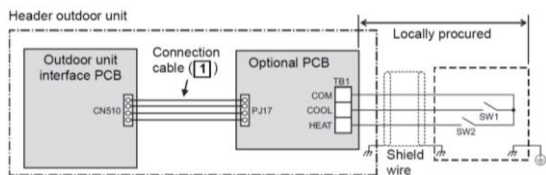
Limitations

The maximum distance the contacts can be from the PCB mounted in the outdoor unit is 500M. The cable that can be used must be either a 2 core or 3 core 0.75mm screened cable.

TCB-PCIN4E OPERATION OUTPUT CONTROL

The Operation Output Control accessory PC Board connects to connector CN511 of the Header outdoor unit PC Board. This PC board provides an output signal based on the On/Off status of the connected units and an error output signal based on detected faults on the system

The operation On/Off output provides the ideal control external ventilation fans. When connected to the SMMS-I product, the TCB-PCIN4E can be used to output the On/Off operation status of the compressors and to output system operation rate

This device is mounted in the outdoor electrical enclosure and is connected to the interface PCB via terminal CN511 on the header unit. The device would typically be used where a remote operation and fault signal may be required.

TCB-IFCB-4E2 REMOTE LOCATION ON/OFF CONTROL

This application connects onto the CN61 connector of the Indoor Unit Interface PC Board.
It can be connected to the Master unit of a group to provide On/Off Control of up to 8 Indoor Units.

This device would typically be used where it is necessary to remotely enable or disable a system and provide a means of operation and fault monitoring. An example of this would be a simple and cost effective means of integration to an existing BMS system.

Connections
This device is enclosed in a galvanized steel enclosure, which should be mounted adjacent to the indoor unit and connected to the indoor PCB via the CN61 socket. The power supply for the device is obtained from the indoor unit supply terminals.

Limitations
The output contacts for operation/fault indication are limited to 230 Volts and 0.5 Amps.
Enclosure Dimensions: 66 x 170 x 200

CONTROL WIRING SPECIFICATION

CONNECTION DEVICES	TYPE	CORES	SIZE	LENGTH	POLARITY	OTHERS
Power cable	60245 IEC 57	3	0.75mm^2 min	Max 80m	-	Procured locally
ON/OFF Control wiring	Shield wire	2	0.75mm^2 min.	Max 500m	Non Polarity	
Operation/Fault Output wiring		3	0.75mm^2 min.	Max 200m		
			1.50mm^2 min.	Max 400m		

Wiring diagram

* For connecting, be sure to use the connected cable.
** Supplementary insulation must be added to user touchable part of switches.
Cables other than cables connected should be required at the site.
Be sure to use the mounting hole to fix the box.
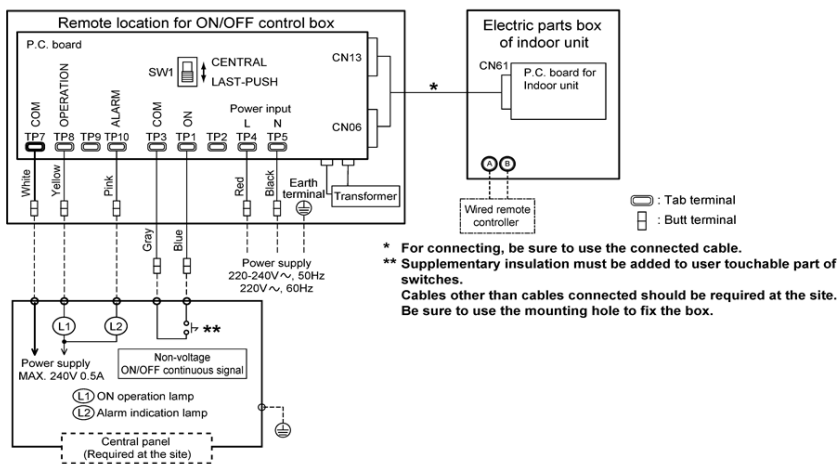
RBC-PCDM4E POWER PEAK CUT CONTROL

This device is designed for use where it is necessary to limit the electrical demand of systems at certain times. This may be where the electrical supply into a building is insufficient to meet the peak demand. At these times a signal can be sent to the device via a relay contact closure, which will limit the demand to present levels. The Power Peak Cut accessory PC Board connects to connector CN513 of the Header Outdoor Unit PC Board.

The upper limit capacity of the Outdoor Unit is restricted based on the demand request signal from the external input. There are two functions that can be selected depending on requirements, the standard function and the advanced function. This device is mounted in the outdoor PC Board using the fixing kit provided and connects directly to the interface PCB via the CN513 socket.

CONTROL WIRING SPECIFICATION

CONNECTION DEVICES	TYPE	CORES	SIZE	LENGTH	POLARITY	OTHERS
Input wiring	Shield wire	2 or 3	0.75mm^2 min.	Max 500m	Non Polarity	Procured locally
Output wiring		2	0.75mm^2 min.	Max 200m		
			1.50mm^2 min.	Max 400m		

STANDARD FUNCTION 2 STAGE

INPUT		SW07-BIT 1 OFF	SW07-BIT 1 ON	DISPLAY RELAY (L1)
SW1	SW2	Capacity	Capacity	
OFF	ON	100% (Normal	100% (Normal)	OFF
ON	OFF	0% (Stop)	Up to 60%	ON

EXPANSION FUNCTION 4 STAGE

INPUT		SW07-BIT 1 OFF	SW07-BIT 1 ON	DISPLAY RELAY (L1)
SW1	SW2	Capacity	Capacity	
OFF	OFF	100% (Normal)	100% (Normal)	OFF
ON	OFF	Up to 80%	Up to 85%	ON
OFF	ON	Up to 60%	Up to 75%	ON
ON	ON	0% (Stop)	Up to 60%	ON

TCB-PCOS1E2 SOUND REDUCTION & DEMAND CONTROL FOR DI

This device is intended for installation on the DI outdoor unit range and has been designed to limit the outdoor unit noise production in the cooling mode by 5dB, limit the maximum power consumption and give a compressor operation signal. The noise and power functions are individually initiated by a relay contact closure, which may be a time clock, switch or any other suitably related device. The compressor operation signal is given via a volt free contact closure. This application connects to the CN510 connector of the Outdoor Unit Interface PC Board (DI Only).

Application
The device would be used where it is necessary to limit noise production at certain times of the day, typically at night in residential areas or where it is necessary to limit power consumption at certain times.

Connections
The PCB and power transformer are mounted in the outdoor unit using the installation kit provided. Electrical connections are required to the outdoor unit supply terminals and the inverter assembly using the connectors supplied.

Limitations
Compressor operation contacts are related at 12-250VDC 10mA-1A
Power Peak Control has three stages: 0%, 50% and 75%.
Only one power peak option may be selected at any one time.

TCB-IFCB5-PE WINDOW SWITCH & ON/OFF

This is an application control PC Board that is capable of providing two different control functions when connected to a Toshiba Indoor Unit, these are:

◆ Window Switch Function
◆ Remote Location ON/OFF Controller

A window switch is a device used to ensure that an Indoor Unit does not operate when a window in the air conditioned space is open. Each time the window is opened (contact open) the indoor unit operation is turned off and will not operate again until the window is closed. There are two possible operation selections for when the window is closed again.

◆ **Standard Function Mode**
  The Indoor Unit operation remains off
◆ **Return Function Mode**
  The Indoor Unit will revert to the last setting before the window was opened.

The TCB-IFCB5-PE Interface can be used to control a single indoor unit or a group of up to 8 indoor units when connected to the master unit of that group. Toshiba constantly works to ensure that our air conditioners help protect the environment while delivering comfort, reassurance, reliability and cost savings to our customers around the world. The TCB-IFCB5-PE is no exception, conceived to offer further efficiency, reliability and cost savings for our already renowned products.

Why use a Window Switch?
A window switch increases the efficiency and working life of the system by reducing the amount of energy that would be wasted in conditioning the outside air that flows into the conditioned space whilst the window is open. Not only does this help to increase environmental friendliness of the Toshiba conditioned buildings, but also helps to reduce the cost of running your Toshiba equipment.

What is the Remote ON/OFF Controller?
The Remote ON/OFF controller is used to allow an external volt-free contact signal to turn the connected air conditioners on and off and has four possible priority settings.

◆ **Full Priority**
  External On/Off control has full ON/OFF priority over the unit.
◆ **On Priority**
  External On/Off control has on priority, but off control is set to last touch priority.
◆ **Off Priority**
  External On/Off control has off priority, but on control is set to last touch priority.
◆ **Last Touch Priority**
  Priority is given to the most recent ON/OFF command.

The remote ON/OFF Controller option operates with the use of a locally supplied volt-free switch. When the switch contact is made the indoor units will turn on. When the switch contact is broken the indoor unit will switch off.

Window switch → TCB-IFCB5-PE → OFF
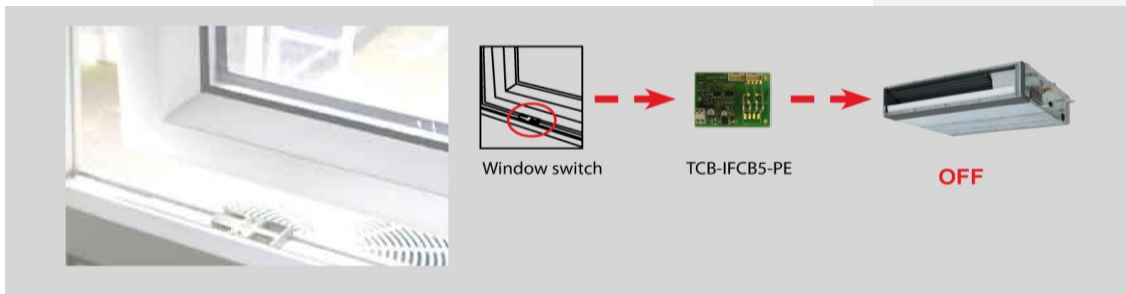
Optional Parts

There are two optional enclosures which can be used to mount the Window Switch / Remote On-Off Controller PCB:

- TCB-PX100-PE: A plastic enclosure for mounting outside of the indoor unit, where there is no room within the unit. It comes supplied with PCB mounts and 1.5m interconnecting cable.

- TCB-PX30MUE: A metal enclosure for mounting inside the 4 Series Split 4-Way Cassettes, the 2 Series VRF 4-Way Cassettes and the Compact 4-Way Cassettes (Split, Multi Split and VRF).

Connection Schematic:
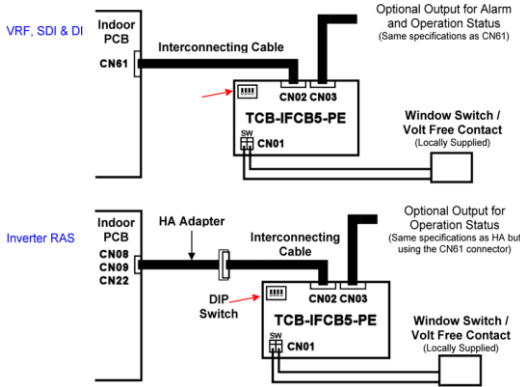
PCB Installation & Setup

Using the table below set the DIP Switch to the required setting depending on the function required.

FUNCTION SETUP

FUNCTION REQUIRED	DIP SWITCH SETTING	MODE / DESCRIPTION
Remote On-Off Controller Application	All = OFF	#1 : Remote On-Off signal has full priority
	Bit 1 = On ~ 2,3 & 4 = Off	#2 : Priority is given to the remote ON signal
	Bit 2 = On ~ 1,3 & 4 = Off	#3 : Priority is given to the remote OFF signal
	Bit 1 & 2 = On ~ 3 & 4 = Off	#4 : Last touch priority
Window Switch Application	Bit 3 = On ~ 1,2 & 4 = Off	#5 : With return back to previous operation
	Bit 4 = On ~ 1,2 & 3 = Off	#6 : With no return back function

The fitting method of this accessory differs depending on the type of Indoor Unit it will be fitted to. Please refer to the correct type of Indoor Unit for the appropriate instructions.

TCB-KBOS2E PEAK-CUT CONTROL, NIGHT OPERATION & COMPRESSOR OUTPUT FOR DI/SDI

This accessory is compatible with Series 4 DI and SDI equipment (excludes SDI 1.5-1.7 RS Units) and can be used to provide three possible functions, these are:

Power Peak-Cut Control

This function provides 3 levels of power saving levels by use of an external input. Settings are stop, 50% and 75% total capacity.

Night Operation

This function reduces the noise of the outdoor unit by restricting the fan and compressor operation.

Compressor Output

Provides a non-voltage contact that is on whilst the compressor is operating.
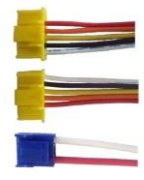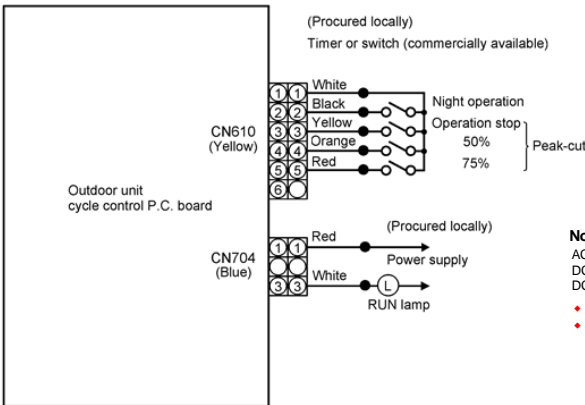
Note: Indication relay contact capacity

AC250V 10mA~1A
DC30V   10mA~1A   Non-inductive load
DC5V   10mA~1A

- Be sure to connect a load such as a lamp (L).
- When connecting an inductive load such as a relay coil, insert a surge-killer capacitor and resistor (for AC circuit) or a surge suppressor diode (for DC circuit) into the bypass circuit.2

TCB-KBCN32VEE CN32 VENTILATION FAN CONTROL

The external ventilation control allows the control of an external (or other equipment) via a 12 VDC Relay output.
Available settings: ON/OFF.
Substitute: RBC-SMFI Fan Interface Lead

TCB-KBCN60OPE CN60 OPERATION STATUS OUTPUT

The Operation status output connector supplies a 12VDC signal to one of the available wires depending on current mode settings
(Pin No: 1, 2, 3, 4, 5, 6).
Available settings:
Cooling, Heating, Fan Only, Defrost, Thermo-On
Substitute: RBC-SMIM3 Indicator Module ON/OFF & Stopping Fault

TCB-KBCN61HAE CN61 ON/OFF CONTROL

The CN61 Connector enables multiple Input and Output functions for the connected indoor unit and can be used to connect additional application control products
(Pin No: 1, 2, 3, 4, 5, and 6)
Available settings:
On/Off Control, ON/OFF Permit/Prohibit Control, Operation Output, Alarm Output
Substitute: RBC-SMIM4 Indicator Module ON/OFF, Stopping Fault & Unit Enable
Substitute: RBC-SMCN61 ON/OFF & Locking Lead

TCB-KBCN70OAE CN70 OPTION ERROR INPUT

The CN70 connector enables an external error signal to be input into the connected indoor unit and displayed on the connected remote controller without stopping the indoor unit.
Available settings:
Alarm display

TCB-KBCN73DEE CN73 DEMAND INPUT CONTROL

The CN73 connector enables an external input signal to force the connected Indoor unit into thermo off status.
Available settings:
Forced Thermo-Off control

TCB-KBCN80EXE CN80 EXTERNAL ERROR INPUT

The CN80 connector enables an external error signal to be input into the connected indoor unit and that will stop the indoor unit and be displayed on the connected remote controller.
Available settings:
Alarm input and forced off.
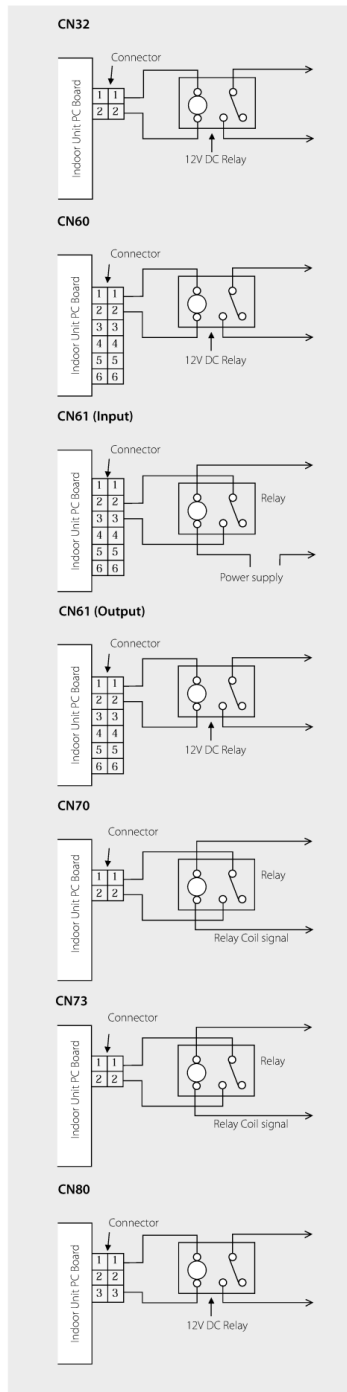
RBC-SMCN61 ON/OFF & LOCKING LEAD

The interface lead consists of a meter three core cable, which can connect to any R410A DI/SDI or SMMS/SHRM indoor unit. The accessory allows the indoor unit to be enabled/disabled by a volt free contact closure. It also allows the remote to be locked to prevent the unit being switched on.

The interface lead is used to allow single or groups of units connected to a master unit to be remotely enabled by an external volt free contact. Also the On/Off function can be locked by a volt free contact. The interface lead is connected to the CN61 connector located on the indoor PCB. If this lead is to be used for the ON/OFF function jumper J05 is to be removed.

When the external contact is operated, all connected systems will be enabled or disabled, depending on whether the contact is opened or closed. Individual units cannot be omitted from the on/off control process. The locking function only locks the operation, however if the remote is locked OFF it is not possible to adjust any functions of the remote. The interface lead may be extended to a maximum total length of 25 meters when using a screened cable, with a cross sectional area of 0.75mm.

1		This will RUN the Indoor Unit or Group
2	Vinyl Tube	
3		This will lock the ON/OFF function of the Rrmote Controller

Connection of Interface Lead

1		This will STOP the Indoor Unit or Group
2	Vinyl Tube	
3		This will unlock the ON/OFF function of the Remote Cotroller

Window switch   TCB-IFCB5-PE   OFF
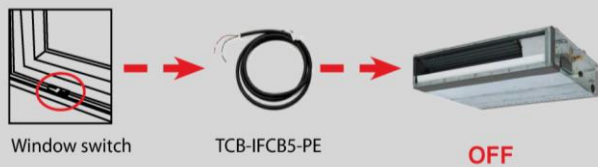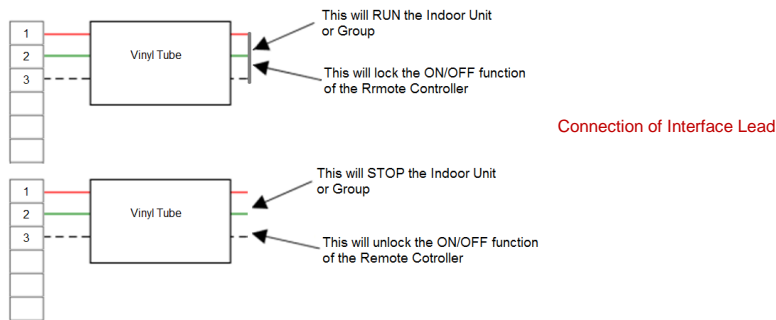
RBC-SMCN61L LOCK LEAD

The lead will allow the ON/OFF functions of the remote to be locked in the ON or OFF position. The interface lead must be plugged into the CN61 connector on the indoor unit PCB. If the units are grouped the lead should be connected to the master unit.

| 2 | | This will lock the ON/OFF function of the Rrmote Controller |
| 3 | Vinyl Tube | |

Connection of Interface Lead

| 2 | | This will unlock the ON/OFF function of the Remote Cotroller |
| 3 | Vinyl Tube | |
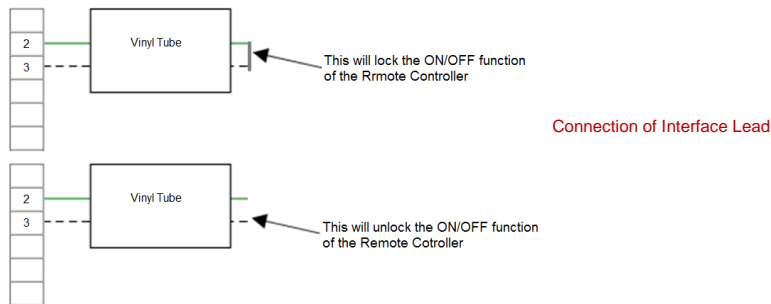
RBC-SMTI TIMER INTERFACE LEAD

The interface lead consists of a 1 meter two core cable and connector, designed for direct connection to the following accessories:

- RBC-AMT32E
- NRC-01HE
- TCB-SC642TLE2
- TCB-CC163TLE2

This lead is used to allow single or groups of units connected to the above devices to be enabled or disabled by means of an external contact. The interface lead is connected to the CN02 connection, which is also used for interfacing the weekly timer option.

When the external contact is operated, all connected systems will be enabled or disabled, depending on whether the contact is opened or closed. Individual units cannot be omitted from the ON/OFF control process.

The interface lead may be extended to a maximum total length of 25 meters when using a screened cable.

Wiring Diagram for RBC-SMTI Lead

RBC-AMT32E

Switch (Local supply)
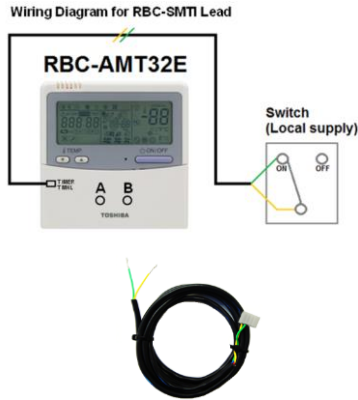
RBC-SMFI FAN INTERFACE LEAD

The fan interface module will allow an external ventilation fan to be controlled from an indoor unit. The device consists of a single pole relay housed in a small electrical enclosure, which connects to a Digital Inverter or VRF indoor unit via the supplied connection lead.

The module is intended to facilitate the installation and control of an external ventilation fan, which may be used to supply fresh air or to move conditioned air to another location. The external fan is enabled with the indoor unit, however this can be over-ridden using the external fan control button on the RBC-AMT21/31E remote controllers.

