



AUTOMATIC DRAFT BEER DISPENSER

DBF-40SAC

SERVICE MANUAL

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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.

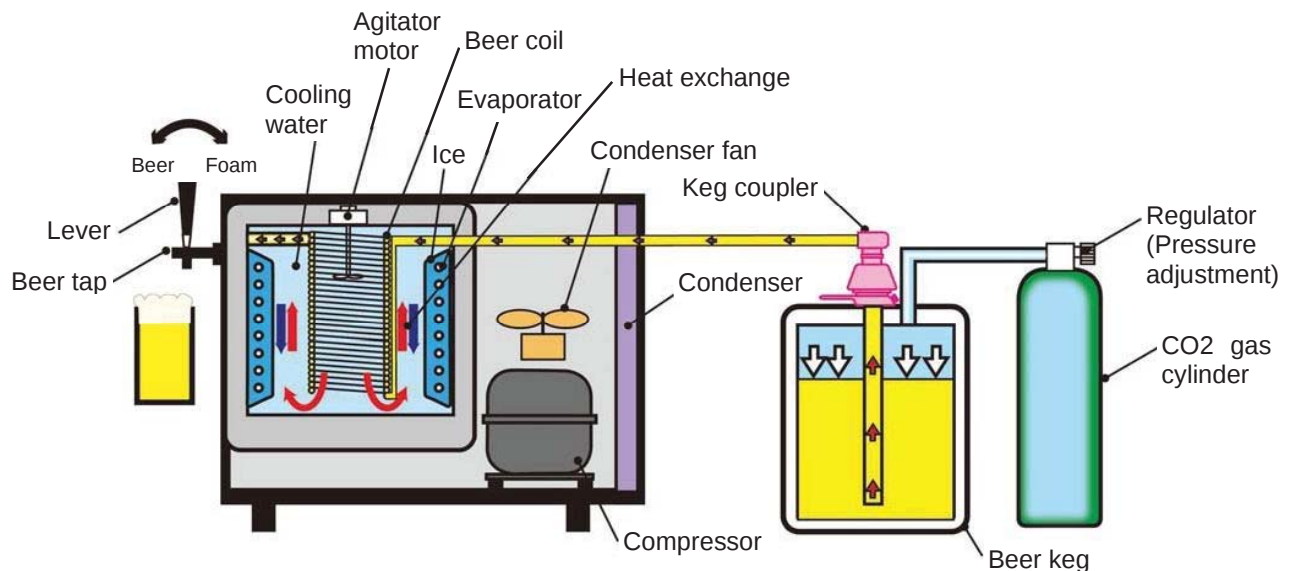
CAUTION

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 vermins 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

