AUTOMATIC DRAFT BEER DISPENSER

DBF-AS65WE-EU

SERVICE MANUAL

B078-1102 (093020)

CONTENTS

GENERAL INFORMATION

TECHNICAL INFORMATION

SERVICE INFORMATION

GENERAL INFORMATION

1. SAFETY INSTRUCTIONS

The following instructions contain important safety precautions and should be strictly observed. The terms used here are defined as follows:

WARNING: There is a possibility of death or serious injury to the service person and a third party or the user due to improper service operations or defects in serviced products.

CAUTION: There is a possibility of injury to the service person and a third party or the user or damage to their property* due to improper service operations or defects in serviced products.

* The term “damage to their property” here refers to extensive damage to household effects, houses and pets.

WARNING

1. Always ask the user to keep children away from the work area. They may be injured by tools or disassembled products.

2. When there is no need to energize the unit during disassembly or cleaning, be sure to unplug the unit or disconnect the main power supply before servicing the unit to prevent electric shocks.

3. If the unit must be energized for inspection of the electric circuit, use rubber gloves to avoid contact with any live parts resulting in electric shocks.

4. Keep the following in mind when servicing the refrigeration circuit:

   (1) Be sure to recover the refrigerant. Do not discharge it into the atmosphere. It will affect the environment.

   (2) Check for any flames in the vicinity, and ensure good ventilation.

   (3) If the refrigerant should leak in servicing, immediately put out any fire used in the vicinity.

   (4) When unbrazing the refrigeration circuit connections, check that the circuit is completely evacuated. The refrigerant may produce a poisonous gas when coming in contact with an open flame.

   (5) Do not braze in an enclosed room to prevent carbon monoxide poisoning.

   (6) In case of a refrigerant leak, locate and repair the leaking part completely before recharging the refrigerant and checking for further leaks. If the leaking part cannot be located, be sure to check again for further leaks after recharging the refrigerant. Leaked refrigerant may produce a poisonous gas when coming in contact with an open flame of a gas cooking stove or a fan heater.

(7) Before servicing, check the surface temperature of the refrigeration circuit to prevent a burn.

5. Keep the following in mind when making electrical connections:

(1) Check for proper grounding connections, and repair if necessary to prevent electric shocks.

(2) Always use service parts intended for the applicable model for replacement of defective parts. Use proper tools to secure the wiring. Otherwise abnormal operation or trouble may occur and cause electric leaks or fire.

(3) Check for proper part installations, wiring conditions and soldered or solderless terminal connections to avoid fire, heat or electric shocks.

(4) Be sure to replace damaged or deteriorated power cords and lead wires to prevent fire, heat or electric shocks.

(5) Cut-off lead wires must be bound using closed end connectors or the like, with their closed ends up to avoid entrance of moisture that could lead to electric leaks or fire.

(6) After servicing, always use a megohmmeter (500V DC) to check for the insulation resistance of at least 1 megohm between the live part (attachment plug) and the dead metal part (grounding terminal).

(7) Do not service the electrical parts with wet hands to prevent electric shocks.

(8) The capacitors used for the compressor and other components may be under high voltage and should be discharged properly before servicing.

CAUTION

1. After servicing, follow the instructions below:

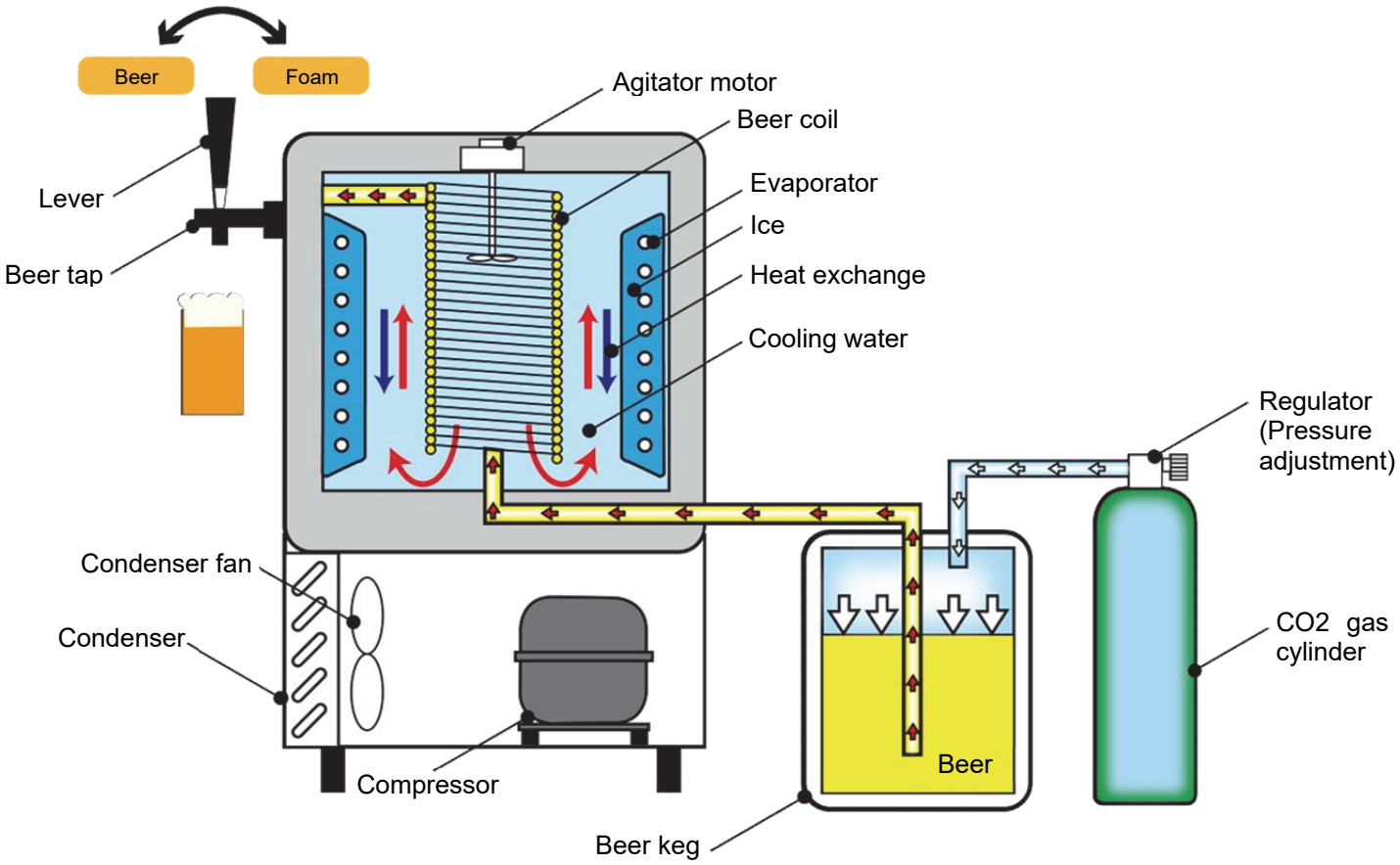
(1) Check the drain connections for water leaks to prevent possible damage to the user’s property.

(2) Always check the unit for proper operation before finishing services.

(3) Be sure to reassemble the parts completely. Loose assembly of such parts as control box cover may cause entrance of vermin resulting in a short circuit between terminals and possible ignition.

2. CONSTRUCTION

BEER CIRCUIT



Beer dispensing system

1) Beer is delivered from the keg to the unit by CO2 gas pressure.
2) Beer is chilled by going through the beer coil.
3) Move the beer tap lever toward you to dispense cold beer.
4) Push the beer tap lever toward the unit to dispense creamy foam.

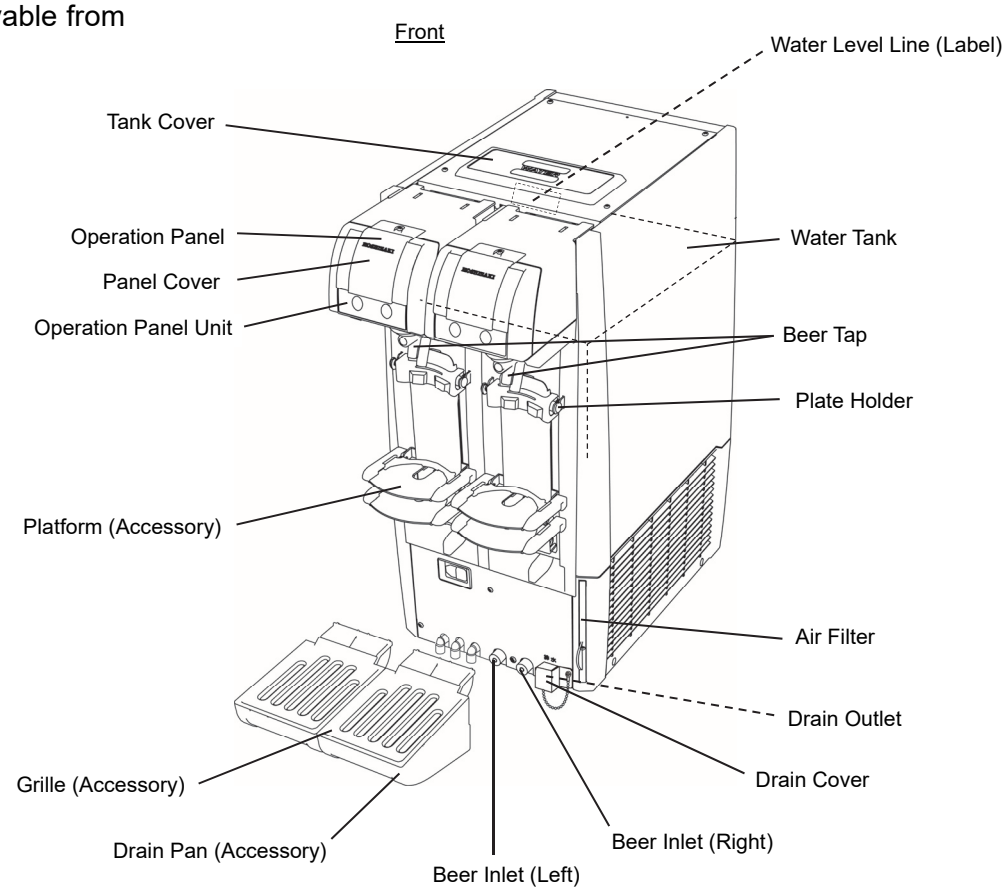
Beer chilling system

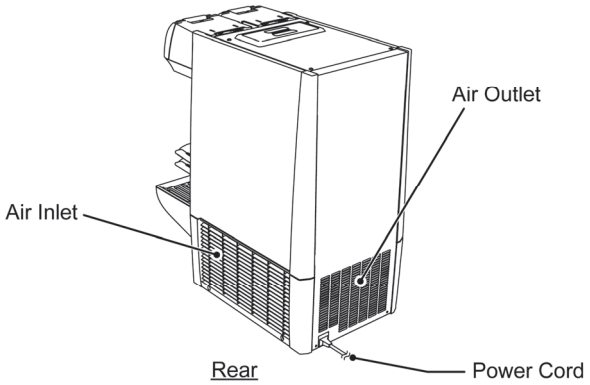
1) The compressor pushes refrigerant out.
2) The condenser exchanges heat.
3) The temperature of the evaporator decreases to freeze water in the cooling water tank.
4) Beer is chilled by going through the beer coil inside the cooling water.
5) To cool beer efficiently, the agitator motor always agitates water inside the cooling water tank to increase thermal conductivity.

FEATURES

This unit automatically dispenses a preset amount (time) of liquid or foam when a button is pressed.

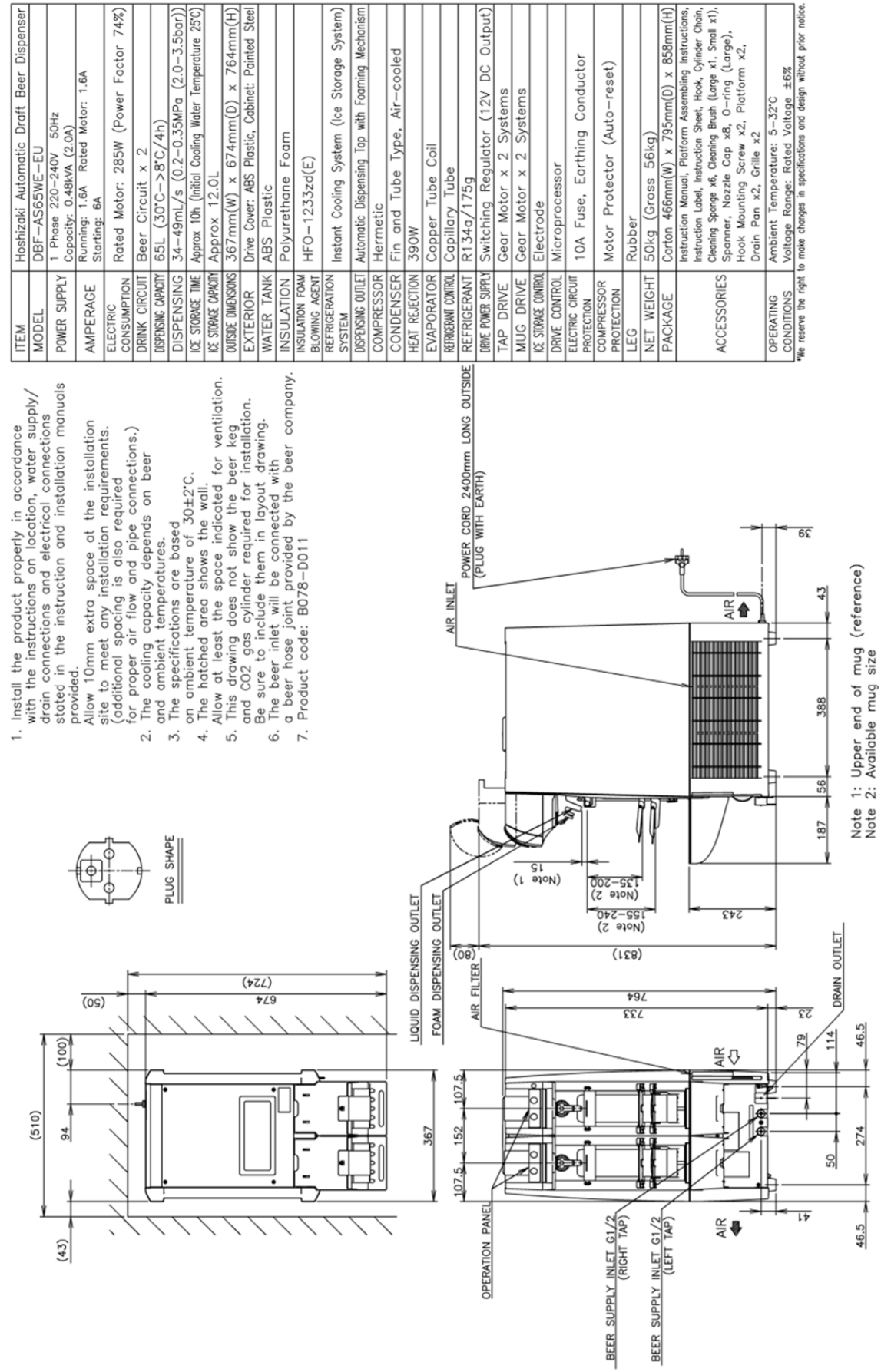
1) Automatic dispensing (portion control) is available by a single button operation.
2) Two different mug sizes are available by changing the mug location.
3) Two different mug sizes are automatically detected by changing the mug location.
4) The pressure reducing valve is manually adjusted.
5) The beer amount is easily adjustable by the front operation panel.
6) Manual dispensing option by beer tap operation is also available.
7) The unit is all driven by electric motors not by air.
8) Two kegs can be connected in parallel.
9) The beer taps are easily removable.
10) The air filter is removable from the front of the unit.





3. DIMENSIONS/SPECIFICATIONS

(1) DIMENSIONS/SPECIFICATIONS



ITEM	Hoshizaki Automatic Draft Beer Dispenser
MODEL	DBF-AS65WE-EU
POWER SUPPLY	1 Phase 220-240V 50Hz Capacity: 0.48kVA (2.0A)
AMPERAGE	Running: 1.6A Rated Motor: 1.6A Starting: 6A
ELECTRIC CONSUMPTION	Rated Motor: 285W (Power Factor 74%)
DRINK CIRCUIT	Beer Circuit x 2
DISPENSING CAPACITY	65L (30°C→8°C/4h)
DISPENSING	34-49mL/s (0.2-0.35MPa (2.0-3.5bar))
ICE STORAGE TIME	Approx 10h (Initial Cooling Water Temperature 25°C)
ICE STORAGE CAPACITY	Approx 12.0L
OUTSIDE DIMENSIONS	367mm(W) x 674mm(D) x 764mm(H)
EXTERIOR	Drive Cover: ABS Plastic, Cabinet: Painted Steel
WATER TANK	ABS Plastic
INSULATION	Polyurethane Foam
INSULATION FOAM BLOWING AGENT	HFO-1233zd(E)
REFRIGERATION SYSTEM	Instant Cooling System (Ice Storage System)
DISPENSING OUTLET	Automatic Dispensing Tap with Foaming Mechanism
COMPRESSOR	Hermetic
CONDENSER	Fin and Tube Type, Air-cooled
HEAT REJECTION	390W
EVAPORATOR	Copper Tube Coil
REFRIGERANT CONTROL	Capillary Tube
REFRIGERANT	R134a/175g
DRIVE POWER SUPPLY	Switching Regulator (12V DC Output)
TAP DRIVE	Gear Motor x 2 Systems
MUG DRIVE	Gear Motor x 2 Systems
ICE STORAGE CONTROL	Electrode
DRIVE CONTROL	Microprocessor
ELECTRIC CIRCUIT PROTECTION	10A Fuse, Earthing Conductor
COMPRESSOR PROTECTION	Motor Protector (Auto-reset)
LEG	Rubber
NET WEIGHT	50kg (Gross 56kg)
PACKAGE	Carton 466mm(W) x 795mm(D) x 858mm(H)
ACCESSORIES	Instruction Manual, Platform Assembling Instructions, Instruction Label, Instruction Sheet, Hook, Cylinder Chain, Cleaning Sponge x6, Cleaning Brush (Large x1, Small x1), Spanner, Nozzle Cap x8, O-ring (Large), Hook Mounting Screw x2, Platform x2, Drain Pan x2, Grille x2
OPERATING CONDITIONS	Ambient Temperature: 5-32°C Voltage Range: Rated Voltage ±6%

*We reserve the right to make changes in specifications and design without prior notice.

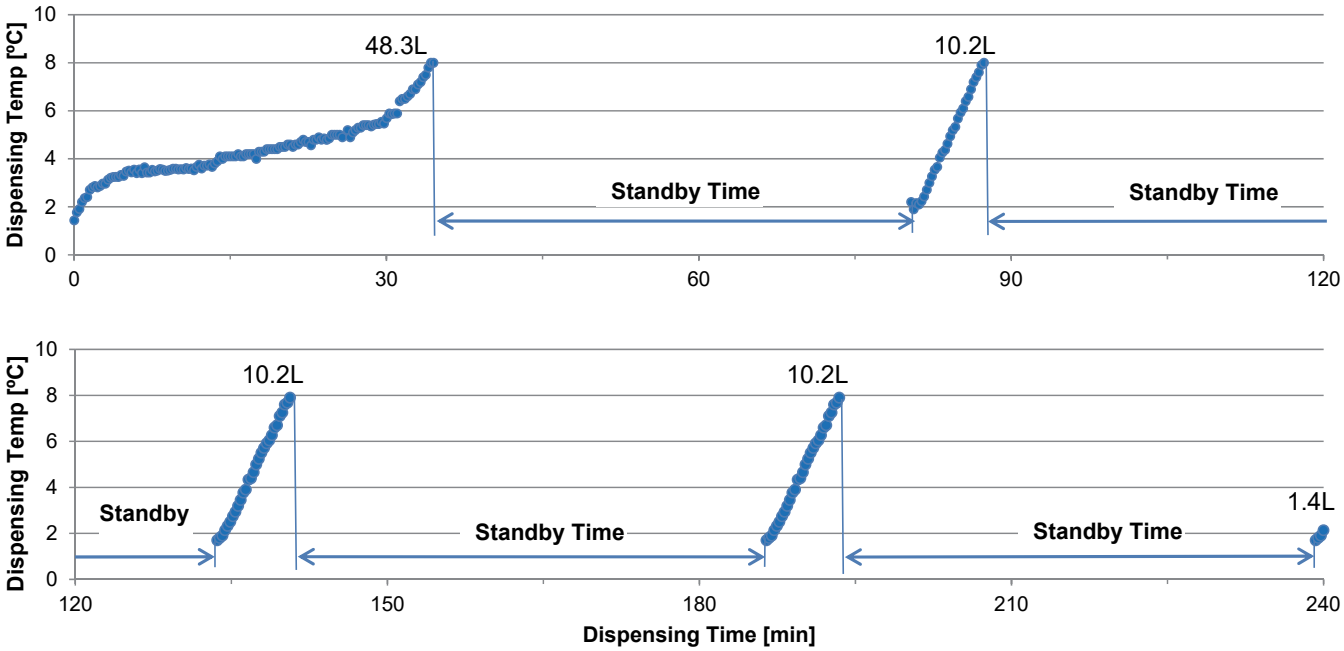
1. Install the product properly in accordance with the instructions on location, water supply/drain connections and electrical connections stated in the instruction and installation manuals provided.
   Allow 10mm extra space at the installation site to meet any installation requirements. (additional spacing is also required for proper air flow and pipe connections.)
2. The cooling capacity depends on beer and ambient temperatures.
3. The specifications are based on ambient temperature of 30±2°C.
4. The hatched area shows the wall. Allow at least the space indicated for ventilation.
5. This drawing does not show the beer keg and CO2 gas cylinder required for installation. Be sure to include them in layout drawing.
6. The beer inlet will be connected with a beer hose joint provided by the beer company.
7. Product code: B078-D011

Note 1: Upper end of mug (reference)
Note 2: Available mug size

(2) DISPENSING PERFORMANCE

Power supply: 220-240V 50Hz
Ambient/keg temp: 30°C
Gas pressure: 0.35MPa
Load: Four 20L beer kegs
Mug: 435mL
Stop dispensing at 8°C or higher dispensing temp --> Resume dispensing at 1°C or higher water temp

Total amount dispensed: approx. 78L



TECHNICAL INFORMATION

4. UNIT CONTROL

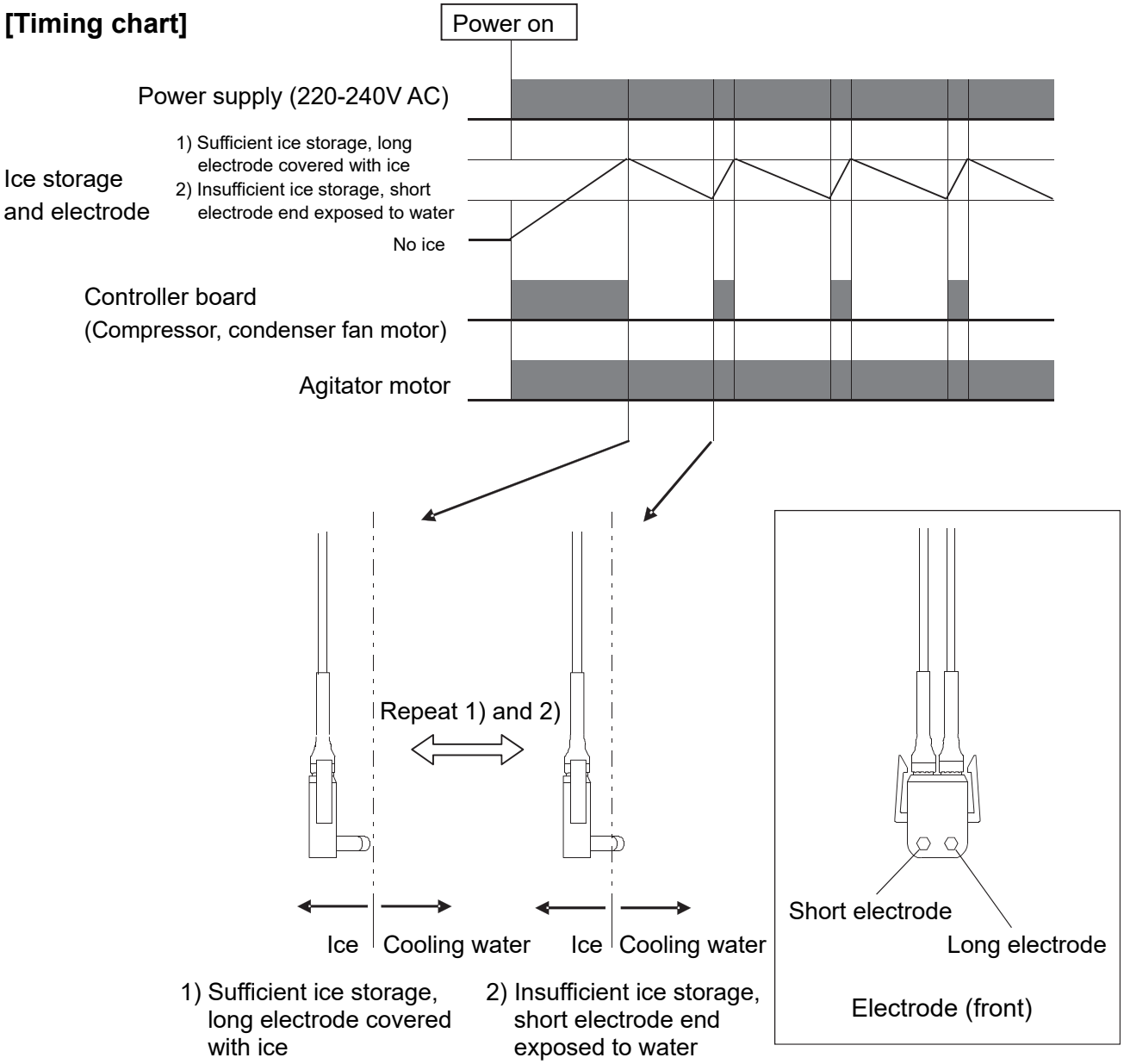
(1) GENERAL OPERATION

a. Normal operation

When the power supply is turned on, one of the lamps on the operation panel lights up and the compressor, condenser fan motor and agitator motor start.