The interface should be mounted adjacent to the indoor unit and secured with the self-adhesive fasteners supplied. Only when the device has been adequately secured should the CN32 connection be then connected via the relay cont acts located in the fan interface enclosure. On completion of the installation works, the remote controller will require configuring to allow the operation of the auxiliary ventilation button.

The interface will operate with the operation of the indoor unit. It can also operate independently by pressing the ventilation button

Fan Run

Connect to Socket CN32
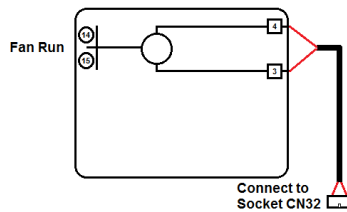
RBC-IT4-PE TIMER INTERFACE LEAD

The RBC-IT4–PE timer interface can be used with Toshiba RAV and VRF range of indoor units. The RBC-IT4-PE timer interface enables these systems to be externally switched ON/OFF by any volt-free external terminals rated at 230 volts A/C. Examples are; using a timer switch, automatic restart after a power failure, frost-thermostat protection, room occupancy sensor, timer, on/off control from a BMS or any other suitably rated volt-free contacts. For further advice please contact Toshiba Air Conditioning's Technical Department.

The device is connected to the indoor unit PCB via the CN06 socket on the 560/800 KRT models and the CN61 socket on all other models. An adaptor lead is supplied with the installation kit to facilitate both options.

It is important to note that when using the RBC-IT4-PE timer interface, the standard 24 hours timer function for the Toshiba remote controller or central controller must not be enabled to avoid potential conflicts in switching command methods. Please note the RBC-IT4-PE timer interface must not be used in conjunction with either of the RBC-WT1-PE or RBC-EX21E seven day timers.

Connected remote controller ON/OFF button is disabled when the RBC-IT4-PE timer interface is connected to socket CN06 or CN61. All other functions of the remote controller are unaffected and remain operational. When more than one system is connected for group operation, it is essential to arrange power supplies to the outdoor units so that the control circuits for all the indoor units are connected from the same phase. The timer interface must be fitted to the Header indoor unit. If the timer interface is fitted to a follower (slave) indoor unit, incorrect system shut down may occur.

It is recommended that the required power supply for the timer interface operation is taken from the connected indoor unit, as indicated on the wiring diagram. The field sourced time-switch or other external switching method may be located in any area. The air conditioning system will start when terminal 1 of the interface is energised and will override the remote controller ON/OFF functions.

Due to the logic used, it is recommended that a minimum switching interval of 30 seconds be adopted. When first energised, it may be noticed that the indoor unit starts briefly and then stops. This is normal and does not indicate a fault with the system.

FIXING DETAILS
The interface should be fitted in position on the relevant indoor unit and secured by means of the adhesive pads provided on the rear. In some cases it is easier to disconnect the electrics box and withdraw it from its housing completely. Any excess cable should be coiled and secured near the interface box.

⚠ CAUTION

Ensure that the electrical feed to the time clock is the same electrical phase as the "L" terminal on the single phase units or "L1" on the three phase units. These terminals are the single phase derivation from the outdoor unit in each case. Zero voltage should be measured between terminal 1 of the Type T2 and terminal 1 of the indoor unit when energised. If 400 V.A.C. is detected between these two terminals it is essential that the unit is isolated and the correct phasing is determined.

Digital Inverter Wiring diagram 560 and 800 KRT Wall

Digital/ SuperDigital Inverter Wiring diagram all other
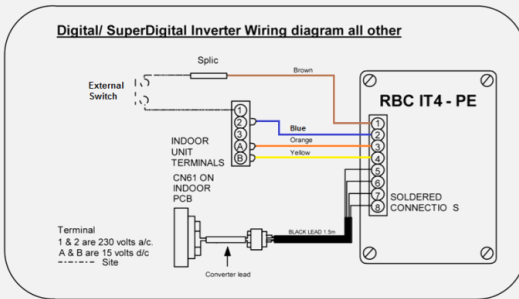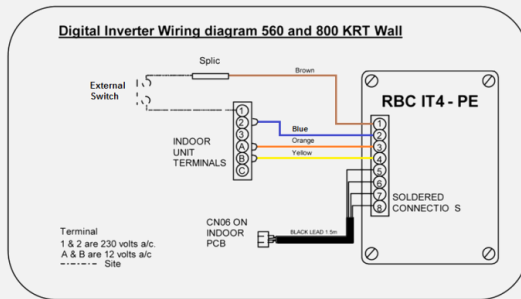
RBC-SMIM2 INDICATOR MODULE MODE

The device is designed to give the operational status of DI/SDI and SMMS/SHRMi systems. An indication of whether a system is heating, cooling or the fan is operating is given via a series of LED's and the activation of a relay output. The volt free relay output terminals allow for remote interfacing with a control panel or BMS system.

The device would be used where the remote indication of a systems status is required. This may be required in order to disable other systems to avoid conflicting heating and cooling demands.

The device should be located adjacent to the indoor unit and connected to the PCB via the CN60 socket.

When ther indoor unit is in a particular mode of operation the appropiate LED will light and the relay will close.

RBC-SMIM3 INDICATOR MODULE ON/OFF & STOPPING FAULT

The device is designed to give the operation and fault status for DI/SDI/SMMS/SHRMi systems. An indication of whether a system operating or has a stopping fault is given via a pair of LED's located on the device and the activation of a relay output. The volt free relay output terminals allow for remote interfacing with a control panel or BMS system.

The device would be used where the remote indication of a systems status is required. This may be required in critical areas such as server rooms and laboratories.

The device should be located adjacent to the indoor unit and connected to the PCB via the CN61 socket.

When the indoor unit is in a particular mode of operation the appropiate LED will light and the relay will close.
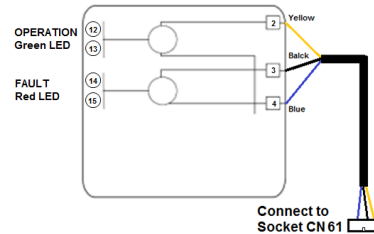
RBC-SMIM4 INDICATOR MODULE ON/OFF, STOPPING FAULT & UNIT ENABLE

This accessory is designed to give the operational status of an air conditioning system and also to enable remote ON/OFF control, with a remote controller lock facility where required. There are LED's on the interface giving a local visual indication of the RUN and FAULT status and in addition to this, relay outputs are provided to give a remote indication facility. There are also two input contacts for ON/OFF and ON/OFF lock. When the ON/OFF lock contact is made the ON/OFF button on the remote controller is disabled.

The interface should be mounted on or adjacent to the indoor unit using the self adhesive fixing tabs provided. It should be connected to the indoor unit PCB via the CN61 connection lead.

Jumper J01 must be removed from the indoor PCB to enable switching operation
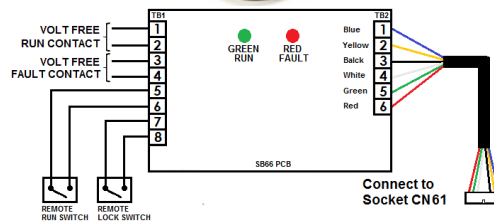
RBC-FDP3-PE BMS INTERFACE

The RBC-FDP3-PE is a low cost 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 $\boxed{A}$ + $\boxed{B}$ remote controller network connection. No other network adaptor cards are required even for split A/C units.

Functions
- **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**
  Read-back of all indoor and outdoor unit fault codes and unit run status.
- **DUTY/STANDBY**
  Run and standby rotation with run on fault and programmable rotation period.
- **MODBUS**
  RS485 Modbus Control and Monitoring Functions.
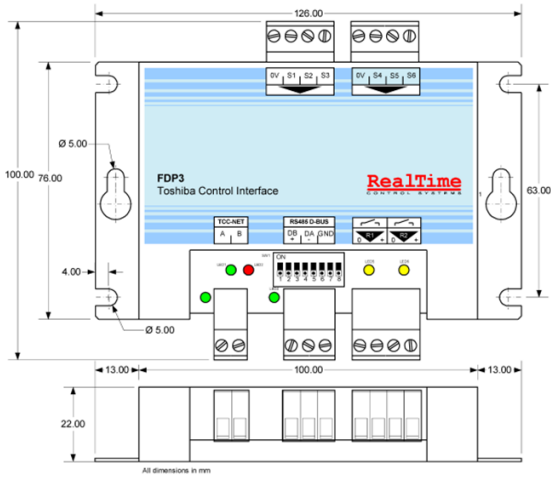
⚠ CAUTION

- **Do not exceed the specified fault relay ratings**
- **Observe precautions for handling Electrostatic Sensitive Devices**
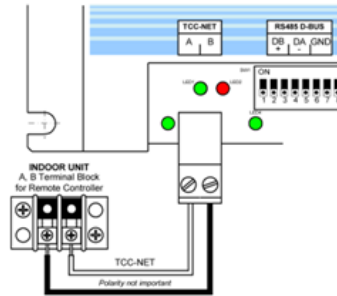
Mounting
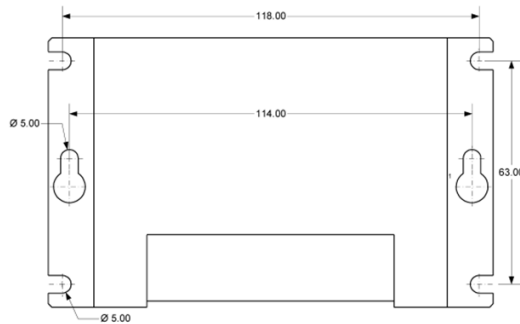
The RBC-FDP3-PE can be mounted horizontally or vertically

TCC-NET Network

TCC-NET Terminals A + B connect to the Toshiba TCC-NET remote controller network. The RBC-FDP3-PE is powered from this connection and communicates with the indoor unit on this network.. The RBC-FDP3-PE can be connected together with one Toshiba remote controller.

RBC-FDP3-PE Standard BMS Mode

The RBC-FDP3-PE operates in Standard BMS Mode with SW1.1 in the OFF position.
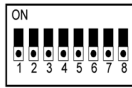
FDP3 Configuration Switches SW1.1-SW1.8

In Standard BMS Mode the RBC-FDP3-PE Inputs S1 to S6 allow individual control of various unit operating parameters. Each input corresponds to a specific unit setting shown in the table to the right. If an input is left unconnected then the corresponding setting will remain at a default value.

S1	Setpoint
S2	Fan speed
S3	Mode
S4	Louvre
S5	ON/OFF
S6	Lock

The configuration switch SW1.2 changes the inputs S1 to S6 between Resistance and Voltage modes.

Resistance Mode

With SW1.2 OFF the inputs S1 to S6 operate in Resistance Mode, unit operation can be controlled by connecting fixed or variable resistors to inputs S1 to S6.
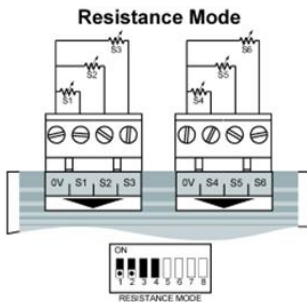
Voltage Mode

With SW1.2 ON inputs S1 to S6 operate in Voltage Mode. Voltage ranges between 1V and 10V can be used to modulate each input. This mode is designed for interfacing the RBC-FDP3-PE to BMS voltage outputs.
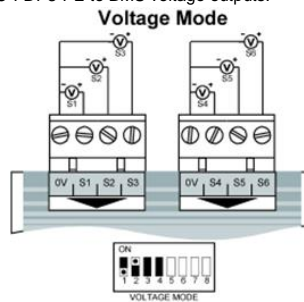
Each control input has a defined control range under voltage and resistance mode as outlined in the following tables. Default settings are applied if the input remains unconnected. These are indicated in the table by the symbol •

Resistance kΩ	<=0.4	1.1	1.8	2.5	3.2	3.9	4.6	5.4	6.1	6.8	7.5	8.2	8.9	9.6	>200k
Voltage V	1.3	2.0	2.6	3.3	3.9	4.5	5.2	5.8	6.5	7.1	7.8	8.4	9.0	9.7	<1
S1 Set point	18	19	20	21	22	23	24	25	26	27	28	29	30	31	•21

S2 FAN SPEED	S3 MODE	S4 LOUVRE	S6 LOCK	RESISTANCE KΩ	VOLTAGE V
AUTO	AUTO	Stop	All	<=1.1kΩ	1 - 1.75V
LOW	HEAT	Swing	S1,S3,S5	2.2kΩ	3.25V
MED	FAN	0 Degree	S3,S5	3.3kΩ	4.75V
HIGH	COOL	15 Degree	S5	4.7kΩ	6.25V
HIGH	DRY	45 Degree	Local	6.8kΩ	7.75V
HIGH	DRY	75 Degree	Unlock	9.6kΩ	9.25V
HIGH	DRY	90 Degree	Unlock	15kΩ	10.00V
•AUTO	•AUTO	•Swing	•Unlock	>200kΩ	<1.00

S5 ON/OFF	RESISTANCE KΩ	VOLTAGE V
•OFF	>5.Ω	<3.5V
ON	<1kΩ	>6.5V

RBC-FDP3-PE Standard Operation Inputs

When S6 is NOT operating in *Local* mode the inputs S1 to S5 allow control of the A/C unit operating parameters. The lock status of the input determines if the corresponding remote controller buttons are locked or unlocked.

If an input is locked then the remote controller button is locked and the input value on S1 to S5 will always be written to the unit. In the locked mode the input will also override central controller operation.

If the input is not locked then the input will operate in a *last-touched* mode with the remote controller in which updates from the input will only be written when a change occurs.

When input S6 is configured in *Local* mode then the A/C unit operates stand-alone and inputs S1 to S5 will not affect the operation of the unit.

RBC-FDP3-PE Standard Operation Outputs

The RBC-FDP3-PE has two output relays (maximum rating 1A 24VDC, / 30VAC). The relays outputs are configured as follows:

OUTPUT	NAME	OPERATION
R1	Run	A/C Unit Operation
R2	Fault	Closed on any unit fault

Using advanced configuration it is possible to change relay functionality and invert operation.

RBC-FDP3-PE Group Control

Connecting additional RBC-FDP3-PE controllers as slaves allows larger groups of units to be controlled from the master controller.
Setting SW1.3 ON for RBC-FDP3-PE Address 0 (Master) causes the settings of the Master to be written to Addresses 1 to 15 (Slaves).
The position of SW1.3 on the Slaves determines if the Slave operate in Locally Locked or Centrally Locked mode.
Note that in Group Control mode it is not possible to attach an external Modbus Master to the network.

Local Locked Group Control

A Slave RBC-FDP3-PE configured with SW1.3 OFF will operate in Locked Slave Group Control. Input S6 on each RBC-FDP3-PE determines the local Lock state of the device. When inputs are locked then the local S1 to S5 input values will be written to the A/C units and the corresponding remote controller buttons will be locked.

If an input is configured as *Last Touched* mode by input S6 then the unit operation is determined by the Remote Controller, or a change to an Input on either the Slave or the Master device.
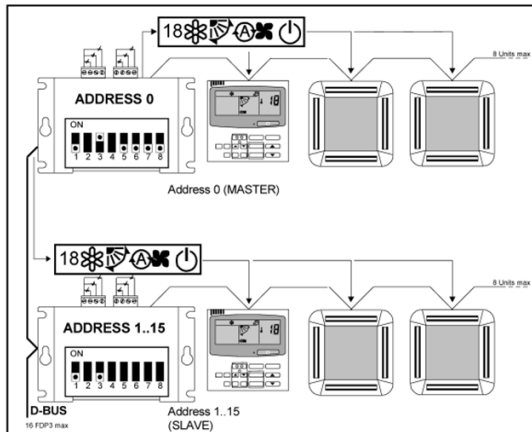
Central Locked Group Control

A Slave RBC-FDP3-PE configured with SW1.3 ON will operate in Locked Master Group Control. Input S6 on each RBC-FDP3-PE determines the local Lock state of the device. When inputs are locked then the control value from the Group Master will be written to the A/C units and the corresponding remote controller button will be locked.

If an input is configured as *Last Touched* mode by input S6 then the unit operation is determined by the Remote Controller, or a change to an Input on either the Slave or the Master device.
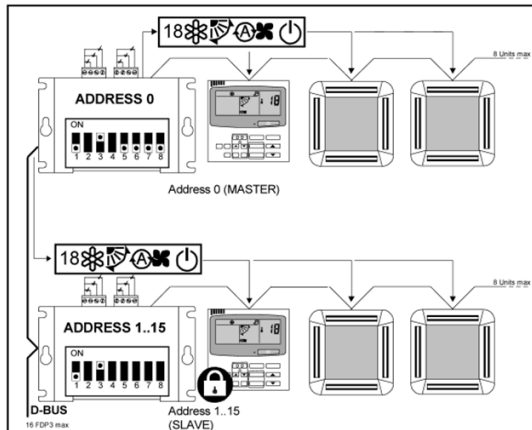
Local Restore BMS Mode SW1.4

SW1.4 enables Local Restore Mode on master and slave RBC-FDP3-PE. In this mode the remote controller settings are saved when the RBC-FDP3-PE enters central/locked operation. When the remote controller returns to local operation the saved settings are restored to the remote controller.

Local Restore operation is shown below:

User Restore

LOCAL → CENTRAL
Save User Settings

CENTRAL CONTROL
Use FDP3 Settings

CENTRAL → LOCAL
Restore User Settings
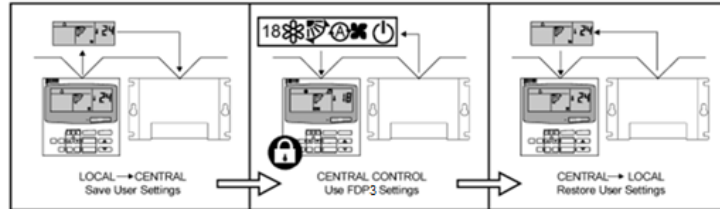
Preset Operating Modes

With SW1.1 set to ON configures the RBC-FDP3-PE to operate in a number of preset modes*. In this mode of operation the inputs S1 to S6 are not *RBC-FDP3-PE Configuration SwitchesSW1.1-SW1.8* used for control.

FDP3 Configuration SwitchesSW1.1-SW1.8

Unlocked Operation
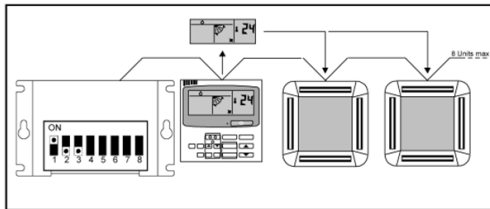
Locked Cooling Preset
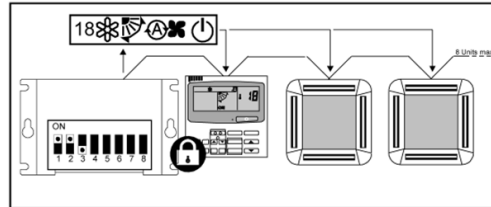
Locked Auto Preset
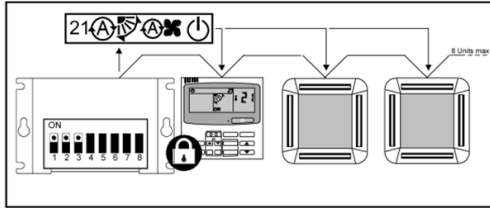
Locked Heating Preset
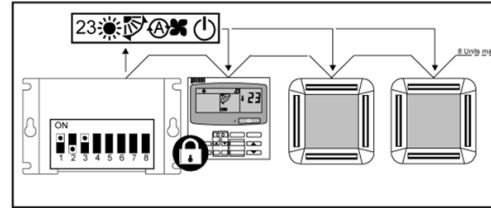
*Units that do not support specific modes for example cooling only, will operate as fan only units in unsupported modes

Duty/Standby Operation

Duty/Standby will alternately run two systems on alternating run/standby rotation. If a fault occurs on either system then both systems are switched on until the fault is cleared. The default rotation period is 24 hours, alternative rotation periods can be selected by linking inputs S1 to S6.

FDP3 Configuration Switches SW1.1-SW1.8

Duty/Standby is achieved using two RBC-FDP3-PE devices, one with Address 0 and one with Address 1 with a D-BUS connection between the two. SW1.1 and SW1.4 must be switched ON for both devices to enable the operation.

The MASTER RBC-FDP3-PE can be configured using SW1.2 and SW1.3 to operate using one of the three preset modes Heat, Cool or Auto. Alternatively the MASTER can be configured for local control, in which case the remote controller attached to the MASTER RBC-FDP3-PE can be used to set the operating settings during master duty.
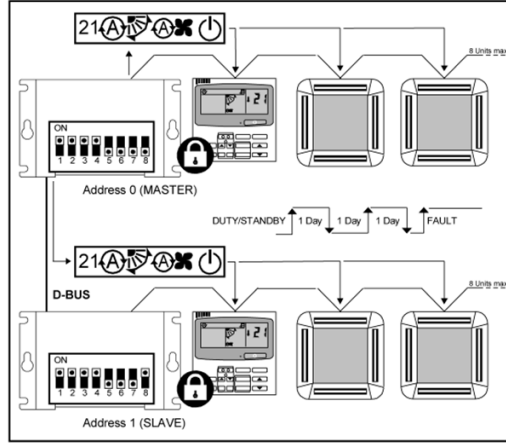
Duty/Standby Rotation Period

The default rotation period is 1 Day. Alternative rotation periods can be selected by linking the RBC-FDP3-PE inputs as shown in the table below. Note that the 1 Minute rotation period is for commissioning purposes only and should not be used for long term unit operation.

Configuration		Rotation Period
0V S1 S2 S3	0V S4 S5 S6	1 Day (default)
0V S1 S2 S3	0V S4 S5 S6	1 Minute (temporary operation only)
0V S1 S2 S3	0V S4 S5 S6	60 Minute
0V S1 S2 S3	0V S4 S5 S6	6 Hour
0V S1 S2 S3	0V S4 S5 S6	2 Days
0V S1 S2 S3	0V S4 S5 S6	1 Week
0V S1 S2 S3	0V S4 S5 S6	2 Week

RBC-FDP3-PE Networking

ADDRESSING

The RBC-FDP3-PE has the facility to create control groups using multiple RBC-FDP3-PEs connected together on the RS485 D-Bus network. In standard configuration up to 16 RBC-FDP3-PE devices can be connected together. Each RBC-FDP3-PE is assigned a D-Bus address using the configuration switches SW1.5 to SW1.8. Unit addresses are shown below.
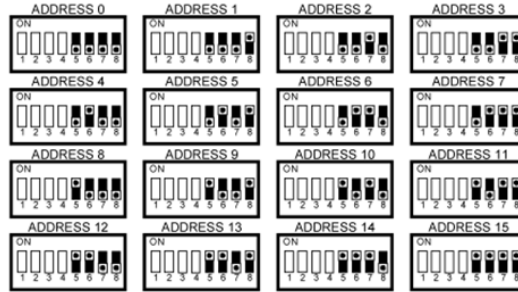
Address 0 is the RBC-FDP3-PE MASTER address. Address 1 to 15 are RBC-FDP3-PE SLAVE addresses.