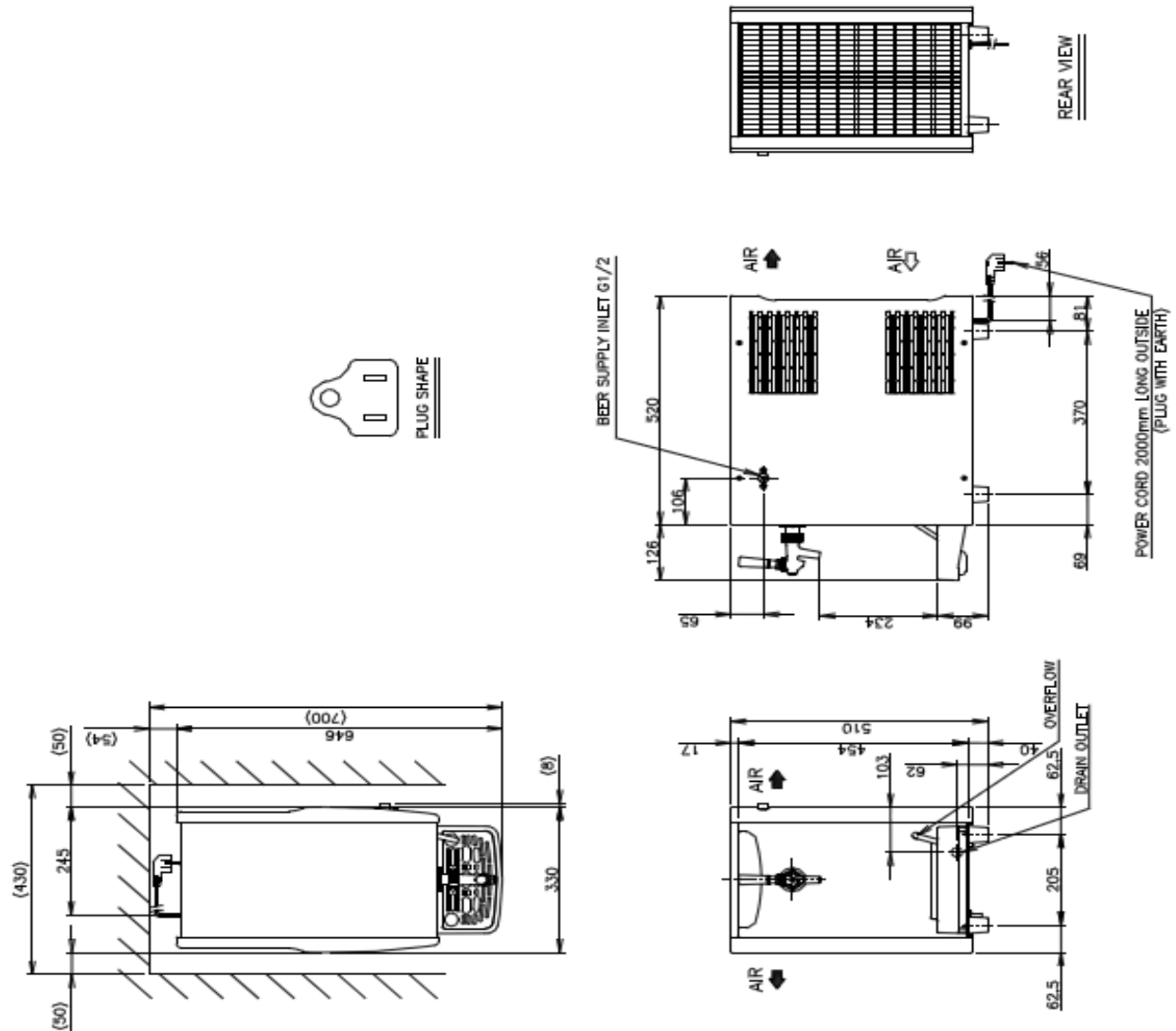
- 1) Compressor pushes refrigerant out.
- 2) Condenser exchanges heat.
- 3) Temperature of evaporator decreases to freeze water in the cooling water tank.
- 4) Beer is chilled by going through the beer coil inside the cooling water.
- 5) To cool beer efficiently, agitator motor always agitates water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

