MITSUBISHI ELECTRIC

2 ZONE KIT

November 2019

No. OCH729

SERVICE MANUAL

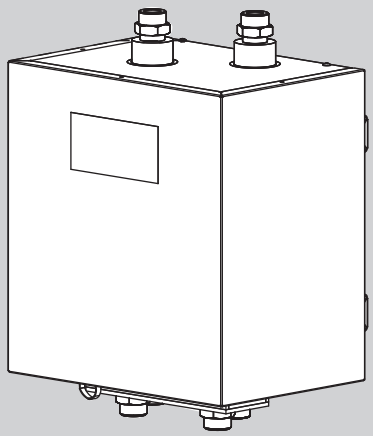
[Model Name]

PAC-TZ02-E

[Service Ref.]

PAC-TZ02-E

Notes:
- This manual describes service data of 2 zone kit only.



2 ZONE KIT

CONTENTS

PARTS CATALOG (OCB729)

1 REFERENCE MANUAL

Model Name	Service Ref.	Service Manual No.
EHSD-MED	EHSD-MED.UK	OCH712 OCB712
EHSD-VM2D	EHSD-VM2D.UK	
EHSD-VM6D	EHSD-VM6D.UK	
EHSD-YM9D	EHSD-YM9D.UK	
EHSD-YM9ED	EHSD-YM9ED.UK	
EHSD-TM9D	EHSD-TM9D.UK	
ERSD-MED	ERSD-MED.UK	
ERSD-VM2D	ERSD-VM2D.UK	
EHSC-MED	EHSC-MED.UK	
EHSC-VM2D	EHSC-VM2D.UK	
EHSC-VM6D	EHSC-VM6D.UK	
EHSC-YM9D	EHSC-YM9D.UK	
EHSC-YM9ED	EHSC-YM9ED.UK	
EHSC-TM9D	EHSC-TM9D.UK	
ERSC-MED	ERSC-MED.UK	
ERSC-VM2D	ERSC-VM2D.UK	
EHPX-MED	EHPX-MED.UK	
EHPX-VM2D	EHPX-VM2D.UK	
EHPX-VM6D	EHPX-VM6D.UK	
EHPX-YM9D	EHPX-YM9D.UK	
EHPX-YM9ED	EHPX-YM9ED.UK	
EHST17D-VM2D	EHST17D-VM2D.UK	OCH714 OCB714
ERST17D-VM2D	ERST17D-VM2D.UK	
EHST20D-MED	EHST20D-MED.UK	
EHST20D-VM2D	EHST20D-VM2D.UK	
EHST20D-VM6D	EHST20D-VM6D.UK	
EHST20D-YM9D	EHST20D-YM9D.UK	
EHST20D-YM9ED	EHST20D-YM9ED.UK	
EHST20D-TM9D	EHST20D-TM9D.UK	
ERST20D-VM2D	ERST20D-VM2D.UK	
EHST30D-MED	EHST30D-MED.UK	
EHST30D-VM6ED	EHST30D-VM6ED.UK	
EHST30D-YM9ED	EHST30D-YM9ED.UK	
EHST30D-TM9ED	EHST30D-TM9ED.UK	
ERST30D-VM2ED	ERST30D-VM2ED.UK	
EHST20C-MED	EHST20C-MED.UK	
EHST20C-VM2D	EHST20C-VM2D.UK	
EHST20C-VM6D	EHST20C-VM6D.UK	
EHST20C-YM9D	EHST20C-YM9D.UK	
EHST20C-YM9ED	EHST20C-YM9ED.UK	
EHST20C-TM9D	EHST20C-TM9D.UK	
ERST20C-VM2D	ERST20C-VM2D.UK	
EHST30C-MED	EHST30C-MED.UK	
EHST30C-VM6ED	EHST30C-VM6ED.UK	
EHST30C-YM9ED	EHST30C-YM9ED.UK	
EHST30C-TM9ED	EHST30C-TM9ED.UK	
ERST30C-VM2ED	ERST30C-VM2ED.UK	
EHPT17X-VM2D	EHPT17X-VM2D.UK	
EHPT17X-VM6D	EHPT17X-VM6D.UK	
EHPT17X-YM9D	EHPT17X-YM9D.UK	
ERPT17X-VM2D	ERPT17X-VM2D.UK	
EHPT20X-MED	EHPT20X-MED.UK	
EHPT20X-VM6D	EHPT20X-VM6D.UK	
EHPT20X-YM9D	EHPT20X-YM9D.UK	
EHPT20X-YM9ED	EHPT20X-YM9ED.UK	
EHPT20X-TM9D	EHPT20X-TM9D.UK	
EHPT20X-MHEDW	EHPT20X-MHEDW.UK	
ERPT20X-MD	ERPT20X-MD.UK	
ERPT20X-VM2D	ERPT20X-VM2D.UK	
ERPT20X-VM6D	ERPT20X-VM6D.UK	
EHPT30X-MED	EHPT30X-MED.UK	
EHPT30X-YM9ED	EHPT30X-YM9ED.UK	
ERPT30X-VM2ED	ERPT30X-VM2ED.UK	

2 SAFETY PRECAUTION

- This 2 zone kit MUST be used with the cylinder unit (hydrobox) **except for E*SE models**.
- Before starting installation, read the following description together with the installation manual included with the cylinder unit (hydrobox) and 2 zone kit.
- Please read it carefully and observe fully the following safety precautions.

⚠ WARNING	Precaution that must be observed to prevent injuries or death.
⚠ CAUTION	Incorrect handling could lead to injury or damage to house and household articles.

- After installation, carry out a test run to ensure correct operation, then explain operation method and safety precautions to the end user.
  Tell your customers when they give or sell this machine to any other person include installation manual.

⚠ WARNING

- If the cylinder unit (hydrobox) has already been connected to the power supply, ensure circuit breaker is off before carrying out electrical work.
- If the 2 zone kit is installed incorrectly or modified after installation by the user, water may leak or 2 zone kit may fall from the cylinder unit or wall.
- All installation should be performed by a qualified technician according to local regulations and the instructions given in this manual.
- Connections must be made securely and without tension on the terminals.