- When the ice making sensor (long electrode) detects sufficient ice storage, the compressor and condenser fan motor stop.
- When the ice making sensor (short electrode) detects insufficient ice storage, the compressor and condenser fan motor restart.
- Repeat the above operations until the power supply is turned off.
- The condenser fan motor runs intermittently at low ambient temperatures (see “c. Condenser fan motor low temperature control” for details).

[Timing chart]



Ice storage and electrode

b. Electrode setting for hard water conditions

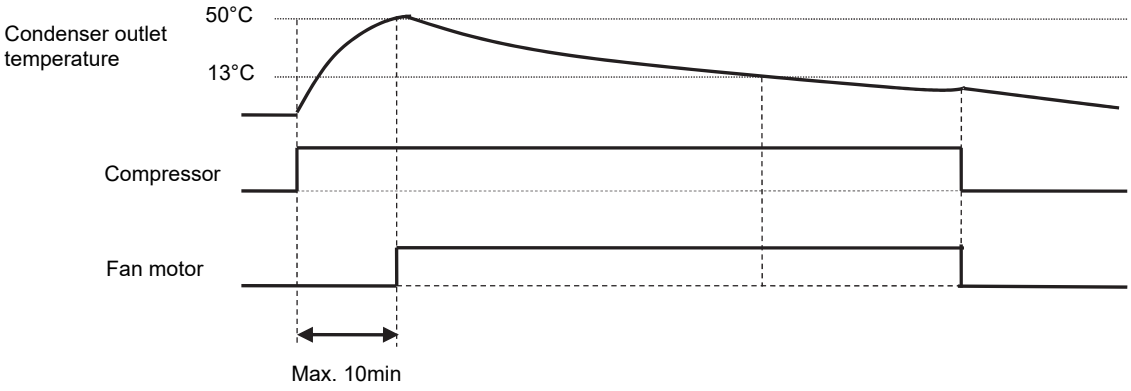
The electrode setting is adjustable by the setting mode “A05”.

c. Condenser fan motor low temperature control

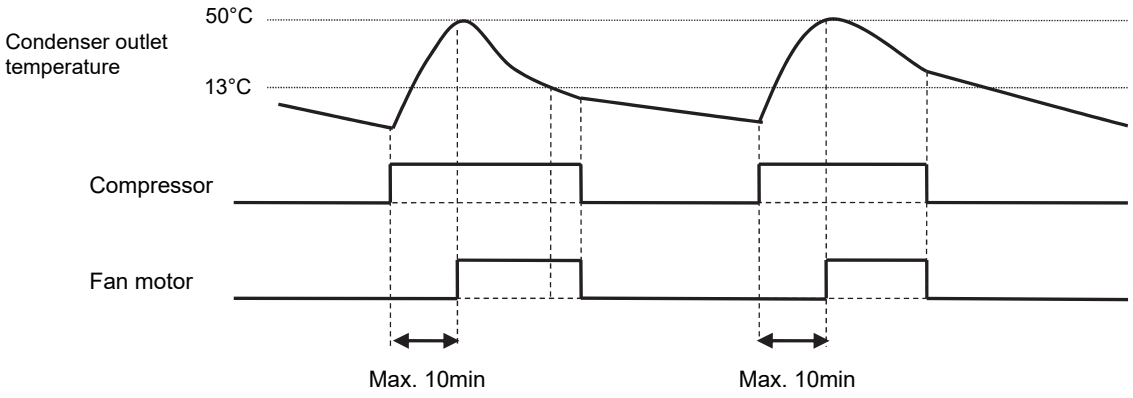
When ambient temperature is low, the control ensures ice forming on the evaporator inside the water tank.

1) When ambient temperature is below 10°C (condenser outlet temperature below 13°C), the condenser fan motor stops to raise the condenser temperature to prevent refrigerant liquefaction.
2) The condenser fan motor restarts when the condenser outlet temperature reaches 50°C or 10 minutes have passed since the compressor started.
3) The condenser fan motor keeps running until ice forming completes (compressor stops) even if the condenser outlet temperature goes down below 13°C.

[During pull-down]



[During control]



d. Compressor protection when condenser fan motor is locked

When the condenser fan motor is locked, the compressor stops to prevent pressure rise in the refrigeration circuit.

1) When the condenser fan motor is locked during operation and the condenser outlet temperature reaches 75°C, the compressor stops.
2) The compressor restarts when the condenser outlet temperature goes down below 55°C and 20 minutes have passed since the compressor stopped.
3) The above process is repeated until the condenser fan motor is unlocked.

* Even when the condenser outlet temperature reaches 75°C, only the compressor stops and the condenser fan motor output stays on.

e. Status indication

Use the check mode “C04” to check the operational status of each component.

f. Error indication

When the condenser thermistor error (temperature below -20°C or above 90°C) occurs, the error code “E51” appears in the display. The fan motor low temperature control (c) and the compressor protection (d) are not available.

g. Condenser thermistor

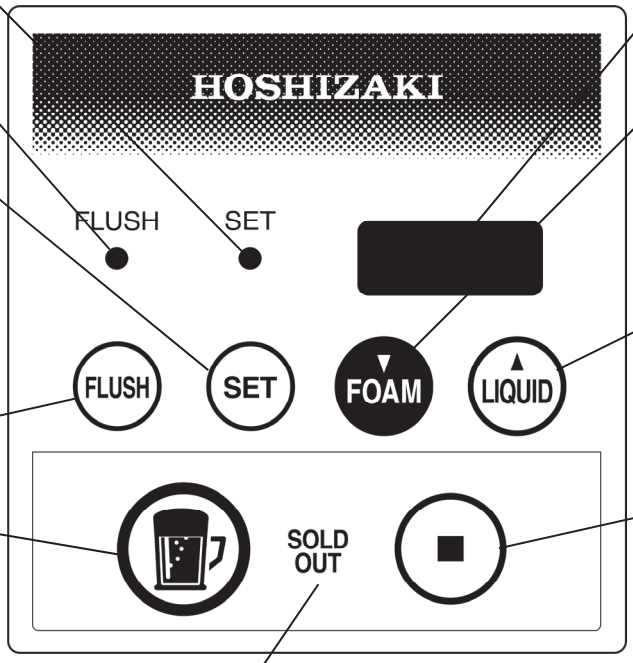
Detection range: -20 to 90°C

Open circuit or short circuit when out of the above range.

5. AUTOMATIC DISPENSING CONTROL

(1) OPERATION PANEL

Operation Panel



Set Lamp
Lights up when the dispenser is in the setting mode.

Flush Lamp
Lights up when the dispenser is in the flush mode.

Set Button
[Press once]
Switches between the setting mode and ready mode (dispense lamp flashes rapidly).
[Press and hold]
Used to make user settings ("U__" on display).

Flush Button
Switches between the ready mode and flush mode.

Dispense Button
(Dispense Lamp)
Lights up when the dispenser is In the ready mode.
[Press once]
Automatically dispenses the preset amount of beer.
[Press and hold]
Makes the automatic dispensing settings available while in the setting mode.

Display
Indicates number of mugs and so on.

Foam Button
[In ready mode]
Press and hold to dispense foam.
[In flush mode]
Press once to dispense foam. Press again to stop.

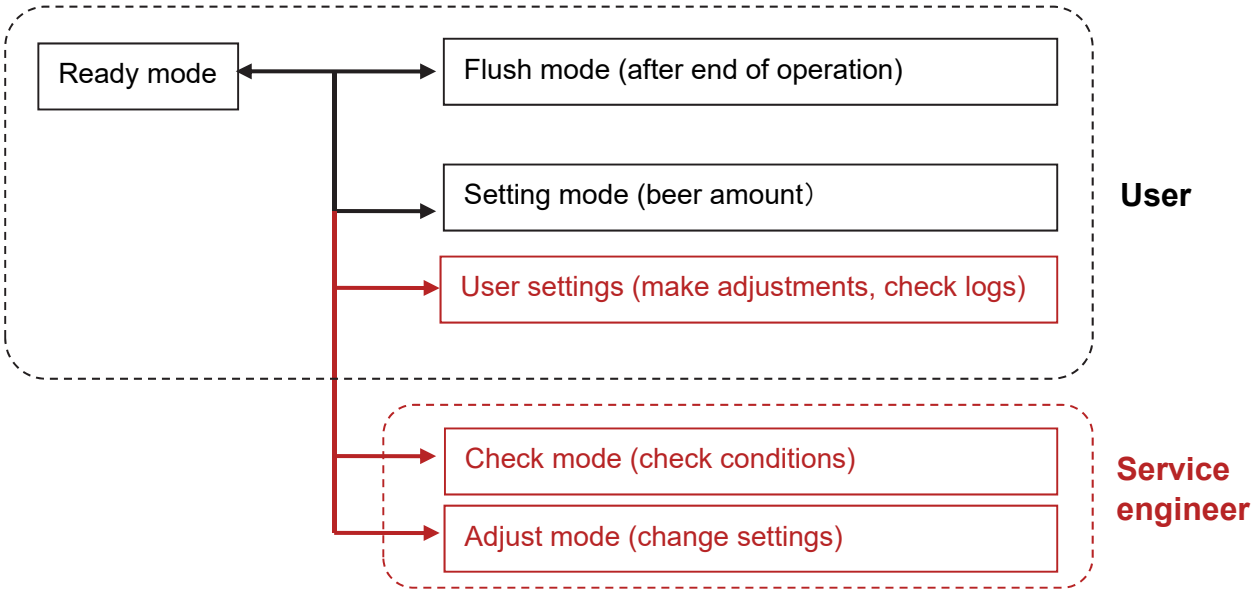
Liquid Button
[In ready mode]
Press and hold to dispense liquid
[In flush mode]
Press once to dispense liquid. Press again to stop.

Stop Button
[Press once]
Manually stops the beer tap or platform operation.
[Press and hold]
Reset the display indication (e.g. number of mugs)

Sold Out Lamp
Lights up when the keg becomes empty.

(2) SETTINGS

a. Overview



b. User Setting Example (checking log of number of mugs)

Staff

Reset number of mugs (press and hold stop button for 3 sec) when replacing kegs.

e.g.

- In operation -

2) Dispense automatically (real-time number of mugs on display)
   * Smaller/larger mug indication switches when platform is changed.
3) End of 1st keg (display: 30 smaller mugs, 20 larger mugs)
4) Press and hold stop button for 3 sec to reset number of mugs
   --> Connect new keg and resume automatic dispensing
5) End of 2nd keg (display: 27 smaller mugs, 21 larger mugs)
6) Reset number of mugs --> Resume automatic dispensing
7) End of 3rd keg (display: 32 smaller mugs, 18 larger mugs)
8) Reset number of mugs --> Resume automatic dispensing
9) Operation ends halfway through 3rd keg (display: 7 smaller mugs, 5 larger mugs)
10) Clean in flush mode

Administrator

- Initial setting -

1) Set user setting (U01) to “Number of mugs”.

- After end of operation -

11) Check mug number log by user setting (U02)
    Smaller: 7 --> 32 --> 27 --> 30 descending order
    Larger: 5 --> 18 --> 21 --> 20 descending order
    * Display log for latest 5 kegs.
12) Check number of keg replacements by user setting (U04)
    “3” on display if keg has been replaced 3 times, that is, 3 kegs have been used today.
    Press and hold stop button for 3 sec to reset to “0”.
13) Check number of flush cycles by user setting (U03)
    “1” on display if 1 flush cycle has run.
    If “10” is on display after 10 days, 1 flush cycle per day has run.
    Press and hold stop button for 3 sec to reset to “0”.

c. User Settings – The user can adjust these settings.

To enter the setting mode:
Press and hold the set button for 3 seconds.

To enter the dispensing mode:
With “U_ _” on the display, press and hold the set button for 3 seconds. The dispensing mode is also resumed if no operation is performed for more than 1 minute.

Item		Description	Default	Setting Range
U01	Digital display (in dispensing mode)	0: No indication 1: Number of mugs (*) * Number switches between the larger and smaller mugs when the mug setting is changed. * To reset, press and hold the stop button for 3 seconds.	0	0 to 1
U02	Log of number of mugs	Log of number of mugs for each reset in descending order * Log is indicated in turn for each keg replacement by “U04”. * Log is indicated for both larger and smaller mugs when the mug setting is changed. * To reset all the current and past logs, press and hold the stop button for 3 seconds. This reset is not counted for “U04”. (*1)	0	Up to 5 logs
U03	Number of flush cycles	Number of flush cycles performed * A flush cycle consists of liquid button operation (total 10 seconds) + foam button operation (total 3 seconds) in the flush mode except when no automatic dispensing action is made during the cycle. * To reset, press and hold the stop button for 3 seconds.	0	0 to 9999
U04	Number of keg replacements (reset frequency)	Reset frequency for number of mugs (*2) * Keg replacement is counted every time the number of kegs is reset by the stop button operation. * To reset, press and hold the stop button for 3 seconds.	0	0 to 9999
U05	Dispense lamp brightness	Adjustment of dispense lamp brightness	6	1 to 8
U06	Dispense lamp flashing duration	Adjustment of dispense lamp flashing duration after completion of dispensing * The dispense lamp flashes to prevent another mug is placed while foam is still dripping. * Automatic dispensing action is not available while the lamp is flashing.	1	0 to 10

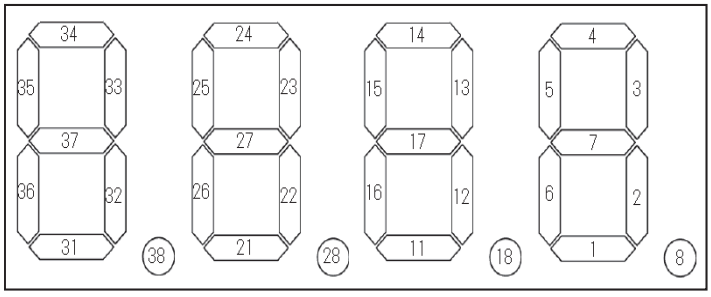
U07	Sold out sensor setting	0: Setting A (mainly beer) / threshold: 2.2V 1: Setting B (mainly cocktail) / threshold: 2.5V 2: Setting C (mainly cocktail) / threshold: 2.8V 3: Setting D (optional) / threshold: optional *The setting depends on the brand of beverage to dispense. Check with your dealer/supplier.	0	0 to 3
U08	Self mode setting	0: No 1: Yes (no button operation is available except dispense/stop button) *The self mode is reset when the manual dispensing mode is selected (by lifting up the operation panel unit). To resume the self mode, switch to the automatic dispensing mode (by pulling down the operation panel unit) and press the dispense button.	0	0 to 1
U09	Mug tilting operation	0: Yes (mug is tilted while beer is being dispensed) 1: No (mug is kept upright while beer is being dispensed)	0	0 to 1
U10	Reset number of mugs	0: Manual 1: Manual or when sold out sensor detects *To reset manually, press and hold the stop button for 3 seconds.	0	0 to 1
U90	Reset settings	Initialize only the user settings *To initialize, with “1” shown on the display, press and hold the stop button for 3 seconds. *If the settings are updated, “U90” appears on the display. If not updated, “0” appears again.	0	0 to 1

*1: When “U10” is set to “1”, only the current log will be reset.
*2: When “U10” is set to “1”, only the number of sold out will be counted. The number of 3-second stop button operation with the number of mugs or “U02” on the display will not be counted.

d. Check Mode – Service engineers use this mode to check the unit condition.

To enter the check mode:
Press and hold the flush and stop buttons for 3 seconds.

To enter the dispensing mode:
Press and hold the set button for 3 seconds, or press the flush and stop buttons.
The dispensing mode is also resumed if no operation is performed for more than 10 minutes.

<table>
<tr><th colspan="2">Item</th><th>Description</th><th>Default</th><th>Display Range</th></tr>
<tr><td>C01</td><td>Check version (main board)</td><td>Display main board version</td><td>–</td><td>–</td></tr>
<tr><td>C02</td><td>Check version (operation board)</td><td>Display operation board version</td><td>–</td><td>–</td></tr>
<tr><td>C03</td><td>Error log</td><td>Display log of errors and canceled dispensing operations
* Displayed in descending order
* Repeated errors are also recorded</td><td>–</td><td>E_ _
F_ _
(20 logs)</td></tr>
<tr><td>C04</td><td>Operation monitor (real-time)</td><td>Digitally display ON/OFF status of each input/output
1: Platform in lowest position
2: Platform in highest position
3: Beer tap slider in liquid dispensing position
4: Operation panel unit in manual mode
5: Beer tap slider in foam dispensing position
6: Sold out
7: Beer tap in center position
8: Larger mug detection (reed switch)
11: Stop button
12: Liquid button
16: Foam button
17: Dispense button
13: Set button
15: Flush button
21: Compressor
22: Fan motor
 

31: Pressure detection (set pressure ± 0.02MPa)
32: Pressure regulating valve operation</td><td></td><td></td></tr>
<tr><td>C05</td><td>Sold out monitor (real-time)</td><td>Display detected voltage (V) real-time (average per 0.45 sec)</td><td>–</td><td>–</td></tr>
<tr><td>C06</td><td>Condenser thermistor (real-time)</td><td>Display condensing temperature real-time (°C)</td><td>–</td><td>-20 to 90</td></tr>
</table>

C07	Ice storage detection [long] (real-time)	Display electrode detected value real-time	–	–
C08	Ice storage detection [short] (real-time)	Display electrode detected value real-time	–	–
C50	Model setting	Check model setting 1: Standard model	1	–

e. Adjust Mode – Service engineers use this mode to adjust the settings.

Note: Do NOT make changes in normal operation.

To enter the adjust mode:
Press and hold the set and stop buttons for 3 seconds.

To enter the dispensing mode:
Press and hold the set button for 3 seconds, or press the set and stop buttons.
The dispensing mode is also resumed if no operation is performed for more than 10 minutes.

Item		Description	Default	Display Range
A01	Mug tilt angle * For use of pitcher, etc.	Set platform tilt angle	120	50 to 120
A02	Manual beer tap slider operation	Manual operation of beer tap slider is available by liquid/foam button Same segment as operation monitor lights up while liquid/foam button is pressed	–	–
A03	Reset self mode	0: Priority on “U08” setting 1: Reset (“U08” to 0)	0	0, 1
A04	Display canceled dispensing operation (F1, F2, F3, F4)	0: Not display (but recorded in error log) 1: Display * F1: stop button, F2: manual, F3: sold out, F4: other * Available until next dispensing operation	0	0, 1
A05	Electrode setting for cooling water	0: Japan - freezing 2.50, melting 2.29 1: Other countries - freezing 2.34, melting 1.97 2: Variable (see “A06”, “A07”) * Both sides cannot be operated at the same time	0	0, 1, 2
A06	Electrode threshold for cooling water (freezing)	Electrode threshold for cooling water (freezing) * Check only if “A05” is set to 0 or 1 * Adjustable if “A05” is set to 2	(2.34)	0.60 to 3.10 / 0.01
A07	Electrode threshold for cooling water (melting)	Electrode threshold for cooling water (melting) * Check only if “A05” is set to 0 or 1 * Adjustable if “A05” is set to 2	(1.97)	0.60 to 3.10 / 0.01
A08	Sold out sensor threshold setting	Sold out sensor threshold setting (V) when “U07” is set to 3	2.95	0.60 to 3.10 / 0.01
A30	Coin mechanism setting	Not in use	0	0, 1, 2

A31	Coin mechanism type 1	Not in use	0	0, 1
A32	Coin mechanism type 2	Not in use	0	0, 1
A40	Foam button operation to reset sold out	Duration to press and hold foam button to cancel sold out * Need to press foam button once even if set to 0 sec	0	0 to 20 / 1
A80	Adjust mode	Not in use	0	0 to 9999 / 1
A90	Reset settings (user settings)	Same as “U90”	0	0, 1
A91	Reset settings (check mode & adjust mode)	Initialize check mode and adjust mode settings to defaults With “1” on display, press and hold stop button for 3 sec --> “A91” on display * “C03” error log will also be deleted * “U02” to “U04” logs and beer amount setting will not be deleted	0	0, 1

A01: The platform tilt angle is adjustable to prevent a mug from touching the beer tap.

A02: As mentioned in (24) of “9. SERVICE DIAGNOSIS”, if the beer tap slider does not go back to the center position to fit the tap handle, the motor must be removed to move the beer tap slider back to the center position. While “A02” is selected, press the liquid/foam button to move the beer tap slider to any position without removing the motor. Not used in normal operation.

A03: Normally, the self mode is reset by lifting up the operation panel unit. If it cannot be moved, use “A03” to reset the self mode.

A04: The administrator can check the dispensing operations canceled, for example, by customers in the self mode.

A05 to A07:

The ice storage condition is checked by the electric conductivity of cooling water. The threshold of the electric conductivity is adjustable. Not used in normal operation.

A08: The setting D of the user setting (U07) is adjustable.

A30 to A32:

Not used in normal operation.