3. DIMENSIONS/SPECIFICATIONS

ITEM	Hoshizaki Draft Beer Dispenser
MODEL	DBF-40SAC
POWER SUPPLY	1 Phase 230V 60Hz Capacity 0.42kVA (1.9A)
AMPERAGE	Running 1.4A Rated Motor 1.4A Starting 7A
ELECTRIC CONSUMPTION	Rated Motor 250W (Power Factor 81%)
REFRESHING CIRCUIT	1 Beer Circuit
DISPENSING CAPACITY	40L (30°C → 8°C / 4h)
ICE MAKING TIME	Approx. 8h (Initial Cooling Water Temp. 30°C)
ICE CAPACITY	Approx. 8L
OUTSIDE DIMENSIONS	330mm(W) x 646mm(D) x 510mm(H)
EXTERIOR	Stainless Steel, Galvanized Steel (Bottom)
WATER TANK	ABS Plastic (Side Panel)
INSULATION	ABS Plastic
COOLING SYSTEM	Polyurethane Foam
DISPENSING VALVE	Instant Cooling (Ice)
COMPRESSOR	Dispensing Valve with Foaming Function
CONDENSER	Hermetic
HEAT REJECTION	Wire Condenser Type, Air-cooled, Fan Motor x1
EVAPORATOR	380W
REFRESHMENT CONTROL	Copper Tube Coil
REFRIGERANT	Capillary Tube
ICE MAKING CONTROL	R134a / 130g
BEER DISPENSING CONTROL	Electrode
BEER DISPENSING PROTECTION	10A Fuse, Earthing Conductor
LEG	Auto-reset Overload Protector
NET WEIGHT	Rubber
PACKAGE	28kg (Gross 31kg)
ACCESSORIES	Carton 416mm(W) x 669mm(D) x 545mm(H) Brush (Large x1, Small x1), Chain, Hook, Hook Mounting Screw x2, Nozzle Cap, O-ring, Cleaning Sponge x6, Spanner, Drain Pan, Grille
OPERATING CONDITIONS	Ambient Temperature: 5~35°C Voltage Range: 198V ~ 242V

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

1. Install the product properly in accordance with the instruction manual 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.
5. Allow at least the space indicated for ventilation. This drawing does not show the beer barrel and CO2 gas cylinder required for installation. Be sure to include them in layout drawing.
6. Product Code: B074-D008