⚠ CAUTION

- The 2 zone kit must be installed by 2 or more people.
- All exposed water pipework should be insulated to prevent unnecessary heat loss and condensation.
- To also use the 2 zone kit in cooling mode, securely apply heat-insulation to draining pipework. If heat-insulation is inadequate, condensation could occur on the surface of pipes and dew could drop on the floor or important goods.
- To prevent dirty water from draining onto the floor next to the cylinder unit or under the hydrobox, please connect appropriate discharge pipework from the 2 zone kit to its disposal location.
- Secure 2 zone kit to prevent it from falling.
- Do not hold piping or drain socket when moving the 2 zone kit.
- Avoid the connection of piping or drain socket from damage. Otherwise, it may cause water leakage.
- To prevent incorrect installation, please connect the flexible hose at the bend radius of 150 mm or more.
- The water flow rate between the cylinder unit (hydrobox) and the 2 zone kit must be greater than the total flow rate of Zone1 and Zone2. Otherwise, Zone1 and Zone2 may not be heated properly.

3 SPECIFICATIONS

Model name		PAC-TZ02-E
Dimension (W × H × D)	mm	265 × 383 × 383
Weight	kg	17
Power supply		230 V/single phase/50Hz from Cylinder unit (Hydrobox)
Sound pressure level	dB(A)	28
Sound power level	dB(A)	40
Pump2, 3		Max. 52 W/0.52 A
		Max. head 7.0 m *1
Mixing valve	W	5
		Running time 90° 120 s
Water flow rate range		Depend on outdoor unit

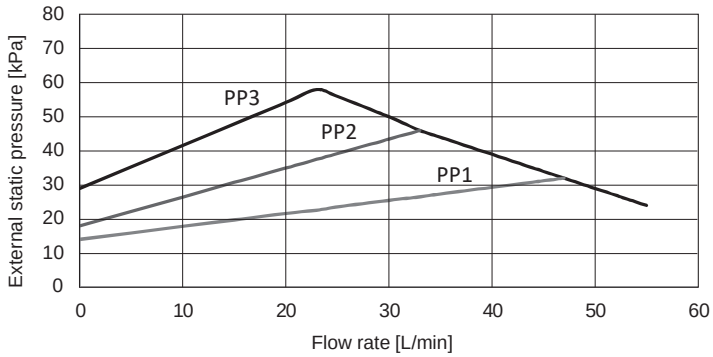
Note:
- Max. flow rate is 36.9 L/min. If the flow rate exceeds 36.9 L/min, pipes would be eroded.
- The water flow rate between the cylinder unit (hydrobox) and the 2 zone kit must be greater than the total flow rate of Zone1 and Zone2.

*1 Refer to the graph below and add any pumps if necessary.

<PP: Proportional pressure>

The head (pressure) is reduced at falling heat demand and increased at rising heat demand.
PP1: lowest proportional pressure curve
PP2: intermediate proportional pressure curve
PP3: highest proportional pressure curve
PP Auto Adapt: highest to lowest proportional pressure curve

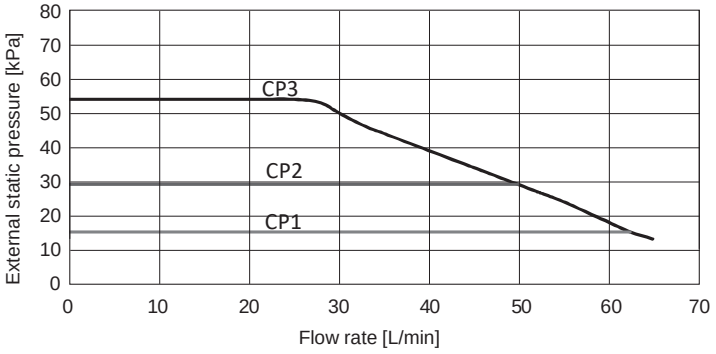
The Auto Adapt function enables the circulator to adjust the pump performance automatically to the size of the system or the variations in load over time.



<CP: Constant pressure>

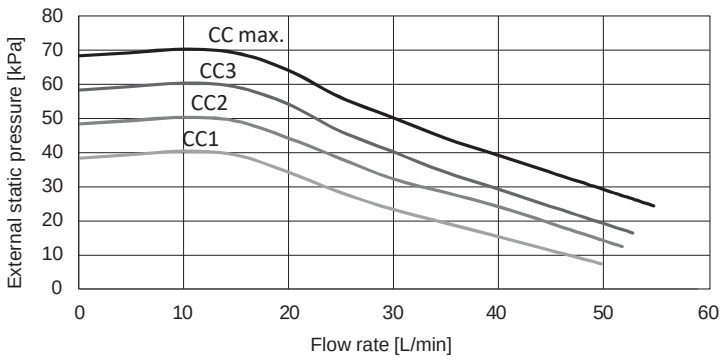
The head (pressure) is kept constant, irrespective of the heat demand.
CP1: lowest constant pressure curve
CP2: intermediate constant pressure curve
CP3: highest constant pressure curve
CP Auto Adapt: highest to lowest constant pressure curve

The Auto Adapt function enables the circulator to adjust the pump performance automatically to the size of the system or the variations in load over time.