NETWORK INSTALLATION

The RS485 D-Bus network requires a twisted pair cable connecting terminals DB(+) and DA(-) on each RBC-FDP3-PE as shown below. Terminal DB must be connected to all other DB terminals. Terminal DA must be connected to all other DA terminals. In addition the common terminal GND on all devices must be connected together. If a shielded cable is used then the shield can be used for this purpose. The network must be installed as a daisy-chained point-to-point Bus configuration, Star and Ring connections must NOT be used.

SPECIFICATION

Use stranded 24awg shielded or unshielded twisted pair to Cat3, Cat4 or Cat5 specification. Use a twisted pair for connections DB, DA and an extra core for connection GND.

NETWORK LENGTH

Standard installation for total network distances of up to 500m can be achieved following the basic daisy-chaining method showed in the above diagram. The network can be extended further using RS485 repeaters.

Run/Standby Wiring Diagram
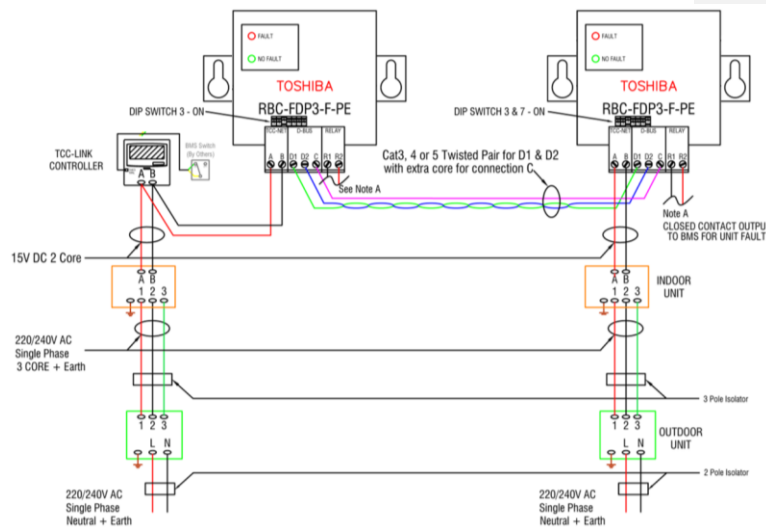
Modbus Operation
CONTROL

The RBC-FDP3-PE can be operated from both the hard-wired inputs and Modbus register commands if input S6 is open-circuit. Under this mode of operation control updates will be sent if a change is made to either a Modbus register or a wired input. All control registers are analogue Holding Registers

HOLDING REGISTER	NAME	RANGE
H0001	Set point	10..40
H0002	Fan speed	0..3 (0: Auto, 1: Low, 2: Medium, 3: High)
H0003	Mode	0..4 (0: Auto, 1: Heat, 2: Fan, 3: Cool, 4: Dry)
H0004	Louvre	1..7 (1: Swing, 2: 0 Degrees, 3: 20 Degrees, 4: 45 Degrees, 5: 70 Degrees, 6: 90 Degrees)
H0005	ON/OFF	0..1 (0: Off, 1: On)

HOLDING REGISTER	NAME	LOCK MODE*
0010	All Lock	0: Last Touch,1: Central, 2: Local, 3: On Change
0011	Set point Lock	0: Last Touch,1: Central, 2: Local, 3: On Change
0012	Fan speed Lock	0: Last Touch,1: Central, 2: Local, 3: On Change
0013	Mode Lock	0: Last Touch,1: Central, 2: Local, 3: On Change
0014	Louvre Lock	0: Last Touch,1: Central, 2: Local, 3: On Change
0015	ON/OFF Lock	0: Last Touch,1: Central, 2: Local, 3: On Change

*Last Touch updates are written to the A/C on every register write. On Change updates are only sent if the value written changes. Central locks the corresponding RC button. Local unlocks the RC button and prevents any updates from the RBC-FDP3-PE.

MONITORING

Unit data is available for each of the indoor units on the TCC-NET network. All read back data is available in analogue Input Registers. Input registers are numbered using the indoor unit number x 100 added to an offset relating to a specific feature. Group data is available as unit 0.

GROUP*	UNIT 1	UNIT 2	UNIT 3~15	UNIT 16	NAME	RANGE
0020	0120	0220	0320~1520	1620	Unit Exists	0..1
0021	0121	0221	0321~1521	1621	Is Fault	0..1
0022	0122	0222	0322~1522	1622	Fault Code	0..65535
0023	0123	0223	0323~1523	1623	Return Air Temp	Degrees C x 100

FAULT CODES

Fault codes are encoded using a standard table to allow standard Toshiba fault codes to be generated from the read back value. The no fault value is 255.

KEYPAD LOCK

When the keypad is locked using input S6 then Modbus commands will not change the lock state but unit settings can still be adjusted. When the S6 input is set to unlock the keypad then Modbus commands can change the lock state.

Additional Modbus registers and more detailed Modbus engineering instructions are available in the **FDP3-Modbus** *datasheet available from* **http://www.realtime-controls.co.uk/FDP3.** *A full list of fault codes is also available from this link.*

SPECIFICATION INDOOR INTERFACE

ELECTRICAL		ENVIRONMENTAL	
Model	RBC-FDP3-PE		
Supply	15V-24V DC, 50mA	Storage Temperature Range	-10°C to 50°C
Power	<1.2VA	Operating Temperature range	0°C to 50°C
Relay	1A, 24VAC max	Humidity Range	0-90% RH non-condensing
	1A, 30VDC max	Mechanical	
Inputs Voltage Mode	S1..S6 0..10VDC <1mA	Casing	Zinc coated mild steel
Inputs Resistance Mode	S1..S6 5V, 1mA	Dimensions	H100 x W100 x D22 mm
EMC Emissions	EN61000-6-1	Weight	120g
EMC Immunity	EN61000-6-3	Mounting	2 / 4 screw
Connectors	Rising clamp to 0.75²mm	Protection	IP30

SPECIFICATION FOR CONNECTION CABLES

INPUT	DESCRIPTION		
S1 to S6	Cable Type	2-core shield wires	Screen must be earthed at one end only
	Wire size and max. length	*1.0 mm² 200m max. (min. 0.5 mm²)*	It is recommended that volt-free contacts or switch mechanisms connected to S4, S5 and S6 have gold plated contacts to ensure low resistance circuit

Resistances should be within +/-250 ohms of the quoted value. Open circuit is R>200kΩ. Voltages should be within +/- 0.25V of the quoted value. Open circuit for V<1V. Under open circuit conditions the input will revert to its default value. S1 in resistance mode is designed to be operated using a linear 10kΩ variable resistance.

RBC-FDP3-AHU MODIFIED SOFTWARE

FDP3 AHU CONTROL

The RBC-FDP3-AHU contains customised software to act as a controller for the RBC-AHU1 interface control panel and is connected using the [A]+[B] connections. The Fixed resistance of the TA return air temperature sensor connection for the RBC-AHU1 interface must not been changed.

DIP SWITCH SETTING

The FDP3-AHU controller can be enabled to operate in two different modes dependent on the position of DIP Switch1 setting. The outdoor unit can be operated at full demand or alternative controlled at different demands by changes in supplied voltage.

SW1 OFF   Full Demand dependent on Digital Input
SW1 ON   Demand dependent on Input 0-10V

FDP3 Configuration Switch SW1
Full Demand

FDP3 Configuration Switch SW1
Demand Input 0-10V
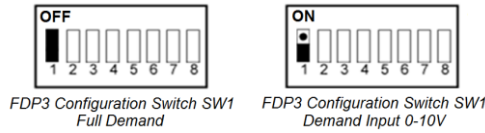
DIGITAL INPUTS

0V - S1 0-10V Input only used in demand control
0V - S3 Heat (Contact Open) Cool (Contact Closed)
0V - S5 OFF   (Contact Open) ON   (Contact Closed)

FULL DEMAND CONTROL

In this mode an instruction is given to the outdoor unit to run in maximum cooling or heating. A contact applied between 0V and S3 to select the mode and 0V and S5 to enable the unit.

0-10V CONTROL

In this mode a voltage is given on 0V-S1 this will then instruct the outdoor unit to operate at speed proportional to that voltage. A contact applied between 0V and S3 to select the mode and 0V and S5 to enable the unit.
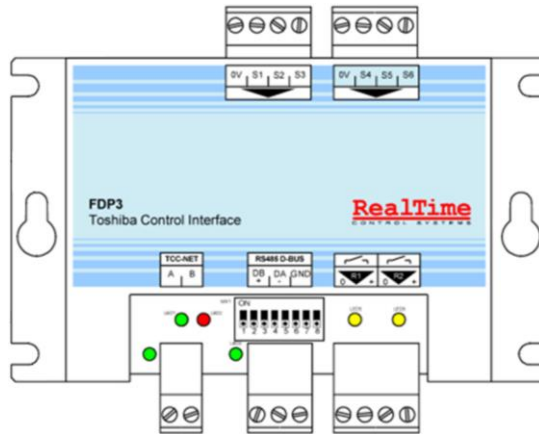
UNIT DN CODE SETTINGS

Connect a Toshiba wired remote controller to set the DN Codes below.
Please refer to CONFIGURATION USING REMOTE CONTROLLER page 10 Configuring Menu.

10 = 0006 (duct high static)
06 = 0000 (stratification control)

FULL DEMAND CONTROL (MODBUS CONECTION)

The Modbus address/network is in accordance with the RBC-FDP3-Modbus interface Instructions. Control is enabled by using the Analogue Holding Registers detailed in the table below.

For Monitoring use the input registers detailed in the RBC-FDP3-Modbus interface instruction. The TA return air temperature sensor is fixed.
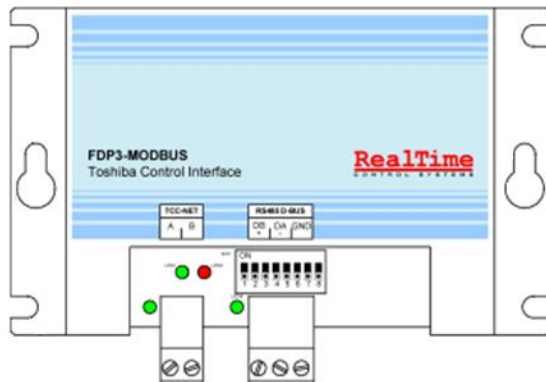
HOLDING REGISTER	NAME	RANGE
H13001	Demand 0-15	(0 Min -15 Max) Values are scaled by 100 so 0 - 1500
H13003	Mode	(0:Heat, 1:Cool) Values are scaled by 100 so 0 and 100
H13005	Enable	(0:Disabled, 1:Enabled) Values are scaled by 100 so 0 and 100

RBC-FDP3-MODBUS INTERFACE

The FDP3-Modbus is a low cost Modbus based monitoring and control interface for Toshiba VR
The interface is compatible with all units that have a TCC-NET [A] + [B] remote controller networ
cards are required even for split A/C units.

Functions

◆ UNIT CONTROL.
   Control of Set point, Fan speed, Run mode, Louvre mode and on/off state through
   Modbus registers.
◆ REMOTE CONTROLLER
   Facility to individually lock and unlock each remote controller button associated with unit
   control.
◆ FAULT CODES
   Read back of all indoor and outdoor unit fault codes
◆ UNIT TEMPERATURES
   Indoor unit air and coil temperatures is available
◆ RS485 NETWORK
   Multiple FDP3-Modbus interfaces can be networked on an RS485 network to provide
   control of multi zone systems.
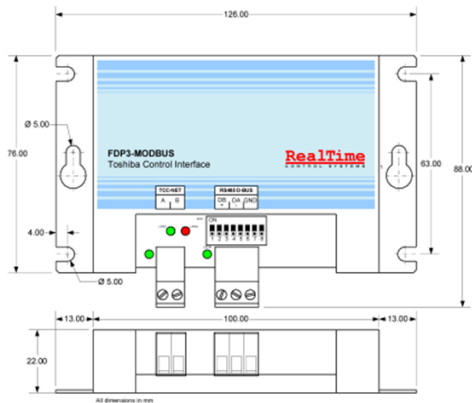
⚠ **CAUTION**

◆ **Do not exceed the specified fault relay ratings**
◆ **Observe precautions for handling**
   Electrostatic Sensitive Devices

Mounting
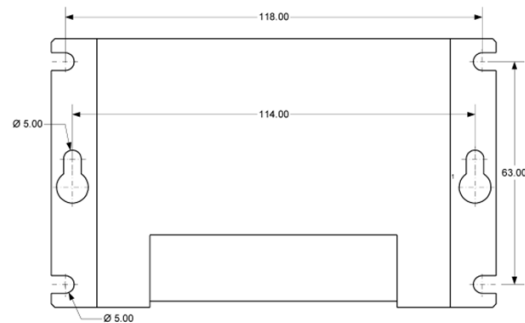
The RBC-FDP3-PE can be mounted horizontally or vertically

TCC-NET Network

TCC-NET Terminals A + B connect to the Toshiba TCC-NET remote controller network. The RBC-FDP3-PE is powered from this connection and communicates with the indoor unit on this network.. The RBC-FDP3-PE can be connected together with one Toshiba remote controller.

Networking

NETWORK INSTALLATION

The RS485 D-Bus network requires a twisted pair cable connecting terminals DB(+) and DA(-) on each RBC-FDP3-PE as shown below. Terminal DB must be connected to all other DB terminals. Terminal DA must be connected to all other DA terminals. In addition the common terminal GND on all devices must be connected together. If a shielded cable is used then the shield can be used for this purpose. The network must be installed as a daisy-chained point-to-point Bus configuration, Star and Ring connections must NOT be used.

SPECIFICATION

Use stranded 24awg shielded or unshielded twisted pair to Cat3, Cat4 or Cat5 specification. Use a twisted pair for connections DB, DA and an extra core for connection GND.

NETWORK LENGTH

Standard installation for total network distances of up to 500m can be achieved following the basic daisy-chaining method showed in the above diagram. Network termination should not be necessary for networks of this length. The network can be extended further using RS485 repeaters.

ADDRESSING

Each FDP3-Modbus must have a unique Modbus network address in the range 0 to 63 using DIP switches SW1.3 to SW1.8. A table of switch setting is given on the last page of this datasheet.

Modbus Protocol

MODBUS CONFIGURATION

Network	3 wire RS485
Mode	Modbus RTU Slave
Baud	9600
Parity	None
Stop Bits	1
Register Base	0

Note: FDP3 interfaces can be configured with different baud rate and parity settings if required

MODBUS REGISTERS

The FDP3-Modbus supports two types of register, analogue *Holding Registers* and analogue *Input Registers*. Register Addresses are '0' based in the range 0..65535.

REGISTER TYPE	ACCESS	FUNCTION
Holding Register	Read/Write	Control and Command Registers
Input Register	Read Only	Read back and Monitoring Registers

All analogue and digital values are accessed through these registers. All register values are 2 byte (16 bit) values.

Different data types are returned using specific conventions:

DATA TYPE	RANGE	CONVENTION
Digital	0..1	0=FALSE, 1=TRUE
Integer	0..65535	No scaling required
Temperature	0..65535	Temperatures values are generally returned multiplied by 100 to allow greater precision. To allow for negative temperature the value is returned as a signed integer, this means that any value greater than 32767 must be converted into a negative value by subtracting 65536 Examples: A read back value of 2150 is a positive temperature therefore: 2150 / 100 = 21.50ºC A read back value of 65036 is a negative temperature therefore: 65036 – 65536 = -500 -500 / 100 = -5.00ºC

Registers are accessed using standard Modbus functions. The following four functions are supported by the FDP3 interface:

FUNCTION CODE (HEX CODE)	FUNCTION NAME	REGISTER COUNT
03 (03h)	Read Holding Registers	1..10
04 (04h)	Read Input Registers	1..10
06 (06h)	Preset Single Holding Register	1
16 (10h)	Preset Multiple Holding Register	1..10

In this document, Holding registers are written as H0010 where 'H' indicates Holding register and '0010' indicates the register address 0010. Similarly Input registers are referred to as I0010 where 'I' indicates an Input register.

Control Functions

CONTROL

The FDP3-Modbus can be used to control all of the operating functions of the air-conditioning system that are available from a standard remote controller. All control registers are analogue Holding Registers.

HOLDING REGISTER	NAME	RANGE
H0001	Set point	10..40
H0002	Fan speed	0..3 (0: Auto, 1: Low, 2: Medium, 3: High)
H0003	Mode	0..4 (0: Auto, 1: Heat, 2: Fan, 3: Cool, 4: Dry)
H0004	Louvre	1..7 (1: Swing, 2: 0 Degrees, 3: 20 Degrees, 4: 45 Degrees, 5: 70 Degrees, 6: 90 Degrees)
H0005	ON/OFF	0..1 (0: Off, 1: On)

CONTROL UPDATE MODE

Each control field has a corresponding Update Register which determines how the control commands update the unit and if the corresponding remote controller button(s) are locked or unlocked. Four update modes are available:

UPDATE MODE	KEYPAD BUTTON(S)	FUNCTIONALITY
0: Last Touch	Unlocked	Unit setting is updated when a holding register WRITE occurs even if the value is unchanged.
1: Central	Locked	The corresponding keypad buttons are locked. The value in the holding register is repeatedly written to the unit.
2: Local	Unlocked	Updates to holding registers are not sent to the unit.
3: On Change	Unlocked	Unit setting is updated when a holding register WRITE occurs only if the value CHANGES.

The Last Touched update mode allows updates from the Keypad or Modbus registers. This requires that WRITES to the Modbus holding register only occur when a change is made. If the Modbus master repeatedly writes the value then this will overwrite the user setting. The On Change update mode can be used if repeated writes occur, in which case updates are only sent to the AC unit if the written value changes.

Global Update register H0010 can be used to set all update registers with one command, or the individual registers can be written to:

HOLDING REGISTER	NAME	LOCK MODE*
H0010	Global Update	0: LastTouch,1: Central, 2: Local, 3: On Change
H0011	Set point Update	0: LastTouch,1: Central, 2: Local, 3: On Change
H0012	Fan speed Update	0: LastTouch,1: Central, 2: Local, 3: On Change
H0013	Mode Update	0: LastTouch,1: Central, 2: Local, 3: On Change
H0014	Louvre Update	0: LastTouch,1: Central, 2: Local, 3: On Change
H0015	ON/OFF Update	0: LastTouch,1: Central, 2: Local, 3: On Change

*Last Touch updates are written to the A/C on every register write. On Change updates are only sent if the value written changes. Central locks the corresponding RC button. Local unlocks the RC button and prevents any updates from the FDP3. The default settings on power up are all fields in Last Touch mode.

CONTROL LIMITING

The Control Limit registers allow adjustment from the remote controller or central controller to be limited to specified ranges. The set point can be optionally limited to minimum and maximum specified values. Fan speed, Mode and Louvre settings can also be limited to specific settings using an inhibit value. If the limit values are set to 0 then no limit is applied.

HOLDING REGISTER	NAME	RANGE
H0020	Set point Min	18..31, 0 = No Limit
H0021	Set point Max	18..31, 0 = No Limit
H0022	Fan speed Inhibit	0 = No Inhibit, else Inhibit Value
H0023	Mode Inhibit	0 = No Inhibit, else Inhibit Value
H0024	Louvre Inhibit	0 = No Inhibit, else Inhibit Value

Fan speed, Mode and Louvre inhibit values are calculated by adding the inhibit values for each setting to be inhibited. The values are as follows:

Fan Inhibit

FAN SPEED	INHIBIT VALUE
Auto	1
Low	2
Medium	4
High	8

Mode Inhibit

RUN MODE	INHIBIT VALUE
AUTO	1
HEAT	2
FAN	4
COOL	8
DRY	26

Louvre Inhibit

LOUVRE POSITION	INHIBIT VALUE
Swing	2
0 Degrees	4
20 Degrees	8
45 Degrees	16
70 Degrees	32
90 Degrees	64

Examples

To limit the Mode setting to Heat, Cool and Fan:
Mode Inhibit Value
= AUTO + FAN + DRY
= (1 + 4 + 16)
= 21

To limit the Louvre setting 0 Degree, 20 Degrees, 45 Degrees:
Louvre Inhibit Value = Swing + 70 Degrees + 90 Degrees

The FDP3-Modbus can be configured to operate with an optional Modbus Master timeout. In this configuration if no Holding Register writes occur for a period of 120 seconds then a timeout event will occur and all A/C units will be switched on with their current settings. In a timeout condition the FDP3 LED's will indicate an *RS485 Communications Timeout* as illustrated in the *LED Functionality* section of this datasheet. FDP3 DIP Switch settings to enable or disable Modbus Master Timeout are shown in the following table

Switch Setting	Function
ON [switch: 1 down, 2-8 up] 1 2 3 4 5 6 7 8	No Timeout
ON [switch: 1 down, 2-8 up] 1 2 3 4 5 6 7 8	Timeout if no Holding Register WRITE command for 120 seconds. All units switched ON with current settings. Remote controllers UNLOCKED.

Readback Data

All readback data is available in analogue Input Registers.

GROUP READBACK

Group data registers provide a summary of the data from all active indoor units on the network.

INPUT REGISTER	NAME	RANGE	NOTES
I0020	Unit Count	0..16	Number of units found on network
I0021	Is Fault	0..1	0:No Fault, 1: At least one unit in fault
I0022	Fault Code	0..65535	255: No Fault, else fault code from first unit in fault
I0023	Return Air Average	Degrees C x 100	Average of all unit return air temperatures
I0024	Filter Alarm	0..1	0: No Alarm, 1: At least one unit with filter alarm
I0025	Return Air Min	Degrees C x 100	Minimum of all unit return air temperatures
I0026	Return Air Max	Degrees C x 100	Maximum of all unit return air temperatures
I0030	Thermo On	0..3	Summary of unit operation 0:Idle/Fan, 1:Heating, 2:Cooling, 3:Heat and Cool
I0035	Defrost	0..1	0: No defrost, 1: At least one unit in defrost

REMOTE CONTROLLER READBACK

INPUT REGISTER	NAME	RANGE
I0050	RC Temperature	Degrees C x 100 (only available for 1 indoor unit)
I0052	RC Exists	0: No RC, 1: RC Available

UNIT READBACK

Unit data is available for each of the indoor units on the network. Unit Input registers are numbered using the indoor unit numbering in the range 1 to 8 x 100 added to an offset relating to a specific feature.