TECHNICAL INFORMATION

4. CONTROL

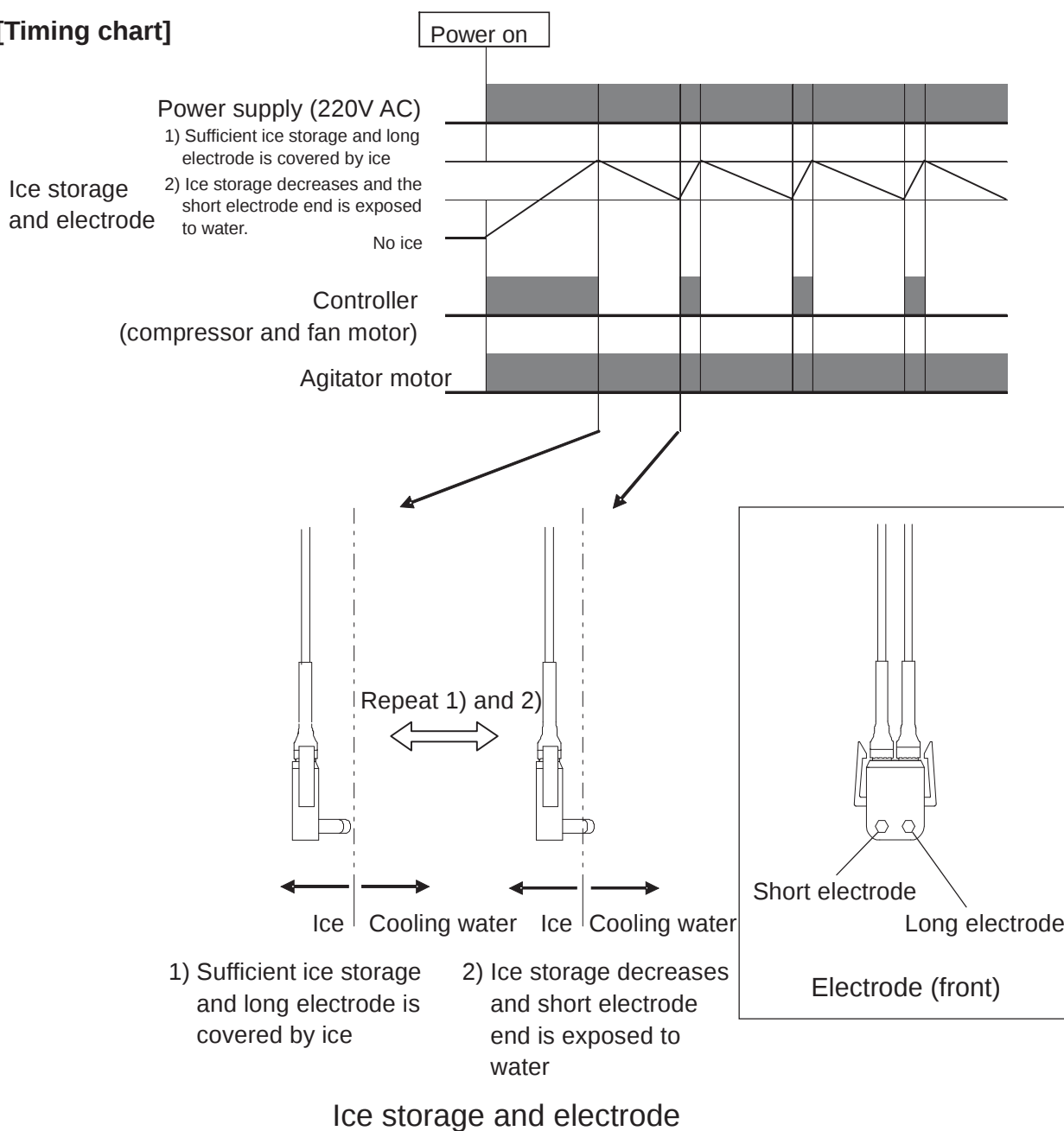
(1) GENERAL OPERATION

a. Normal operation

When the power supply is turned on, the compressor, fan motor and agitator motor start.

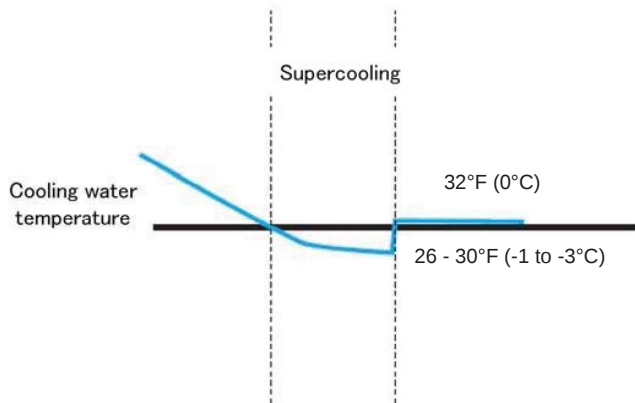
- When the ice making sensor (electrode) detects sufficient ice storage, the compressor and fan motor stop.
- When the ice making sensor (electrode) detects insufficient ice storage, the compressor and fan motor restart.
- Repeat the above operations until the power supply is turned off.

[Timing chart]

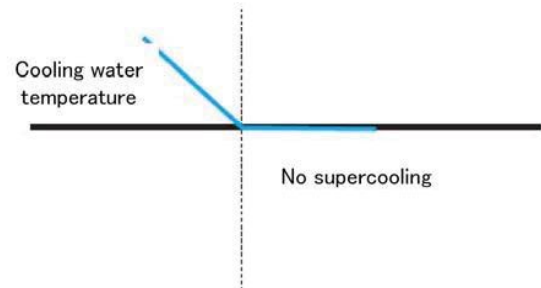


[Supercooling of cooling water and slush ice]

< No ice is stored in the water tank >



< Ice is stored in the water tank >



Ice normally freezes at 32°F (0°C) and ice nucleus is necessary for solidification.

By agitating cooling water slowly, ice nucleus will not form easily and temperature of the water will be lowered below its freezing point without becoming ice. This is called "supercooling".