<CC: Constant curve>

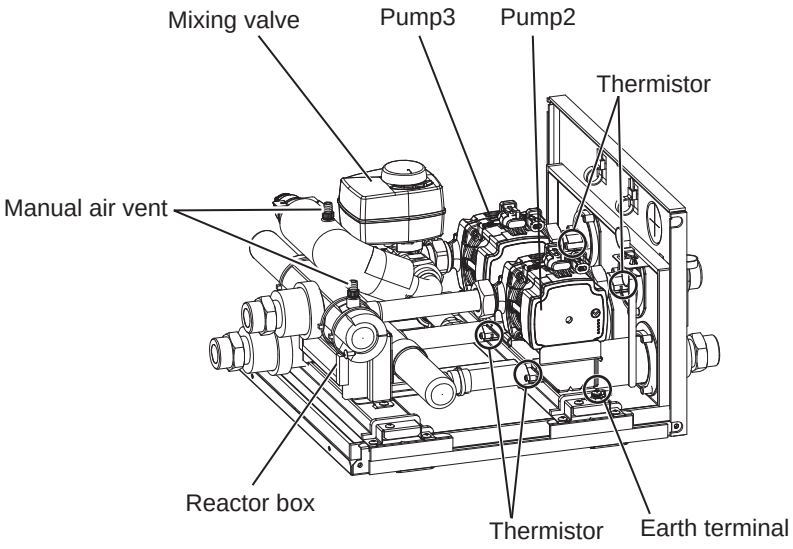
The circulator runs on a constant curve.