UNIT 1	UNIT 2	...	UNIT 8	NAME	RANGE	NOTES
0120	0220	...	0820	Unit Exists	0..1	0: No Unit Found, 1: Unit Found
0121	0221	...	0821	Is Fault	0..1	0: No Unit Fault, 1: Unit in Fault
0122	0222	...	0822	Fault Code	0..65535	255: No Fault, else fault code
0123	0223	...	0823	Return Air Temperature	Degrees C x 100	Unit Return Air Sensor Value
0124	0224	...	0824	Filter Alarm	0..1	0: No Alarm, 1: Filter Alarm
0130	0230	...	0830	Thermo On	0..2	0:Idle/Fan, 1:Heating, 2:Cooling
0131	0231	...	0831	Coil TC* Temperature	Degrees C x 100	TC Coil Temperature (*TC2 for VRF)
0132	0232	...	0832	Coil TCJ Temperature	Degrees C x 100	TCJ Coil Temperature
0134	0234	...	0834	Indoor Duty	0..15	Unit Duty 0..15 = 0..100%
0135	0235	...	0835	Defrost	0..1	0:Unit Operating, 1:Unit Defrost
0142	0242	...	0842	Line address	1..32	
0143	0243	...	0843	Unit address	1..32	

SPECIFICATION INDOOR INTERFACE

ELECTRICAL		ENVIRONMENTAL	
Model		RBC-FDP3-PE	
Supply	15V-24V DC, 50mA	Mechanical	
Power	<1.2VA	Casing	Zinc coated mild steel
EMC Emissions	EN61000-6-1	Dimensions	H100 x W100 x D22 mm
EMC Immunity	EN61000-6-3	Weight	120g
Connectors	Rising clamp to 0.75²mm	Mounting	2 / 4 screw
Storage Temperature Range	-10°C to 50°C	Protection	IP30
Operating Temperature range	0°C to 50°C		
Humidity Range	0-90% RH non-condensing		

SPECIFICATION FOR CONNECTION CABLES

INPUT	DESCRIPTION		
S1 to S6	Cable Type	2-core shield wires	Screen must be earthed at one end only
	Wire size and max. length	$1.0\ mm^2$ 200m max. (min. 0.5 mm²)	It is recommended that volt-free contacts or switch mechanisms connected to S4, S5 and S6 have gold plated contacts to ensure low resistance circuit

Resistances should be within +/-250 ohms of the quoted value. Open circuit is R>200kΩ. Voltages should be within +/- 0.25V of the quoted value. Open circuit for V<1V. Under open circuit conditions the input will revert to its default value. S1 in resistance mode is designed to be operated using a linear 10kΩ variable resistance.

Fault Codes

FAULT CODES

Fault codes are encoded using a standard table to allow standard Toshiba fault codes to be generated from the readback value. The no fault value is 255.

Special fault codes generated by the FDP3 are as follows

CODE VALUE	MEANING
0	Waiting for data
255	No Fault
14384	(80) Group Fault, timeout on no units found
14388	(84) Unit Missing, reported if unit data previously observed

All other codes are Toshiba fault codes. The full table of fault code values is available from http://www.realtime-controls.co.uk/

Fault codes returned from a Modbus Input register are 16 bit values. The fault code is encoded in the 16 bit value by encoding the two 8 bit fault fields in the high and low byte parts of the 16 bit value. The high byte represents an ASCII text character and the low byte is a decimal value in the range 0 to 31. The low byte value is written as two digits, so e.g. 9 is written as 09.

16 Bit Register Value															
15						8	7								0

8 Bit High Rate								8 Bit Low Rate							
15						8		7							0

ASCII Character	Number 0..31
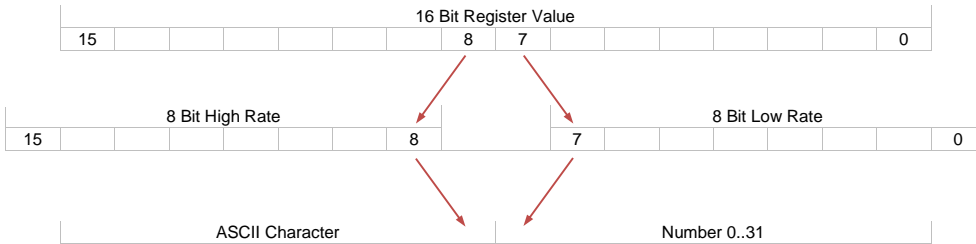
Example:
A fault code value of 17668 is returned

HighByte (17668) = 69 = ASCII Character 'E'
LowByte (17668) = 4 = Decimal Code 04

Fault Code: 'E04'

Modbus Addressing

The Modbus Address of the FDP3 is set with the 6 right dip switches on SW1. The address range is 0 to 63.
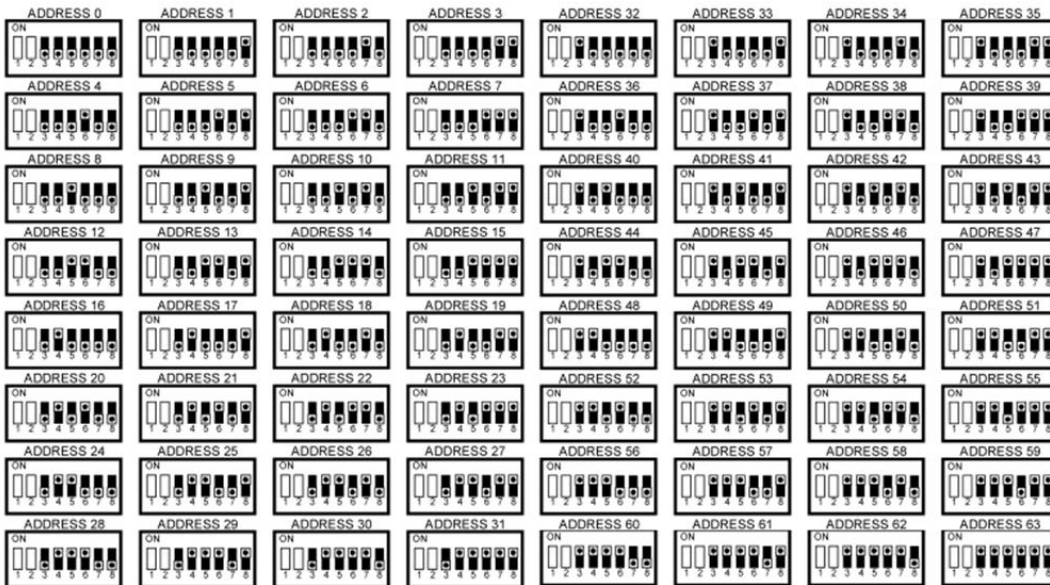
TCB-PCNT30TLE TCC-LINK NETWORK ADAPTOR

The TCB-PCNT30TLE is intended for use on all Digital Inverter and Super Digital Inveter indoor units with the exception of indoor High Wall models SM_KRT-E that include the netwrk adaptor as standard. The adptor is designed to enable Network devices such as Central Controllers and BMS systems to interface with DI/SDI systems.

The adptor consists of a small PCB, which is installed within the indoor unit and is typically used where indoor unit(s) are interfaced with a Central Controller or any other network device, such as a BMS system. One adaptor is required for each indoor unit or group of indoor units. Where indoor units are grouped together they will be assigned with one address on the central device and will consequently all receive the same operational instruction.

The device connects to the indoor unit PCB via socket CN50 and have two network terminal connections U3 + U4 .

When the adapotor(s) has been installed and a termination resistance enabled it is necessary to apply a unique network and refrigerant line address to each indoor unit.
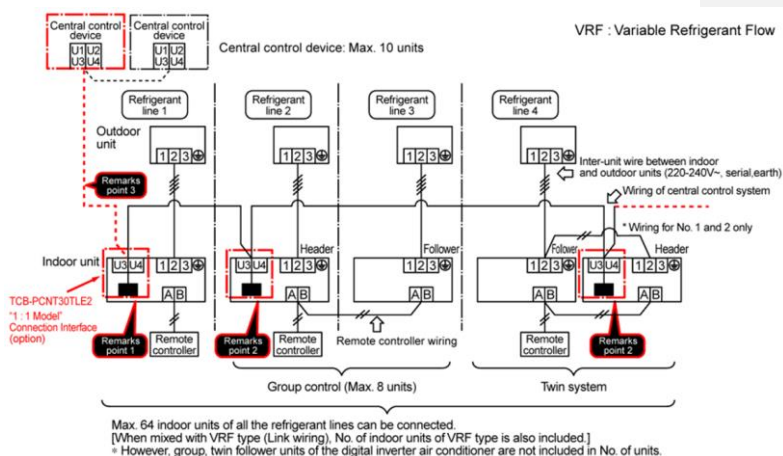
Point 1	Use "1:1 Model" connection Interface to Network control Digital Inverter and Super Digital Inverter air conditioner.
Point 2	In group control or twin, triple, quad system, this interface must be connected to the Header indoor unit (connection to follower unit is unavailable).
Point 3	Connect the central control devices to wires of the central control system.
Note	When controlling the Digital Inverter and or Super Digital Inverter air conditioner collectively it is necessary to set one unit with a 100ohm termination resistance. This is achieved by configuring the interface that is fitted to the indoor unit with the lowest network line address, setting Bit 1 of SW01 to ON.

Address setting is carried from a standard RBC-AMT32E remote controller. Where units do not have standard remote controllers installed, one should be temporarily attached in order to carry out the configuration process.

Wiring Diagram Indoor Control PCB with "1:1 Model"
For details, refer to installation procedure for each model.
Parts encircled with chain line are accessories indicates control P.C. board, and indicates terminal block (Characters inside of mark indicate terminal number). There is no polarity for wire connection to terminal blocks U3 and U4.

⚠ **CAUTION**

If the indoor unit has been powered prior to fitting "1:1 Model" ensure the unit has been switch OFF for approximately 1 minute otherwise interface may be damaged.
Do not apply voltage to terminals U3 and U4.
If applying voltage to U3 or U4 terminal by mistake, fusing occurs to protect terminals.
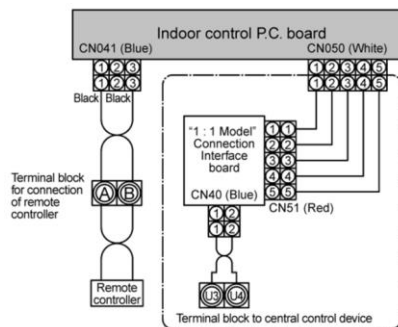
CONTROL WIRING SPECIFICATION

CONNECTION DEVICES	TYPE	CORES	SIZE	LENGTH	POLARITY	OTHERS
Indoor to Outdoor Units	Shield wire	2	1.5mm^2 (min.1.25mm^2)	Max 1000m	Non Polarity	Procured locally
Central Control Devices			2.5mm^2 (min.2.00mm^2)	Max 2000m		

Accessing the Engineers configuration menu

Check and Change of Group Address of Indoor Unit

In group control or twin, triple, double twin operation, the group address is allocated to indoor unit by automatic address setup after the system power supply has been turned on. From these addresses, "Header unit": "1" and "Follower unit": "2" can be recognized. As the central control device (remote controller) communicates with "Header unit" only, set up the group address from wired remote controller so that the indoor unit attached with the interface becomes "Header unit".

Check Method for Header Unit

Beforehand check the indoor unit attached with this interface.
During stop of the Set.

<Procedure>

1. Press TEST + SET + CL buttons at the same time for more than 4 seconds.

   (The first displayed unit No. is the header indoor unit No. in the group control.)

2. The indoor unit of which fan was turned on is the header indoor unit.
   If the header unit is not one with this interface, change it according to "How to set up Header unit".

3. Pushing TEST button returns the mode to normal mode.
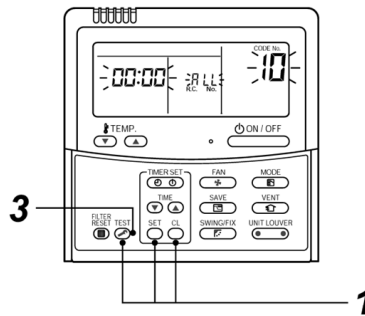
How to set up Header Unit

(In case when the indoor unit of which fan was turned on is not one attached with interface) Change address in the following procedure.

<Procedure>

1. Press TEST + SET + CL buttons at the same time for more than 4 seconds.

   (The first displayed unit No. is the header indoor unit No. in the group control.)

2. The indoor unit of which fan was turned on is the header indoor unit.

3. Using the setup temperature ▼ ▲ buttons, select CODE No. "14".

4. Check that the setup data is 0001, and then change the setup data to 0002 using the ▼ ▲ buttons.

5. Push SET button. In this time, the setup ends if display changes from flashing to lighting.

6. Push UNIT LOUVER button, and then turn on fan of the indoor unit which is attached with interface.

7. Leave the CODE No. as it is. (Select CODE No. 14)

8. Check that the setup data is 0002, and then change the setup data to 0001 using the ▼ ▲ buttons.

9. Push SET button. In this time, the setup ends if display changes from flashing to lighting.

10. When the above setup is completed, push UNIT LOUVER button to select indoor unit of which setup was changed and then check the changed contents (CODE No. 14 as it is).
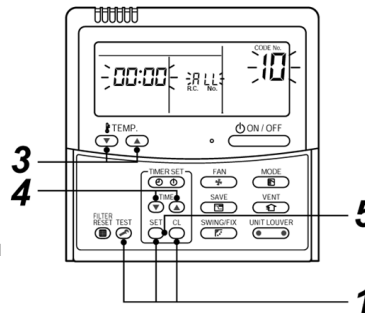
    * When pushing CL button, the setup contents can be cleared (in this case, repeat procedure from 1).

    Note) Cancellation is unavailable if the CODE No. is changed.

11. Push TEST button (Setup is determined).
    When pushing TEST button, the display disappears and the status becomes the normal stop status.
    (The remote controller operation is not accepted for approx. 1 minute after pushing TEST button).

* If the remote controller operation is not accepted for 1 minute or more after pushing TEST button, it is considered that the address setup is incorrect and the automatic address setup is being performed again. Change setup again after approx. 5 minutes.

<Procedure>

1. Press TEST + SET + CL buttons at the same time for more than 4 seconds. LCD changes to flashing.

(The firstly displayed unit No. is the header indoor unit No. in the group control.)

2. In group control, use UNIT LOUVER button for change.

Select the indoor unit No. (The fan of the selected indoor unit is turned on).

<Line address>

3. Using the setup ▼ ▲ buttons, select CODE No. "12".

4. Using ▼ ▲ buttons, set up the line address.

5. Push SET button (OK when display goes on).

<Indoor unit address>

6. Using the ▼ ▲ buttons, select CODE No. "13".

7. Using ▼ ▲ buttons, set up the indoor unit address.

8. Push SET button (OK when display goes on).

<Group address>

9. Using the setup ▼ ▲ buttons, select CODE No. "14".

10. Using ▼ ▲ buttons, set up Individual = 0000, Header unit = 0001, and Follower unit = 0002.

11. Push SET button (OK when display goes on).

12. Using UNIT LOUVER button, select an indoor unit No. to be changed at the next time. Repeat procedure from 3 to 12 and change setup so that addresses are not overlapped.

13. After the above change, push UNIT LOUVER button to check the changed contents.

14. If all is right, push TEST button, Setup ends.

Group address

Individual	: 0000	
Header unit	: 0001	] In case of group control
Follower unit	: 0002	

<Wiring example of 2 lines>

		#1			#2	
Line address	→ 1	1	1	2	2	
Indoor unit address	→ 1	2	3	1	2	
Group address	→ 1	2	2	2	2	

Header unit   Follower unit
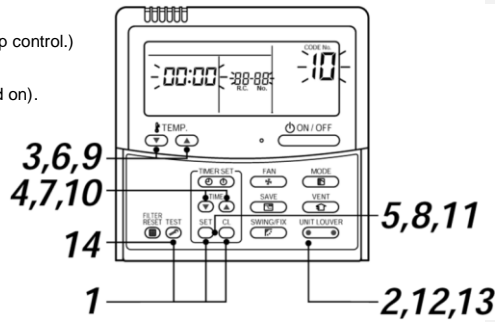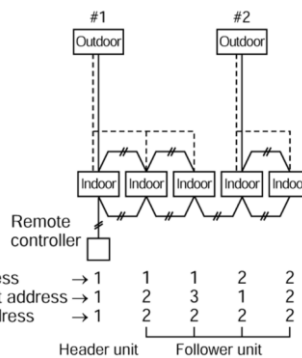
TCB-PCNT20E NETWORK ADAPTER
TO CONNECT A DI UNIT TO THE OLD AI NETWORK

The device is intended for use on the DI/SDI/SMMS/SHRM ranges of equipment and is designed to convert TCC Link to AI network protocol. This enables earlier types of control equipment to be interfaced with the current range.

The device consists of a PCB, transfomer and connection cables which should be installed in or adjacent to the indoor unit. Where indoor units are in a Group Control configuration, it is only necessary to install one device on the Header unit. Typically the protocol converter would be used to integrate new equipment onto an existing AI control system. This may be for example the RBC-CR1/64-PE Central Controller or a third party Building Management System.

Power for the primary side of the transformer is obtained from the CN309 socket on the indoor PCB. A further connection is then made to the |A|+|B| terminals from CN02. Multiple devices should be connected together in a "daisy chain" sequence and each device must be assigned a unique address by configuration of the dip switches SW01.

⚠ CAUTION

If the indoor unit has been powered prior to fitting the network adaptor ensure the unit has been switch OFF for approximately 1 minute otherwise interface may be damaged.

CONTROL WIRING SPECIFICATION

CONNECTION DEVICES	TYPE	CORES	SIZE	LENGTH	POLARITY	OTHERS
Remote Controller and Inter-unit Cable	Shield wire	2	1.5mm^2 (min.1.25mm^2)	Max 400m	Non Polarity	Procured locally

Connection of Cables
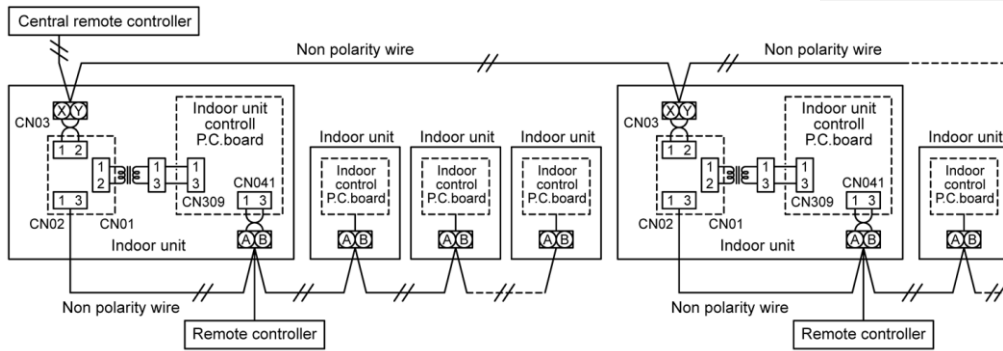
Connectable indoor units per group : Up to 8 units (In case of 1-remote controller system*)
* In case of 2-remote controllers system, up to 7 indoor units are allowable to be connected.

♦ There is no polarity for wiring to the terminal blocks, A, B and X, Y.
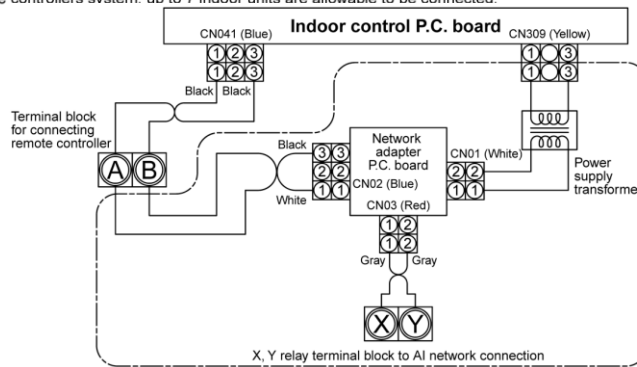
Setup of the Address No.

To connect the indoor unit to the central remote controller using the adapter, it is necessary to set up the network address No.
- It is required to agree the network address No. with the central remote controller system No.
- The network address No. is set to 1 at the shipment from the factory. The following two methods are used for setup.

1. Setup from the Remote Controller at the Indoor Unit side
This method is available only when [7] of the setup switch SW01 on the adapter P.C.
board is OFF.
<Procedure>
 Set up the address No. while the air conditioner stops.

1. Press 🔧 and 🔲 buttons at the same time for more than 4 seconds.

   In case of the group control, the unit No. **ALL** is displayed, and then all

   the indoor units in the group control are selected.
   In this time, the fans of all the selected indoor units start and the swing operation
   also starts in the models with flaps.
   (Keep the display status of **ALL** without pushing ⬜ button).
   In case of individual remote controller with no group control, the system address
   and the indoor unit address are displayed.

2. Using ⬇⬆ buttons specify the item code **03**

3. Using ⬇⬆ buttons select the setup data.
   The following table shows the setup data (table below).

4. Push 🔧 button.
   (When the display goes on, the setup data is accepted).
   To change the setup item, return to the step 2.

5. Push ⬜ button the status returns to the normal stop status.
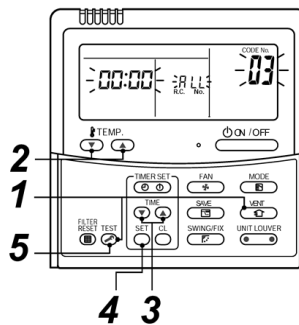
SETUP DATA	NETWORK ADDRESS NO.
0001	1
0002	2
0003	3
•	•
•	•
•	•
0064	64
0099	No setting (Shipment from the factory.)

2. Setup by the Switch on the Adapter P.C. Board
When the remote controller is not found, or when you do not want to change the setup of network address No. on the remote controller,
set up the address No. by using the setup switch SW01 (Network address No. setup switch) on the adapter P.C. board.

<Procedure>
1. Turn off the power supply.
2. Set [7] of the address No. setup switch SW01 to ON side.
   Accordingly, the setup of the address No. from the remote controller is
   invalidated.
3. The network address No. is set up by combining ON/OFF of the address No.
   setup switch, from SW01 [6] to [1].
   For relationships for ON/OFF combination and the address No., see table below.
   Setup example (Address No. 16) is shown opposite.
   When the network address No. has been changed, turn on the power of the
   central remote controller again or reset the central remote controller from the
   reset hole on the control panel of the central remote controller.