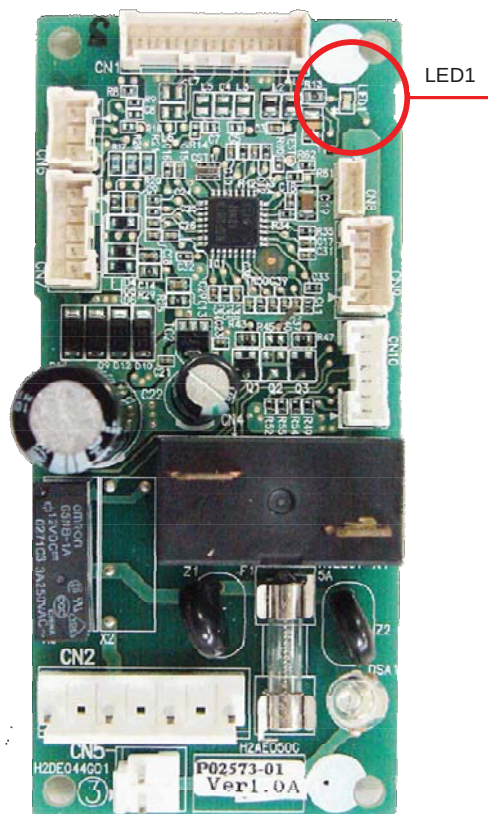
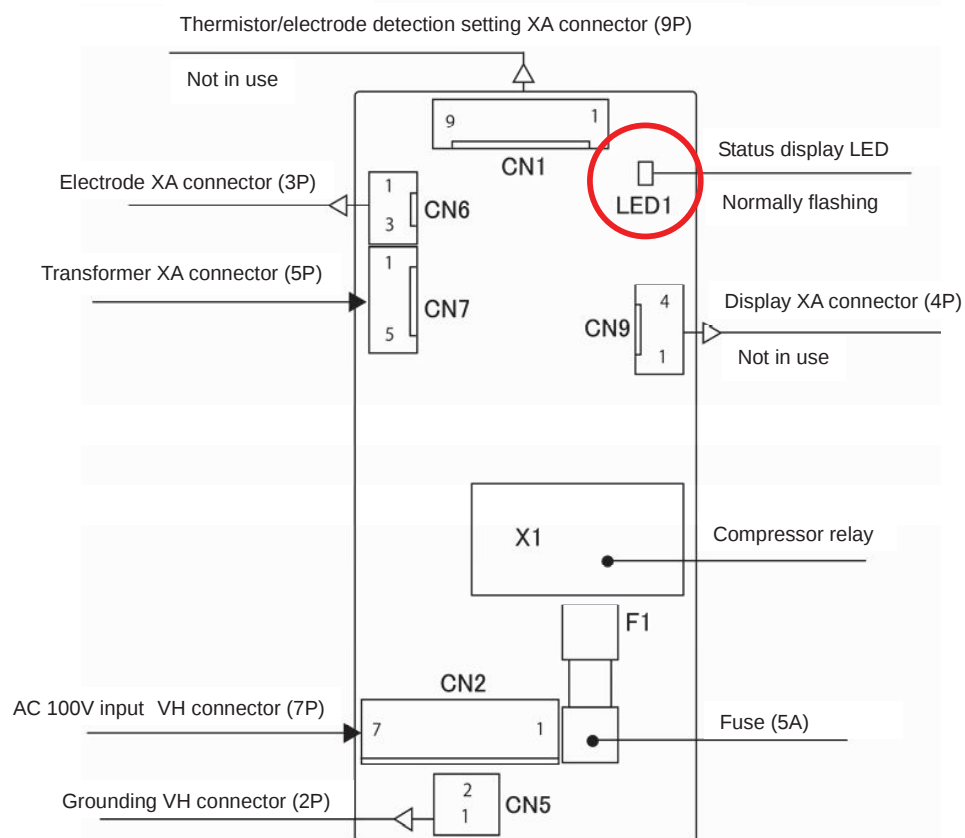
When enough calories are stored in water, the water instantly freezes by the vibration such as the vibration of agitator motor impeller. Water will crystallize at the time of freezing. The ice formed at this time is called "slush ice".

Supercooling will not occur if there is any presence of ice nucleus in the water inside the tank.