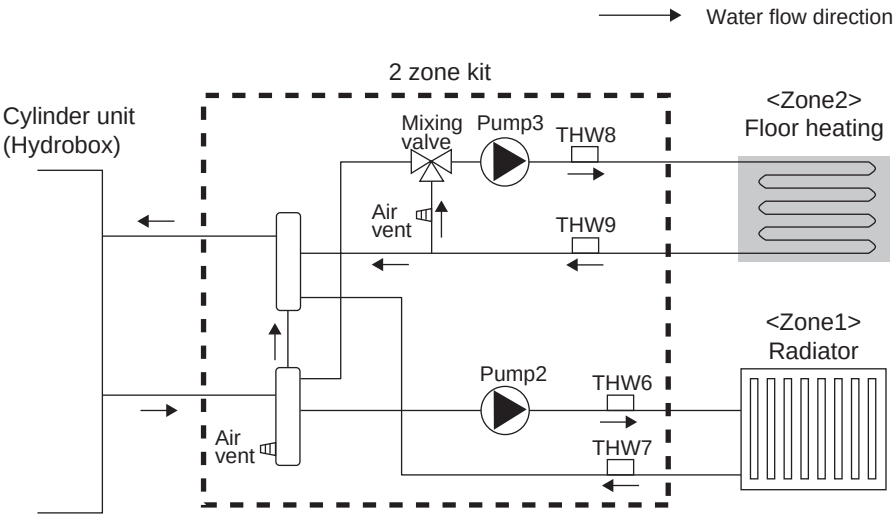
4 PARTS NAMES AND FUNCTIONS

PAC-TZ02-E

4-1. Component parts



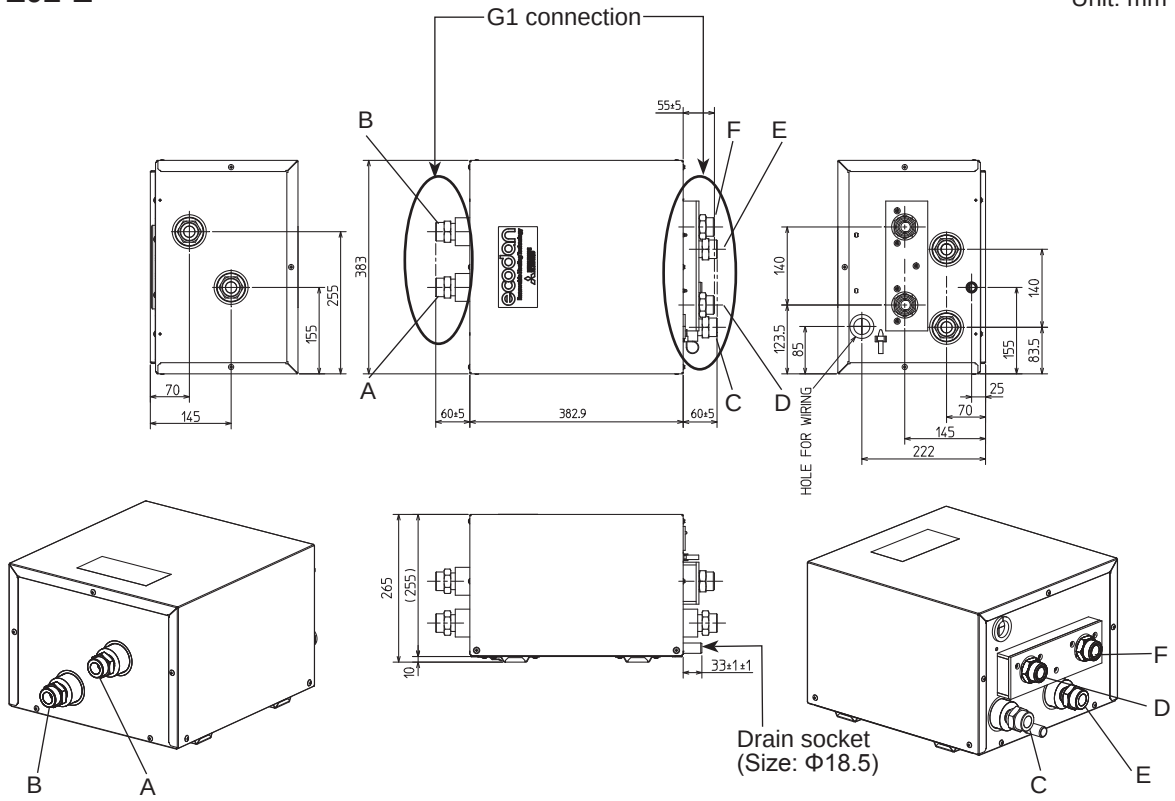
4-2. Water circuit and system figure



5 OUTLINES AND DIMENSIONS

PAC-TZ02-E

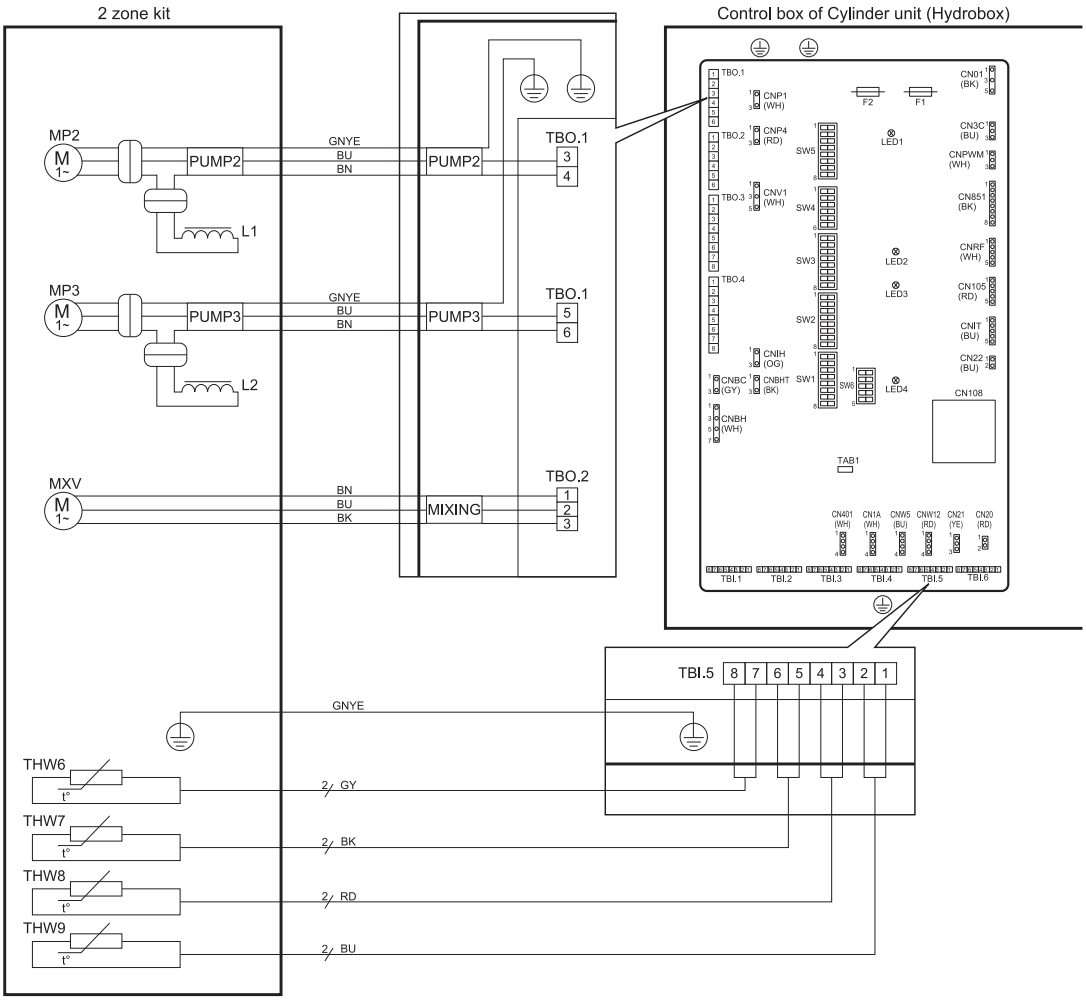
Unit: mm



	Legend
A	From Cylinder unit (Hydrobox)
B	To Cylinder unit (Hydrobox)
C	From Zone1
D	To Zone1
E	From Zone2
F	To Zone2

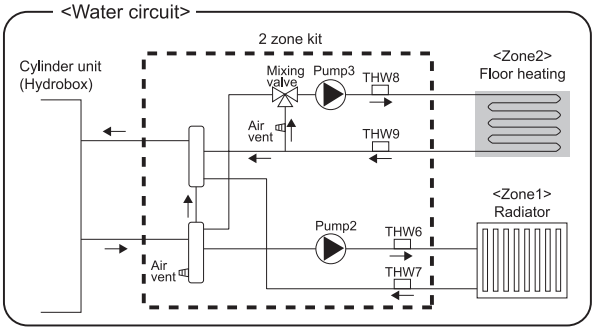
6 WIRING DIAGRAM

PAC-TZ02-E



2 zone kit

Symbol	Name
MP2	Water circulation pump 2 (Space heating/cooling for zone1)
MP3	Water circulation pump 3 (Space heating/cooling for zone2)
MXV	Mixing valve
THW6	Thermistor (Zone1 flow temp.)
THW7	Thermistor (Zone1 return temp.)
THW8	Thermistor (Zone2 flow temp.)
THW9	Thermistor (Zone2 return temp.)
L1	Reactor 1 (for pump 2)
L2	Reactor 2 (for pump 3)



Control box of Cylinder unit (Hydrobox)

Terminal block	Item
TBO.1 3-4	Water circulation pump 2 output (Space heating/cooling for zone1)
TBO.1 5-6	Water circulation pump 3 output (Space heating/cooling for zone2)
TBO.2 1-3	Mixing valve output
TBI.5 1-8	Thermistor input

DIP Switch settings of the cylinder unit (hydrobox)

Setting the following DIP switches are necessary for 2 zone control. (See the installation manual of the cylinder unit (hydrobox) for more information.)

DIP switch	Function	OFF	ON	Setting when using 2 zone kit
SW2-6	Mixing tank	WITHOUT Mixing tank	WITH Mixing tank	ON
SW2-7	2-zone temperature control	Inactive	Active *	ON

* Active only when SW3-6 is set to OFF.

7 TROUBLESHOOTING

7-1. Troubleshooting

<Summary of self diagnosis based on error codes and service procedures>

Present and past error codes are logged and displayed on the main remote controller or control board of the outdoor unit.
If error codes are displayed, refer to the service manual of the cylinder unit (hydrobox) to solve the problem.