A40: After keg replacement, if beer foam is not led to the beer tap enough, beer may splash out of the beer tap. To prevent this, the foam button must be pressed and held for this duration to cancel the sold out condition.

* The longer the duration is adjusted, the more beer is wasted to lead beer foam to the beer tap. Customer approval is required before adjustment.

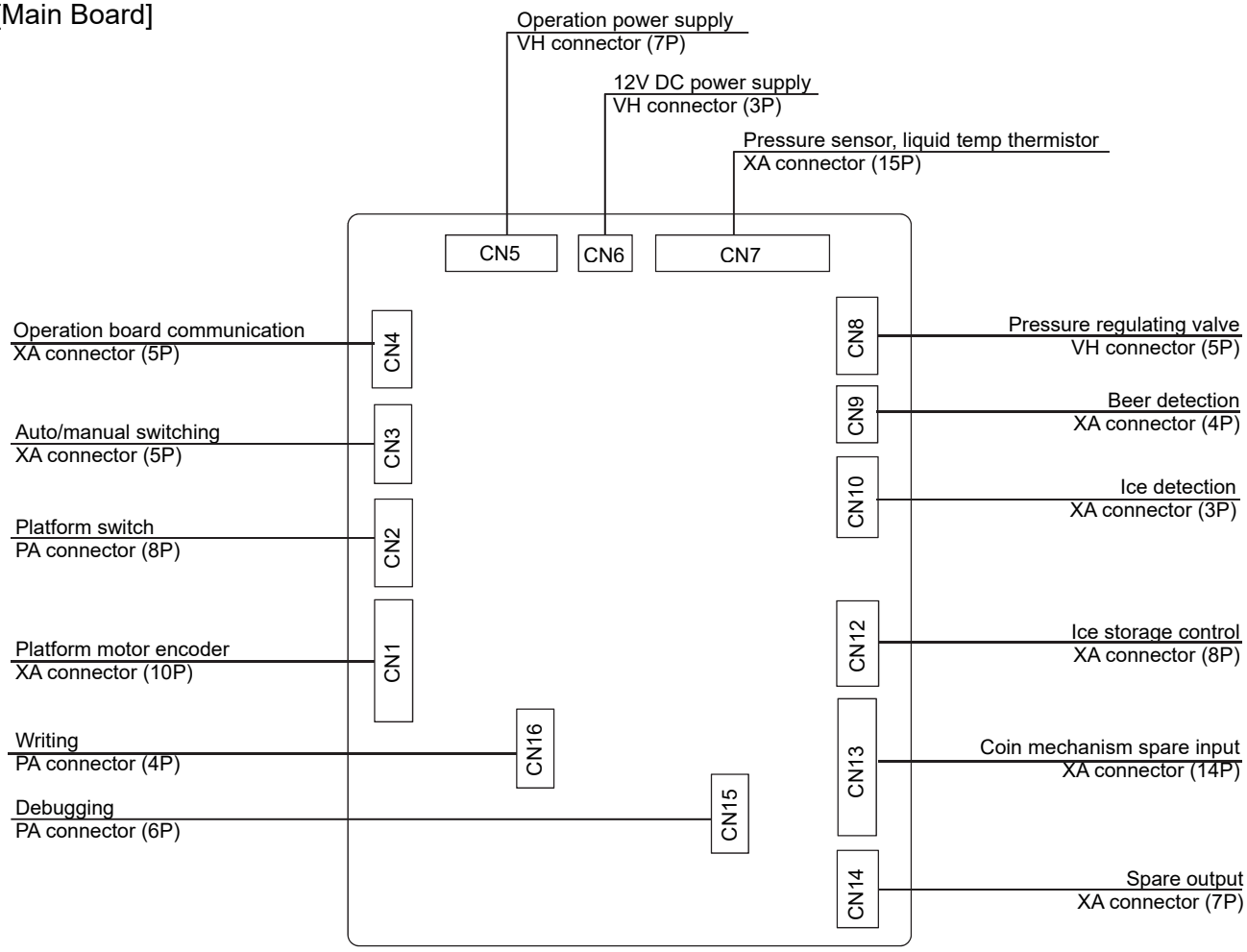
A80: Not in use.

A90, A91:

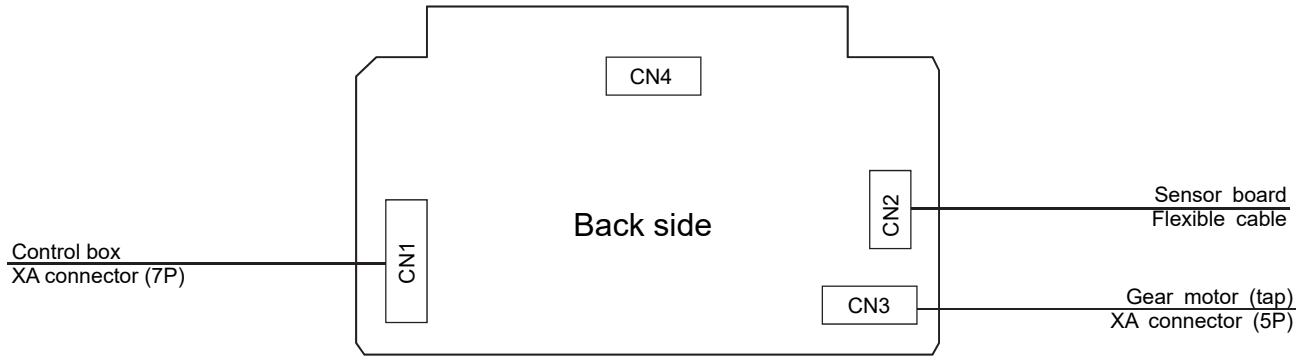
To leave the settings as they are and delete the logs (U02, U03, U04, C03) only, press and hold the set and flush buttons, turn off the breaker, and turn it back on. The beer amount setting will not be deleted.

(3) INPUT/OUTPUT

[Main Board]

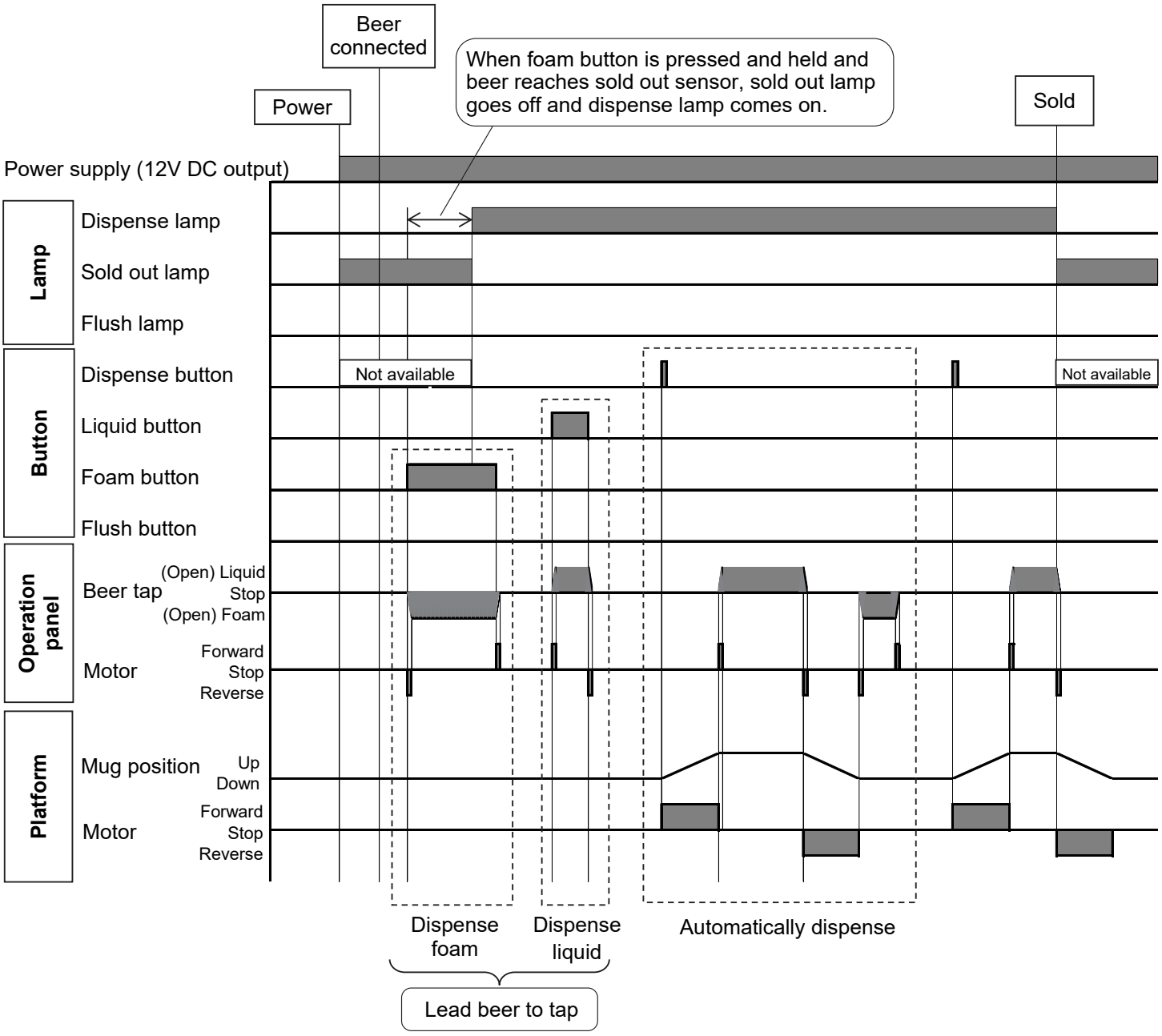


[Operation Board]

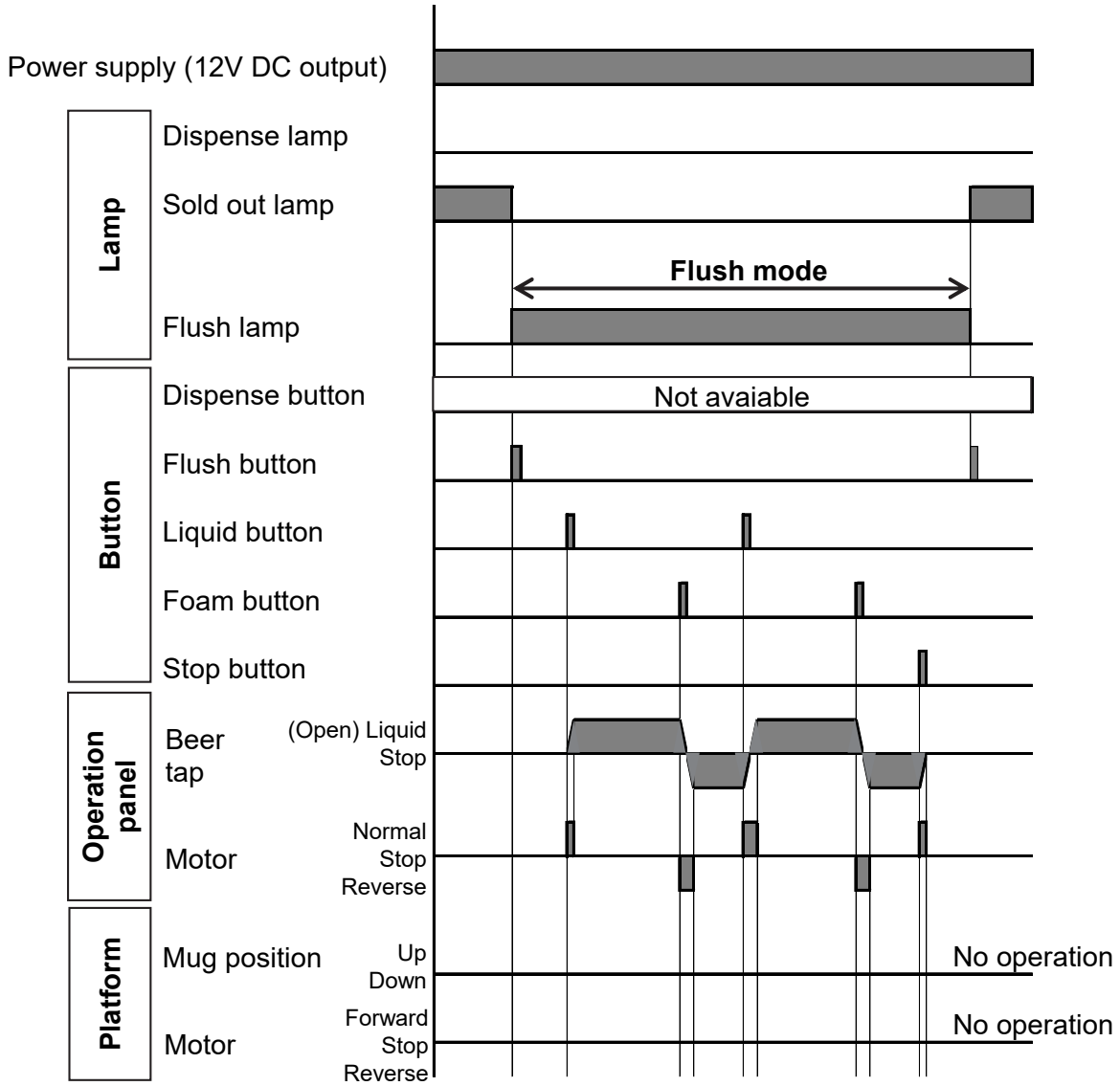


(4) TIMING CHART

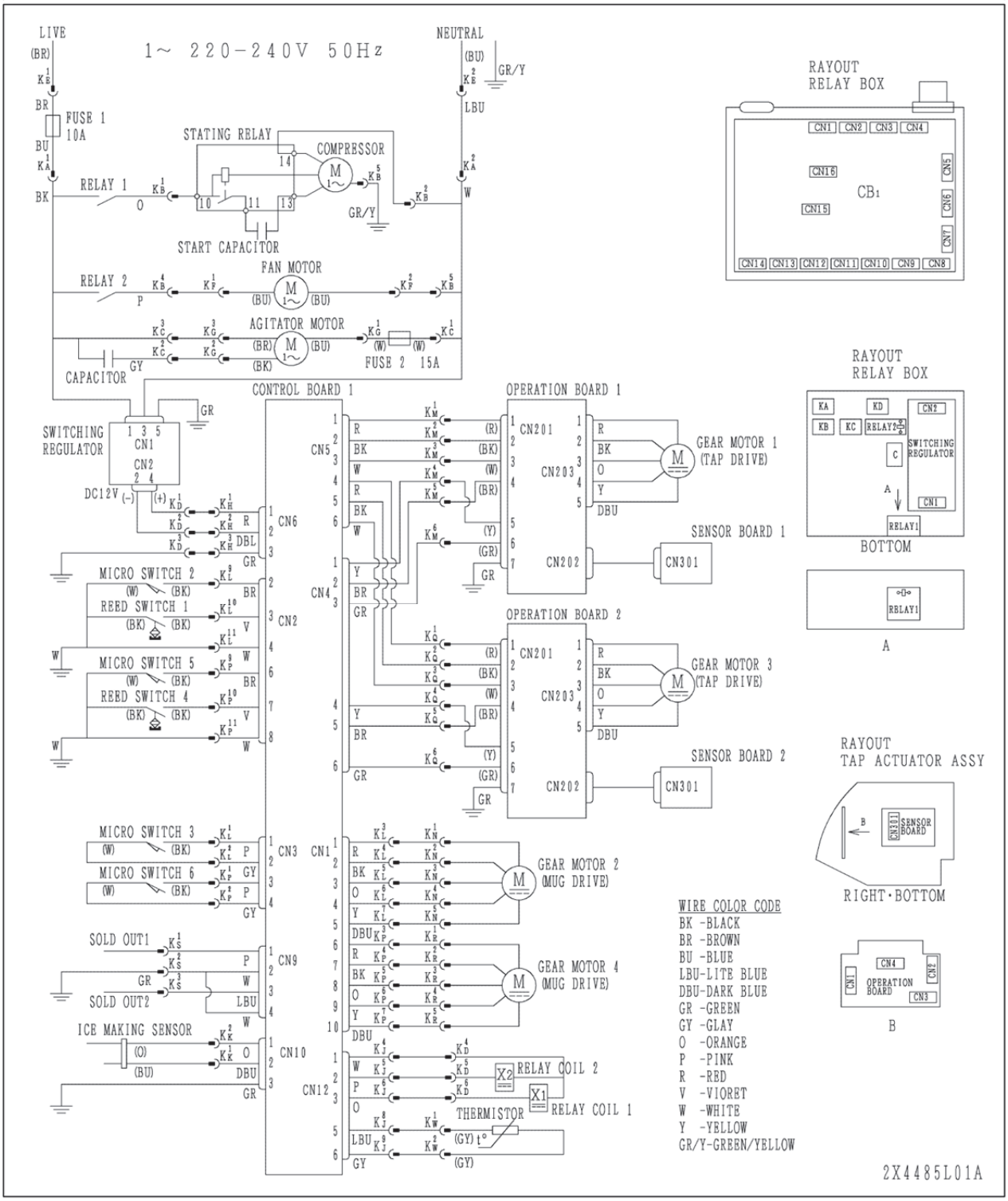
[Ready <--> Sold out]



[Flush]

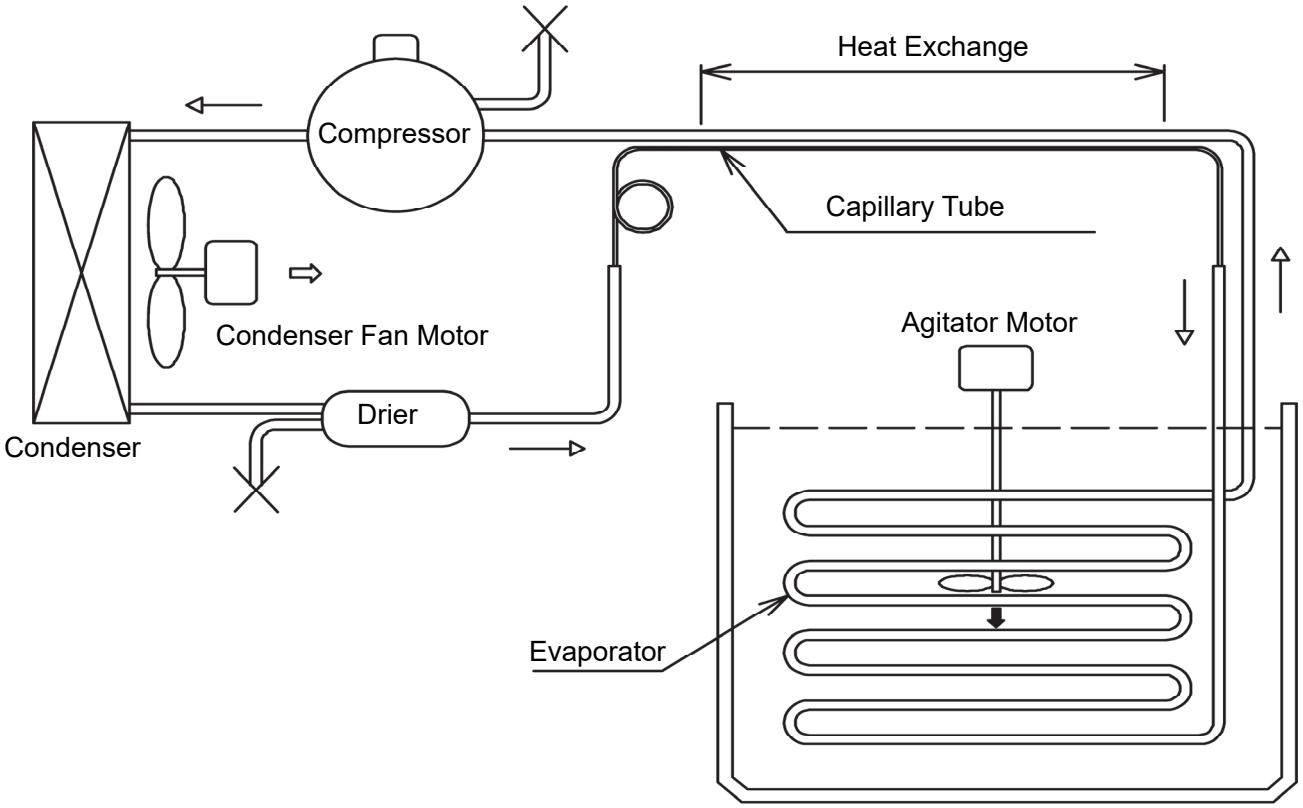

Power supply (12V DC output)
Lamp
Dispense lamp
Sold out lamp
Flush mode
Flush lamp
Button
Dispense button
Not avaiable
Flush button
Liquid button
Foam button
Stop button
Operation panel
Beer tap
(Open) Liquid
Stop
Motor
Normal
Stop
Reverse
Platform
Mug position
Up
Down
No operation
Motor
Forward
Stop
Reverse
No operation

6. WIRING DIAGRAM

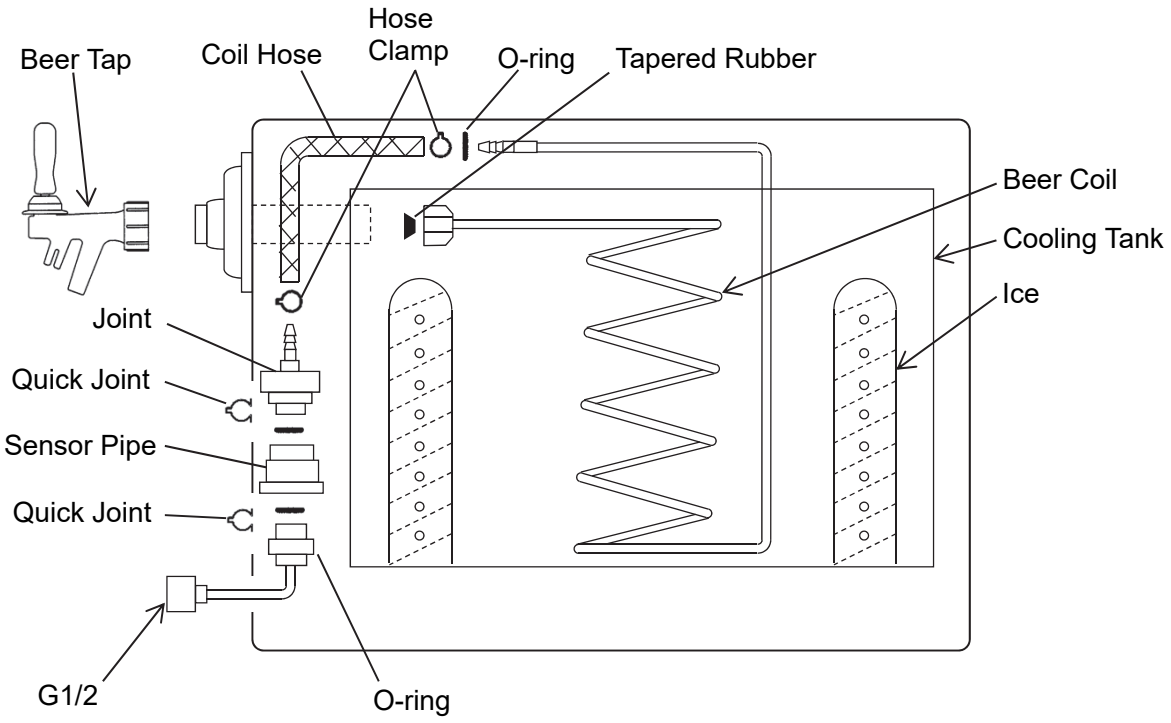


7. CIRCUITS

(1) REFRIGERATION CIRCUIT



(2) BEER CIRCUIT



SERVICE INFORMATION

8. ERROR DIAGNOSIS

When the unit detects an error, the display on the operation panel shows one of the following error codes. See “9. (23) Display shows error” for the remedies.