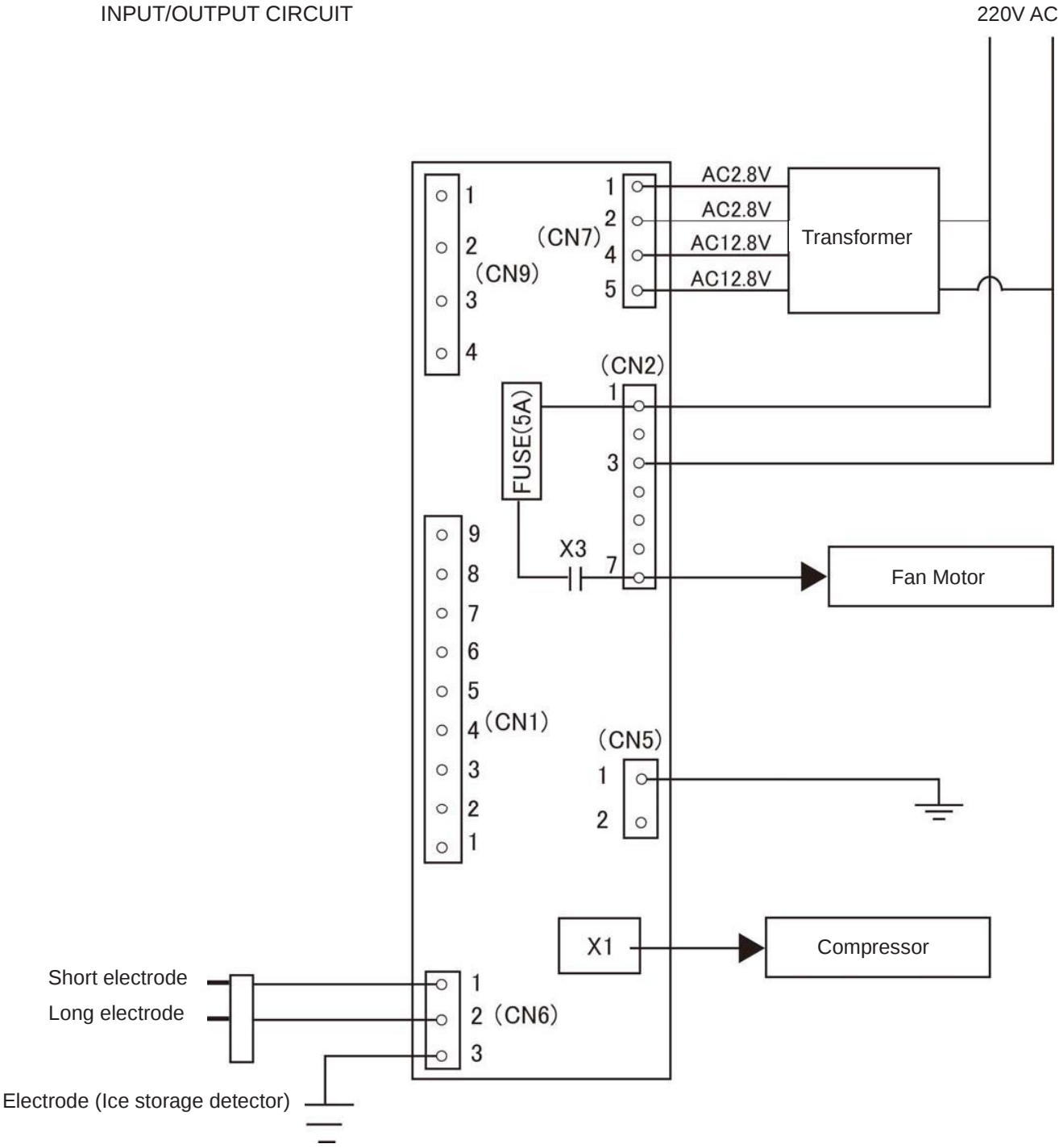
(2) INPUT/OUTPUT

INPUT/OUTPUT LAYOUT