7-2. Test Run

Before a test run

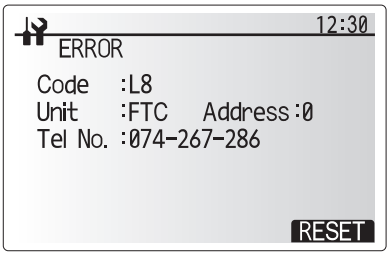
- After installation of outdoor unit, pipework and electrical wiring, recheck that there is no water leakage, loosened connections or miswiring.
- Measure impedance between the ground and the power supply terminal block (L,N) on the outdoor and indoor units with suitable (500 V) ohmmeter. Resistance should be ≥ 1.0 MΩ .
- Read the Installation and Operation Manuals fully especially the safety requirements before carrying out any test runs.

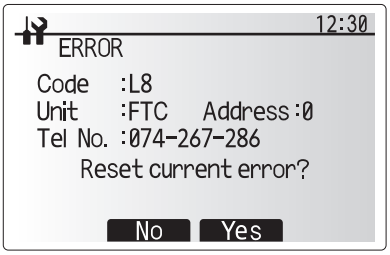
7-3. Malfunction diagnosis method by main remote controller

If a malfunction occurs during start up or operation, the error code screen may be displayed on the main remote controller.
The error code screen shows the following; code, unit, ref. address, and telephone number of installer (only if previously entered by the installer).
Please note in the case of some malfunctions that an error code is not generated, please refer to the service manual for the cylinder unit (hydrobox) for more details.

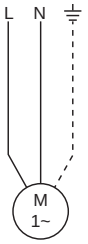
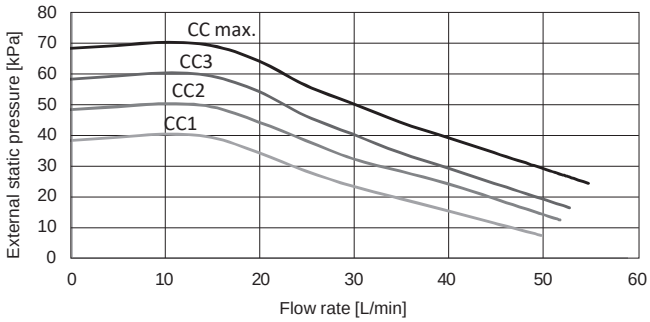
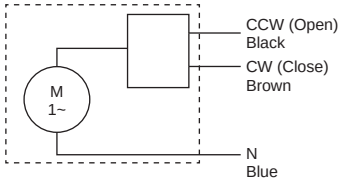
To reset

1. To reset the main remote controller press F4 button (Reset).
2. Then press F3 (Yes) to confirm.





7-4. Checking component parts' function

Part Name	Check Points
Water circulation pump 2/3 	**<CC: Constant curve>** The circulator runs on a constant curve. 
Mixing valve 	(1) Check if wirings are correct. TBO.2-1: Brown TBO.2-2: Blue TBO.2-3: Black (2) Remove the motor part from the mixing valve and check if it functions properly as follows: • The motor dial rotates in a CW direction when 230 V is applied between brown and blue. • The motor dial rotates in a CCW direction when 230 V is applied between black and blue. (3) If the motor functions properly, the valve may be locked by some cause: Remove the valve to check for clogging inside.
Thermistors	Disconnect the connector then measure the resistance with a tester. (At ambient temperatures of 10–30°C.)

Thermistor	Normal	Abnormal
THW6	4.3–9.5 kΩ	Open or short
THW7		
THW8		
THW9		

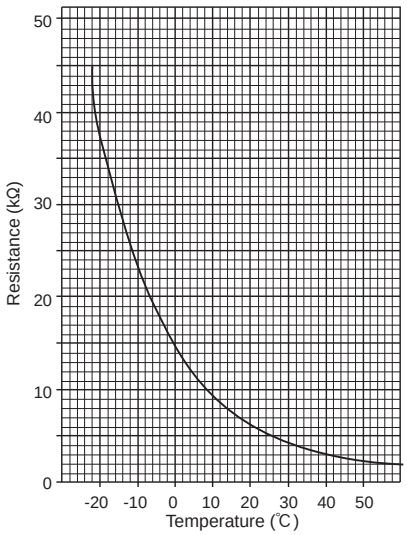
<Thermistor Characteristics Charts>

- Zone1 flow water temperature thermistor (THW6)
- Zone1 return water temperature thermistor (THW7)
- Zone2 flow water temperature thermistor (THW8)
- Zone2 return water temperature thermistor (THW9)