Address No. setup on the remote controller is invalid.

SW01

ON side
OFF side
(Numeral side)
1 2 3 4 5 6 7

Address No. setup

Setup example (Address No. 16)

ON side
OFF side
(Numeral side)
1 2 3 4 5 6 7
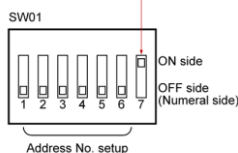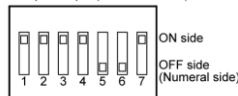
ADDRESS NO.	①	②	③	④	⑤	⑥	ADDRESS NO.	①	②	③	④	⑤	⑥
01	×	×	×	×	×	×	33	×	×	×	×	×	0
02	0	×	×	×	×	×	34	0	×	×	×	×	0
03	×	0	×	×	×	×	35	×	0	×	×	×	0
04	0	0	×	×	×	×	36	0	0	×	×	×	0
05	×	×	0	×	×	×	37	×	×	0	×	×	0
06	0	×	0	×	×	×	38	0	×	0	×	×	0
07	×	0	0	×	×	×	39	×	0	0	×	×	0
08	0	0	0	×	×	×	40	0	0	0	×	×	0
09	×	×	×	0	×	×	41	×	×	×	0	×	0
10	0	×	×	0	×	×	42	0	×	×	0	×	0
11	×	0	×	0	×	×	43	×	0	×	0	×	0
12	0	0	×	0	×	×	44	0	0	×	0	×	0
13	×	×	0	0	×	×	45	×	×	0	0	×	0
14	0	×	0	0	×	×	46	0	×	0	0	×	0
15	×	0	0	0	×	×	47	×	0	0	0	×	0
16	0	0	0	0	×	×	48	0	0	0	0	×	0
17	×	×	×	×	0	×	49	×	×	×	×	0	0
18	0	×	×	×	0	×	50	0	×	×	×	0	0
19	×	0	×	×	0	×	51	×	0	×	×	0	0
20	0	0	×	×	0	×	52	0	0	×	×	0	0
21	×	×	0	×	0	×	53	×	×	0	×	0	0
22	0	×	0	×	0	×	54	0	×	0	×	0	0
23	×	0	0	×	0	×	55	×	0	0	×	0	0
24	0	0	0	×	0	×	56	0	0	0	×	0	0
25	×	×	×	0	0	×	57	×	×	×	0	0	0
26	0	×	×	0	0	×	58	0	×	×	0	0	0
27	×	0	×	0	0	×	59	×	0	×	0	0	0
28	0	0	×	0	0	×	60	0	0	×	0	0	0
29	×	×	0	0	0	×	61	×	×	0	0	0	0
30	0	×	0	0	0	×	62	0	×	0	0	0	0
31	×	0	0	0	0	×	63	×	0	0	0	0	0
32	0	0	0	0	0	×	64	0	0	0	0	0	0

RBC-LLTS LOW LIMIT TEMPERATURE SENSOR

The RBC-LLTS low limit temperature sensor is designed for use with most Toshiba VRF and RAV Digital Inverter and Super Digital Inverter systems to limit temperature air off indoor unit to a pre-determined value. The discharge air off indoor unit can be limited to either 12ºC, 14ºC or 16ºC DB temperatures. Primarily designed for use with ducted indoor units, it can be fitted to other some other models if required. Please consult with Toshiba Technical Team for application use of this accessory which should only be fitted when this type of application specification is requested. Using the RBC-LLTS may affect the normal cooling capacity operation of the indoor unit.

The RBC-LLTS temperature sensing must be set to the indoor unit. If the wired remote controller has been previously set to detect room temperature at the controller, configuration must be change to return air temperature sensing at the indoor unit (TA) sensor. Configuration engineering code is DN32 value 0000.

Please note the RBC-LLTS must not be used in conjunction with the TCB-TC21LE remote temperature sensor kit.

Installation

The device is to be mounted within the indoor unit by applying the self-adhesive mounting pads. The standard return air temperature sensor must be removed from the indoor unit CN104 connector and the yellow plug connected to the RBC-LLTS temperature sensing device must be inserted into CN104. The RBC-LLTS TA (Return Air) sensor connected to the device must be secured to existing return air sensor with the cable ties supplied. The additional Discharge Air Sensor fixed to the white bracket arrangement should be mounted as near to the discharge grille outlet as possible or bracketed into the discharge air flow of the unit. The back of the bracket must face the direction of air travel.

The Brown and Blue wires are connected to A and B terminals. Please not that polarity must be tested with a multi-meter. The brown cable must be connected to the Positive (+) terminal and the blue cable must be connected to Negative (-) terminal. Failure to do this will result in the device not working.

Wiring Diagram
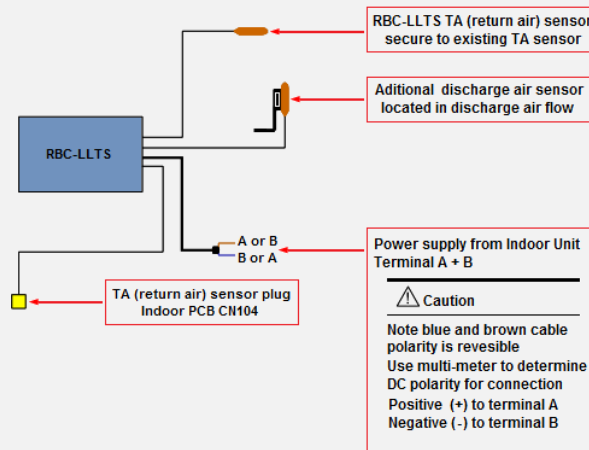
REFRIGERANT MONITORING AND CONTAINMENT

"Toshiba UK team has provided Accor UK & Ireland Hotel Group with a professional and efficient VRF solution to meet customer comfort requirements while complying with the latest regulations".

Didier Louis (Operations Director Accor Hotel Group)

Application Details

BREEAM Compliant
EN378 Compliant
140 x Bedrooms

5 x 3-Pipe Heat Recovery Systems
Leak Detection Pump-Down
Leak Detection Room Indication
Fail Safe Pump-Down/Detection Indication

Leak Detection Set-up

The leak detection system works via sensors which detect changes in the refrigerant pressure and temperature that signify a decrease in the levels of refrigerant gas. This triggers an audible and visual alarm and shuts down the device. In the event of the RBC-RD6 activation, the outdoor unit cooling mode is enabled and pump-down operates to recover refrigerant gas
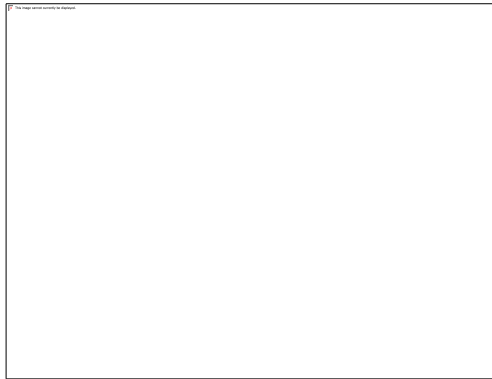
Challenges

The challenge from the Accor Hotel Group was to provide a system that would achieve heating and cooling to the bedrooms in the most energy efficiency way. As a new build project they also required Toshiba to look at ways in which they could achieve BREEAM credits and compliance with BSEN378 by raising an alarm within the bedrooms and at supervisory level in the event of a major leak of refrigerant from the system. This needed to be achieved without the use of a refrigerant concentration sensor within the bedrooms. There was also a requirement for a simple central control system by which the hotel staff, including the maintenance team, could view and adjust the following key elements of the system:-

Temperature control limitation to the user
Room temperature & operation adjustment
Global reset of the system at a set time during the day
Simple central control of the system via PC software based system
Remote indication of the status of the leak detection system

How it all Works

By utilising the above controls solution we are able to provide fully integrated controls systems for Toshiba VRF air conditioning. As a result our leak detection systems comply with BSEN378 and offer real time maintenance and monitoring for the requirements of the F-Gas regulation by providing the ability to identify any potential system leaks at an early stage. Preventing and reducing the amount of R410A leakage to atmosphere ensures that system run at peak energy efficient performance levels

Installation Examples

OUTDOOR UNITS
Pressure Sensor
RBC-PCMO4E Interfaces
Discharge Sensors

Example of Refrigerant Monitoring & Detection

RBC-RD6-PE

Additional
Indoor Units

Flow Selector
Box

RBC-AIP1(2)
Remote
Alarm Panel

RBC-RD6-PE
Leak Detection Panel

Remote
Controller

RBC-RCS#

RBC-RP1
Leak Detection
Multi-room Indication

RBC-RI1

RBC-AIP3(C)
Leak Detection
Panel

Additional
Indoor Units

Flow Selector
Box

RBC-AIP4
Leak Detection
Room Indicator

Remote
Controller

RBC-RI1

OUTDOOR
UNITS
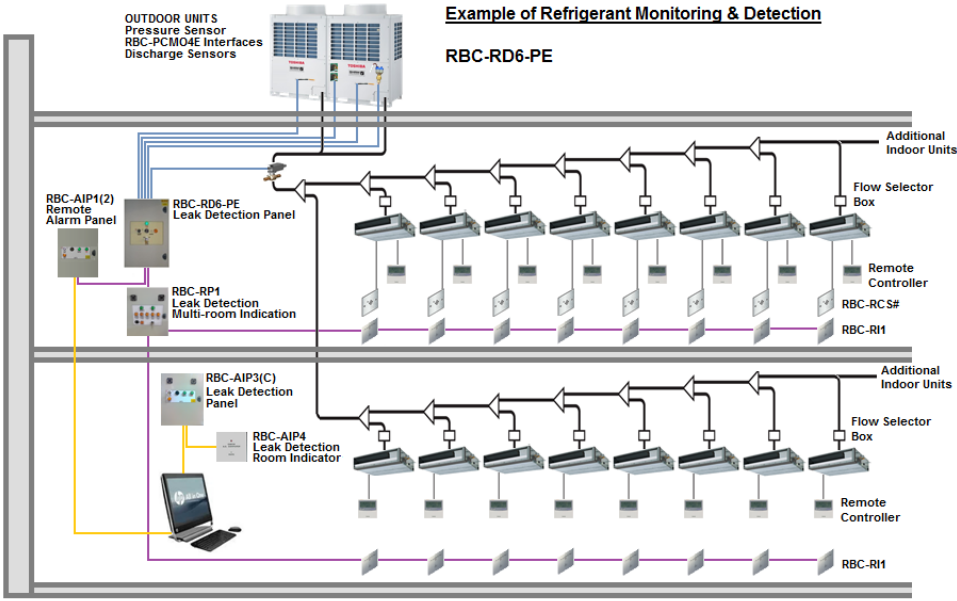
Example of Refrigerant Monitoring & Detection

RBC-RD6-DI
RBC-RD7

Additional
Indoor Units

Flow Selector
Box

RBC-RD6-DI
Leak Detection
Panel

Remote
Controller

Additional
Indoor Units

Refrigerant
Isolation Valves

Flow Selector
Box

Refrigerant
Isolation Valves

RBC-RD7

RBC-RD7 *

Remote
Controller

0.44m²/kg
Exceeded
RBC-RCS#
20m²

30m²   30m²   30m²   30m²   30m²
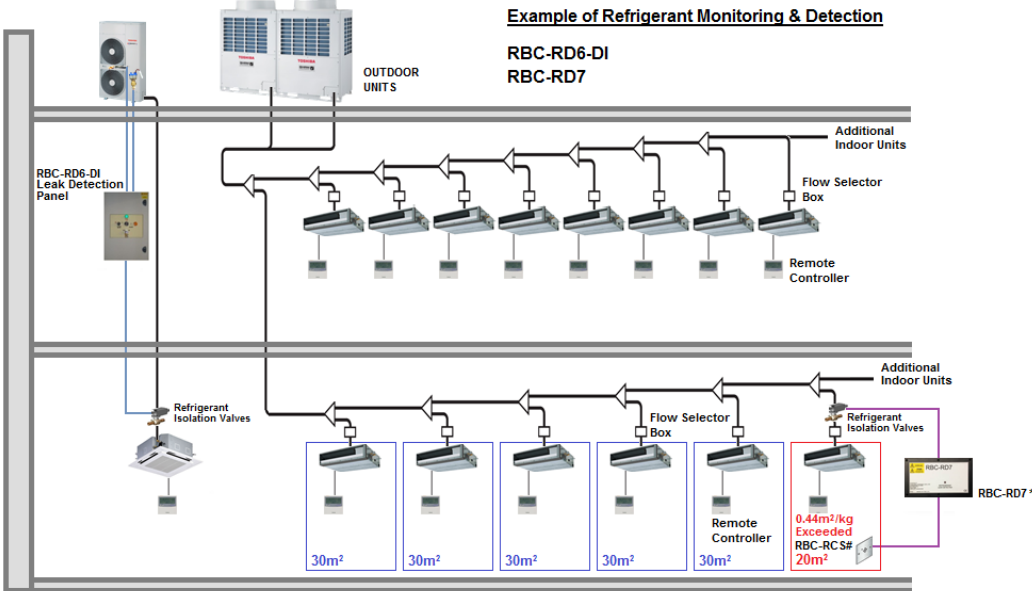
* RBC-RD7 enables isolation of a single Indoor Unit and continuous operation of unaffected system(s) with significant cost saving versus RBC-RD6

Control Schematic

Example
Interactive Intelligence System with
Refrigerant Leak Detection & Monitoring

TOSHIBA Leading Innovation ›››

■ Specification

		RBC-RD6	RBC-RD6-DI	RBC-RP1	RBC-RI1	RBC-RD7
LEAK DETECTION PANEL						
LEAK DETECTION PANEL						
LEAK DETECTION REPEATER PANEL (MULTI-ROOM INDICATION)						
REFRIGERANT LEAK DETECTOR						
LEAK DETECTION ROOM INDICATOR						
PRODUCTS		VRF	RAV-DI/SDI	VRF - RAV DI/SDI	VRF - RAV DI/SDI	VRF - RAV DI/SDI
Standard Rating	(IP)	65		40	40	50
Enclosure		Metal		Metal	Plastic	Plastic
Colour		Light grey RAL 7035		Light grey RAL 7035	White	Black
Colour Cost Option Upgrade	(Various)	-		-	Facia Plate	-
Height	(mm)	600		500	92	114
Width	(mm)	400		400	92	194
Depth	(mm)	200		150	60	62
Weight	(kg)	12		15	0.2	700
Isolating Gas Valve (Supplied Loose)	(mm)	Bespoke per application	-	-	-	-
Isolating Liquid Valve (Supplied Loose)	(mm)	Bespoke per application		-	-	Bespoke per application
Isolating Suction Valve (Supplied Loose)	(mm)	Bespoke per application		-	-	Bespoke per application
Sensor(s) Type (Supplied Loose)		Discharge pipe sensing		-	-	-
Interface Cards (Supplied Loose)		2 x TCB-PCM04E	-	-	-	-
		Sockets CN510 & CN512		-	-	-
Option BMS Interface Card (Panel Fitted)		-	RBC-FDP3	-	-	-
Audible Alarm		Yes		Yes	Yes	-
Audible Alarm Sound Level	(dB)	-		-	95 (3400Hz ±500)	-
Alarm Mute		Yes (Key Switch)		Yes	Mute Button / Powered OFF	-
Visual Indicator (Neon)		Live		Live		
				Healthy	Yes	Leak Detected
		Alarm		Alarm		
Fault Code Generated To Local Remote Controller		-		-	-	-
Interconnecting Multi-core Cable Length / Fused	(m)	-		-	-	-
Interconnecting Cable Max. Length	(m)	12	12	100	100	24
Interconnecting Cable Type	(mm²)	0.75	0.75	3 core 1.5	3 core 1.5	0.5
Interconnecting Cable Type Remote Indication		-		2 core 0.75	-	
Control Circuit Power	(Volts)	24	24	24	24 (via RP1)	
Power Supply		1 phase 230v 50Hz	1 phase 230v 50Hz	1 phase 230v 50Hz	-	1 phase 230v 50Hz
Power Consumption Min. / Max.	(mA)	-		-	-	-
Suggested Fused Supply	(Amps)	3	3	6	(via RP1)	1
Interface Card(S) (Required Accessory) *Max. 4 Circuits		-		*RBC-RI1	-	-
In Room Detector (Required Accessory) *Max. 10 per Circuit		-		*RBC-RD3 / RCS1 / RCS2	-	*RBC-RD3 / RCS1 / RCS2
Circuit Protection Fuse Supplied With Cable		-		-	-	-
Cable Link For Remote ON / OFF (Ving Card)		-		-	-	-
Screw Terminal Connections		-		-	-	-
Fail Safe Relay Operation		-		-	-	-
Mounting Height Above Floor Level	(mm)	-		-	-	-
On-site Commissioning Support		-		-	-	-

■ Specification

RBC-RD3	RBC-RCS1	RBC-RCS2	RBC-AIP1	RBC-AIP2	RBC-AIP3	RBC-AIP3C	RBC-AIP4
ALL COMMON HFC's	ALL COMMON HFC's	ALL COMMON HFC's	VRF - RAV DI/SDI	VRF - RAV DI/SDI	VRF - RAV DI/SDI	VRF - RAV DI/SDI	VRF - RAV DI/SDI
Surface Mounted	Recessed	Recessed	30	30	40	40	40
Plastic	Plastic	Steel	Metal	Metal	Metal	Metal	Plastic
White	White	Stainless	Light grey RAL 7035	Light grey RAL 7035	Light grey RAL 7035	Light grey RAL 7035	White
Facia Plate	Facia Plate	Facia Plate	-	-	-	-	Facia Plate
85	85	85	500	500	500	500	92
85	85	85	400	400	400	400	92
32	32	32	150	150	150	150	60
0.085	0.085	0.085	15	15	15	15	0.2
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
85 (2300Hz ±300)	85 (2300Hz ±300)	85 (2300Hz ±300)	95 (3400Hz ±500)	95 (3400Hz ±500)	95 (3400Hz ±500)	95 (3400Hz ±500)	95 (3400Hz ±500)
Powered OFF	Powered OFF	Powered OFF	Yes (Key Switch)	Yes (Key Switch) & Remote	Yes (Key Switch)	Yes (Key Switch)	Mute Button / Powered OFF
3-coloured LED	3-coloured LED	3-coloured LED	Live	Live	Live	Live	Yes
			Healthy	Healthy	Healthy	Healthy	
			Alarm	Alarm	Alarm	Alarm	
L30	L30	L30	-	-	-	-	-
10 / Yes	10 / Yes	10 / Yes	-	-	-	-	-
-	-	-	100	100	3	3	100
-	-	-	3 core 1.5	3 core 1.5	USB	USB	3 core 1.5
-	-	-	-	2 core 0.75			
12-24 AC/DC	12-24 AC/DC	12-24 AC/DC	24	24	24	24	24 (via RP1)
Local indoor unit PCB	Local indoor unit PCB	Local indoor unit PCB	1 phase 230v 50Hz	1 phase 230v 50Hz	Battery Back-up	Battery Back-up	-
40 / 100	40 / 100	40 / 100	-	-	-	-	-
-	-	-	6	6	-	-	(via RP1)
-	-	-	inc. RBC-DI1	inc. RBC-DI1	-	-	-
-	-	-	-	-	-	-	-
Yes	Yes	Yes	-	-	-	-	-
Yes	Yes	Yes	-	-	-	-	-
5	5	5	-	-	-	-	-
Yes	Yes	Yes	-	-	-	-	-
150	150	150	-	-	-	-	-
-	-	-	-	-	Half Day Included	Full Day Included	-

RBC-RD6-PE LEAK DETECTION

The RBC-RD6-PE Leak Detection System continuously monitors the air conditioning circuits and initiates the pump down of the refrigeration system in the event of identification of both a major or gradual refrigerant leak. The solution incorporates all refrigerant isolation valves, pressure and temperature sensors and control PCB's. The combination of the RBC-RD6# with RBC-RCS# leak detection sensors achieves the standard design requirements for compliance with BSEN378 & BREEAM.

ACCESSORY PARTS LIST

PART NAME	QTY	SHAPE	USAGE
Control Panel	1		IP65 rated panel with visual & audible alarm
Pressure Sensor	1		Pressure sensor
Discharge Sensor (inc.12m cable)	4		Temperature sensing
TCB-PCMO4E Interface	2		ON/OFF control
Connection cable	1		Interface installation
Support to fix the board	4		
Earth screw	2		
Binding band A	4		
Clamp filter	2		
Binding band B	2		
Refrigerant Valves	Project Specific		Isolation of refrigerant line

■ **Mounting the Control Panel**

Mount the control panel ideally adjacent to the valves. Remove the gland plate prior to drilling. Ensure that the correct type glands are fitted to maintain panel IP rating integrity. Connect the mains power, isolation valve wiring and other components as illustrated in schematic wiring diagram.

400

600

200

All dimensions in mm

PANEL WIRING

For the panel, connect a power wire with the following specifications.

	RBC-RD6-PE
Power supply	220-240 V~, 50 Hz2
Installation fuse rating	2 A (all types can be used)
Power supply wire	H07 RN-F or 60245 IEC 66 (1.5 mm^2 or more)
System interconnection wires	H07 RN-F or 60245 IEC 66 (1.5 mm^2 or more)

How to wire

1. open the electrical control panel door.
2. Connect the power supply wires and system interconnection wires to the terminal block of the electrical control panel.
3. Tighten the screws of the terminal block, connect the wires matching the terminal numbers (Do not apply tension to the connecting section of the terminal block.)
4. Close the electrical control panel door.
• When connecting the system interconnection wire to the outdoor unit terminal, prevent water from coming into the outdoor unit.
• Insulate the unsheathed cords (conductors) with electrical insulation tape. Process them so that they do not touch any electrical or metal parts.
• For system interconnection wires, do not use a wire joined to another on the way. Use wires long enough to cover the entire length.

Stripping length power cord and system interconnection wire

Wiring diagram

* For details on the remote controller wiring / installation, refer to the Installation Manual enclosed with the remote controller.

Single system

Simultaneous twin system

* Use 2-core shield wire (MVVS 0.5 to 2.0 mm² or more) for the remote controller wiring in the simultaneous twin system to prevent noise problems. Be sure to connect both ends of the shield wire to earth leads.
* Connect earth wires for each indoor unit in the simultaneous twin system.

EARTHING ⚠ WARNING

Be sure to connect the earth wire. (grounding work)
Incomplete grounding may cause an electric shock.