Priority	Code	Error	Motors stop	Display	Error log (Check mode "C3")	Possible cause and remedy
High ↑	E10 E60 E61	Main board error		Yes	No	Main board defective -->Turn off power supply and turn it back on, or replace board.
	E11	Operation board error	-	Yes	No	Operation board defective --> Turn off power supply and turn it back on, or replace board.
	E12	Communication error	Yes	-	Yes	Communication error between main and operation boards --> Check contact of connectors and wires.
	E22	Hall voltage error (open circuit, short circuit)	Yes (3 times in a row)	-	Yes	Open or short circuit of sensor board wiring --> Check contact of connectors and wires.
	E20	Encoder error	Yes (3 times in a row)	-	Yes	Operation panel unit motor failure --> Check for seized or jammed beer tap.
	E21	Hall element error	Yes (3 times in a row)	-	Yes	Operation panel unit not in center position --> Check for seized beer tap, valve shaft spring out of position or sensor board error.
	E31	Descending platform error	Yes (3 times in a row)	-	Yes	Failure to detect platform's lowest position --> Check for microswitch failure
	E40	Pressure sensor error	Yes	-	Yes	Abnormal pressure level --> Short or open circuit of wires, sensor malfunction
	E41	Abnormal liquid thermistor	-	Yes	Yes	Open or short circuit of liquid thermistor --> Replace thermistor.
	F1	Canceled dispensing (operation button)	-	Yes (*1)	Yes (*2)	Canceled automatic dispensing operation * Error log is recorded for each cancellation to identify cause of failure to dispense a preset amount of beer. * When "A04" is set to "1", every cancellation is displayed.
	F2	Canceled dispensing (lift up operation panel unit)	-	Yes (*1)	Yes (*2)	
	F3	Canceled dispensing (sold out)	-	Yes (*1)	Yes (*2)	
	F4	Canceled dispensing (other)	-	Yes (*1)	Yes (*2)	
↓	E51	Condenser thermistor error	-	Yes	Yes	Open or short circuit of condenser thermistor --> Replace thermistor.
	E52	Condenser high temperature error	-	Yes	Yes	Insufficient condensation --> Check for clogged filter or air inlet/outlet.
Low	E30	Ascending platform error	-	-	Yes	Failure to detect platform's highest position --> Check for jammed mug.

*1 Canceled dispensing (F1 to F4) is displayed only when "A04" is set to "1". Error log is recorded regardless of the display setting.
*2 When dispensing is canceled (F1 to F4) and an error occurs at the same time, only error log is recorded.
*3 When an error occurs with the number of mugs on display, both are displayed alternately.

9. SERVICE DIAGNOSIS

Beer

(1-a) Beer is not cold - No ice is stored and no cooling water is available

(1-b) Beer is not cold - Cooling water is available, but no ice is stored

(1-c) Beer is not cold - Insufficient ice is stored

(1-d) Beer is not cold - Sufficient ice is stored, but beer is not cold

(2) No beer is dispensed

(3) Beer will not stop

(4) Beer tap keeps dripping beer

(5) Underfoaming

(6) Overfoaming

(7) Large bubbles

(8) Beer tastes strange (watery)

CO_2 cylinder

(9) Cylinder runs out of gas easily

Leak

(10) Cooling water mixed with beer comes out of overflow pipe on unit front

(11) Beer tap joint leaks beer

(12) Unit leaks water

Electrical

(13) Abnormal noise - Unplug the unit immediately

(14) Burning smell - Unplug the unit immediately

(15) After unit is turned on, refrigeration circuit clicks every 3 - 5 minutes
Condenser fan motor is running, but beer is not cold

(16) Main power supply earth leakage circuit breaker trips

(17) Unit is turned on, but condenser fan motor will not run

(18) Instructions for handling controller board

(19) Thermistor service diagnosis

Before making service diagnosis

(20) Beer will not stop

(21) Dispensed amount is different from preset amount

(22) Motors will not operate normally

(23) Display shows error

(24) Operation panel unit will not go down completely

(25) Operation panel unit goes down, but dispense button will not light up with “OFF” displayed

(26) Beer remains in keg, but sold out lamp lights up

No beer remains in keg, but sold out lamp will not light up

(27) Adjustment of platform and reed switch (for mug size detection)

Beer

(1-a) Beer is not cold - No ice is stored and no cooling water is available

Possible Cause	Remedy
1. Refrigeration circuit will not start.	
1-1 Power supply off.	1-1 Check that unit is plugged in and main power supply leakage circuit breaker (if provided) is not off.
1-2 Low voltage	1-2 Check voltage at plug. If 90V or less, change wiring connections to make it 90V or more.
1-3 Voltage drop by shared power supply.	1-3 Use separate power supply.
1-4 Overload relay damaged by low voltage.	1-4 Replace overload relay. Check voltage at plug. If 90V or less, change wiring connections to make it 90V or more.
1-5 Open circuit.	1-5 Check open point.
1-6 Cooling water leaks.	1-6 Check and repair. Fill water tank until water starts leaking from overflow pipe.
1-7 Defective ice storage control.	
1-7-1 Scaled electrode.	1-7-1 Replace contaminated cooling water. If electrode is browned, blackened or dirty, polish electrode (do not change its location).
1-7-2 Electrode lead has open circuit or bad contact.	1-7-2 Repair.
1-7-3 Damaged controller board.	1-7-3 Replace. See (18) of “9. SERVICE DIAGNOSIS”.
1-7-4 Damaged transformer.	1-7-4 Replace.
1-8 Defective compressor	1-8 Replace.
1-9 Clogged condenser.	1-9 Clean condenser and air filter.
1-10 Condenser fan will not turn.	
1-10-1 Open circuit or unplugged.	1-10-1 Rewire or plug in.
1-10-2 Damaged fan motor.	1-10-2 Replace.
1-10-3 Blocked fan.	1-10-3 Unblock.
1-10-4 Condenser low temperature detected.	1-10-4 Wait for a while.
1-11 Poor ventilation.	1-11 Poor ventilation causes lower cooling capacity and longer ice storage time. Allow at least 43mm clearance at both sides and 50mm at rear of unit.
2. Refrigeration circuit leaks refrigerant (evaporator will not refrigerate).	2. Locate and repair leaks. Evacuate refrigeration circuit and recharge. See nameplate for proper refrigerant charge. Note: Extend vacuum pump operation to raise vacuum.
3. Clogged capillary tube	3. Replace heat exchanger and drier. If clogged, ice may start forming in the middle of capillary tube.
4. Cooling water quality	4. Cooling does not start with water having low conductivity.
4-1 Cooling water has low conductivity.	4-1 Replace cooling water with water having proper conductivity. See “13. MAKING AND SUPPLYING COOLING WATER”.
4-2 Cooling water added with ice.	4-2 Melted ice water has low conductivity. Replace cooling water with water having proper conductivity.
5. Defective controller board	5. Restart.

Beer

(1-b) Beer is not cold - Cooling water is available, but no ice is stored

Possible Cause	Remedy
1. Dispensing operation exceeds unit's capacity.	1. Instruct user to operate unit within its specified capacity.
2. Unit was not properly conditioned before operating hours.	2. Before initial operation or operation after stopped unit for a long period, condition unit to store enough ice.
3. Cooling water has low conductivity.	3. Cooling does not start with water having low conductivity.
3-1 Cooling water has low conductivity.	3-1 Replace cooling water with water having proper conductivity. See "13. MAKING AND SUPPLYING COOLING WATER".
3-2 Cooling water added with ice.	3-2 Melted ice water has low conductivity. Replace cooling water with water having proper conductivity.

(1-c) Beer is not cold - Insufficient ice is stored

Possible Cause	Remedy
1. Continuous control operation with no load. Continuous control operation without dispensing beer may change ice shape and reduce ice at evaporator top or bottom.	1. In early spring and winter, low ambient temperature tends to decrease refrigerant gas pressure and gas circulation in refrigeration circuit, causing less ice storage volume. Ice at evaporator bottom may decrease. But after beer is dispensed and ice melts, normal ice storage volume is resumed in the following freeze cycle. Even when ice storage volume decreases, beer dispensing capacity meets specifications.
2. Refrigeration circuit leaks refrigerant (evaporator will not refrigerate).	2. Locate and repair leaks. Evacuate refrigeration circuit and recharge. See nameplate for proper refrigerant charge. Note: Extend vacuum pump operation to raise vacuum.
3. Clogged capillary tube.	3. Replace heat exchanger and drier. If clogged, ice may start forming in the middle of capillary tube.
4. Poor ventilation.	4. Poor ventilation causes lower cooling capacity and longer ice storage time. Allow at least 43mm clearance at both sides and 50mm at rear of unit.
5. Defective thermistor.	5. See (19) of "9. SERVICE DIAGNOSIS"

(1-d) Beer is not cold - Sufficient ice is stored, but beer is not cold

Possible Cause	Remedy
1. Defective cooling water agitator motor.	
1-1 Open circuit and bad contact.	1-1 Repair.
1-2 Burnt out agitator motor.	1-2 Replace agitator motor.
1-3 Defective agitator motor blade.	1-3 Replace agitator motor blade.
2. Cooling water not circulating properly. Defective heat exchanger.	
2-1 Dirty cooling water.	2-1 Clean water tank and replace cooling water.
2-2 Clogged water tank filter.	2-2 Clean water tank and filter and replace cooling water.
2-3 Low cooling water level. (check water level below overflow level)	2-3 Add cooling water.

Beer

(2) No beer is dispensed

Possible Cause	Remedy
1. Frozen beer cooling line.	
1-1 Damaged controller board.	1-1 See instructions for handling controller board. (See (18) of “9. SERVICE DIAGNOSIS”.)
1-2 Electrode out of position. Electrode is too close to beer coil.	1-2 Reposition electrode. (See “10. Parts”.)
1-3 Dirty cooling water (mixture of beer in water tank causes freezing).	1-3 Cooling water mixed with beer will be entirely frozen. Repair leaks and replace cooling water.
2. Beer tap will not move smoothly.	
2-1 Valve shaft sliding failure.	2-1. Disassemble and clean beer tap. Completely deburr beer tap. Especially deburr and chamfer edge of lever insert hole in valve shaft sliding part.
2-2 Abrasion powder in spherical lever bearing.	2-2. Remove lever from beer tap to polish spherical bearing.
3. No CO2 gas in beer keg.	
3-1 Empty CO2 gas cylinder.	3-1 Replace CO2 gas cylinder.
3-2 Closed main valve of CO2 gas cylinder.	3-2 Open main valve of CO2 gas cylinder.
3-3 Closed keg coupler handle.	3-3 Open keg coupler handle.
4. Beer circuit clogged with cleaning sponge or foreign matter.	4. Flush from beer tap to unclog beer circuit.
5. Empty beer keg.	5. Replace beer keg.

(3) Beer will not stop

Possible Cause	Remedy
1. Rubber seal fell off beer tap valve shaft.	1. Disassemble beer tap and attach rubber seal on valve shaft.
2. Beer tap valve shaft cannot return to original position. Valve shaft sliding failure.	2. Disassemble and clean beer tap. Completely deburr beer tap. Especially deburr and chamfer edge of lever insert hole in valve shaft sliding part.
3. CO2 gas pressure too low.	3. Adjust CO2 gas pressure to proper level. The chart below is general example. Adjust to gas pressure specified by beer manufacturer.

Temperature of beer keg	CO2 gas pressure
10°C	0.20MPa
20°C	0.22MPa
30°C	0.32MPa

Beer

(4) Beer tap keeps dripping beer

Possible Cause	Remedy
1. Damaged or deformed rubber seal in beer tap valve shaft.	1. Replace rubber seal.
2. Damaged beer tap valve shaft.	2. Replace valve shaft.
3. Loosened rubber seal in valve shaft.	3. Disassemble beer tap and fix rubber seal.
4. Beer tap valve shaft will not move smoothly. 4-1 Valve shaft sliding failure. 4-2 Abrasion powder in spherical lever bearing.	4-1. Disassemble and clean beer tap. Completely deburr beer tap. Especially deburr and chamfer edge of lever insert hole in valve shaft sliding part. 4-2. Remove lever from beer tap to polish spherical bearing.
5. CO2 gas pressure too low.	5. Adjust CO2 gas pressure to proper level.

(5) Underfoaming

Possible Cause	Remedy
1. CO2 gas pressure too low.	1. Adjust CO2 gas pressure to proper level. The chart below is general example. Adjust to gas pressure specified by beer manufacturer. Temperature of beer keg / CO2 gas pressure 10°C / 0.20MPa 20°C / 0.22MPa 30°C / 0.32MPa
2. Beer dispensing manner.	2. Instruct user to make foam.
3. Beer too cold. In winter, low beer temperature causes underfoaming even after dispensing foam.	3. Instruct user to make foam. Instruct user to keep temperature of beer keg above 10°C.

Beer

(6) Overfoaming

Possible Cause	Remedy
1. Beer keg temperature too high. Improper CO2 gas pressure for keg temperature.	1. Refrigerate keg below 30°C and apply proper gas pressure. Instruct user on keg temperature control.
2. CO2 gas pressure too high or too low. 2-1 Low CO2 gas pressure causes beer to bubble in beer hose. 2-2 High CO2 gas pressure causes gas to dissolve in beer.	2-1 Adjust CO2 gas pressure to proper level. 2-2 In winter, gas easily dissolves in beer resulting in supersaturation. Be sure to close main valve of CO2 gas cylinder after operating hours.
3. Beer is dispensed with foam dripping into beer mug (common case).	3. After dispensing beer, wait until beer tap stops dripping remaining foam before placing another mug. Dispense lamp flashing duration can be extended by user setting “U06” as required (to complete dispensing action after beer tap stops dripping foam).
4. Foam touching beer tap liquid nozzle. Coarse foam is generated when liquid is dispensed.	4. Adjust platform position to prevent foam in mug from touching liquid nozzle.
5. Foaming set to start at low liquid level. Coarse foam is generated when liquid level is too far from foam nozzle.	5. Adjust to dispense foam at higher liquid level. To raise liquid level during beer amount setting, add liquid (dispense liquid while lowering platform) after setting the first liquid amount.
6. Too much vibration on beer keg.	6. Wait for at least 1 hour. Instruct user to keep beer keg cool and still.
7. Dispensing operation exceeds unit’s capacity.	7. Instruct user to operate unit within its specified capacity.
8. Beer circuit clogged with cleaning sponge or foreign matter.	8. Flush from beer tap to unclog beer circuit.
9. Small vent hole at beer tap nozzle bottom clogged with beer residue, leaving foam and liquid inside nozzle.	9. Disassemble beer tap and unclog small vent hole.
10. Defective seal gasket in keg coupler.	10. Replace gasket.
11. Defective backflow preventing ball (rubber) in keg coupler.	11. Replace defective part.
12. Beer mug not clean.	12. Use clean mug.

Beer

(7) Large bubbles

<table>
<tr><th>Possible Cause</th><th>Remedy</th></tr>
<tr><td>1. Beer circuit and beer tap not washed thoroughly.</td><td>1. Rinse thoroughly with tap water.</td></tr>
<tr><td>2. Little gas dissolved in beer.</td><td>2. Adjust CO2 gas pressure to proper level.
The chart below is general example.
Adjust to gas pressure specified by beer manufacturer.
<table><tr><th>Temperature of beer keg</th><th>CO2 gas pressure</th></tr><tr><td>10°C</td><td>0.20MPa</td></tr><tr><td>20°C</td><td>0.22MPa</td></tr><tr><td>30°C</td><td>0.32MPa</td></tr></table></td></tr>
<tr><td>3. Mug soiled with grease.</td><td>3. Wash mug thoroughly with detergent. Instruct user to store mugs in clean place.</td></tr>
<tr><td>4. Air mixed in.
4-1. Air comes in from tap lever bottom.

4-2. Air comes in from valve shaft sliding part.</td><td>
4-1. Securely tighten union nut at tap lever bottom. Replace gasket.
4-2. Beer tap is damaged by valve shaft burrs. Deburr valve shaft and replace beer tap.</td></tr>
</table>

(8) Beer tastes strange (watery)

<table>
<tr><th>Possible Cause</th><th>Remedy</th></tr>
<tr><td>1. Little gas dissolved in beer.</td><td>1. Adjust CO2 gas pressure to proper level.
The chart below is general example.
Adjust to gas pressure specified by beer manufacturer.
<table><tr><th>Temperature of beer keg</th><th>CO2 gas pressure</th></tr><tr><td>10°C</td><td>0.20MPa</td></tr><tr><td>20°C</td><td>0.22MPa</td></tr><tr><td>30°C</td><td>0.32MPa</td></tr></table></td></tr>
<tr><td>2. Beer circuit and beer tap not washed thoroughly.</td><td>2. Wash beer tap and beer circuit thoroughly.
(Dry well after washing.)</td></tr>
<tr><td>3. Mug not washed thoroughly.</td><td>3. Wash mug thoroughly with detergent.</td></tr>
</table>

CO2 cylinder

(9) Cylinder runs out of gas easily

Reference: Approx. 900L of beer is available with a 10kg cylinder at 0.3MPa.

Possible Cause	Remedy
1. CO2 gas leak.	
1-1 Gasket out of position and tightening nut loosened at pressure reducing valve and cylinder connection.	1-1 If gasket is damaged, replace. Securely tighten tightening nut using spanner and apply soapy water to check for CO2 gas leak.
1-2 Loose gas hose connection to quick gas hose joint.	1-2 Properly cut gas hose and securely connect it to quick gas hose joint.
1-3 Defective gasket in keg coupler	1-3 Replace gasket.
1-4 Loose gas hose joint.	1-4 Securely tighten gas hose joint.

Leak

(10) Cooling water mixed with beer comes out of overflow pipe on unit front

Possible Cause	Remedy
1. Beer leaking from joint nut on beer coil connected to tap mounting shaft inside cooling water tank.	1. Check for damaged taper gasket at joint nut. If there is no damage, reassemble. If damaged, replace.

(11) Beer tap joint leaks beer

Possible Cause	Remedy
1. Beer leaking from union nut of beer tap.	1. Remove beer tap and check for damaged O-ring. If there is no damage, reassemble. If damaged, replace.

(12) Unit leaks water

Possible Cause	Remedy
1. Cooling water overflowing drain pan.	1. Instruct user to empty drain pan frequently. * Overflowing water only stays in right drain pan. Even when using only left beer tap, do not remove right drain pan.
2. Condensate leaking from unit.	2. Instruct user to maintain ambient humidity at 84% or less. Tightly wrap refrigeration circuit with insulation pipe.

Electrical

(13) Abnormal noise - Unplug the unit immediately

Possible Cause	Remedy
1. Blocked condenser fan.	1. Unblock.
2. Agitator motor and condenser fan motor resonating.	2. Tighten mounting screws of agitator motor and condenser fan motor to prevent resonance. Fix resonating parts.
3. Aged agitator motor bearing.	3. Replace agitator motor (ensure proper installation and wiring).
4. Water flowing (draining) sound in water tank.	4. Fill water tank with cooling water.

(14) Burning smell - Unplug the unit immediately

Possible Cause	Remedy
1. Burnt out agitator motor.	1. Check for inadequate rotation and replace agitator motor (ensure proper installation and wiring).
2. Overheated or burnt out condenser fan motor.	2. If fan is blocked, unblock and check fan for proper movement and fan motor. If burnt out, replace condenser fan motor.

(15) After unit is turned on, refrigeration circuit clicks every 3 - 5 minutes Condenser fan motor is running, but beer is not cold

Possible Cause	Remedy
1. Defective compressor.	1. If compressor is locked, replace.
2. Overload relay tripped by voltage drop.	2. Do not share power supply, but use separate power supply. * During initial ice storage operation, overload relay may be tripped temporarily by high water tank temperature, but will automatically reset to resume ice storage operation.
3. Power supply was turned off and turned back on immediately.	3. Wait a few minutes with power on. Check refrigeration circuit for proper operation. (Wait at least 5 minutes to restart unit.)

(16) Main power supply earth leakage circuit breaker trips

Possible Cause	Remedy
1. Electric leak by dust or moisture on control terminals.	1. Remove dust or moisture and make proper earth connection.
2. Disconnected wiring or bad contact.	2. Wire properly.
3. Agitator motor winding insulation failure.	3. Replace agitator motor.
4. Condenser fan motor winding insulation failure.	4. Replace condenser fan motor.
5. Compressor winding insulation failure.	5. Replace compressor.

Electrical

(17) Unit is turned on, but condenser fan motor will not run

Possible Cause	Remedy
1. Low ambient temperature	1. When air temperature is 10°C or less, low temperature control operates. Wait a few minutes to restart the condenser fan motor.

(18) Instructions for handling controller board

* Instructions for service engineer

a. Notes

If receiving a service call, ask the user to turn off the power to the unit and turn it back on after 30 seconds. This will reset the controller, and in some cases normal operation will resume.

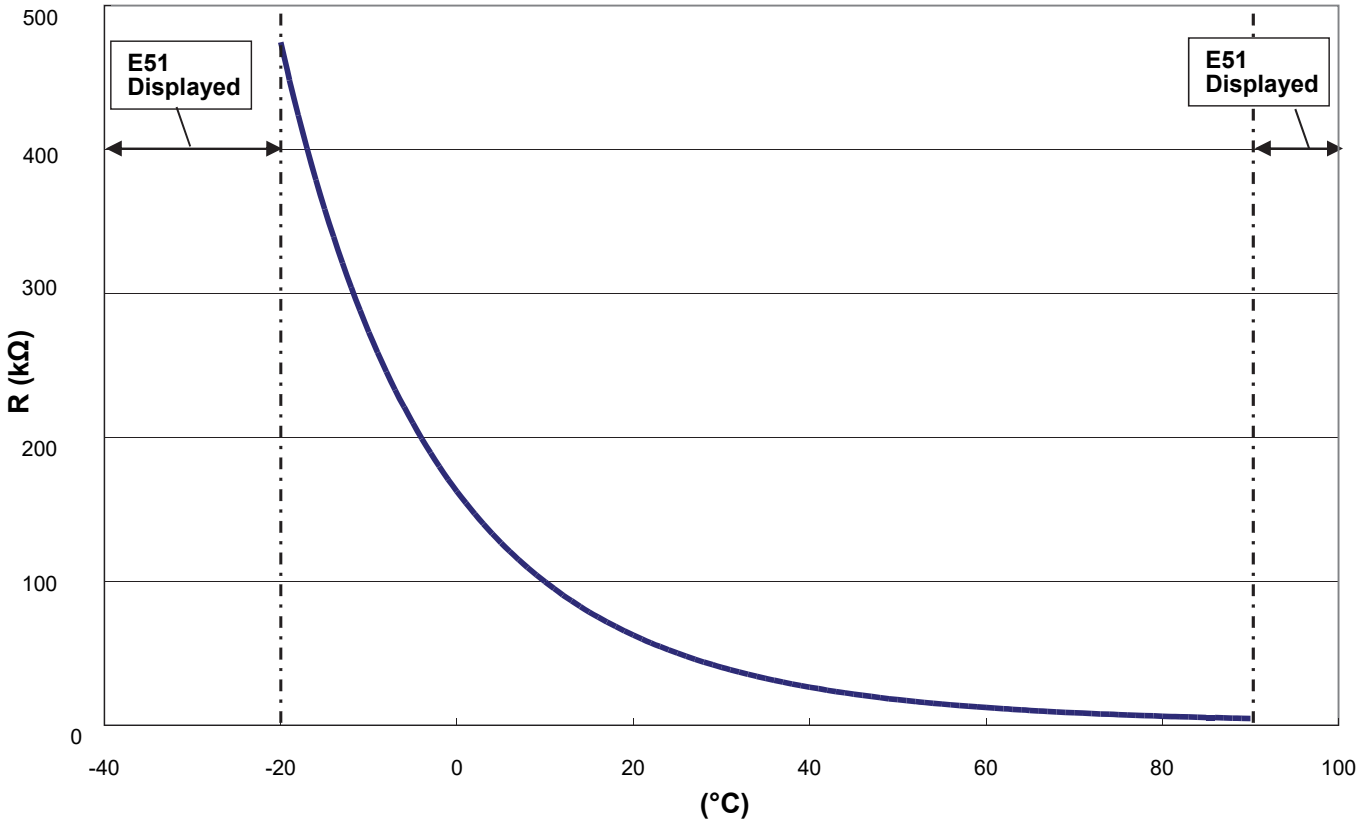
b. Servicing

1) Check that the unit has been earthed properly. If not, the controller board will not work properly.
2) To get static free, always touch the metal part of the unit before servicing. Electrostatic discharge will cause severe damage to the controller board. Also, keep things that produce static electricity (e.g. vinyl bag or plastic product) away from the controller board.
3) Do not touch the electronic devices on the controller board or the back of the controller board.
4) The controller board and thermistor can be replaced separately.
5) Handle the controller board by the edges only. Do not touch the electronic parts and wiring.
6) Do not drop the controller board on the floor. The controller board is fragile.
7) Put the controller board on a flat surface and prevent damage to the electronic parts and devices.
8) Do not pull wires with thin insulation to prevent damage.
9) Do not short the relay output.
10) Do not pull connectors to prevent disconnection or damage to the wires. Check that the connectors are fixed after servicing.
11) The thermistor wire is single. Do not bend or stretch it too much.
12) Be careful not to pinch or crush the thermistor and thermistor wire. The insulation may be damaged and cause short circuit.