Thermistor R0 = 15 kΩ ± 3 %
B constant = 3480 ± 2 %

$$Rt = 15\exp\left\{3480\left(\frac{1}{273+t} - \frac{1}{273}\right)\right\}$$

0°C	15 kΩ
10°C	9.6 kΩ
20°C	6.3 kΩ
25°C	5.2 kΩ
30°C	4.3 kΩ
40°C	3.0 kΩ



8 DISASSEMBLY PROCEDURE

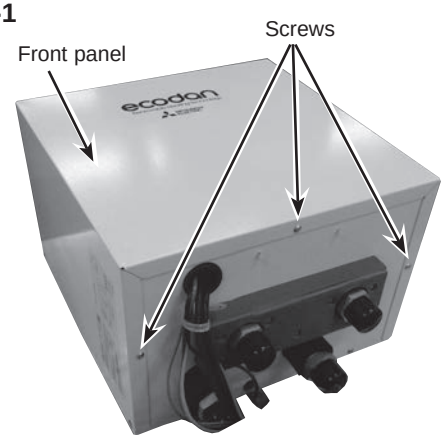
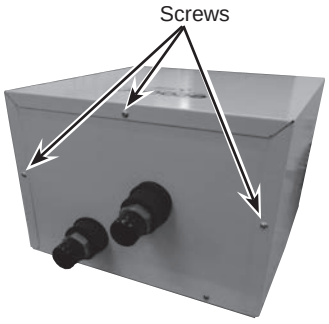
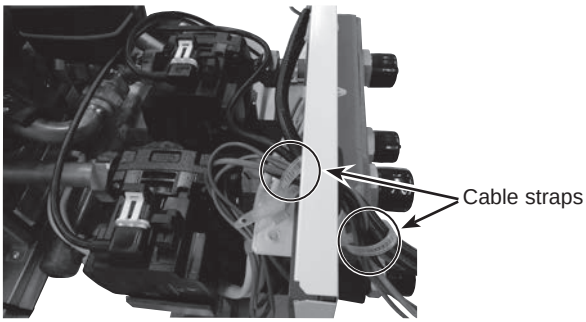
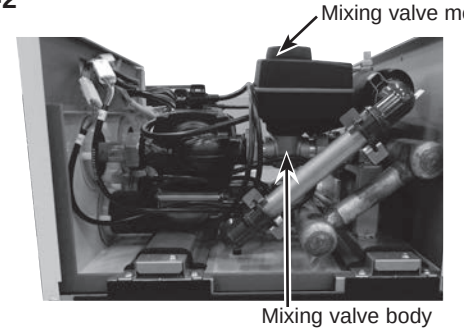
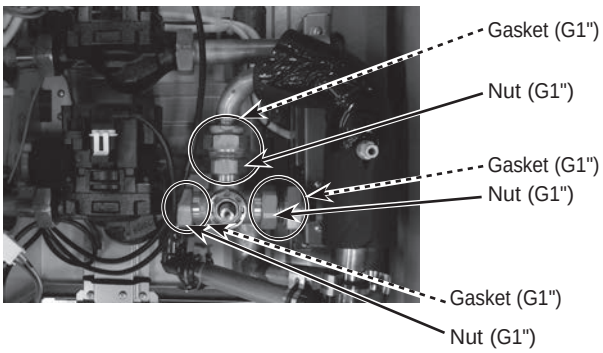
<Preparation for the repair service>

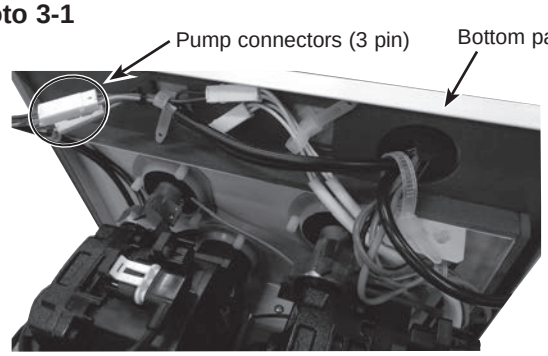
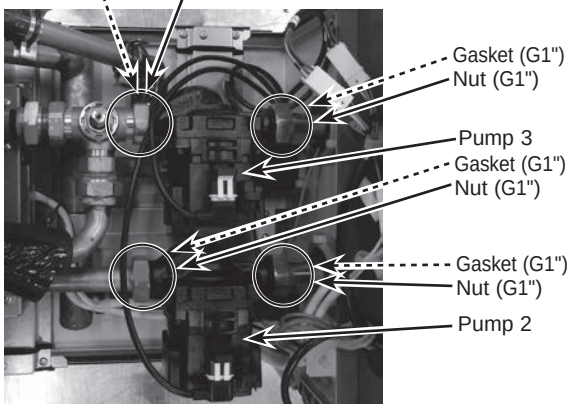
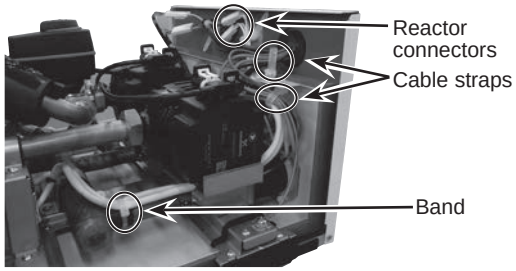
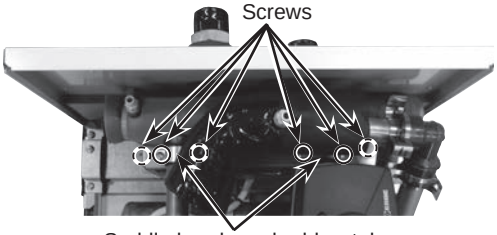
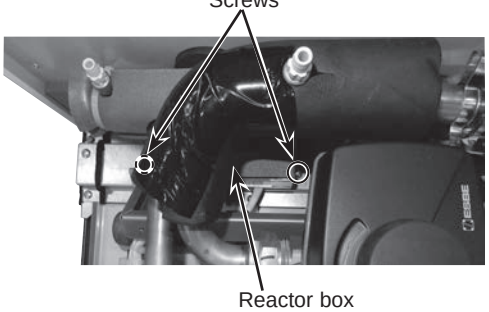
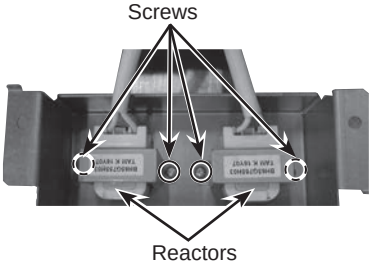
- Prepare the proper tools.
- Prepare the proper protectors.
- Provide adequate ventilation.
- After stopping the operation of the cylinder unit (hydrobox) and outdoor unit, turn off all the power-supply breaker.
- Discharge the condenser before the work involving the electric parts.
- Allow parts to cool.
- Do not expose the electric parts to water.
- When replacing or servicing water circuit parts, drain system first.