Connect the earth wire properly following applicable technical standards.
Connecting the earth wire is essential to preventing electric shock and to reducing noise and electrical charges on the outdoor unit surface due to the high-frequency wave generated by the frequency converter (inverter) in the outdoor unit.
If you touch the charged outdoor unit without an earth wire, you may experience an electric shock.

RBC-RD6-PE - Control Circuit Wiring
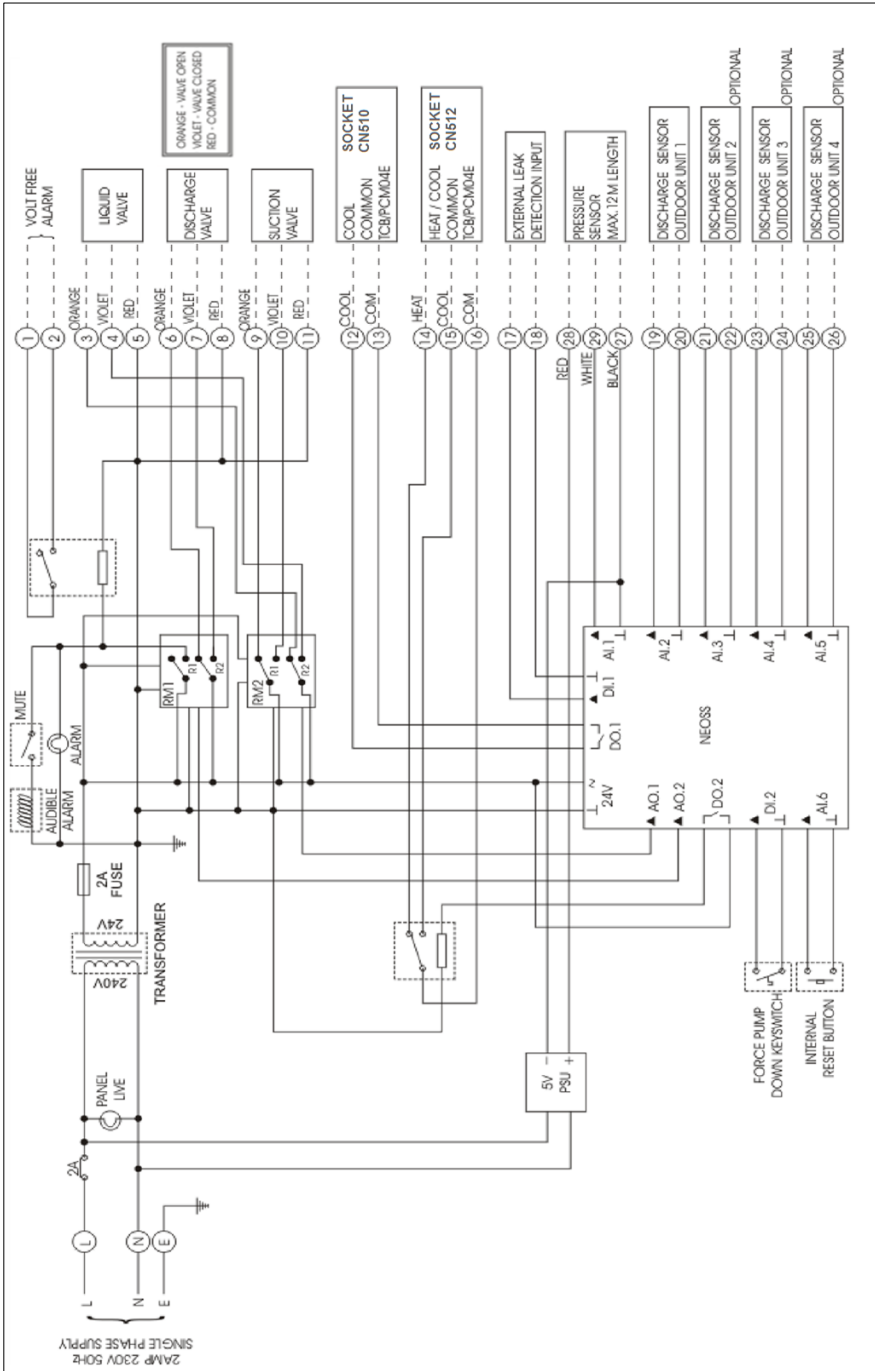
■ **Fitting the Pressure Sensor**

The pressure sensor must be fitted onto the suction gas service port (Fig.1 below shows the location of the sensor). The pressure sensor must be securely mounted in the outdoor unit. Remove the sensor plug and extended the cables back to the control panel.

Pressure sensor characteristics

♦ Input/output wiring summary

Pin No.	Low pressure side (Ps)	
	Input/output name	Lead wire colour
1	—	—
2	OUTPUT	White
3	GND	Black
4	+5V	Red

♦ Output voltage vs. pressure

Low pressure side (Ps)
0.5~3.5V
0~0.98MPa
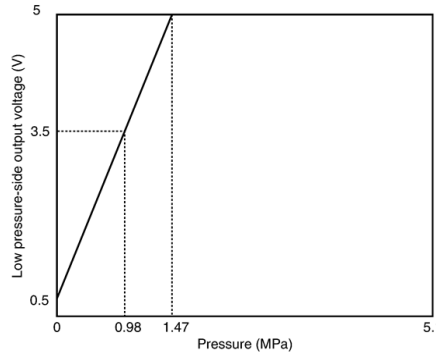
Details of Operation and Wiring

1. The pressure sensor is supplied with a 12m long, 3 Core 0.75mm² connection cable.
2. Check that the wires are connected correctly.
   Connect wires 4 (red), 2 (white) and 3 (black) to terminations 28 (red), 29 (white) and 27 (black) in the control panel.
3. Apply a control signal (24 Vac).
4. Check the operation.
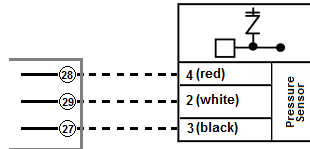
■ **Fitting the Suction Temperature Sensor(s)**

One sensor must be fitted in each individual outdoor unit forming a~~in a~~ system. ~~.~~
The sensor must be fitted on the ~~common~~ suction~~discharge~~ pipe adjacent to the existing TS sensor ~~approximately 100mm at which point the pipes meet from compresso~~compressor two (See Fig.2, 3 & 4 below for location and fixing position of the sensor using supplied installation clip).
The cable ties securing the section of insulation over the existing TS sensor should be cut and the insulation drawn back to expose the TS sensor. The new sensor should be secured next to the existing TS sensor using the clip provided. The insulation should be stretched back over the sensors and secured in place using the cable ties provided. ~~strip of insulation provided must be wrapped around the sensor after fitting the fastening clip and secured using the cable ties supplied.~~
The Suction~~Discharge~~ Temperature Sensor ~~is~~ supplied can be extended up to a maximum of 12 ~~with a 12m long~~using 0.75mm² CSA 2-core cable.

Details of Operation and Wiring

1. Check that the wires are connected correctly.
2. Connect Outdoor Unit 1 wires to terminations 19 and 20 in the Control Panel.
3. Connect Outdoor Unit 2 wires to terminations 21 and 22 in the Control Panel.
4. Connect Outdoor Unit 3 wires to terminations 23 and 24 in the Control Panel.
5. Connect Outdoor Unit 4 wires to terminations 25 and 26 in the Control Panel.
6. Apply a control signal (24 Vac).
7. Check the operation.
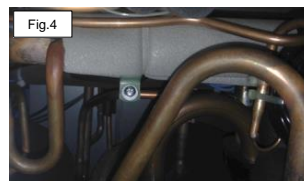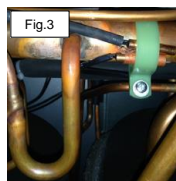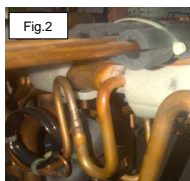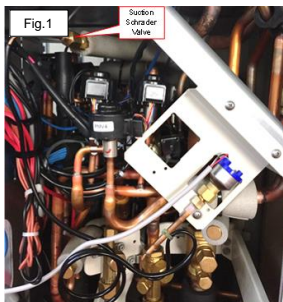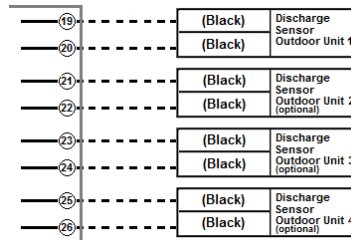
Fig.1

Fig.2

Fig.3

Fig.4

■ **Refrigerant Isolation Valves**

Details of Operation and Wiring
Connect the isolation valve wiring to the dedicated terminals within the control panel.

1. **Maximum cable connection length is 40m. Use 3 Core 0.75mm² cable.**
2. Check that the wires are connected correctly.
3. Connect wires 1 (red) and 6 (violet) to a Digital, Multimeter (DMM) with the dial set at Vac. Apply a control signal (24 Vac) to wires 1 and 6 to verify that the operating voltage is within range.
4. Check that the direction of the rotation switch matches the rotation of the valve ball.
5. Check the operation.
    a. Connect wire 1 (red) to the actuator.
    b. Apply a control signal (24 Vac) to wires 1 (red) and 6 (violet).
    c. Allow the actuator shaft coupling to rotate from 0 to 90°.
    d. Stop applying a control signal to wires 1 (red) and 6 (violet).
6. Check the Auxiliary Switch A.
    a. Set the DMM dial to Ohms (resistance) or continuity check.
    b. Connect wires S1 and S3 to the DMM. The DMM should indicate an open circuit or no resistance.
    c. Apply a control signal (24 Vac) to wires 1 (red) and 6 (violet). The DMM should indicate contact closure as the actuator shaft coupling reaches the setting of switch A.
    d. Stop applying a control signal to wires 1 (red) and 6 (violet).
    e. Connect wires S1 and S2 to the DMM. The DMM should indicate an open circuit or no resistance.
    f. Apply a control signal (24 Vac) to wires 1 (red) and 7 (orange). The DMM should indicate contact closure as the actuator shaft coupling reaches the setting of switch A.
7. Check the Auxiliary Switch B.
    a. Set the DMM dial to Ohms (resistance) or continuity check.
    b. Connect wires S4 and S6 to the DMM. The DMM should indicate an open circuit or no resistance.
    c. Apply a control signal (24 Vac) to wires 1 (red) and 6 (violet). The DMM should indicate contact closure as the actuator shaft coupling reaches the setting of switch B.
    d. Stop applying a control signal to wires 1 (red) and 6 (violet).
    e. Connect wires S4 and S5 to the DMM. The DMM should indicate an open circuit or no resistance.
    f. Apply a control signal (24 Vac) to wires 1 (red) and 7 (orange). The DMM should indicate contact closure as the actuator shaft coupling reaches the setting of switch B.

③	7 (Orange)	Liquid
④	6 (Violet)	
⑤	1 (red)	
⑥	7 (Orange)	Discharge
⑦	6 (Violet)	
⑧	1 (red)	
⑨	7 (Orange)	Suction
⑩	6 (Violet)	
⑪	1 (red)	

(Orange)	Valve Open
(Violet)	Valve Closed
(red)	Common
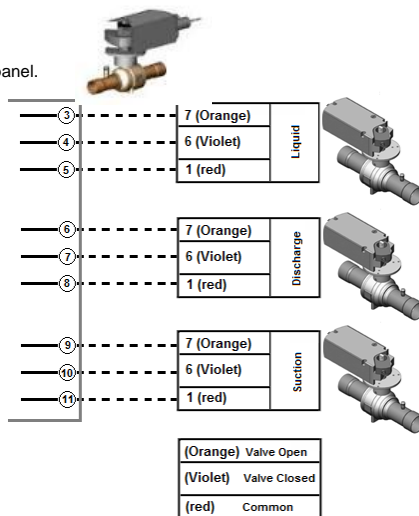
Standard Symbol	Function	Terminal Designation	Colour Code
1	Supply (SP)	G	Red
6	Control signal clockwise	Y1	Violet
7	Control signal counter clockwise	Y2	Orange

TCB-PCMO4E Interface Card
One of the PCBs controls system ON/OFF and the other controls the operation Mode.

Details of Operation, Wiring Diagram

External master ON/OFF Control

▼ Model : SMMS-i, SHRM-i, MiNi-SMMS

▼ Functions
Indoor units connected to the outdoor unit can be batch-operated or batch-stopped by connecting to the interface PCB of those outdoor units. Batch operation is performed in the previously active mode.

▼ Operation
The outdoor unit connection is for the header unit (U1).
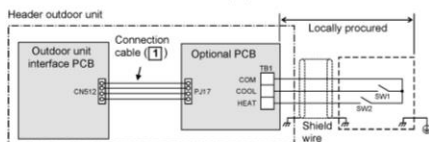
SW1: Operation input switch
SW2: Stop input switch

Terminal	Input Signal		Operation
COOL (SW1)	ON OFF		Batch-operates indoor units.
HEAT (SW2)	ON OFF		Batch-stops indoor units.

⚠ CAUTION

Be sure to provide no-voltage pulse contacts for each terminal.
Hold the ON state for at least 100 msec.
Do not turn SW1 and SW2 ON simultaneously

Operation Mode Selection Control

▼ Functions
The heating/cooling mode of the system can be selected by connecting to the interface PCB of outdoor units.

▼ Operation
The outdoor unit connection is for the header unit (U1).
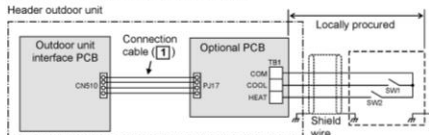
SW1: Cooling mode specified input switch
SW2: Heating mode specified input switch

Input Signal		Operation: Selected operation mode
Cooling (SW1)	Heating (SW2)	
ON	OFF	Cooling operation only allowed
OFF	ON	Heating operation only allowed
OFF	OFF	Normal operation

⚠ CAUTION

Be sure to provide no-voltage continuous contacts for each terminal.

▼ Model : SMMS-i, SHRM-i
About Switching of Processing of Indoor Unit Operation State [Setting can be changed only on the SMMS-i.]
Processing of the operation state can be switched for indoor units in a mode other than the selected operation mode by setting the jumper lead (J01) of the header outdoor unit interface PCB.

Jumper lead	Details of Processing		
J01 connected (factory default)	Unallowed indoor units in a mode other than the selected operation mode are not treated as priority (thermo OFF state). (Unallowed indoor units)		
	Operation Mode	Operation State	Remote control
	Cooling unit	Air blow operation at blow rate set on remote control	🕐, ⦿ indicator is displayed.
	Heating unit	Air blow operation at super-slow blow rate	
	Air blow unit	Regular air blow operation at blow rate set on remote control	
J01 cut	Indoor units in a mode other than the selected operation mode are forcibly switched to the selected operation mode.		
	PC board selection mode	Remote control operation/display	
	Normal	❄, △, ☀, or ✂ can be selected	When using the remote control, 📃 (mode select control) indicator is displayed.
	Cool	Only ❄, △, or ✂ can be selected	
	Heat	Only ☀ or ✂ can be selected	

▼ Model : MiNi-SMMS
The jumper lead is not switched.
Unallowed indoor units in a mode other than the selected operation mode are not treated as priority (thermo OFF state).
(Unallowed indoor units)

Operation Mode	Operation State	Remote control
Cooling unit	Air blow operation at blow rate set on remote control	🕐, ⦿ indicator is displayed.
Heating unit	Air blow operation at super-slow blow rate	
Air blow unit	Regular air blow operation at blow rate set on remote control	

Dimensions

55.5
45.5

TOSHIBA

Terminal block (M3)

4-4 mm dia. mounting holes

60
50
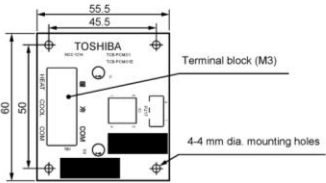
TCB-PCMO4E Installation

1. Before starting installation work, be sure to turn the power supply OFF.
2. Install the TCB-PCMO4E interface cards at the position on the electrical components box shown in the figure below.
3. Install the TCB-PCMO4E interface cards at the specified location inside the electrical components box using the fixing support.
4. There are four mounting holes for the fixing support at specified locations inside the 2 electrical components box.
5. Connect the connector PJ17 on the TCB-PCMO4E interface card to the connector CN512 on the Outdoor Unit PCB using the connection cable supplied.
6. Secure the cable supplied using the binding band.

[PCB Installation Position]

SMMSi, SHRMi

MMY-MAP080 to 120 | MMY-MAP140, 160

Optional PCB

(max. number installed: 4 pcs)

Optional PCB

Input wiring

SMMSi, SHRMi Connector Positions

CN508 (red) | CN510 (white)

CN509 (black) | CN512 (blue)

Outdoor unit interface PCB

1. Tie the input wiring using the binding band A [4] at the position in the figure on the left.
   [4]-a : Tie the input wiring together with other leads.
   [4]-b : Tie the input wiring after passing the upper fixation hole on of the binding band.
2. Attach the clamp filter [5] to the input wiring and connection cable [1] as shown in the figure. Use binding band B [6] to fix the clamp filter [5] to the wirings.
   * When more than one optional PC boards are installed, band all the connection cables and attach one clamp filter.

MiNi-SMMS

Screw
Screw
Hook part
Interface P.C. board

Optional P.C. board
• Optional PCB (both side)

(max. number installed: 2 pcs)

Install this optional P.C. board to the back side of the Interface P.C. board on outdoor unit.

1. If the screw of the position shown in the figure is removed and an upper right hook is slipped, an interface board will open.
2. Place this P.C. board by using the support of the electric component box. There are four installation holes to place the support of the electric component box.

MiNi-SMMS Connector Positions

CN510 (white)
CN508 (red)
CN509 (black)
CN512 (blue)

Outdoor unit interface PCB

RBC-RP1 LEAK DETECTION REPEATER PANEL (MULTI ROOM INDICATION)

The RBC-RP1 repeater panel is designed to work in conjunction with the Toshiba RBC-RD6 (Refrigerant Pump down panel) and the RBC-RI1 (Room Indicator). When activated it will send a signal out to the room indicators activating the visual and audible indication.

ACCESSORY PARTS LIST

PART NAME	QTY	SHAPE	USAGE
Control Panel	1		IP65 rated panel with visual & audible alarm

■ **Mounting the Control Panel**

Mount the control panel in a waterproof location ideally in a riser or cleaners area.
Remove the gland plate prior to drilling. Ensure that correct type glands are fitted to maintain panel integrity.
Connect the mains power, connect to the RD6 panel and the room indicators as illustrated in schematic wiring diagram.

⚠ **IMPORTANT**

Items that must be observed
- Before applying power to the panel the Battery must be connected.
- One RBC-RP1 Panel is required for each System / RBC-RD6-PE(DI).
- Rooms associated with the System must be connected to the panel.

There are 5 outputs each output can accommodate a Maximum of 10 room indicators.

All dimensions in mm

PANEL WIRING

For the panel, connect a power wire with the following specifications.

	RBC-RD6-PE
Power supply	220-240 V~, 50 Hz2
Installation fuse rating	2 A (all types can be used)
Power supply wire	H07 RN-F or 60245 IEC 66 (1.5 mm^2 or more)
System interconnection wires	H07 RN-F or 60245 IEC 66 (1.5 mm^2 or more)

How to wire

1. open the electrical control panel door.
2. Connect the power supply wires and system interconnection wires to the terminal block of the electrical control panel.
3. Tighten the screws of the terminal block, connect the wires matching the terminal numbers (Do not apply tension to the connecting section of the terminal block.)
4. Close the electrical control panel door.
• When connecting the system interconnection wire to the outdoor unit terminal, prevent water from coming into the outdoor unit.
• Insulate the unsheathed cords (conductors) with electrical insulation tape. Process them so that they do not touch any electrical or metal parts.
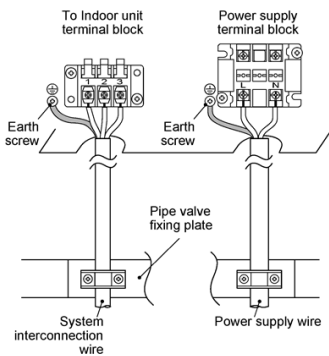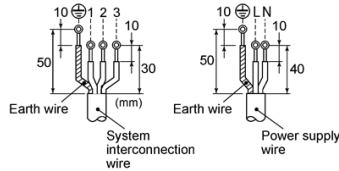• For system interconnection wires, do not use a wire joined to another on the way. Use wires long enough to cover the entire length.

Stripping length power cord and system interconnection wire

Wiring diagram

* For details on the remote controller wiring / installation, refer to the Installation Manual enclosed with the remote controller.

Single system

Simultaneous twin system

* Use 2-core shield wire (MVVS 0.5 to 2.0 mm² or more) for the remote controller wiring in the simultaneous twin system to prevent noise problems. Be sure to connect both ends of the shield wire to earth leads.
* Connect earth wires for each indoor unit in the simultaneous twin system.

EARTHING ⚠ WARNING

Be sure to connect the earth wire. (grounding work)
Incomplete grounding may cause an electric shock.

Connect the earth wire properly following applicable technical standards.
Connecting the earth wire is essential to preventing electric shock and to reducing noise and electrical charges on the outdoor unit surface due to the high-frequency wave generated by the frequency converter (inverter) in the outdoor unit.
If you touch the charged outdoor unit without an earth wire, you may experience an electric shock.

RBC-RP1 - Control Circuit Wiring

TOSHIBA Leading Innovation >>>

Refrigerant Monitoring Field Wiring Diagrams

RBC-RI1 FLOOR LEAK DETECTION INDICATOR

The RBC-RI1 Floor Leak Detection Indicator is designed to work in conjunction with the Toshiba RBC-RD6 Leak Detection Refrigerant Pump-down Panel and the RBC-RP1 Leak Detection Repeater Panel. When the RBC-RP1 is activated it provides a visual and audible indication that the RBC-RD6 monitoring the area has measured a refrigerant fault and initiated a pump-down of the affected system.

Dimensions
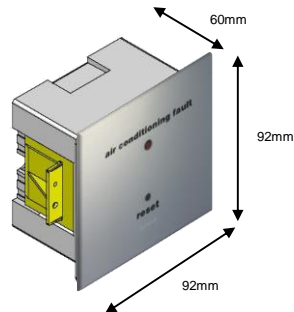
Mounting the Control Panel

1. The RBC-RI1 is supplied in a 47mm deep single dry lining box.
2. It should be mounted in a prominent location
3. The fascia is removed by inserting a small screw driver in the location marked and gently levering to release the clips.
4. The room indicators are wired in parallel.
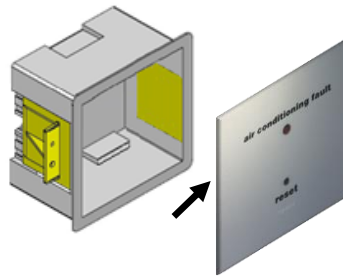
⚠ **CAUTION**

Toshiba will not accept any liability for scratched or damaged Indicator facia cause through mishandling or poor installation. Take care when accessing ad removing facia from fixing box.