Electrical

(19) Thermistor service diagnosis

When the thermistor has a trouble, the display shows the error code “E51”. (See “8. ERROR DIAGNOSIS”.)



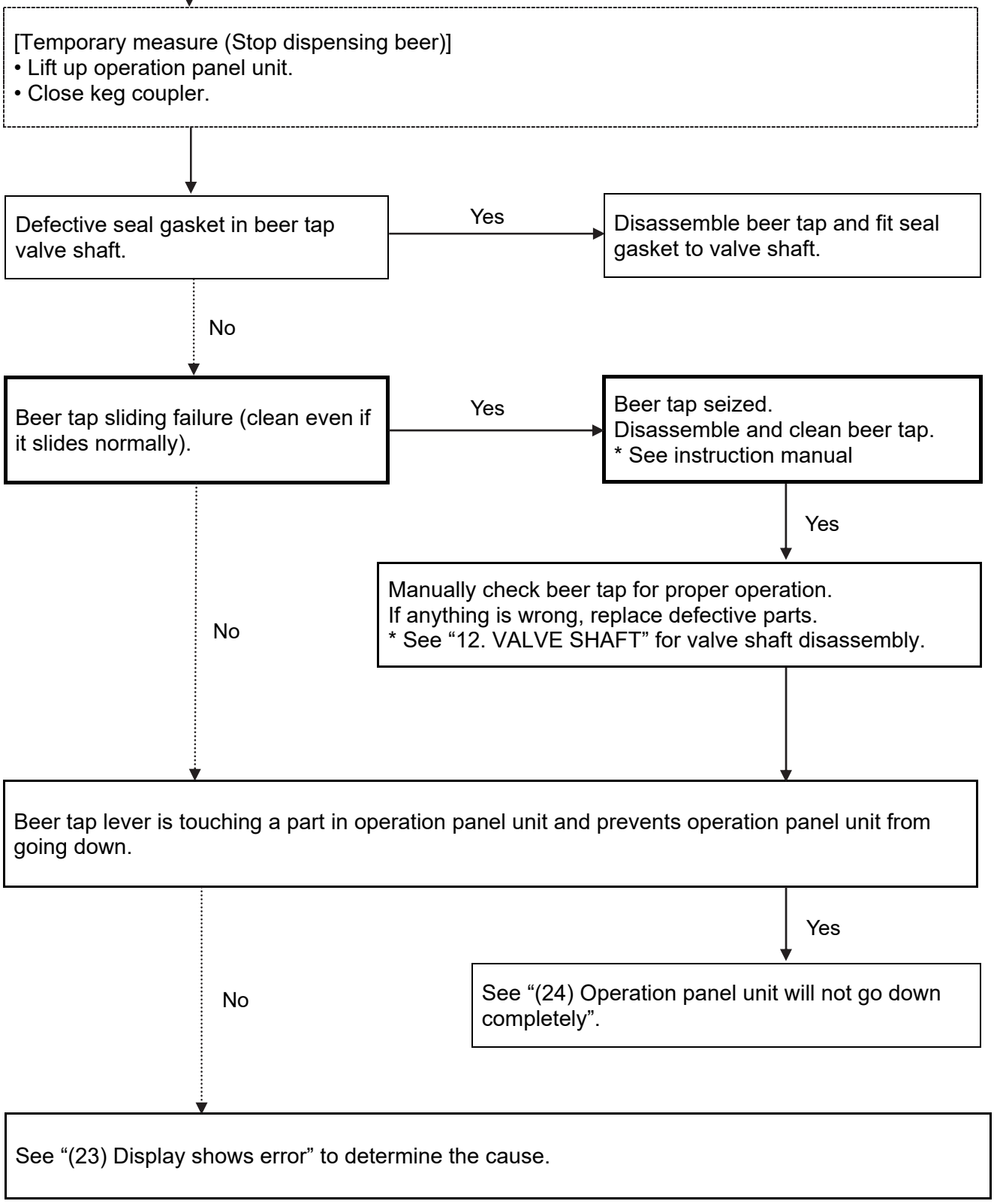
Before making service diagnosis

1) Check the digital display on the operation panel. See “8. ERROR DIAGNOSIS”.
   After checking, turn on the power supply and turn it back on.

2) For double tap models, if one side goes wrong, operation can be checked by replacing the left and right parts (such as beer taps, motors, and sensors) one by one.

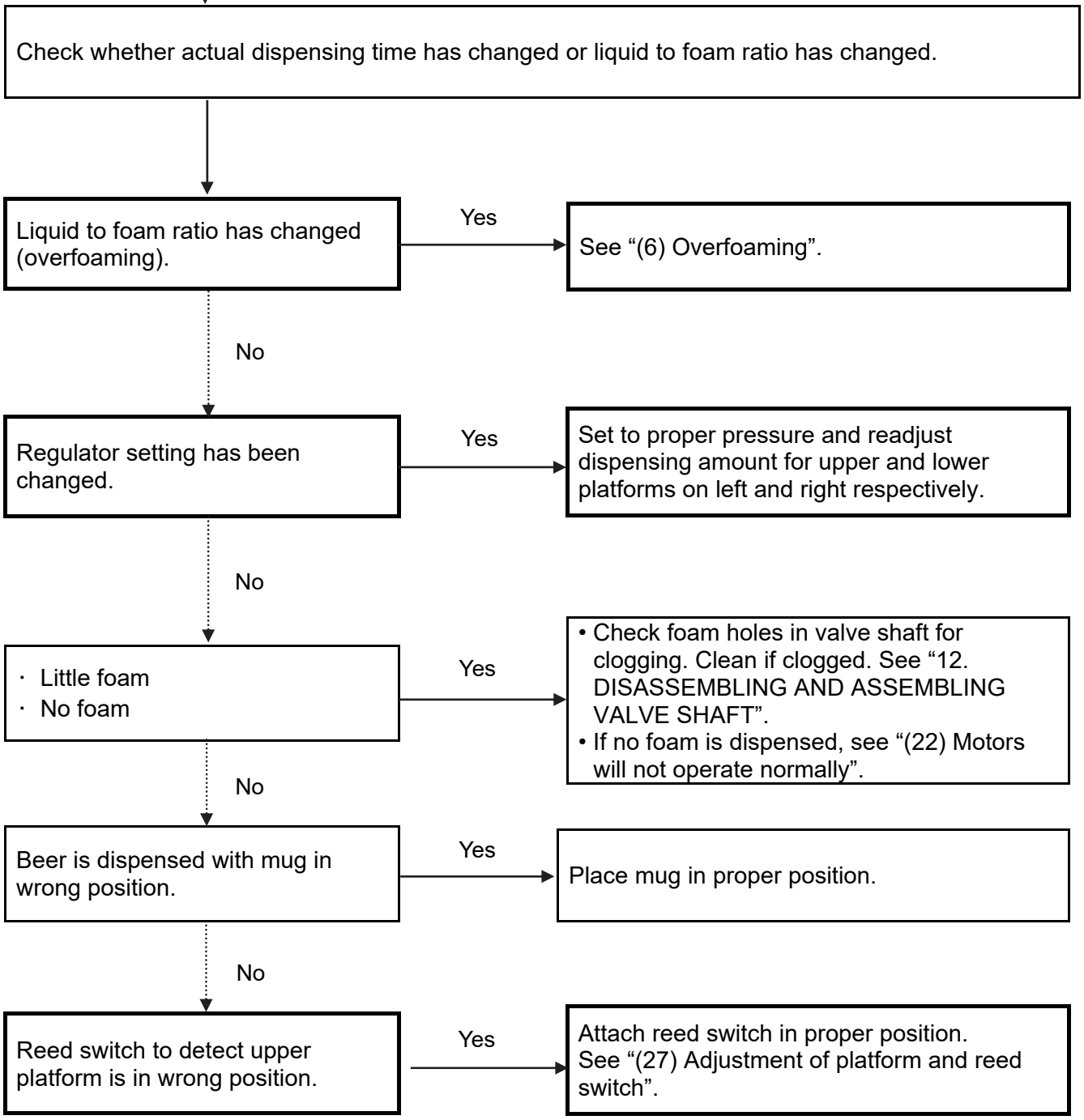
(20) Beer will not stop

*** Thick frames show common cases.**



(21) Dispensed amount is different from preset amount

*** Thick frames show common cases.**

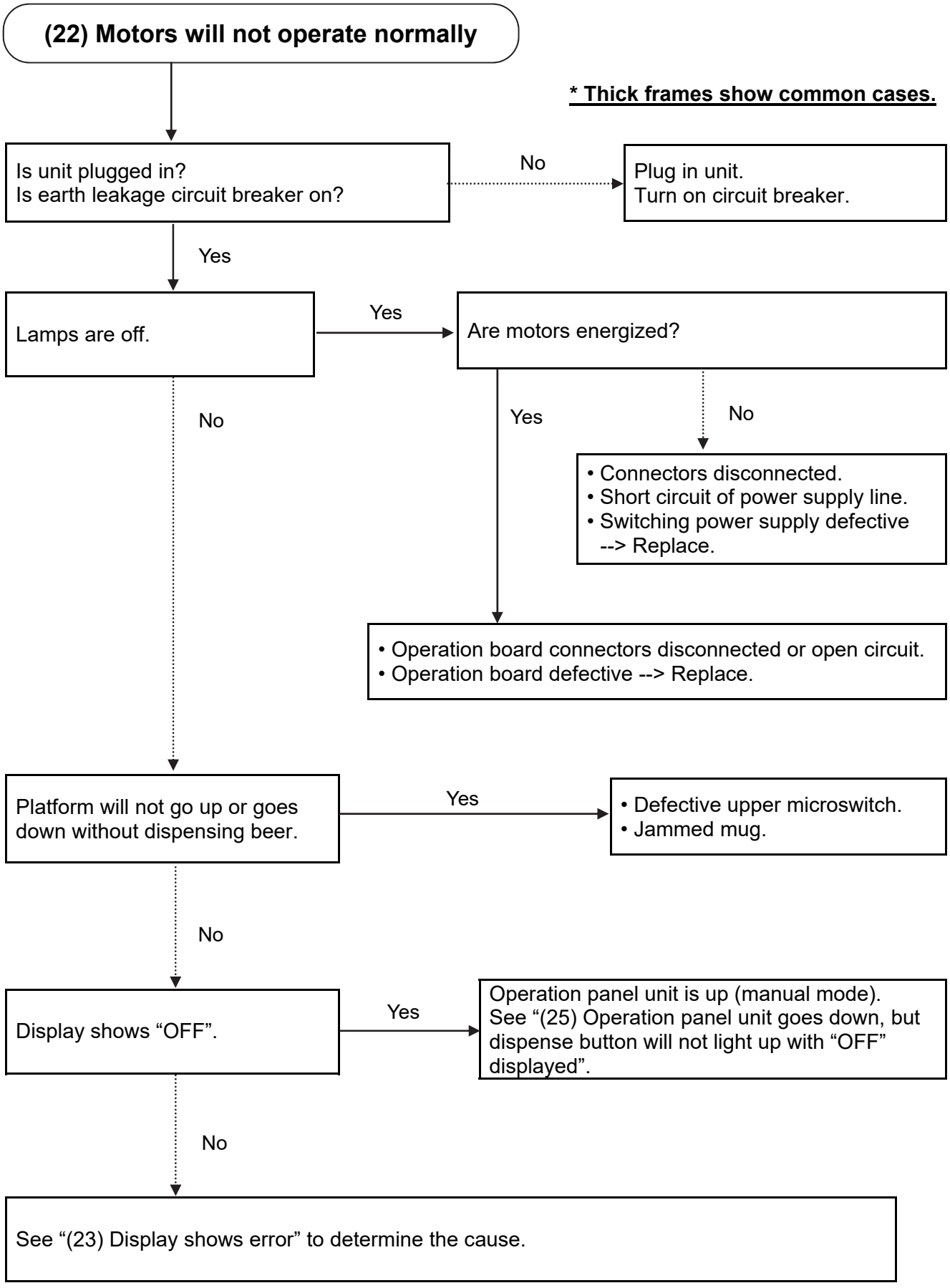


Note:

As beer in the keg decreases, the dispensing amount tends to increase slightly due to residual pressure. The liquid level may change by 1 cm while a full keg becomes empty.

(22) Motors will not operate normally

*** Thick frames show common cases.**

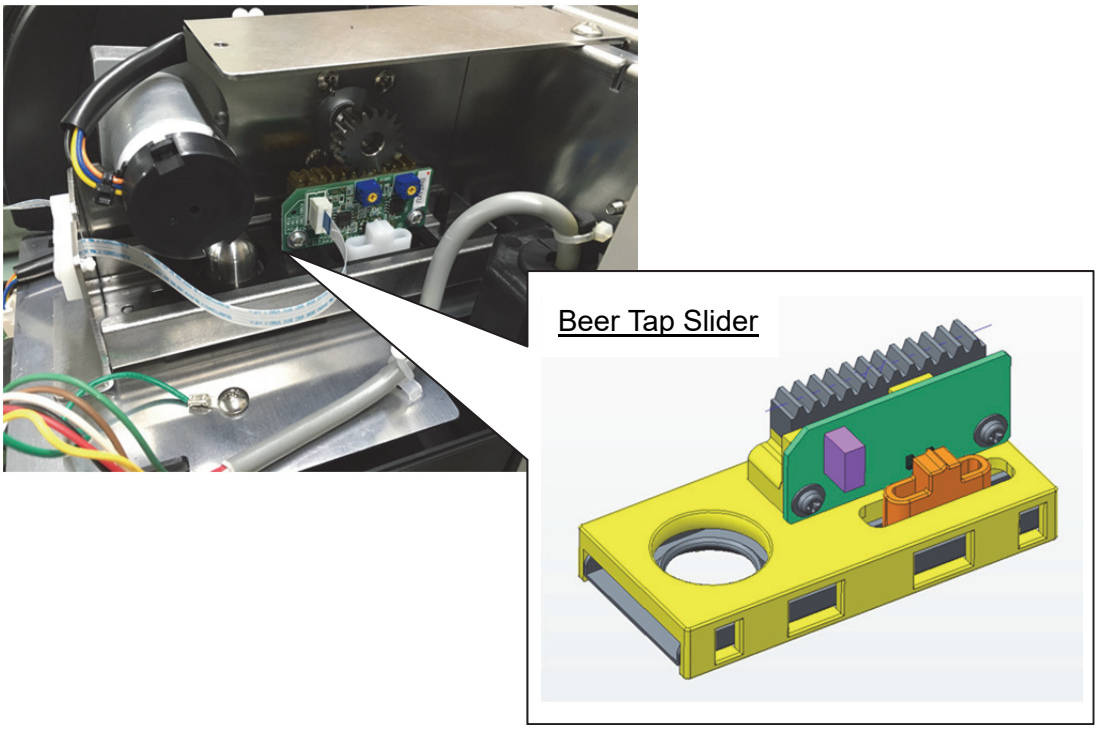


(23) Display shows error (See “8. ERROR DIAGNOSIS”.)

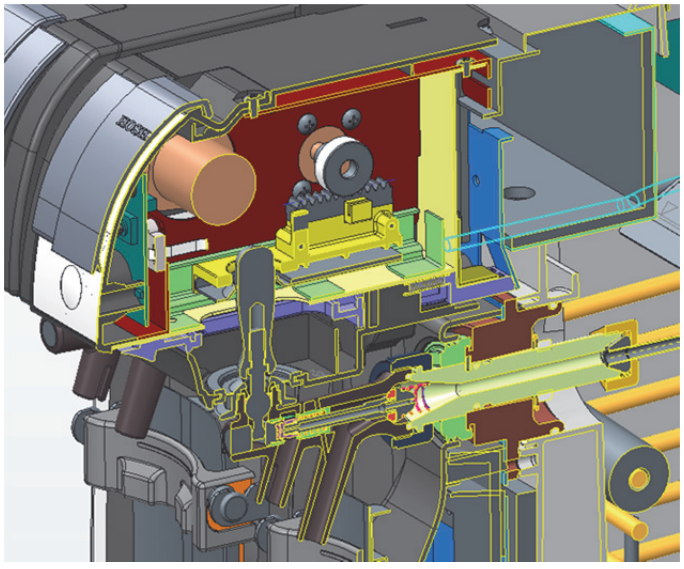
* To delete the displayed error code, turn off the power supply and turn it back on.
* To delete the error log “C03”, press and hold the stop button for 3 seconds with “C03” on display.
* The error log “C03” can also be deleted by pressing and holding the flush and set buttons and turning on the earth leakage circuit breaker.

Code	Error	Possible cause and remedy
E10 E60 E61	Main board error	Replace main board.
E11	Operation board error	Replace operation board.
E12	Communication error	Bad contact in communication wiring.
E22	Hall voltage error (open circuit, short circuit)	Bad contact in sensor board wiring.
E20	Encoder error (operation panel unit failure)	Beer tap seized. Beer tap slider (plastic) jammed. Bad contact in beer tap motor wiring. Beer tap motor failure.
E21	Hall element error (operation panel unit not in center position)	Beer tap opening/closing operation with tap removed --> Attach beer tap. Beer tap seized --> Clean beer tap. Beer tap slider (sheet metal) jammed. Magnet out of white part on beer tap slider. Sensor board defective.
E31	Descending platform error	Platform jammed. Lower platform switch failure. Beer tap motor failure.
E40	Pressure sensor error	Bad contact in pressure sensor wiring. Pressure sensor defective.
E41	Abnormal liquid thermistor	Open or short circuit of liquid thermistor
F1	Canceled dispensing (operation button)	Log of canceled automatic dispensing operation. Not errors. Use "A04" to select display options.
F2	Canceled dispensing (lift up operation panel unit)	
F3	Canceled dispensing (sold out)	
F4	Canceled dispensing (other)	
E51	Condenser thermistor error	Open or short circuit of condenser thermistor
E52	Condenser high temperature error	Clean filter. High ambient temperature (especially around right side air inlet). High temperature water in water tank.
E30	Ascending platform error	Jammed mug. * Error due to usage conditions. Displayed only when error log is checked.

(24) Operation panel unit will not go down completely (beer tap will not go back to center position even after power supply is turned back on)



The beer tap slider may have stopped at a wrong position.
With the power supply turned off, set the beer tap lever in the beer tap slider hole, and lower the operation panel unit. When the power supply is turned on, the beer tap center position is corrected.



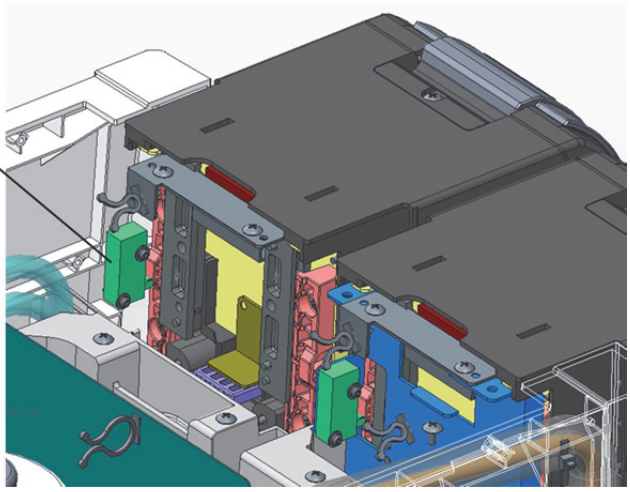
* Be sure to turn off the power supply before servicing the unit.

* When the beer tap slider is too heavy to move, remove the gear motor before moving the slider.

(25) Operation panel unit goes down, but dispense button will not light up with “OFF” displayed

1) The operation panel unit may not have reached the lowest position to turn on the detection switch.

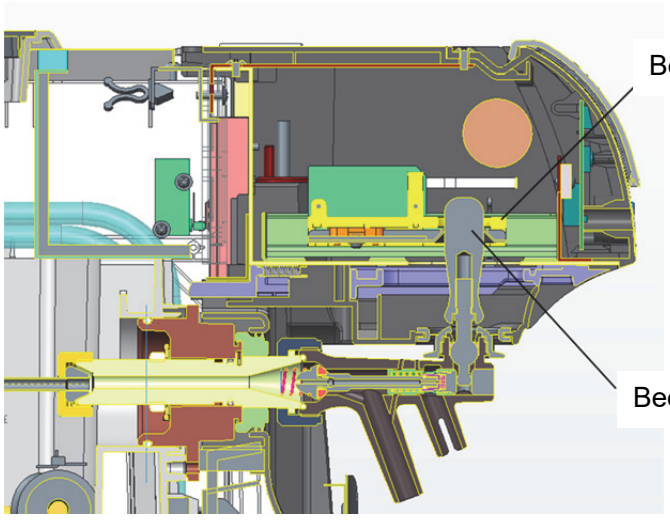
Detection Switch
Turns on when the slide rail side convex reaches the lower limit.



Check:

- Sliding failure
- Open circuit
- Defective switch

2) The beer tap slider may have stopped out of the center position and jammed the beer tap lever, preventing the operation panel unit from going down. This is the same case as “(24) Operation panel unit will not go down completely”.



See “(24) Operation panel unit will not go down completely”.

(26) Beer remains in keg, but sold out lamp lights up
No beer remains in keg, but sold out lamp will not light up

*** Thick frames show common cases.**

When sold out lamp lights up, dispense lamp does not light up unless foam button is pressed. When a keg is replaced, press foam button to lead beer to tap. (Press and hold foam button until gas is purged out of beer tap.)

Setting depends on brand of beverage to dispense. Is setting correct? (User setting “U07”)

No → Check with your dealer/supplier for U07 settings.

Yes

Regulator is not set to proper pressure.

Yes → Set to proper pressure.

No

Beer hose is heated by exhaust heat to generate bubbles inside.