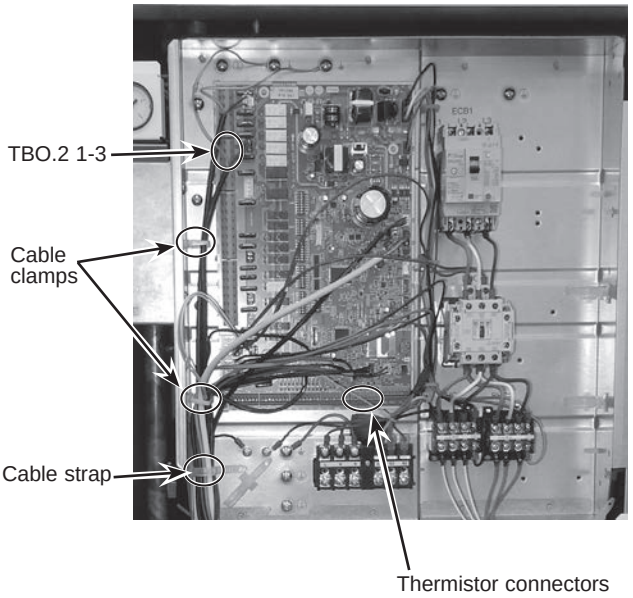
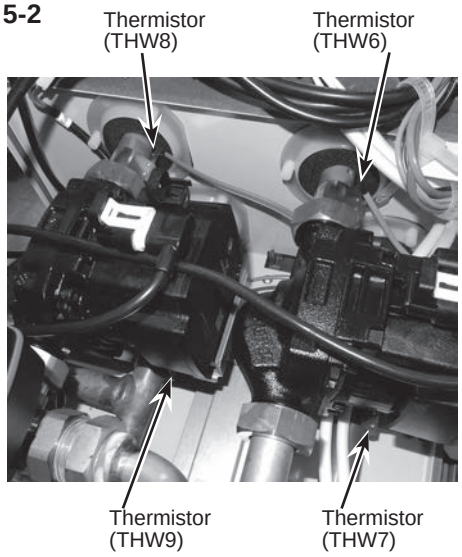
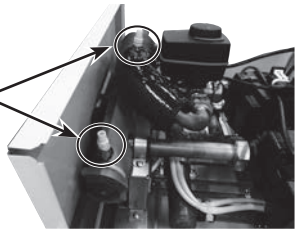
Check individual illustrations and positions of the parts by referring to the parts catalog.
Some lead wires and pipes are bundled with Bands. Cut the bands to undo the fastened pipes and lead wires if necessary. When removing the parts associated with water pipe work, drain the 2 zone kit. Refer to "Draining the cylinder unit" or Draining the hydrobox" on page 14.)
When draining the 2 zone kit, keep water from splashing on the internal parts (mainly electric parts and insulations).

PAC-TZ02-E

→ : Indicates the visible parts in the photos/figures.
⇢ : Indicates the invisible parts in the photos/figures.

DISASSEMBLY PROCEDURE	PHOTOS/ FIGURES
1. How to remove the front panel (1) Remove the 6 screws fixing the front panel (Photo 1-1 and Photo 1-2). (2) Remove the front panel.	**Photo 1-1** 
Photo 1-2  	
2. How to remove the mixing valve motor/mixing valve body <Mixing valve motor> (1) Remove the front panel (Refer to Procedure 1). (2) Disconnect the TBO.2 1-3 from the controller board of the cylinder unit (hydrobox) (Photo 5-1). (3) Release the lead wires from the following fixtures: (Photo 2-1 and 5-1) • 2 cable straps on the 2 zone kit • Cable straps and cable clamps in the control box of the cylinder unit (hydrobox) • Cable straps on the cylinder unit (hydrobox) (4) Hold the motor of the mixing valve and pull hard to remove it from the valve (Photo 2-2). <Mixing valve body> (5) Loosen the 3 G1" nuts using the 2 spanners (Photo 2-3). Note: When reinstalling the G1" nuts, use new G1" gaskets.	**Photo 2-1** 
Photo 2-2  	**Photo 2-3** 

DISASSEMBLY PROCEDURE	PHOTOS/ FIGURES
3. How to remove the water pump 2/pump 3 (1) Remove the front panel (Refer to Procedure 1). (2) Remove the mixing valve motor (Refer to Procedure 2). (3) Disconnect the connector between the pump lead wire and the relay connector (Photo 3-1). (4) Loosen the 2 G1" nuts of the removing water pump (Photo 3-2). Note: • When reinstalling the G1" nuts, use new G1" gaskets. • Install the water pump in the direction that the lead wire comes to the bottom panel side (Photo 3-1).	**Photo 3-1**  **Photo 3-2** 
4. How to remove the reactor 1 / reactor 2 (1) Remove the front panel (Refer to Procedure 1). (2) Disconnect the connector between the reactor and the relay connector (Photo 4-1). (3) Release the 2 cable straps and cut the band (Photo 4-1). (4) Remove the 6 screws fixing the pipe stay to remove the 2 saddle bands and the rubber tubes (Photo 4-2). (5) Tilt the pipe stay toward the mixing valve, pull to the side to remove (Photo 4-3). (6) Remove the 2 screws for the reactor box (Photo 4-4). (7) Remove the 4 screws for the reactors (Photo 4-5).	**Photo 4-1** 
Photo 4-2  	**Photo 4-3** 
Photo 4-4  	**Photo 4-5** 

DISASSEMBLY PROCEDURE	PHOTOS/ FIGURES
5. How to remove the flow water temp. & return water temp. thermistor (THW6, THW7, THW8, THW9) (1) Remove the front panel (Refer to Procedure 1). (2) Disconnect the removing thermistor connector from the controller board of the cylinder unit (hydrobox) (Photo 5-1). (3) Release the lead wires from the following fixtures: (Photo 4-1 and 5-1) • Cable straps on the 2 zone kit • Cable straps and cable clamps in the control box of the cylinder unit (hydrobox) • Cable straps on the cylinder unit (hydrobox) (4) Remove the thermistor from the holder (Photo 5-2).	**Photo 5-1**  **Photo 5-2** 
6. How to remove the air vent (manual) (1) Remove the front panel (Refer to Procedure 1). (2) Remove the air vent (manual) by turning the air vent (manual). (Photo 6)	**Photo 6** 

Thermistor	Connecting part of the controller board
THW6	TBI.5 7-8
THW7	TBI.5 5-6
THW8	TBI.5 3-4
THW9	TBI.5 1-2