- The RBC-RI1 must connect to the RBC-RP1 and RBC-RD6-PE(DI) Leak Detection monitoring panels of the associated refrigerant system.
- A maximum of 4 RBC-RI1 room indicators can connected to the RBC-RP1 Leak Detection Repeater Panel.
- A maximum of 10 room indicators can be connected in parallel to each out put on the RBC-RI1
- The maximum number of rooms that can be monitored on 1 RBC-RP1 Leak Detection Repeater Panel is 40.

RBC-RI1 - Control Circuit Wiring

RD6 PANEL FAIL SAFE CONTACT

VOLT FREE PANEL ACTIVATED 24V 2AMPS MAXIMUM

N.C. PUSHBUTTON REMOTE RESET. IF NO REMOTE RESET THESE CONTACTS MUST BE LINKED

24V.D.C. TO REMOTE ROOM INDICATORS

ROOMS 1-10
ROOMS 11-20
ROOMS 21-30
ROOMS 31-40
ROOMS 41-50

PANEL ACTIVATED AUDIBLE + VISUAL ALARM

FUSES
2A 2A 2A 2A 2A

ALARM OUTPUTS ON

PANEL RESET KEY SWITCH

2A

1.6A 1 POLE RELAY LINK COM TO COM. LINK NC TO NC. LINK NO TO NO.

24V
+V
+V
SWITCH MODE POWER SUPPLY

STAND BY HEALTHY

1.6A

PANEL LIVE

BATTERY CHARGER
13A PLUG SOCKET

2A
BROWN

12V BATTERY
12V BATTERY

230V 50Hz 2AMP SUPPLY

RBC-RD7 LEAK DETECTION PANEL

The RBC-RD7 Leak Detection Panel enables the isolation of an individual bedroom or occupied space without the need to fully shut down the air conditioning system. Operating in conjunction with any RBC-RCS# range of leak detection sensor, the RBC-RD7 Leak Detection Panel allows all other indoor units on the system to remain operational ensuring that comfort levels within the building are maintained.

PART NAME	QTY	SHAPE	USAGE
Control Panel	1	RBC-RD7	Panel with visual alarm
Refrigerant Valves	Project Specific		Isolation of refrigerant line

■ **Mounting the Control Panel**

Mount the control panel in a waterproof location ideally adjacent to the indoor unit.
Remove the gland plate prior to drilling. Ensure that correct type glands are fitted to maintain panel integrity.
Connect the mains power, isolation valve wiring and other components as illustrated in schematic wiring diagram.

Dimensions

62mm
114mm
194mm

Installation

Refrigerants are significantly heavier than air and the refrigerant detector must be positioned at low level in the room with the associated indoor unit. The unit is designed to fit on the surface or over a standard single socket recessed box. The refrigerant detector PCB can be accommodated inside a standard single gang electrical back box (locally procured). The minimum depth of any back box is 45mm, which can be flush mounted into the wall.

♦ Maximum distance from indoor unit is 10m.
♦ Mount leak detector 150mm above the floor level.

Refrigerant Leak Detector Position

150mm above floor level

BED

Not installed near windows

Not installed by door

Not installed behind cupboards

Not installed near

PANEL WIRING

For the panel, connect a power wire with the following specifications.

	RBC-RD6-PE
Power supply	220-240 V~, 50 Hz2
Installation fuse rating	2 A (all types can be used)
Power supply wire	H07 RN-F or 60245 IEC 66 (1.5 mm^2 or more)
System interconnection wires	H07 RN-F or 60245 IEC 66 (1.5 mm^2 or more)

How to wire

1. open the electrical control panel door.
2. Connect the power supply wires and system interconnection wires to the terminal block of the electrical control panel.
3. Tighten the screws of the terminal block, connect the wires matching the terminal numbers (Do not apply tension to the connecting section of the terminal block.)
4. Close the electrical control panel door.
• When connecting the system interconnection wire to the outdoor unit terminal, prevent water from coming into the outdoor unit.
• Insulate the unsheathed cords (conductors) with electrical insulation tape. Process them so that they do not touch any electrical or metal parts.
• For system interconnection wires, do not use a wire joined to another on the way. Use wires long enough to cover the entire length.

Stripping length power cord and system

interconnection wire

Wiring diagram

* For details on the remote controller wiring / installation, refer to the Installation Manual enclosed with the remote controller.

Single system

Simultaneous twin system

* Use 2-core shield wire (MVVS 0.5 to 2.0 mm² or more) for the remote controller wiring in the simultaneous twin system to prevent noise problems. Be sure to connect both ends of the shield wire to earth leads.
* Connect earth wires for each indoor unit in the simultaneous twin system.

EARTHING ⚠ WARNING

Be sure to connect the earth wire. (grounding work)
Incomplete grounding may cause an electric shock.

Connect the earth wire properly following applicable technical standards.
Connecting the earth wire is essential to preventing electric shock and to reducing noise and electrical charges on the outdoor unit surface due to the high-frequency wave generated by the frequency converter (inverter) in the outdoor unit.
If you touch the charged outdoor unit without an earth wire, you may experience an electric shock.

Details of Operation and Wiring

Sensor — Control Panel

Sensor terminals: 1 2 3 4 5
Control Panel terminals: 1 2 3
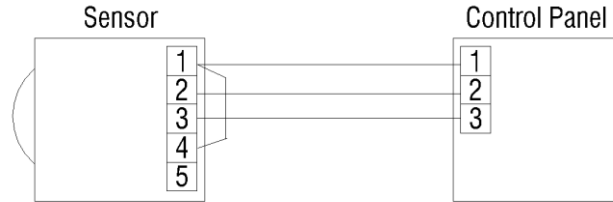
- Connect the room sensor to the RBC-RD7 Panel using three core a 0.75mm^2 cable
- Connect a link wire between terminals 1 and 4 on the room leak detection sensor
- Connect the refrigeration isolation valves to the RBC-RD7 Panel
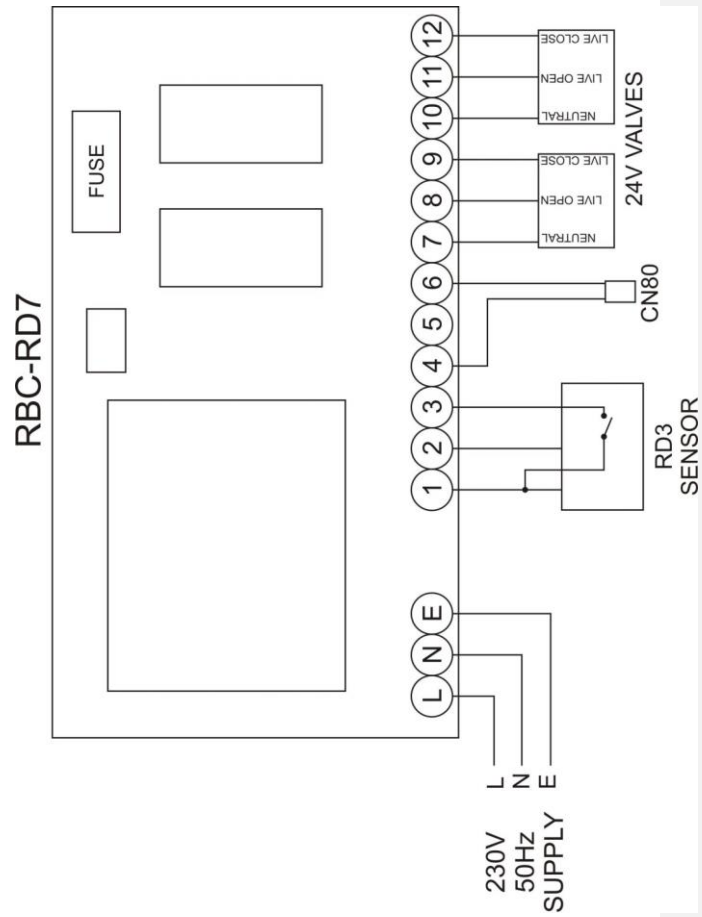
RBC-RD7 - Control Circuit Wiring

RBC-RD7

FUSE

Terminals 1–12

24V VALVES
LIVE CLOSE / LIVE OPEN / NEUTRAL
CN80
RD3 SENSOR

L N E
230V 50Hz SUPPLY

■ **Refrigerant Isolation Valves**

Details of Operation and Wiring
Connect the isolation valve wiring to the dedicated terminals within the control panel.

1. **Maximum cable connection length is 40m. Use 3 Core 0.75mm² cable.**
2. Check that the wires are connected correctly.
3. Connect wires 1 (red) and 6 (violet) to a Digital, Multimeter (DMM) with the dial set at Vac. Apply a control signal (24 Vac) to wires 1 and 6 to verify that the operating voltage is within range.
4. Check that the direction of the rotation switch matches the rotation of the valve ball.
   a. Check the operation.
   b. Connect wire 1 (red) to the actuator.
   c. Apply a control signal (24 Vac) to wires 1 (red) and 6 (violet).
   d. Allow the actuator shaft coupling to rotate from 0 to 90°.
5. Stop applying a control signal to wires 1 (red) and 6 (violet).
   a. Check the Auxiliary Switch A.
   b. Set the DMM dial to Ohms (resistance) or continuity check.
   c. Connect wires S1 and S3 to the DMM. The DMM should indicate an open circuit or no resistance.
   d. Apply a control signal (24 Vac) to wires 1 (red) and 6 (violet). The DMM should indicate contact closure as the actuator shaft coupling reaches the setting of switch A.
   e. Stop applying a control signal to wires 1 (red) and 6 (violet).
   f. Connect wires S1 and S2 to the DMM. The DMM should indicate an open circuit or no resistance.
6. Apply a control signal (24 Vac) to wires 1 (red) and 7 (orange). The DMM should indicate contact closure as the actuator shaft coupling reaches the setting of switch A.
   a. Check the Auxiliary Switch B.
   b. Set the DMM dial to Ohms (resistance) or continuity check.
   c. Connect wires S4 and S6 to the DMM. The DMM should indicate an open circuit or no resistance.
   d. Apply a control signal (24 Vac) to wires 1 (red) and 6 (violet). The DMM should indicate contact closure as the actuator shaft coupling reaches the setting of switch B.
   e. Stop applying a control signal to wires 1 (red) and 6 (violet).
   f. Connect wires S4 and S5 to the DMM. The DMM should indicate an open circuit or no resistance.
   g. Apply a control signal (24 Vac) to wires 1 (red) and 7 (orange). The DMM should indicate contact closure as the actuator shaft coupling reaches the setting of switch B.

(Orange)	Valve Open	
(Violet)	Valve Closed	
(red)	Common	
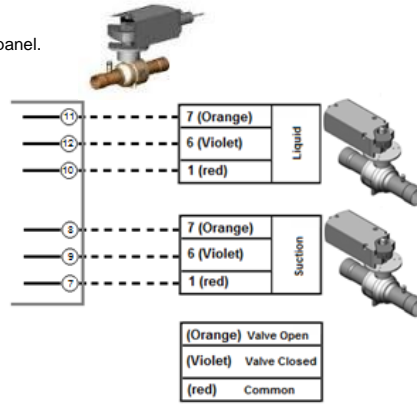
Standard Symbol	Function	Terminal Designation	Colour Code
1	Supply (SP)	G	Red
6	Control signal clockwise	Y1	Violet
7	Control signal counter clockwise	Y2	Orange

RBC-RCS1(2)(SPECIAL) & RD3 LEAK DETECTION SENSOR

The RBC-RCS Leak Detection Sensor PCB fits inside a flush mount electrical back box and is available with a range of cover plates to compliment electrical switches and sockets fitted within the conditioned room. Alternatively, the Leak Detection Sensor can be surface mounted by using the RBC-RD3 with White plastic surround. The microprocessor controller is configured to monitor the environment for any refrigerant leaks that exceed safety limits of 0.44Kg/m3 as stated in BSEN378 2012. Normal operation is confirmed by a green LED and fault indication is displayed by alternating red/amber LED. In the event of activation the sensor emits an audible and visual alarm within the bedroom and transmits an indoor unit L30 fault indication.

Flush Mount Electrical Box
(not supplied)

RCB-RCS Special
(option painted facia)

RCB-RCS Special
(option brass facia)

RBC-RCS1
(white plastic facia)

RBC-RCS2
(stainless steel facia)
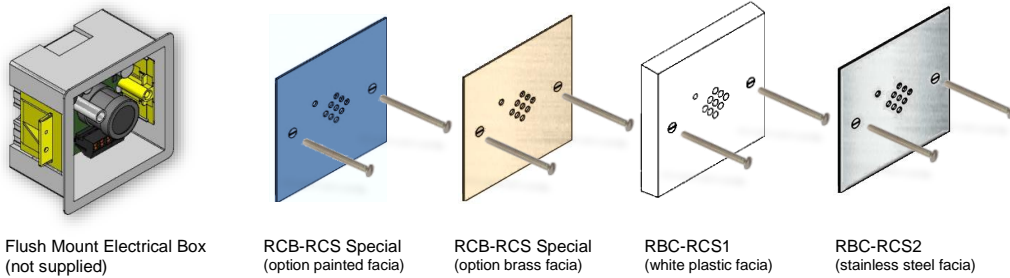
RBC-RD3
(surface mount)

PCB

Dimensions
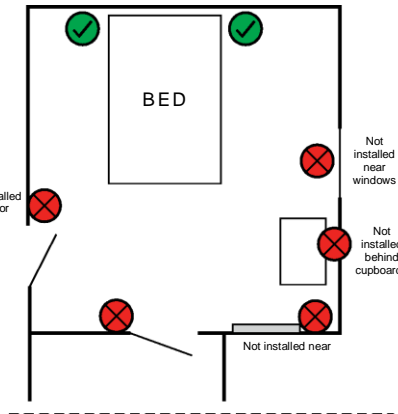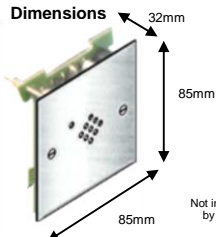
32mm

85mm

85mm

BED

Not installed
by door

Not installed
near
windows

Not
installed
behind
cupboards

Not installed near

Installation

Refrigerants are significantly heavier than air and the refrigerant detector must be positioned at low level in the room with the associated indoor unit. The unit is designed to fit on the surface or over a standard single socket recessed box. The refrigerant detector PCB can be accommodated inside a standard single gang electrical back box (locally procured). The minimum depth of any back box is 45mm, which can be flush mounted into the wall.

- Maximum distance from indoor unit is 10m.
- Mount leak detector 150mm above the floor level.

Refrigerant Leak
Detector Position

150mm above floor
level
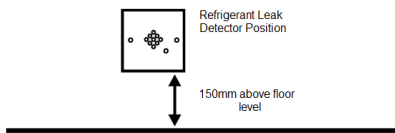
**Suggested
Installation Example**
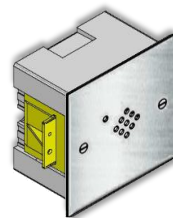
Operation and Sensor Wiring

The leak detector derives its power from the indoor unit PCB and in the event of a leak the indoor unit will stop and a L30 fault code will be generated. This fault code will be displayed on the local remote controller and the network based controls connected.
The wiring lead that is supplied includes the additional functionality for indoor unit remote ON/OFF and locking. This is ideal for integrating into a hotel room key card application.
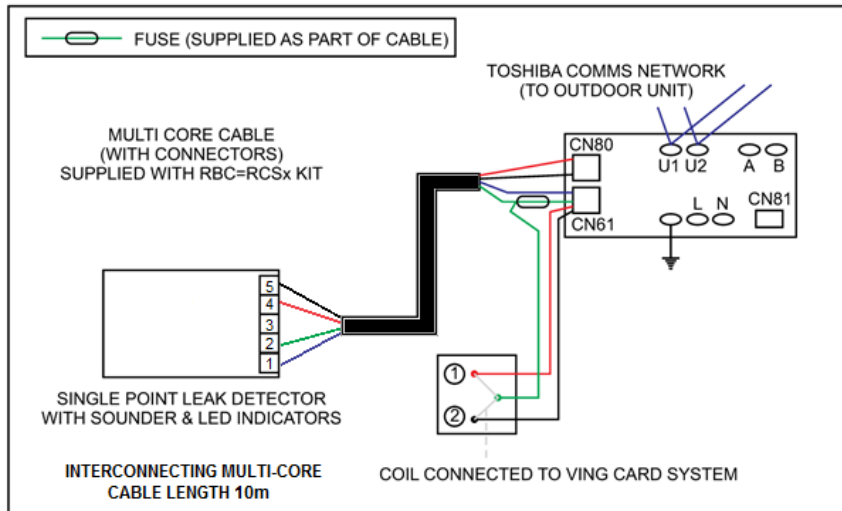
The drawing above shows the leak detector connected to a VRF indoor unit

- Switch to position 1 - unit starts e.g. Ving card is inserted
- Switch to position 2 - unit stops and remote controller ON/OFF function is locked e.g. Ving card is removed

Note: jumper J01 to be cut on indoor unit main PCB board
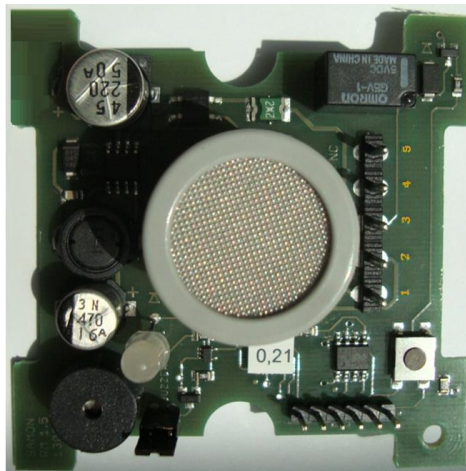
Sensor PCB Connections

RBC-AIP1 LEAK DETECTION PANEL

The RBC-AIP1 Indicator panel is designed to work in conjunction with the RBC-RP1 (Repeater panel). When the Toshiba RBC-RD6 (Refrigerant Pump down panel) is activated the RBC-RP1 initiates the RBC-AIP1 panel to indicate a remote fault/alarm condition at a supervisory level and provides an output to the Windows Interactive Intelligence software package.

PART NAME	QTY	SHAPE	USAGE
Control Panel	1		Panel with visual & audible alarm

■ **Mounting the Control Panel**

Mount the control panel in a waterproof location ideally in a riser or cleaners area. Remove the gland plate prior to drilling. Ensure that correct type glands are fitted to maintain panel integrity.
Connect the mains power, connect to the RD6 panel and the room indicators as illustrated in schematic wiring diagram.

⚠ **IMPORTANT**

Items that must be observed
◆ Before applying power to the panel the Battery must be connected.
◆ One RBC-RP1 Panel is required for each System / RBC-RD6-PE(DI).
◆ Rooms associated with the System must be connected to the panel.
◆ There are 5 outputs each output can accommodate a Maximum of 10 room indicators.

All dimensions in mm

PANEL WIRING

For the panel, connect a power wire with the following specifications.

	RBC-RD6-PE
Power supply	220-240 V~, 50 Hz2
Installation fuse rating	2 A (all types can be used)
Power supply wire	H07 RN-F or 60245 IEC 66 (1.5 mm² or more)
System interconnection wires	H07 RN-F or 60245 IEC 66 (1.5 mm² or more)

How to wire

1. open the electrical control panel door.
2. Connect the power supply wires and system interconnection wires to the terminal block of the electrical control panel.
3. Tighten the screws of the terminal block, connect the wires matching the terminal numbers (Do not apply tension to the connecting section of the terminal block.)
4. Close the electrical control panel door.
• When connecting the system interconnection wire to the outdoor unit terminal, prevent water from coming into the outdoor unit.
• Insulate the unsheathed cords (conductors) with electrical insulation tape. Process them so that they do not touch any electrical or metal parts.
• For system interconnection wires, do not use a wire joined to another on the way. Use wires long enough to cover the entire length.

Stripping length power cord and system interconnection wire

Wiring diagram

* For details on the remote controller wiring / installation, refer to the Installation Manual enclosed with the remote controller.

Single system

Simultaneous twin system

* Use 2-core shield wire (MVVS 0.5 to 2.0 mm² or more) for the remote controller wiring in the simultaneous twin system to prevent noise problems. Be sure to connect both ends of the shield wire to earth leads.
* Connect earth wires for each indoor unit in the simultaneous twin system.

EARTHING ⚠ WARNING

Be sure to connect the earth wire. (grounding work)
Incomplete grounding may cause an electric shock.

Connect the earth wire properly following applicable technical standards.
Connecting the earth wire is essential to preventing electric shock and to reducing noise and electrical charges on the outdoor unit surface due to the high-frequency wave generated by the frequency converter (inverter) in the outdoor unit.
If you touch the charged outdoor unit without an earth wire, you may experience an electric shock.

RBC-AIP1 - Control Circuit Wiring

REPEATER PANEL
SYSTEM 5 ALARM
CONTACT
TERMINALS 3&4
IN REPEATER PANEL 5

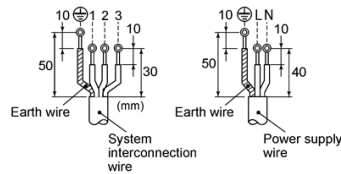A

H5

REPEATER PANEL
SYSTEM 5 ALARM

H6
D

REPEATER PANEL
SYSTEM 6 ALARM
CONTACT
TERMINALS 3&4
IN REPEATER PANEL 6

H7
B

REPEATER PANEL
SYSTEM 6 ALARM

H8

REPEATER PANEL
SYSTEM 7 ALARM
CONTACT
TERMINALS 3&4
IN REPEATER PANEL 7

A

H9

REPEATER PANEL
SYSTEM 7 ALARM

H10
D

REPEATER PANEL
SYSTEM 8 ALARM
CONTACT
TERMINALS 3&4
IN REPEATER PANEL 8

H11
B

REPEATER PANEL
SYSTEM 8 ALARM

H12

Refrigerant Monitoring Field Wiring Diagrams

RBC-AIP2 LEAK DETECTION PANEL

The RBC-AIP2 Indicator panel is designed to work in conjunction with Toshiba RBC-RD6 (Refrigerant Pump down panel). When the RBC-RD6 panel is activated the RBC-AIP2 panel indicates a fault/alarm condition and provides an output to the Windows Interactive Intelligence software package. The RBC-AIP2 Indicator panel has the ability to connect to the RBC-RP1 (Repeater panel) for multi-room applications.