Yes → Avoid exhaust heat. If necessary, wrap insulation.

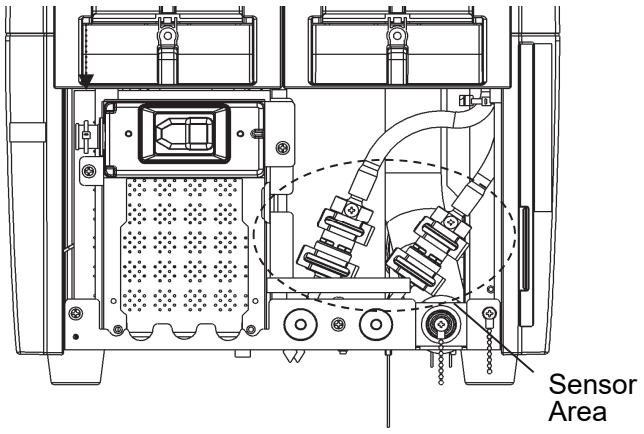
No

Bad contact in sold out sensor wiring.

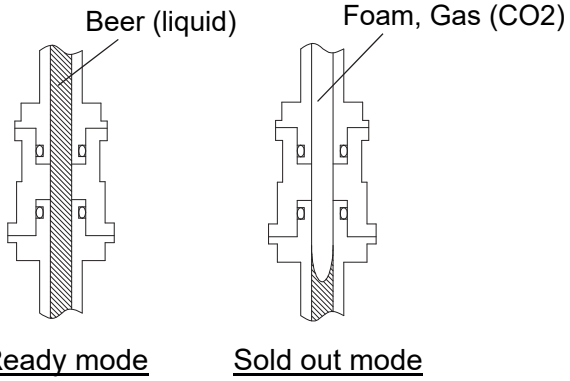
Yes → Tightly fix sold out sensor wiring to sensor area.

[Sold out sensor operation]
When the electrical resistance measured by the beer circuit electrode is higher than the specified value, the sensor detects beer is “sold out”. When the resistance is lower than the specified value, the sensor detects beer is “available”.

* Beer has a lower electrical resistance while CO2 gas has a higher resistance. When a beer keg becomes empty during automatic dispensing operation, CO2 gas bubbles go through the beer circuit and pass the sensor area. Then, the electrical resistance rapidly increases, and the sensor detects beer is sold out, causing the unit to stop dispensing.



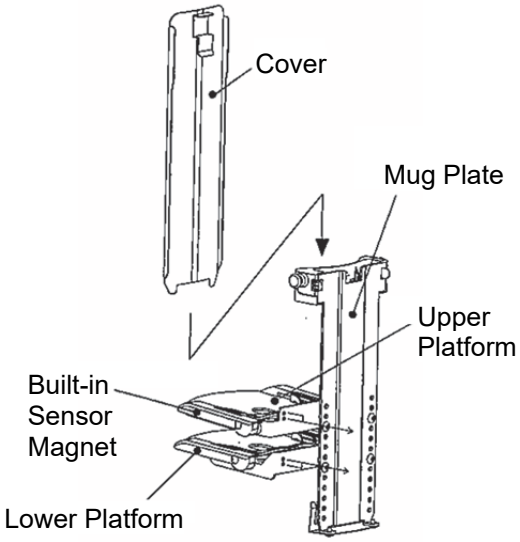
[Sensor area cross-section]



(27) Adjustment of platform and reed switch (for mug size detection)

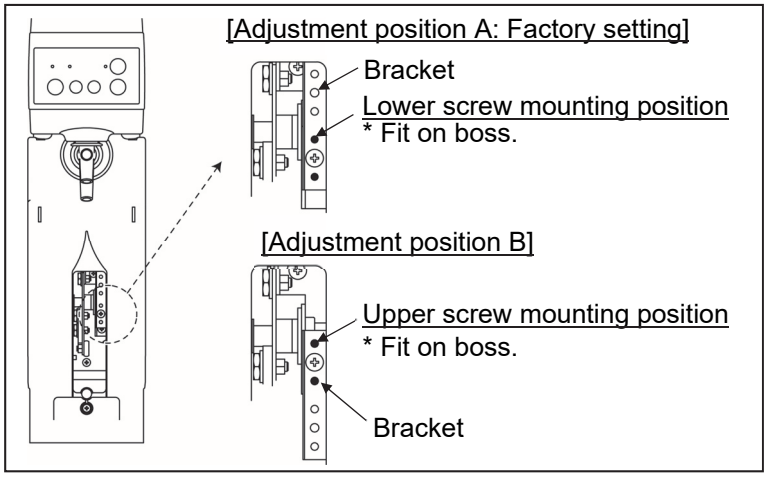
The platform needs adjustment to fit the mug used. The reed switch to detect the mug size also needs to be positioned according to the upper platform position. Follow the instructions below. *See the instruction manual for details.

Platform assembly

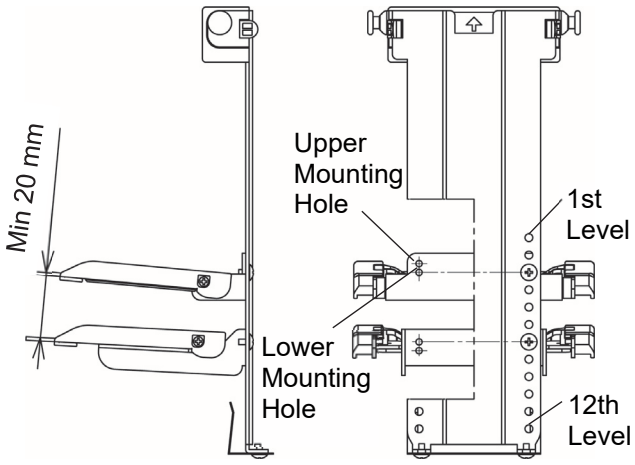


Bracket mounting position

Adjust bracket according to upper platform position.

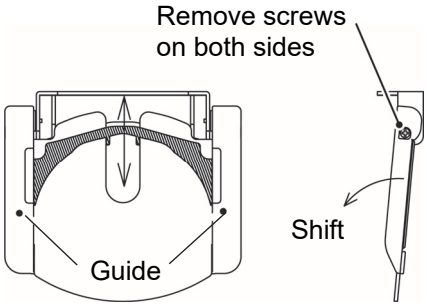


Platform mounting position



Upper platform adjustment

Adjust guide to position bottom of mug.



Mug height and platform mounting position (reference)

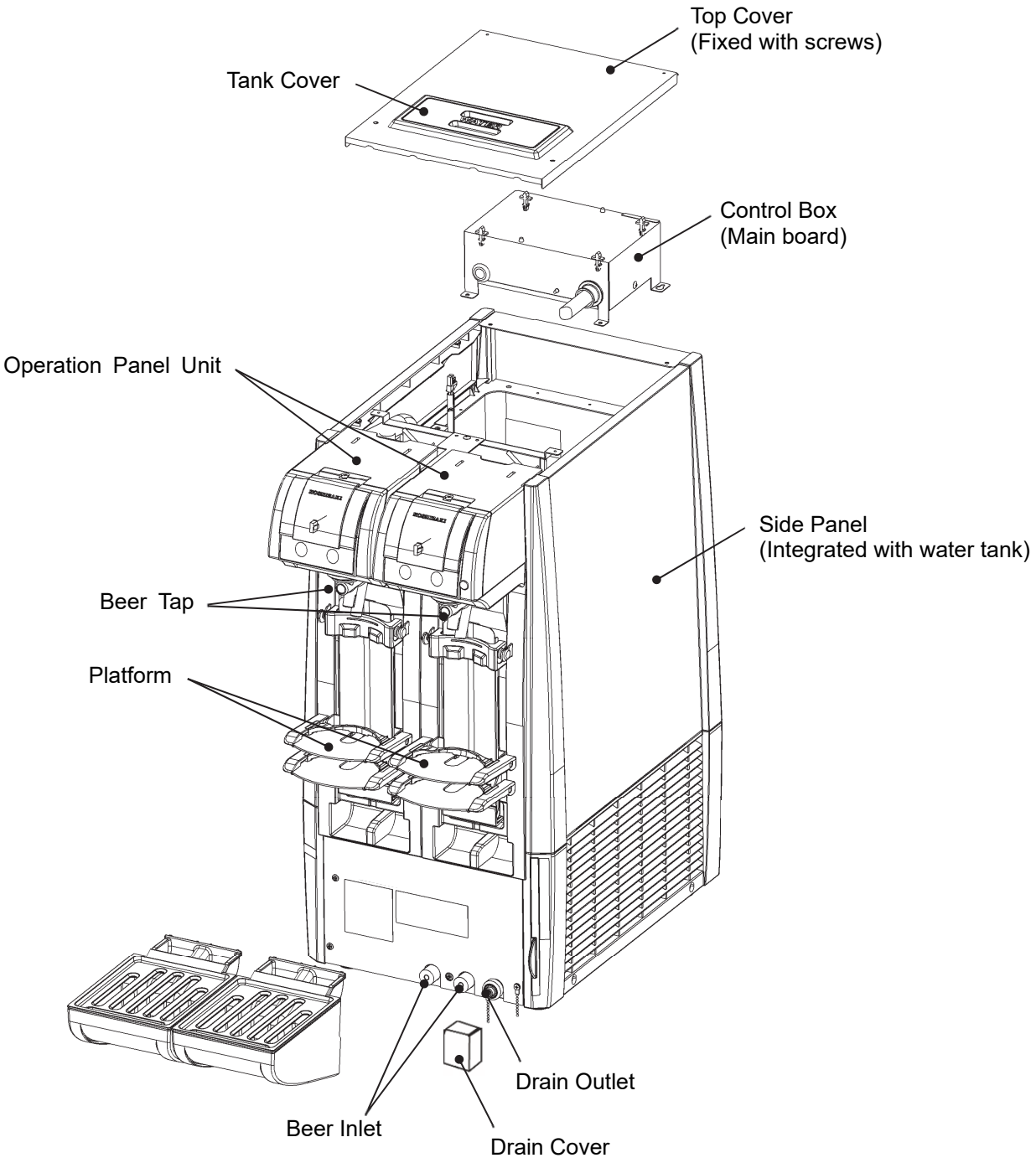
Mug plate level	Upper platform			Lower platform	
	Mounting hole	Mug height (mm)	Bracket position	Mounting hole	Mug height (mm)
1	Lower	135	A	Not available	
	Upper	140			
2	Lower	145			
	Upper	150			
3	Lower	155			
	Upper	160			
4	Lower	165		Lower	155
	Upper	170	B	Upper	160
5	Lower	175		Lower	165
	Upper	180		Upper	170
6	Lower	185		Lower	175
	Upper	190		Upper	180
7	Lower	195		Lower	185
	Upper	200		Upper	190
8	Not available			Lower	195
				Upper	200
9				Lower	205
				Upper	210
10				Lower	215
				Upper	220
11				Lower	225
				Upper	230
12				Lower	235
				Upper	240

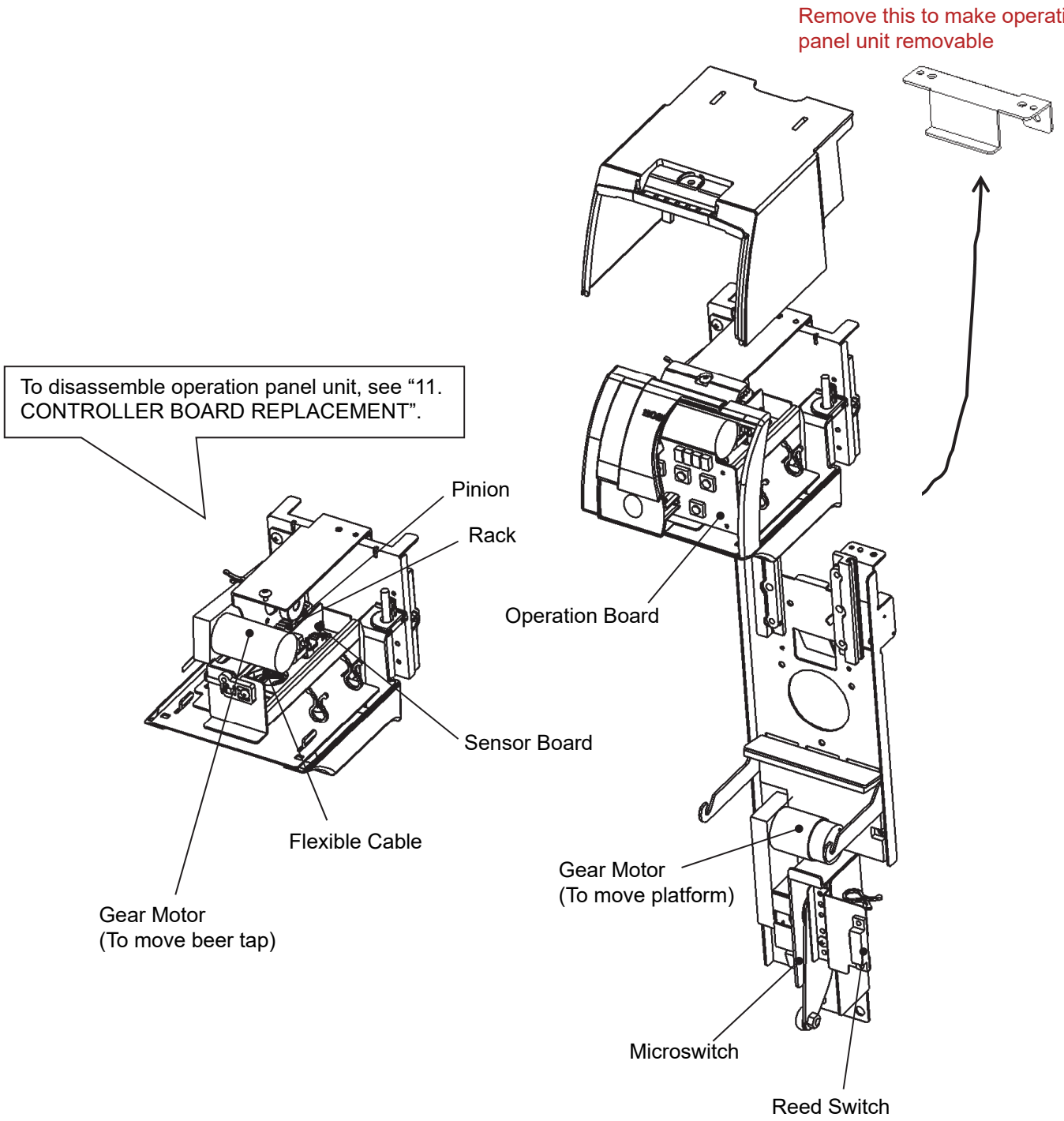
Note:
1) Mug diameter: 50 mm inside diameter to 105 mm outside diameter and bottom diameter
2) The larger mug must be at least 20 mm higher than the smaller mug.

10. PARTS REPLACEMENT

Notes:

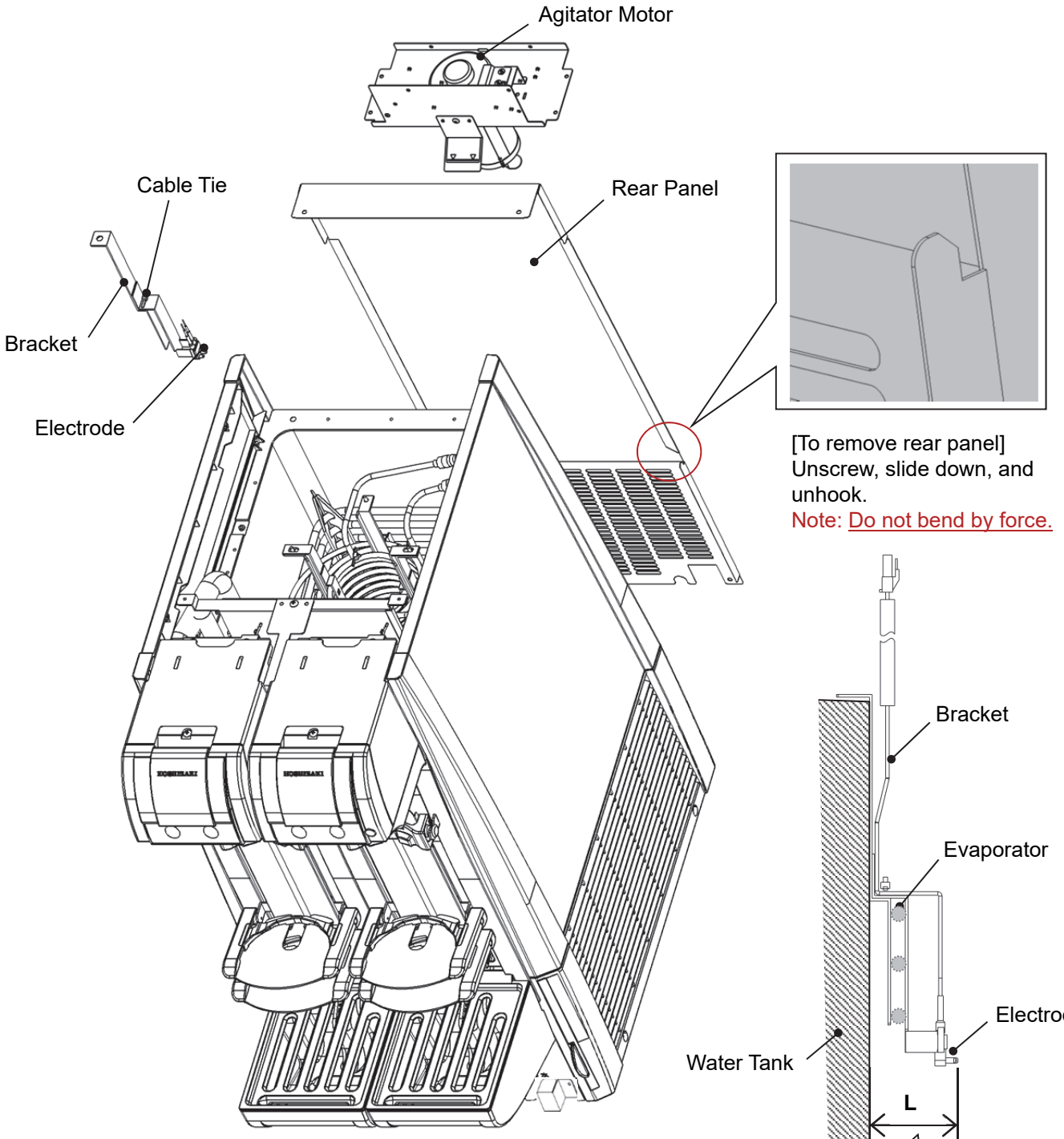
* When replacing parts, be sure to unplug the unit or disconnect the main power supply.
* Attached parts and their location differ from model to model.
* Do not pinch wiring when installing parts.
* When rebinding wiring, keep wiring away from the fan and piping.
* Do not damage piping to avoid CO2 gas leak from the refrigerant pipe connections.
* Before welding the evaporator, fill the water tank with water to prevent deformation caused by heating.





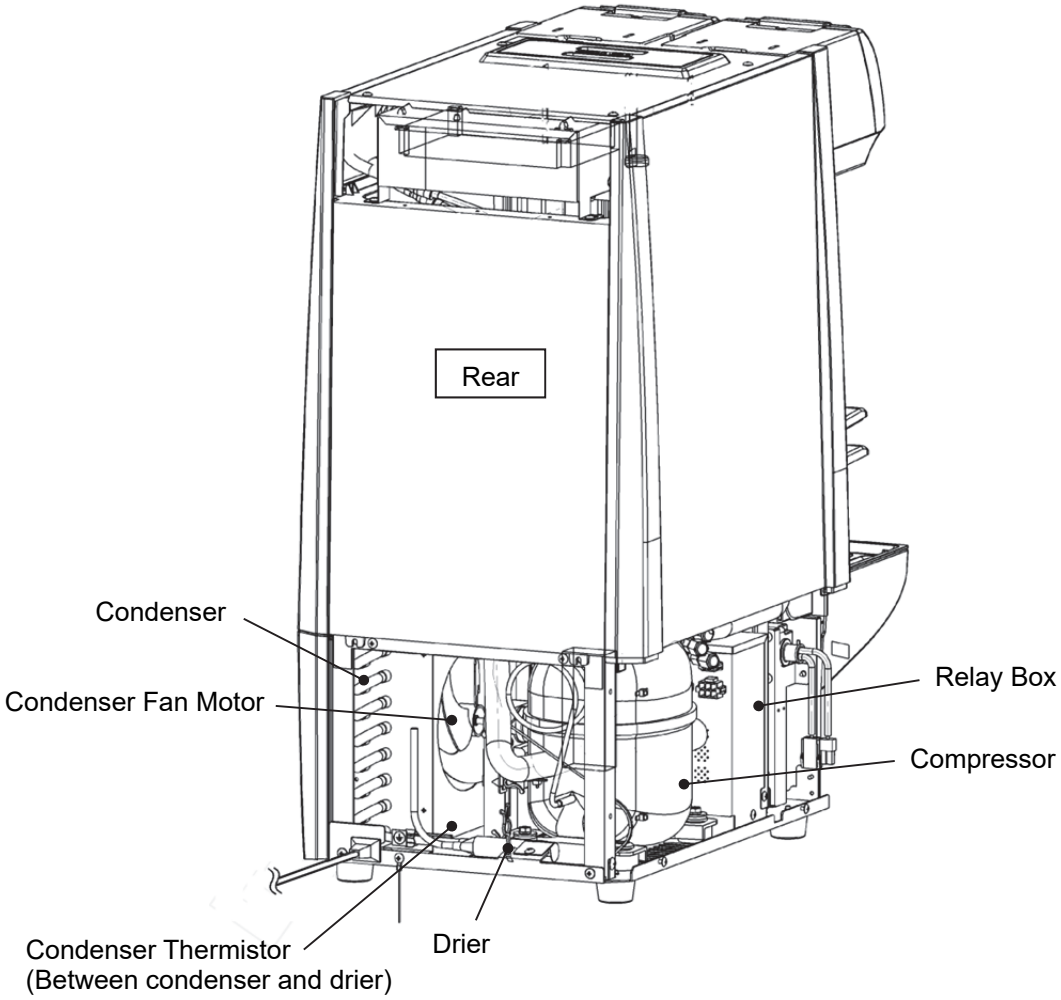
To adjust the platforms and reed switches, see (27) of “9. SERVICE DIAGNOSIS”.

For details, refer to “I. 5. [c] PLATFORM ADJUSTMENT”.