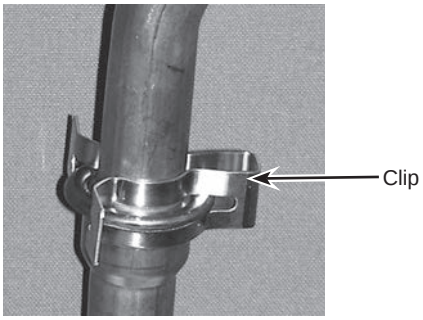
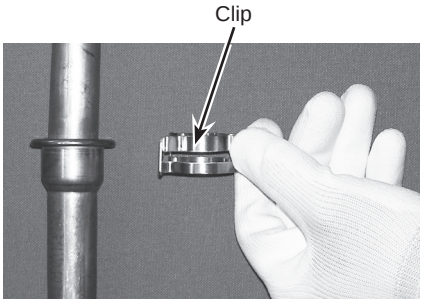
DISASSEMBLY PROCEDURE	PHOTOS/ FIGURES
7. How to detach and attach the quick connection Refer to the following steps when detaching and attaching the quick connection. (1) Remove the clip (Photos 7-1 and 7-2). (2) Separate the connected parts to remove the O-ring (Photo 7-3). • Do not reuse the removed O-ring. • Wipe off if dirt or foreign matters are found on the sealing surface where the O-ring touches. (3) Apply grease on the O-ring using a plastic bag, etc. (Photo 7-4) (4) Attach the O-ring to the male part of quick connection. (Photo 7-5) • Keep the O-ring free from dirt or foreign matters. (5) Connect the male and female parts of the quick connection. (Photo 7-6) (6) Attach the clip. (Photo 7-7) • Ensure to attach the wider diameter of the clip to the female side. Failure to do so it may cause water leak at the connected part. (Photo 7-8) (For the same diameter quick connection, following this note is not necessary.)	**Photo 7-1**  **Photo 7-2** 

Photo 7-3

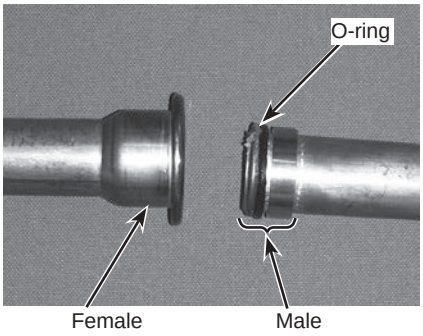


Photo 7-4

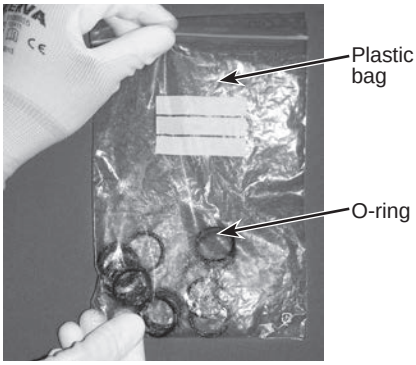


Photo 7-5

Photo 7-6

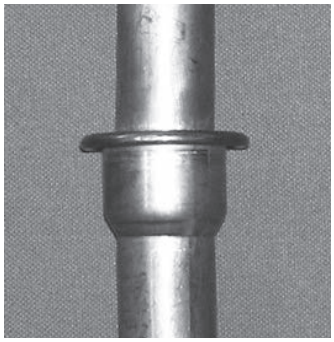


Photo 7-7

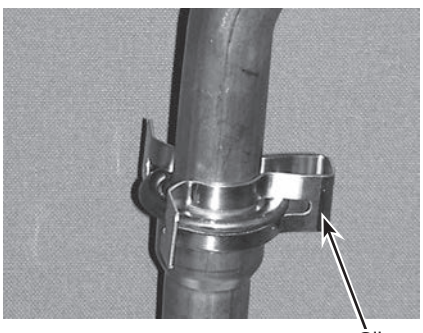
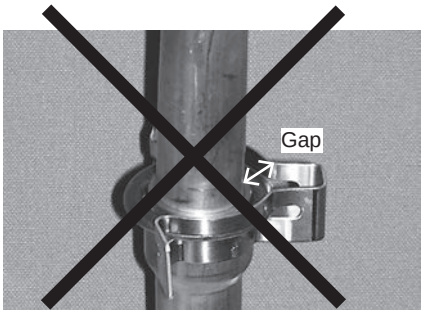


Photo 7-8



Notes on replacing the parts

When reinstalling the parts that are listed below, observe the tightening torques in accordance with Table 8-1.
Always use a new O-ring or gasket.

Table 8-1

Size [inch]		Recommended tightening torque [Nm]
Gasket	G1	42 ± 2
Attached packing	Air vent (manual)	0.25 ± 0.05

Draining the cylinder unit

WARNING: DRAINED WATER MAY BE VERY HOT

1. Before attempting to drain the cylinder unit isolate from the electrical supply to prevent the immersion and booster heaters burning out.
2. Isolate cold water feed to DHW tank.
3. Attach a hose to the DHW tank drain cock. The hose should be able to withstand heat as the draining water could be very hot. The hose should drain to a place lower than the DHW tank bottom to encourage siphoning.
   Open a hot water tap to start draining without a vacuum.
4. When the DHW tank is drained close drain cock and hot tap.
5. Attach hose to water circuit drain cock. The hose should be able to withstand heat as the draining water could be very hot. The hose should drain to a place lower than the booster heater drain cock to encourage siphoning. Open the pump valve and the strainer valve.
6. Water remains in the strainer still after the cylinder unit was drained.
   Drain the strainer by removing the strainer cover.

Draining the hydrobox

WARNING: DRAINED WATER MAY BE VERY HOT

1. Before attempting to drain the hydrobox isolate from the electrical supply to prevent booster heater burning out.
2. Isolate hydrobox from primary water circuit and drain water from hydrobox. Use a suitable heat resistant hose to assist in these operations.
3. Drain any remaining water from booster heater using fitted drain cock and hose, and the drain valve on the primary circuit to safely drain the unit.
4. After the hydrobox is drained, water remains in the following component parts. Drain water completely by checking the inside of the parts.
   - Strainer (Remove the strainer cover.)
   - Pressure relief valve (Operate the valve.)

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