PART NAME	QTY	SHAPE	USAGE
Control Panel	1		Panel with visual & audible alarm

■ **Mounting the Control Panel**

Mount the control panel in a constantly occupied area. Remove the gland plate prior to drilling. Ensure that correct type glands are fitted to maintain panel integrity.
Connect the mains power, connect to the RBC-RD6-PE (DI) panel and the room indicators as illustrated in schematic wiring diagram.
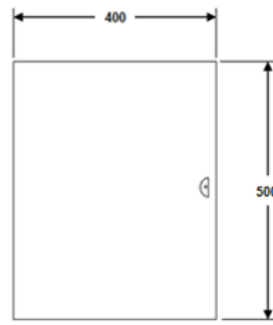
⚠ IMPORTANT

Items that must be observed
- Ensure the RBC-AIP2 panel is located in an occupied area.
- One RBC-RP2 Panel connects to a maximum of four RBC-RD6 panels.

Associated apparatus must be connected to the panel.

All dimensions in mm

PANEL WIRING

For the panel, connect a power wire with the following specifications.

	RBC-RD6-PE
Power supply	220-240 V~, 50 Hz2
Installation fuse rating	2 A (all types can be used)
Power supply wire	H07 RN-F or 60245 IEC 66 (1.5 mm^2 or more)
System interconnection wires	H07 RN-F or 60245 IEC 66 (1.5 mm^2 or more)

How to wire

1. open the electrical control panel door.
2. Connect the power supply wires and system interconnection wires to the terminal block of the electrical control panel.
3. Tighten the screws of the terminal block, connect the wires matching the terminal numbers (Do not apply tension to the connecting section of the terminal block.)
4. Close the electrical control panel door.
• When connecting the system interconnection wire to the outdoor unit terminal, prevent water from coming into the outdoor unit.
• Insulate the unsheathed cords (conductors) with electrical insulation tape. Process them so that they do not touch any electrical or metal parts.
• For system interconnection wires, do not use a wire joined to another on the way. Use wires long enough to cover the entire length.

Stripping length power cord and system

interconnection wire

Wiring diagram

*   For details on the remote controller wiring / installation, refer to the Installation Manual enclosed with the remote controller.

Single system

Simultaneous twin system

*   Use 2-core shield wire (MVVS 0.5 to 2.0 mm² or more) for the remote controller wiring in the simultaneous twin system to prevent noise problems. Be sure to connect both ends of the shield wire to earth leads.
*   Connect earth wires for each indoor unit in the simultaneous twin system.
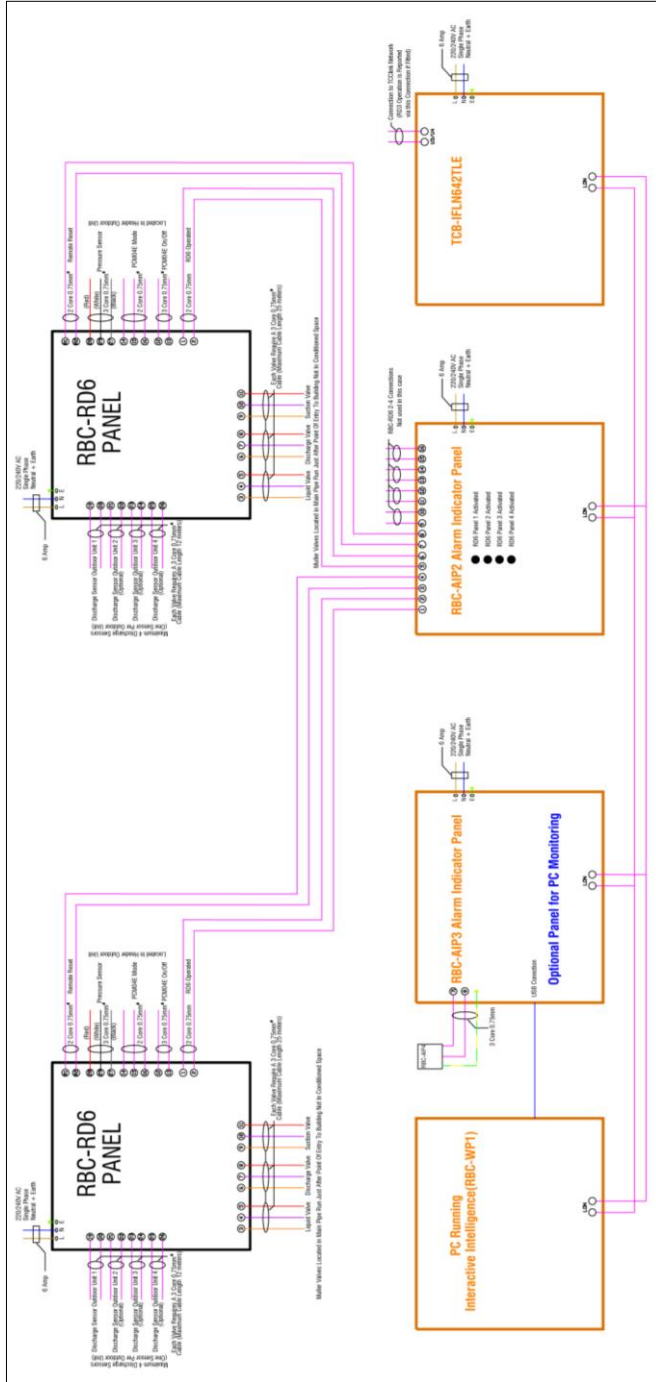
EARTHING ⚠ WARNING

Be sure to connect the earth wire. (grounding work)
Incomplete grounding may cause an electric shock.

Connect the earth wire properly following applicable technical standards.
Connecting the earth wire is essential to preventing electric shock and to reducing noise and electrical charges on the outdoor unit surface due to the high-frequency wave generated by the frequency converter (inverter) in the outdoor unit.
If you touch the charged outdoor unit without an earth wire, you may experience an electric shock.
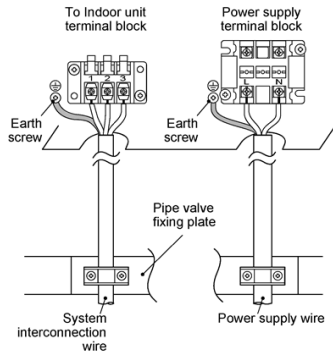
Refrigerant Monitoring Field Wiring Diagrams

RBC-AIP3 LEAK DETECTION PANEL

The RBC-AIP3 Indicator panel is designed to work in conjunction with the Toshiba RBC-WP1 Interactive Intelligence Windows software package. In the event of the PC operating the RBC-WP1 Interactive Intelligence software being shut down the RBC-AIP3 will activate a visual/audible alarm. The RBC-AIP3 panel has the ability to connect to the RBC-AIP4 alarm panel to provide remote indication of the fault/alarm.

PART NAME	QTY	SHAPE	USAGE
Control Panel	1		Panel with visual & audible alarm

■ **Mounting the Control Panel**

Mount the control panel in a constantly occupied area. Remove the gland plate prior to drilling. Ensure that correct type glands are fitted to maintain panel integrity.
Connect the mains power, connect to the RD6 panel and the room indicators as illustrated in schematic wiring diagram.

⚠ **IMPORTANT**

Items that must be observed
 ◆ Ensure the RBC-AIP2 panel is located in an occupied area.
 ◆ Connect the panel to the PC operating the RBC-WP1 Interactive Intelligence Window software.
 ◆ Maximum distance between RBC-AIP2 and PC operating system is 2m.
Associated apparatus must be connected to the panel.

All dimensions in mm

PANEL WIRING

For the panel, connect a power wire with the following specifications.

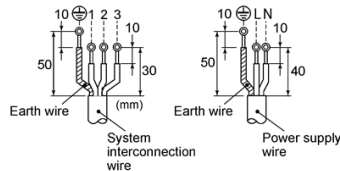|	RBC-RD6-PE
Power supply	220-240 V~, 50 Hz2
Installation fuse rating	2 A (all types can be used)
Power supply wire	H07 RN-F or 60245 IEC 66 (1.5 mm^2 or more)
System interconnection wires	H07 RN-F or 60245 IEC 66 (1.5 mm^2 or more)

How to wire

1. open the electrical control panel door.
2. Connect the power supply wires and system interconnection wires to the terminal block of the electrical control panel.
3. Tighten the screws of the terminal block, connect the wires matching the terminal numbers (Do not apply tension to the connecting section of the terminal block.)
4. Close the electrical control panel door.
- When connecting the system interconnection wire to the outdoor unit terminal, prevent water from coming into the outdoor unit.
- Insulate the unsheathed cords (conductors) with electrical insulation tape. Process them so that they do not touch any electrical or metal parts.
- For system interconnection wires, do not use a wire joined to another on the way. Use wires long enough to cover the entire length.
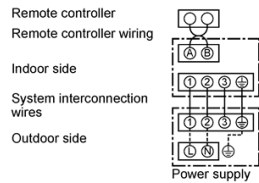

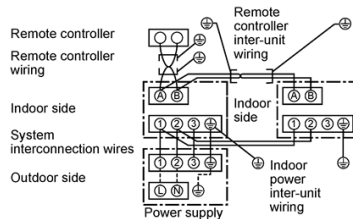## Stripping length power cord and system interconnection wire

Wiring diagram

* For details on the remote controller wiring / installation, refer to the Installation Manual enclosed with the remote controller.

Single system

Simultaneous twin system

* Use 2-core shield wire (MVVS 0.5 to 2.0 mm² or more) for the remote controller wiring in the simultaneous twin system to prevent noise problems. Be sure to connect both ends of the shield wire to earth leads.
* Connect earth wires for each indoor unit in the simultaneous twin system.

EARTHING ⚠ WARNING

Be sure to connect the earth wire. (grounding work)
Incomplete grounding may cause an electric shock.

Connect the earth wire properly following applicable technical standards.
Connecting the earth wire is essential to preventing electric shock and to reducing noise and electrical charges on the outdoor unit surface due to the high-frequency wave generated by the frequency converter (inverter) in the outdoor unit.
If you touch the charged outdoor unit without an earth wire, you may experience an electric shock.

RBC-AIP3 - Control Circuit Wiring
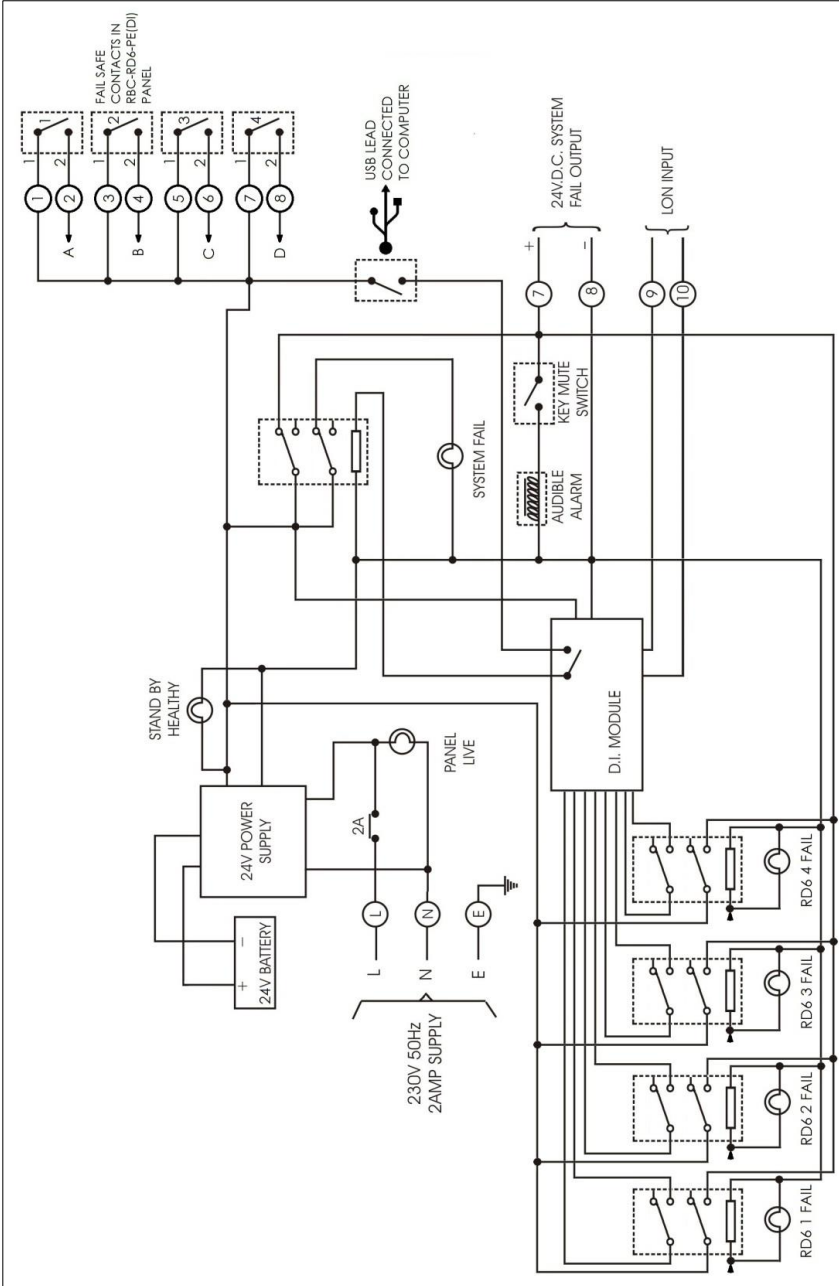
**Refrigerant Monitoring Field Wiring Diagrams**
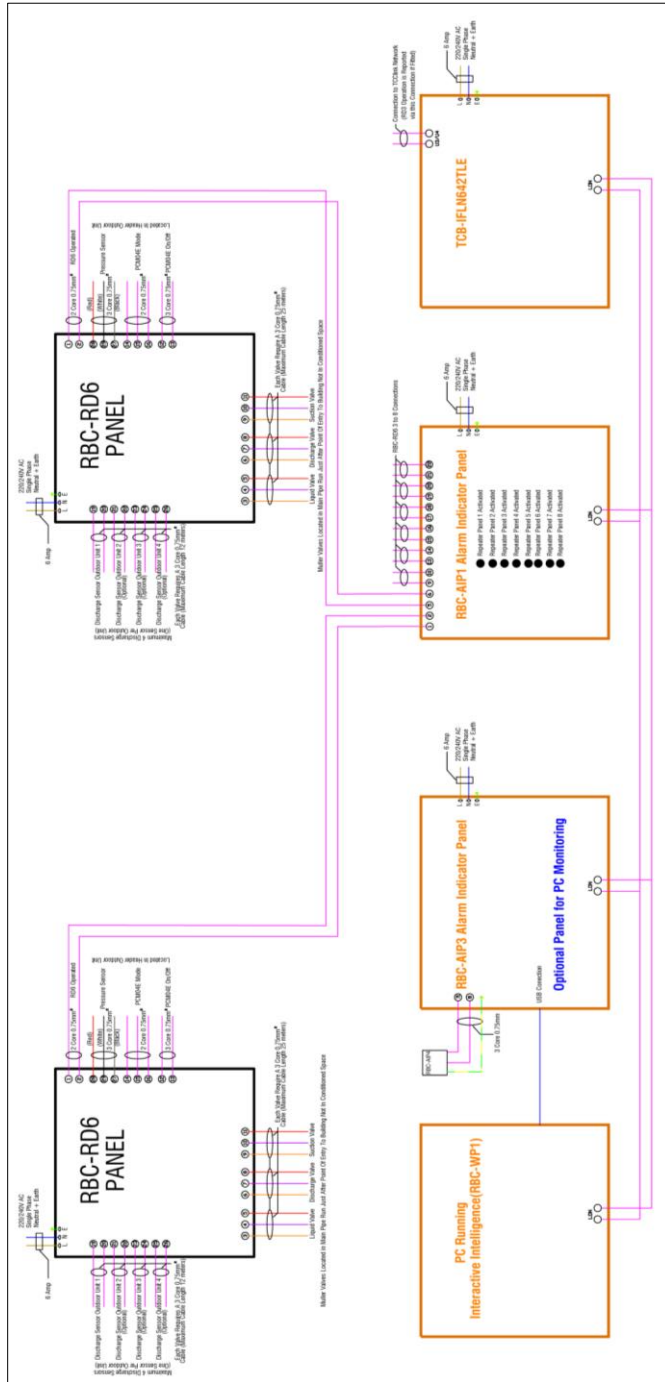
RBC-AIP4 LEAK DETECTION PANEL

The RBC-AIP4 remote room Indicator is designed to work in conjunction with the Toshiba RBC-AIP3 Indicator panel. In the event of the RBC-AIP3 panel activation the RBC-AIP4 remote room Indicator will signal an audible/visual alarm.

PART NAME	QTY	SHAPE	USAGE
Control Panel	1		Panel with visual & audible alarm

**Dimensions**
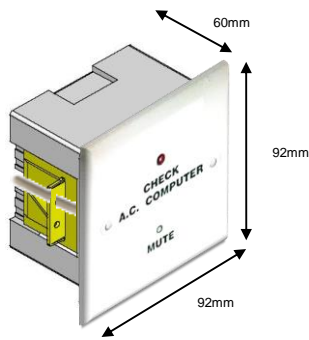
Mounting the Control Panel

1. The RBC-AIP4 is supplied in a 47mm deep single dry lining box.
2. It should be mounted in a prominent location

⚠ CAUTION

Toshiba will not accept any liability for scratched or damaged Indicator facia cause through mishandling or poor installation. Take care when accessing ad removing facia from fixing box.

- ♦ The RBC-AIP4 must connect to the RBC-AIP3 Leak Detection monitoring panel of the associated refrigerant system.
- ♦ The computer connected to the RBC-AIP3 Leak Detection panel must be operating the Toshiba RBC-WP1 Interactive Intelligence Windows software program.
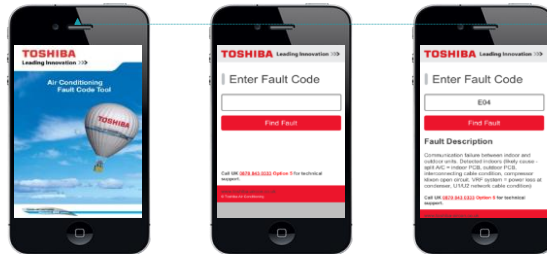
Details of Operation and Wiring

24 V (-)
DC   (+)
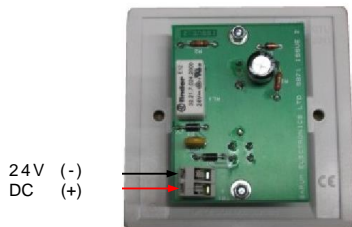
- ♦ Connect the room sensor to the RBC-AIP3 Leak Detection Panel using 3 core a 0.75mm^2 cable
- ♦ Connect the RBC-AIP3 link wire terminal 7 to the (+) connection on the RBC-AIP4 remote room indicator
- ♦ Connect the RBC-AIP3 link wire terminal 8 to the (-) connection on the RBC-AIP4 remote room indicator
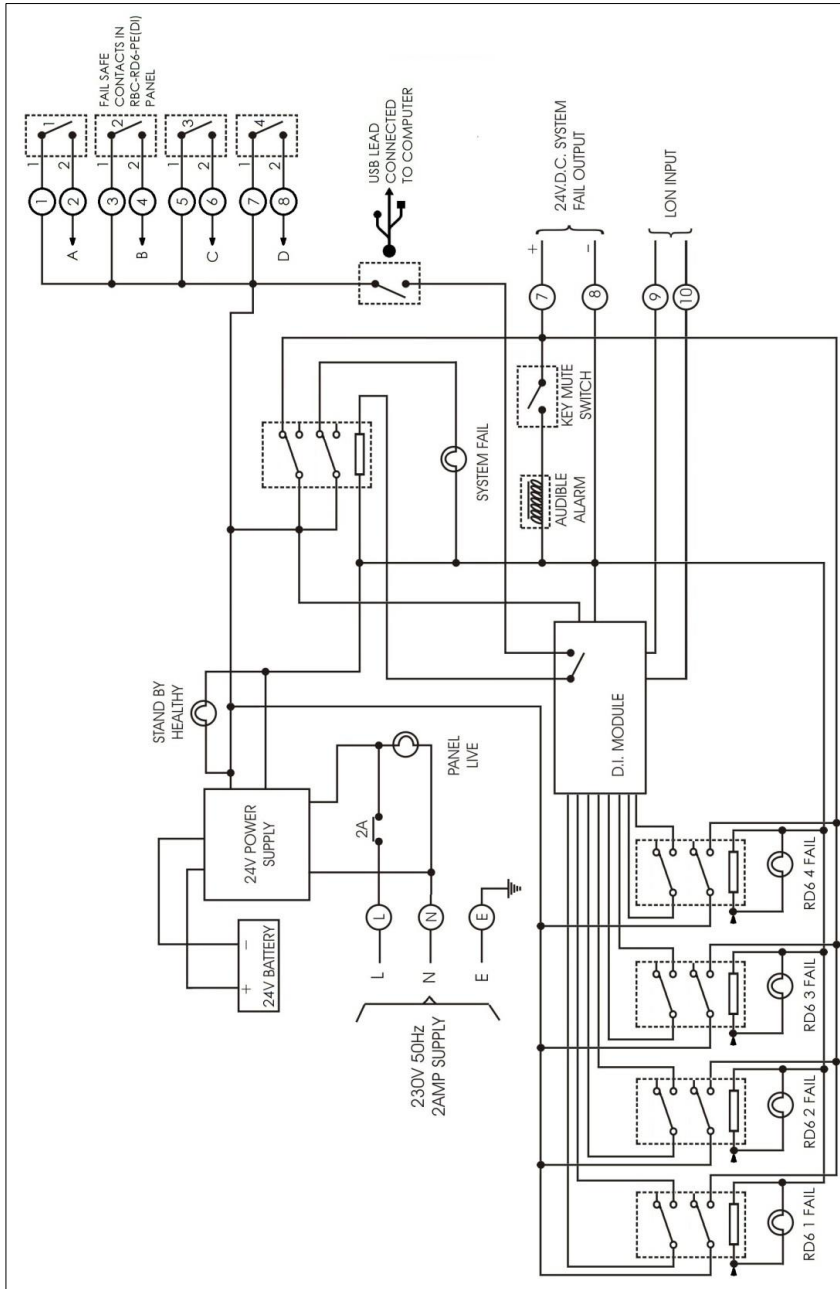
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