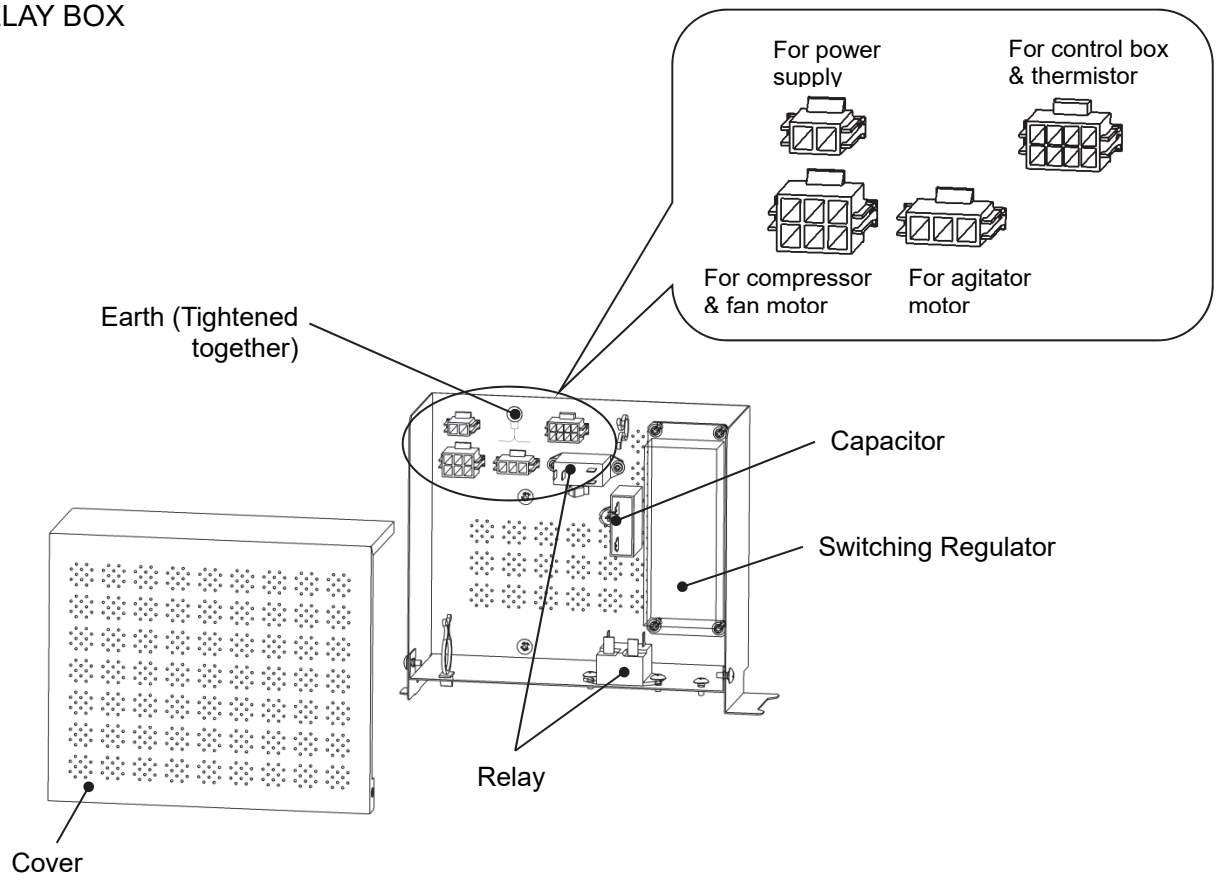


Model	Location	L
DBF-AS65WE-EU	Back left	49.1 mm

"L" shows horizontal distance from water tank interior wall to long electrode end. See table for "L".


Rear
Condenser
Condenser Fan Motor
Relay Box
Compressor
Condenser Thermistor
(Between condenser and drier)
Drier

RELAY BOX


For power supply
For control box & thermistor
For compressor & fan motor
For agitator motor
Earth (Tightened together)
Capacitor
Switching Regulator
Relay
Cover

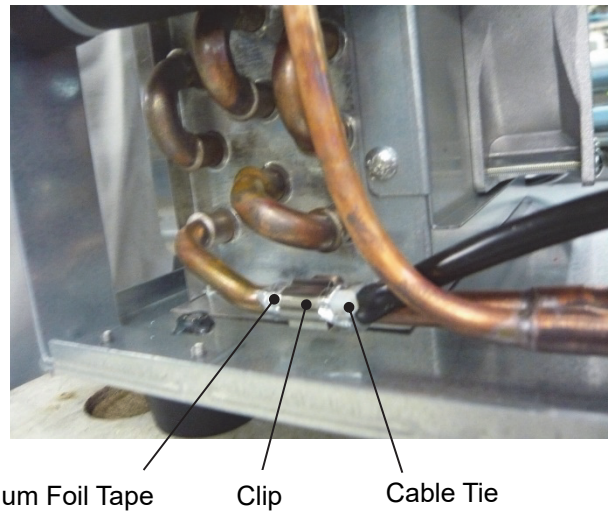
CONDENSER THERMISTOR

Notes:

* Be sure to replace the condenser thermistor in its correct position (between the condenser outlet and drier inlet).
* Do not let the thermistor leads touch the capillary tube and compressor.
* Do not pinch the thermistor leads between the exterior and base.

To replace:

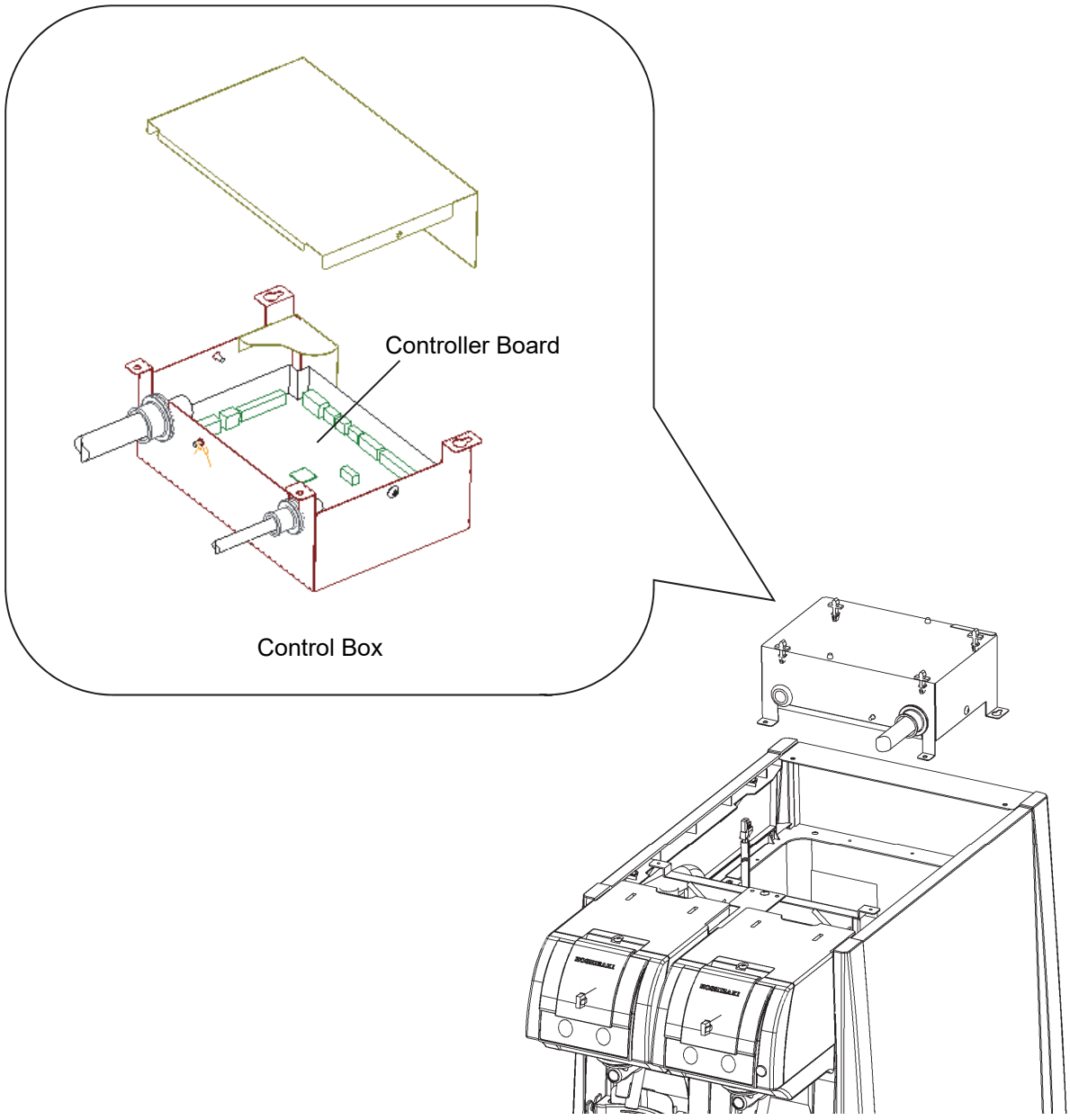
1) Use a cable tie to fix the thermistor, then wrap two turns of 25 mm x 70 mm aluminum foil tape tightly around the thermistor bulb (do not reuse aluminum foil tape).
2) Attach the clip over the aluminum foil tape.
3) Use aluminum foil tape AT-501 by Settsu Kogyo or equivalent.



11. CONTROLLER BOARD REPLACEMENT

(1) CONTROLLER BOARD

1) Turn off the power supply.
2) Remove the top cover.
3) Remove the control box. Turn it over, and remove the cover.
4) Disconnect the controller board wiring.
5) To replace, reverse the above procedure.

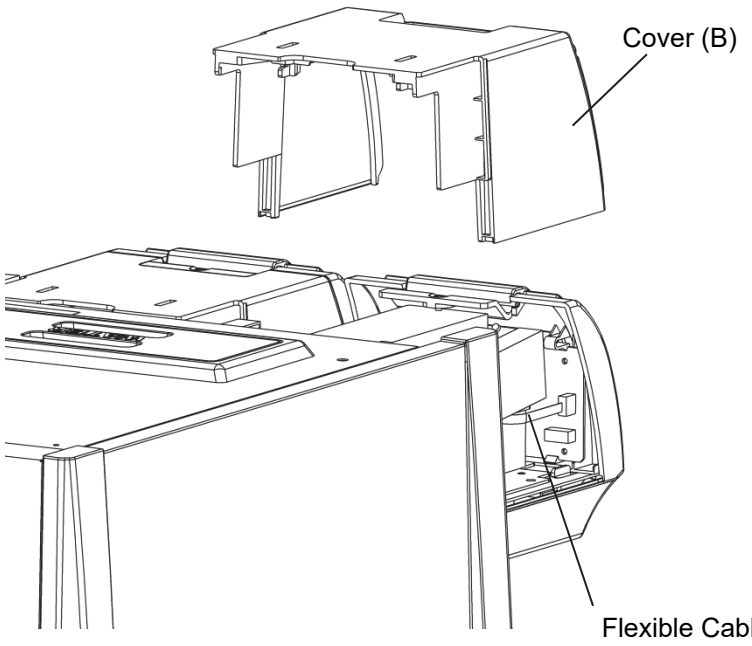


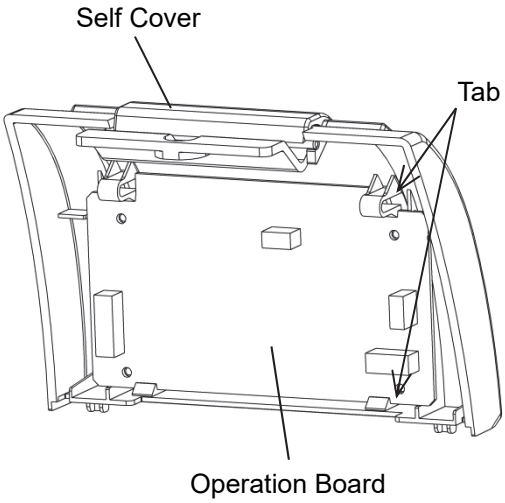
(2) OPERATION BOARD

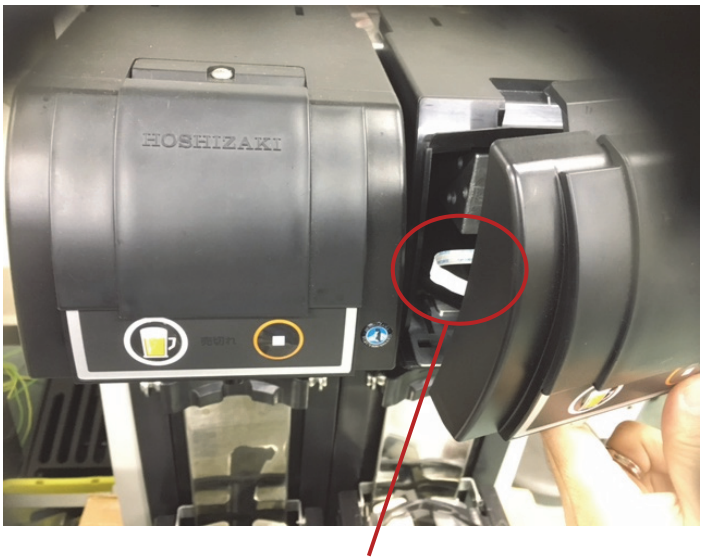
1) Remove the screw on top, and take off the cover (B) and self cover.
2) Disconnect the flexible cable from the operation board (unlock the connector).
3) Take the operation board off the operation panel tabs.
4) To replace, reverse the above procedure.

Note:

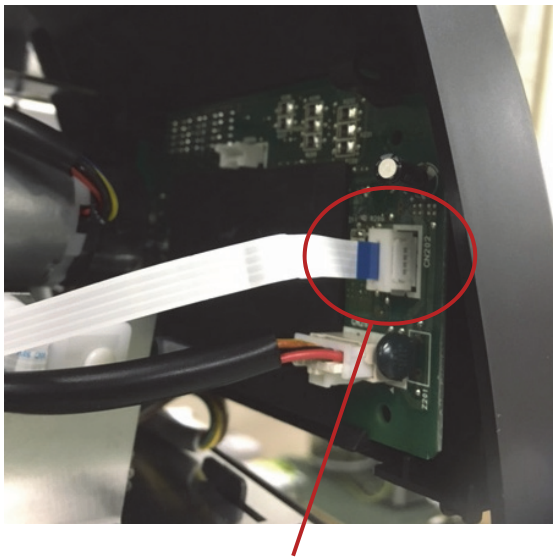
* Be sure to connect the flexible cable in the proper direction (see the picture below).
* After connecting the flexible cable, be sure to lock the connector.
* Do not get the flexible cable caught under the cover (B).







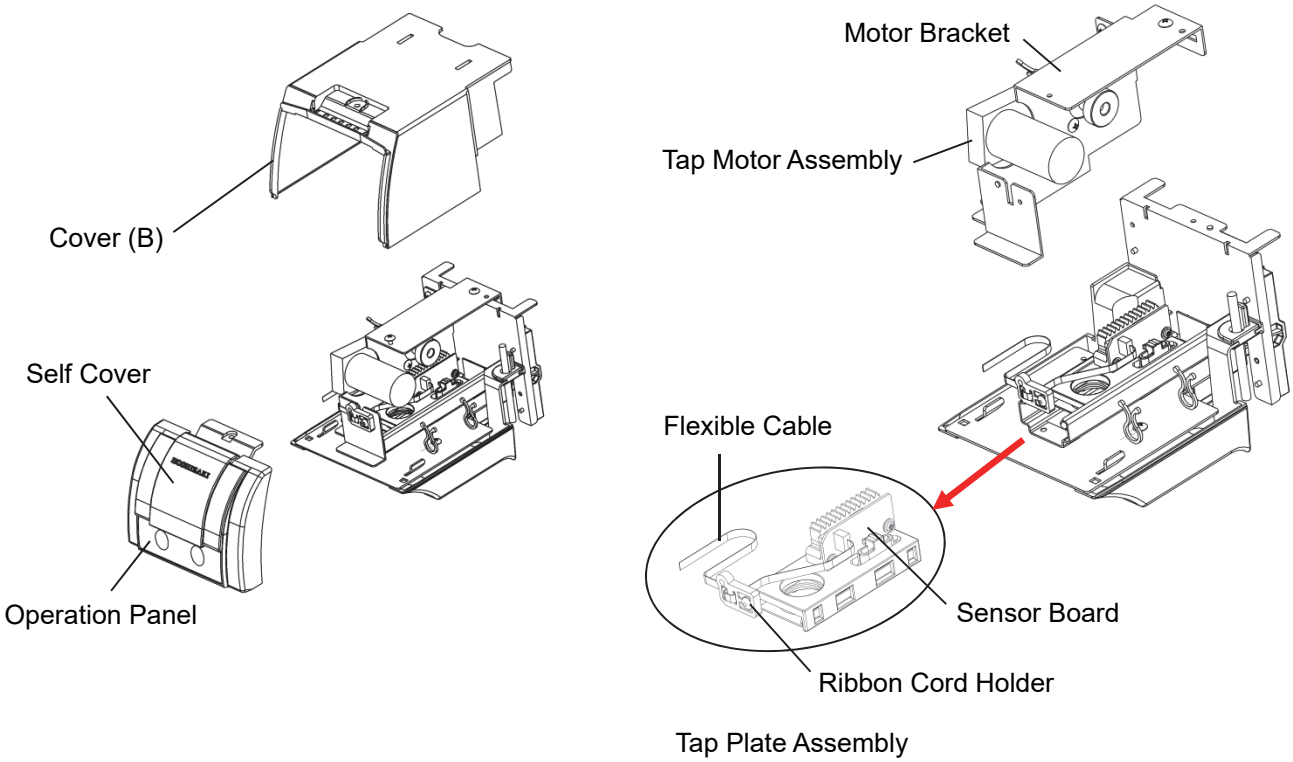
Do not get it caught



Connect in proper direction

(3) SENSOR BOARD

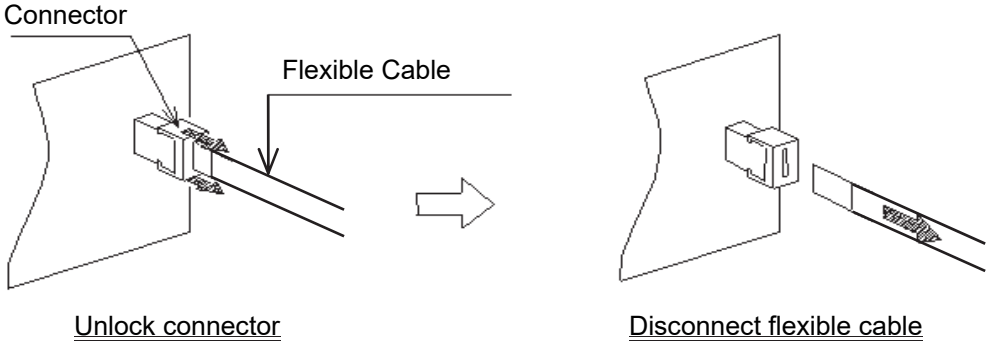
1) Remove the plastic covers from the operation panel unit.
2) Disconnect the flexible cable from the connector on the operation board.
3) Remove the self cover and operation panel.
4) Unscrew the motor bracket, and remove the gear motor together with the motor bracket.
5) Pull the tap plate assembly out of the operation panel unit.
   * Be careful not to damage the flexible cable.
6) To replace, reverse the above procedure.
   * See the instructions of “(4) FLEXIBLE CABLE”.



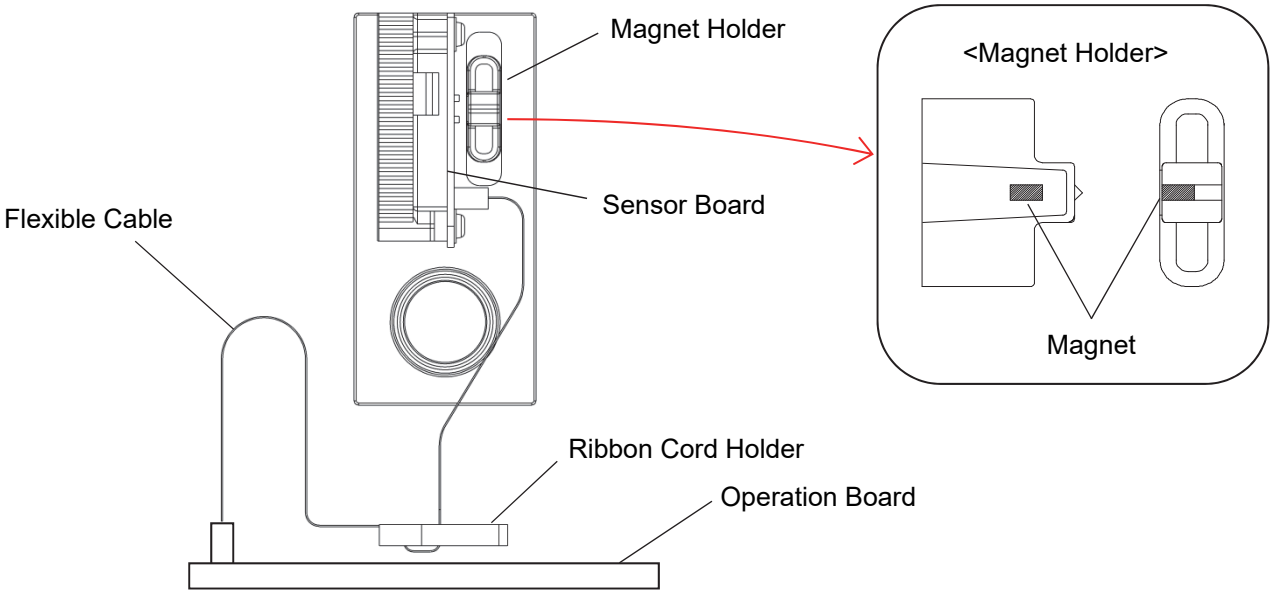
(4) FLEXIBLE CABLE

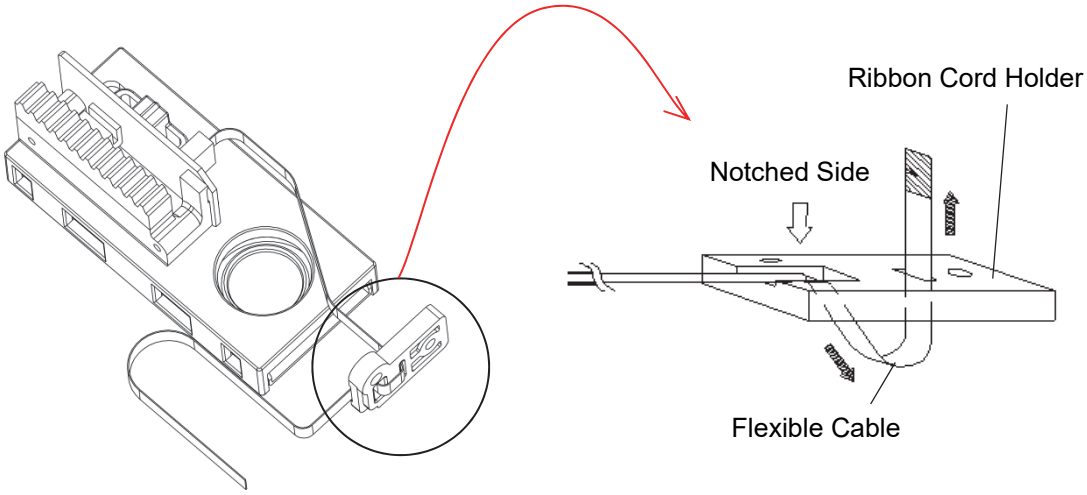
To remove:

1) Pull the flexible cable connector in the direction perpendicular to the operation board to unlock (see the figure below). The coating may have stuck to the operation board.
2) Pull the flexible cable off the connector.



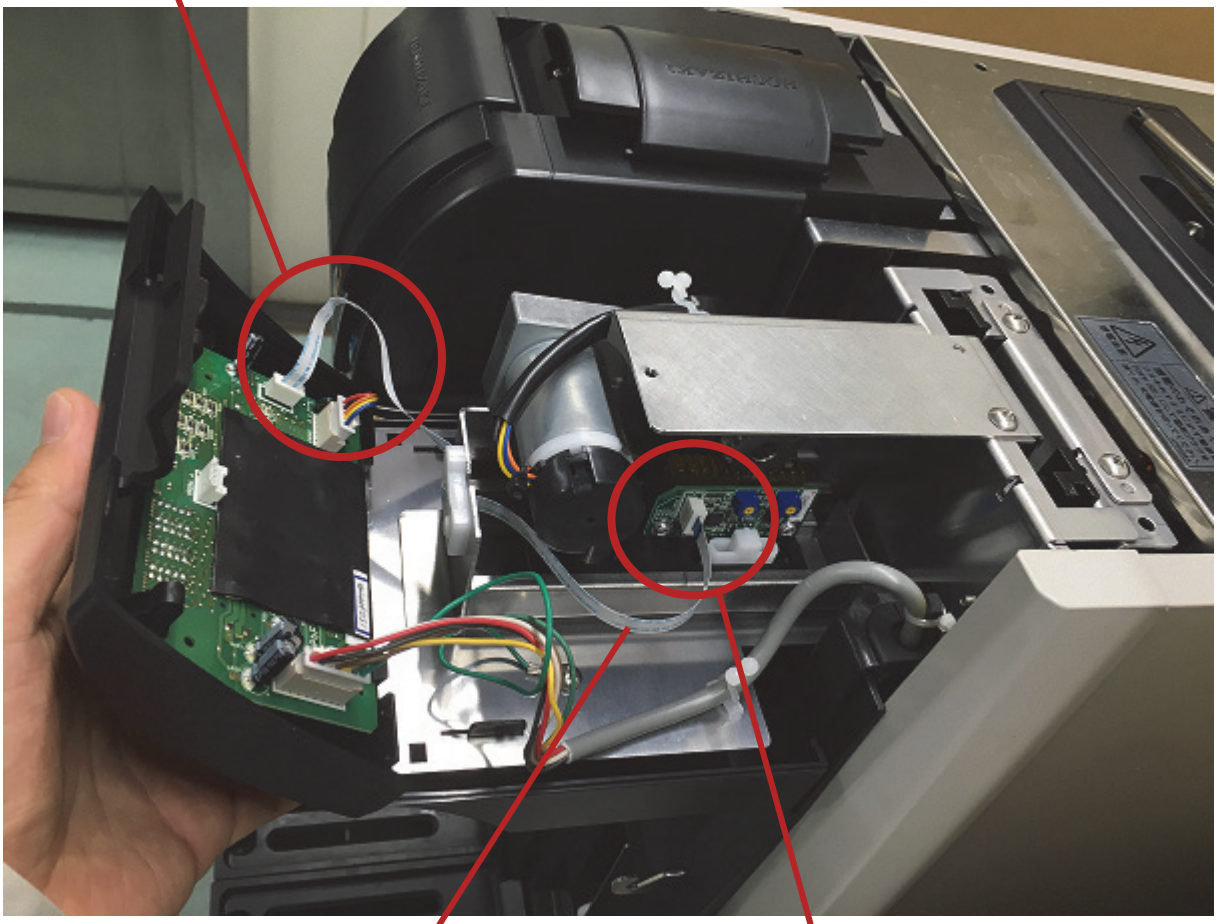
To route:


Magnet Holder
Sensor Board
Flexible Cable
Ribbon Cord Holder
Operation Board
<Magnet Holder>
Magnet

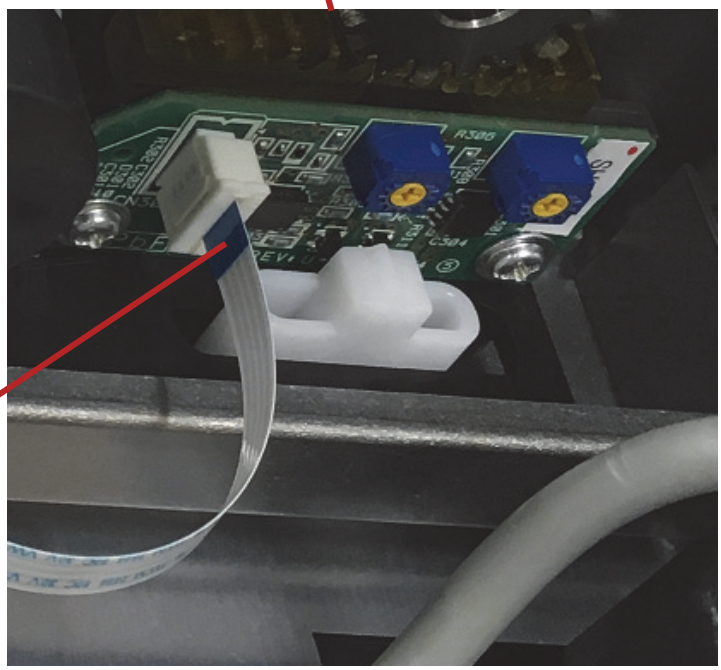

Ribbon Cord Holder
Notched Side
Flexible Cable

To replace:

When reassembling the operation panel unit, be careful not to get the flexible cable caught under the cover.



Adjust the location of the ribbon cord holder to keep the flexible cable long enough.

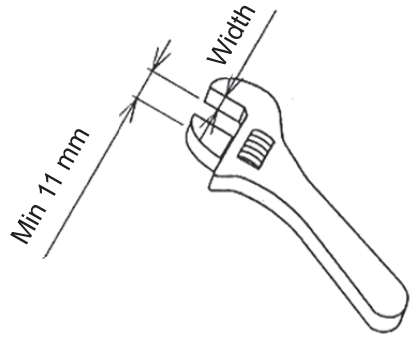


Connect the flexible cable with the blue tape facing the front.

12. DISASSEMBLING AND ASSEMBLING VALVE SHAFT

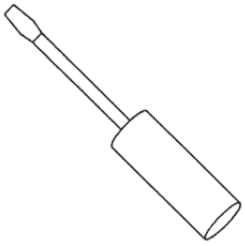
(1) REQUIRED TOOLS AND PARTS

1) Adjustable wrench (small type)
   * 7 mm wide (thick) or less
     [Preferably 4 mm wide (thick)]

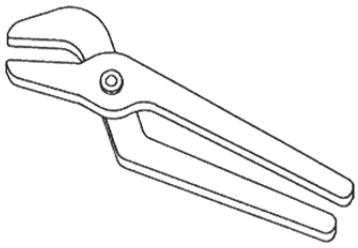


2) Phillips screwdriver

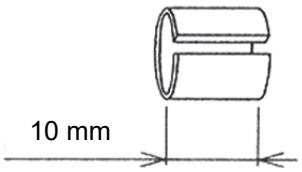
3) Flat-blade screwdriver



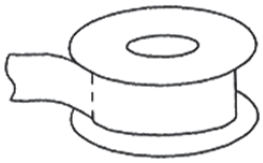
4) Pliers



5) Braided hose or commercial gas hose (slit vertically)
   * To prevent slipping and damage

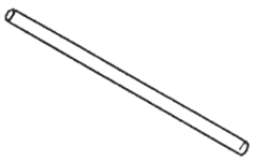


6) Seal tape
   * To prevent damage



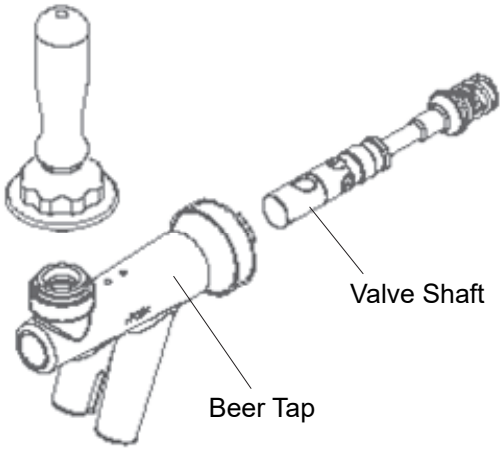
7) O-ring (1AS4)
   * Replace every time valve shaft is disassembled

8) Wire (φ0.9 mm or less)
   * May be substituted by clip

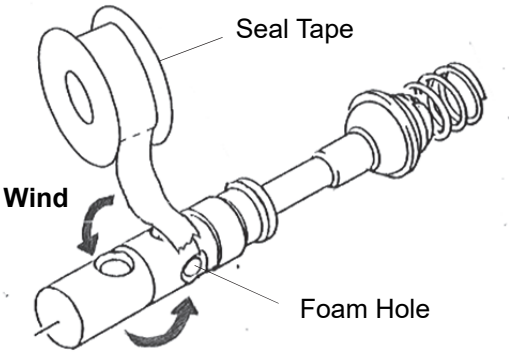


(2) DISASSEMBLING

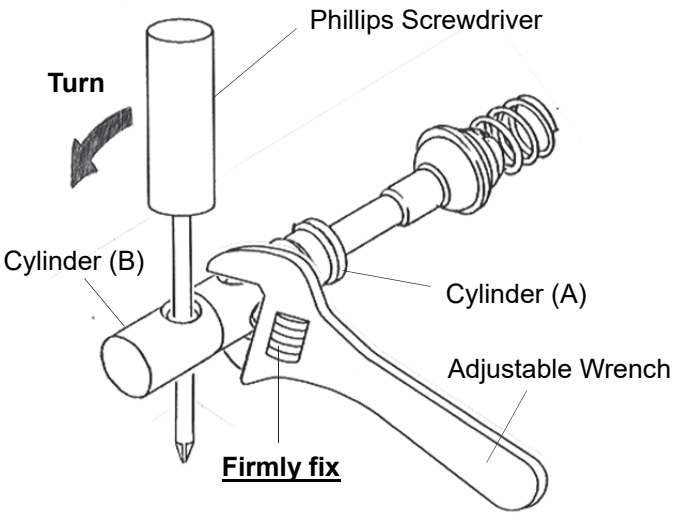
1) Remove the beer tap from the dispenser. Disassemble the beer tap, and remove the valve shaft.



2) Wind 3 to 5 turns of seal tape around the foam holes in the valve shaft.
   * Seal tape is used to prevent damage to the valve shaft, but cannot protect it fully.

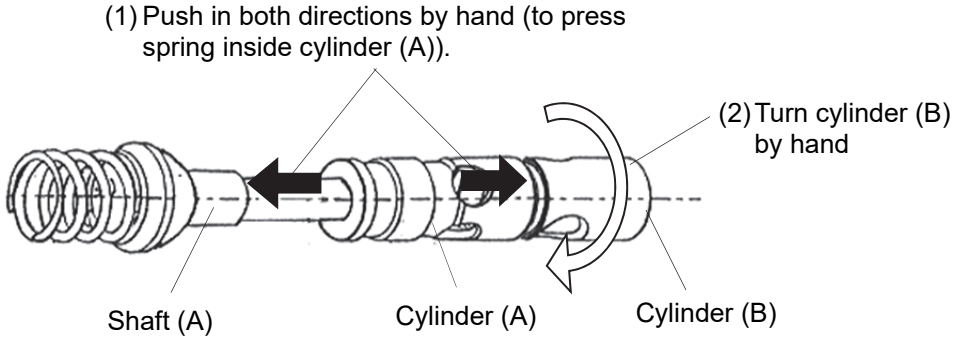


3) Use an adjustable wrench to hold the foam hole part protected with the seal tape. Put a Phillips screwdriver into the hole in the cylinder (B). While fixing the adjustable wrench, turn the screwdriver in the arrow direction to <u>loosen</u> the screw of the cylinder (B).

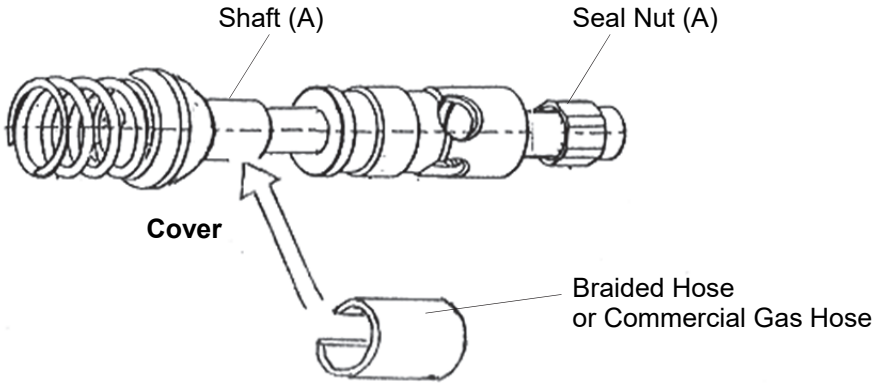


   * The foam hole part of the cylinder (A) is hard to hold and can be damaged at the edges when the cylinder (B) is turned.
   <u>Be sure to hold the adjustable wrench securely by hand.</u>
   To prevent deformation, do not use pliers to hold the cylinder (A).

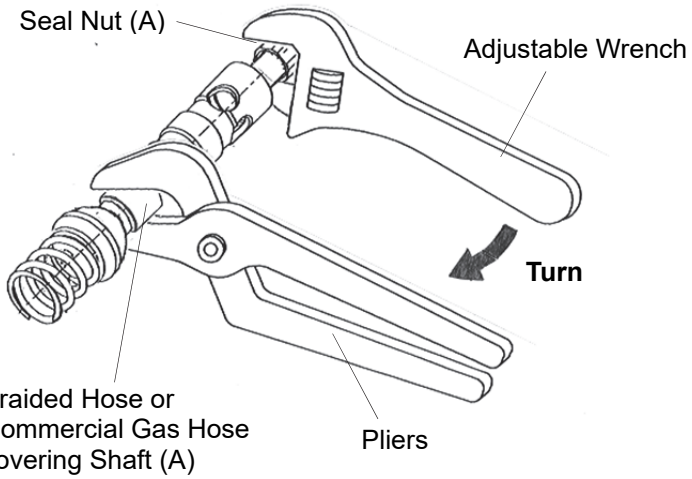
4) After loosening the screw of the cylinder (B), push the shaft (A) and cylinder (A) with one hand in the arrow directions, and remove the cylinder (B) with the other hand.
   * The seal nut (A) is pressed against the seat (B) by spring pressure. Just turning the cylinder (B) to remove may damage the seat (B).



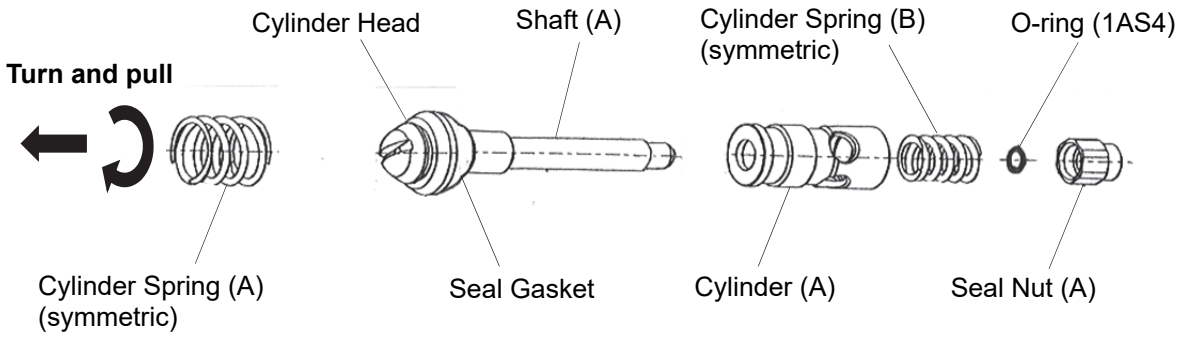
5) Cover the larger diameter part of the shaft (A) with a braided hose.



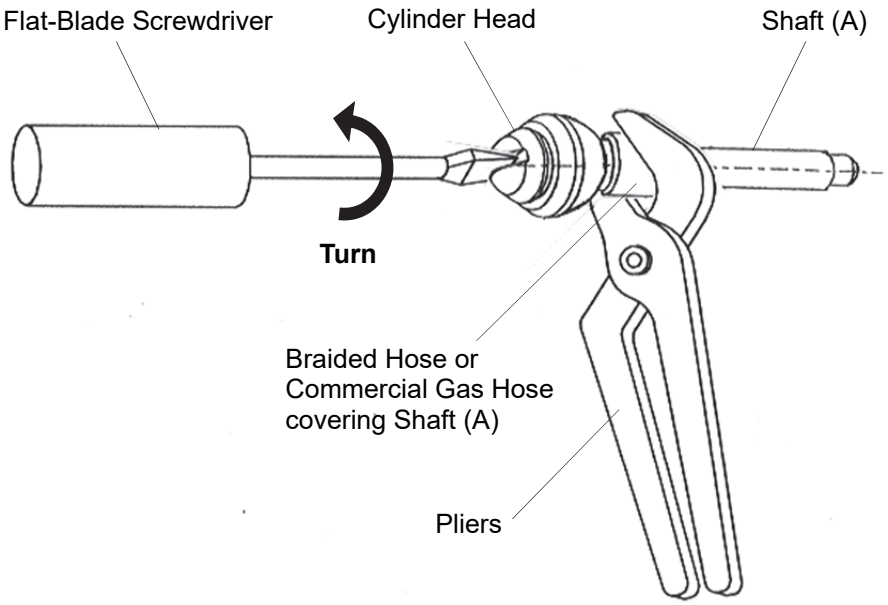
6) Use pliers to hold the shaft (A) where covered by the braided hose. Use an adjustable wrench to securely hold and turn the seal nut (A) in the arrow direction to remove.

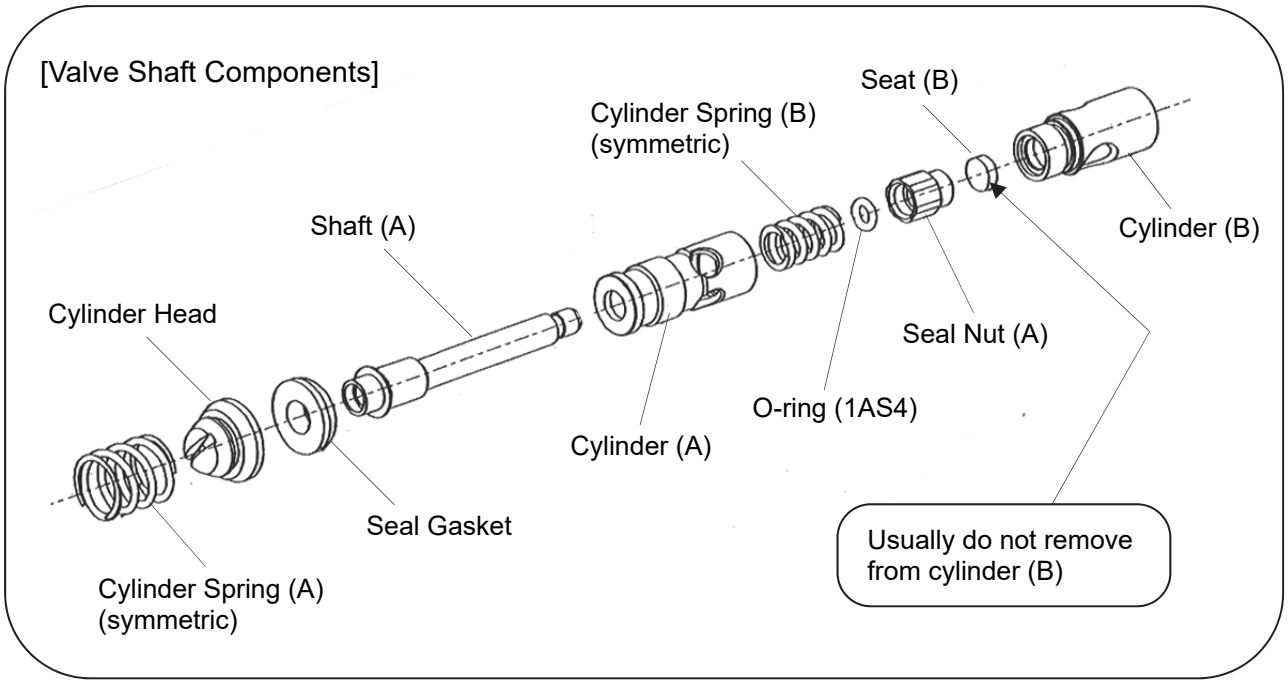


7) The figure below shows the parts disassembled by removing the seal nut (A) and O-ring.
Replace the O-ring (1AS4) with a new one when reassembling the cleaned valve shaft.
* The cylinder spring (A) is readily removable by turning and pulling in the arrow direction. Handle with care because it can deform easily.



8) Use pliers to hold the shaft (A) where covered by the braided hose. Use a flat-blade screwdriver to turn the tip of the cylinder head and remove it.
* There is no need to remove the cylinder spring (A).





(3) ASSEMBLING

Reverse the disassembling procedure.

(4) NOTES

[Disassembling / Assembling]

1) Use a fine file to remove any burrs on the exterior of the cylinders (A) and (B). Otherwise, the burrs may scrape the beer tap (plastic) when the valve shaft is inserted.
2) Replace the cylinders (A) and (B) if they are deformed. Always replace the seat (B) together with the cylinder (B).
3) When replacing the seat (B), use a pointed tool to pick it out of the cylinder (B). When pushing the seat (B) back into the cylinder (B), be careful not to damage the seat (B).

[Cleaning]

1) Use the accessory brush or something soft, water and a neutral detergent for cleaning.
2) For normal cleaning, do not remove the seat (B) from the cylinder (B).
3) Check the small holes in the cylinder head, shaft (A) and seal nut (A) for clogging. If clogged, use a wire to clean.

[Time]

Disassembling and assembling take about 4 minutes each, but only 2 minutes for experienced workers.

13. MAKING AND SUPPLYING COOLING WATER

(1) HOW TO MAKE COOLING WATER

IMPORTANT

Carefully read this before filling the water tank.

Electric conductivity (E.C.) of cooling water for water tank

Do not use tap water.
Fill the water tank with water having 100-300 μS/cm of E.C.
Measure the electric conductivity with conductivity meter.

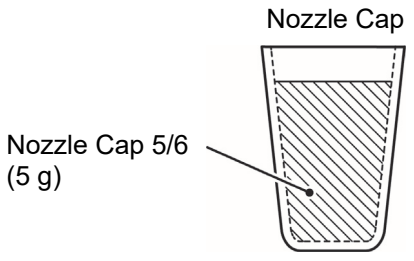
*E.C. : Physical property to show the ability of conducting electricity.
Unit: μS(microsiemens)/cm

Below 100 μS/cm:
Compressor may not work resulting in poor cooling performance.

Above 300 μS/cm:
Excessive ice may build up on evaporator and freeze beer inside beer coil preventing beer from being dispensed properly.

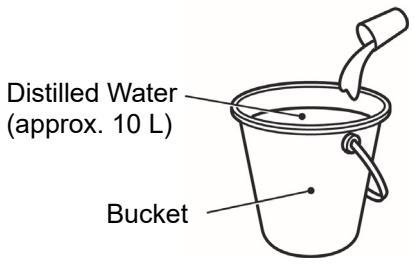
How to make cooling water with 100-300 μS/cm of E.C.

The capacity of the water tank of this unit is approx. 30 L.
Make the cooling water by dissolving 5 g of pure baking soda in approx. 10 L of distilled water, and then add approx. 27 L of distilled water to fill the water tank.



Step 1
Measure 5 g of pure baking soda with nozzle cap (accessory).

Step 2
Fill a bucket with approx. 10 L of distilled water and stir well after adding the 5 g of baking soda measured in step 1.
Rinse the nozzle cap after use.



(2) COOLING WATER SUPPLY

WARNING

Before filling the water tank, turn off the power switch (earth leakage breaker) and unplug the unit.

NOTICE

1. Do not splash water on the electrical parts.
2. Do not fill the water tank above the water level line, or the drain pan will overflow and spill water.

1) Remove the top cover.

2) Pour the bucket (approx. 10 L) of cooling water prepared.

3) Fill the water tank up with approx. 27 L of distilled water to the water level line marked inside the water tank.

4) Use a conductivity meter if measuring the electric conductivity.

5) Close the top cover.