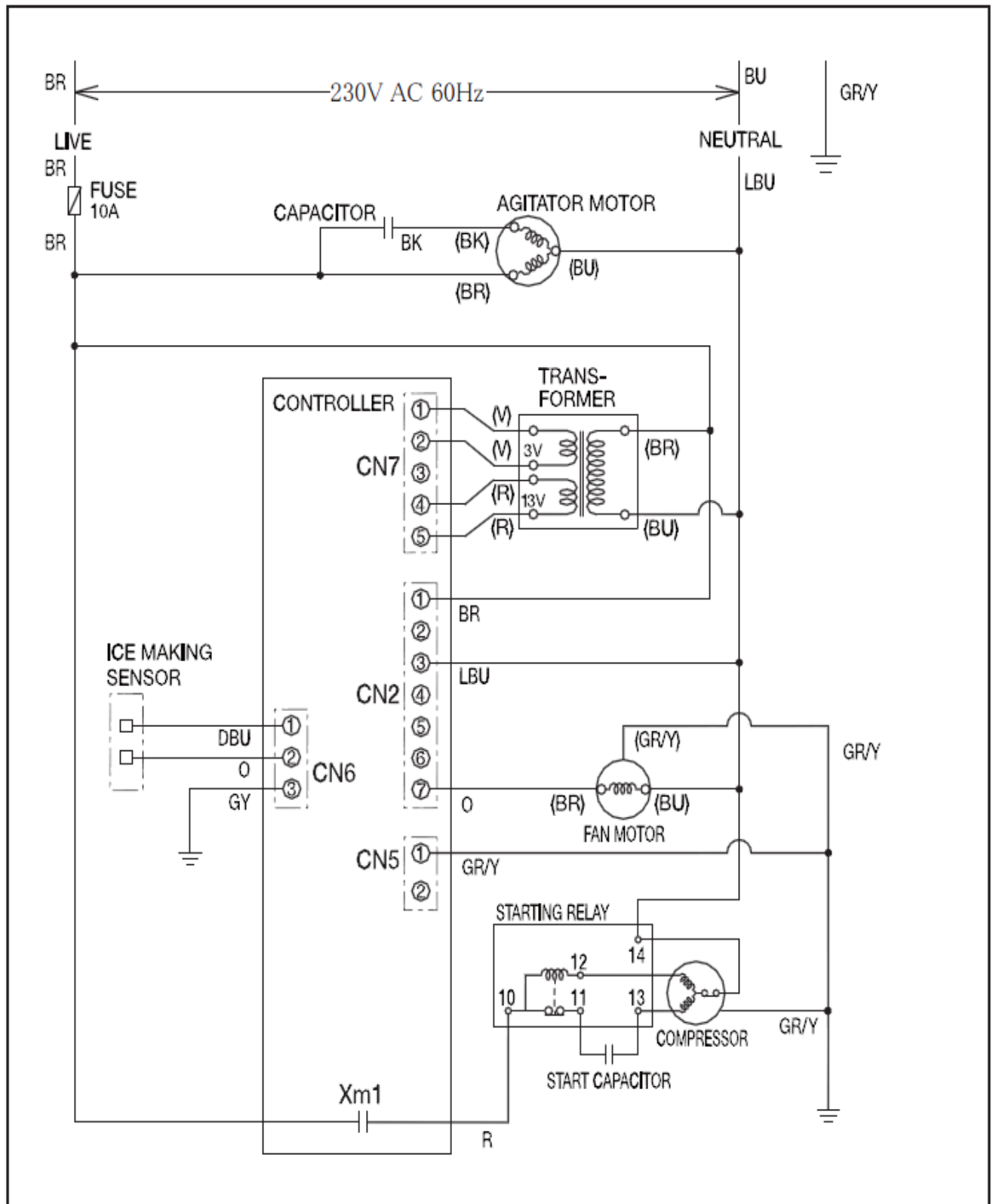


Note: Status display LED is normally flashing.

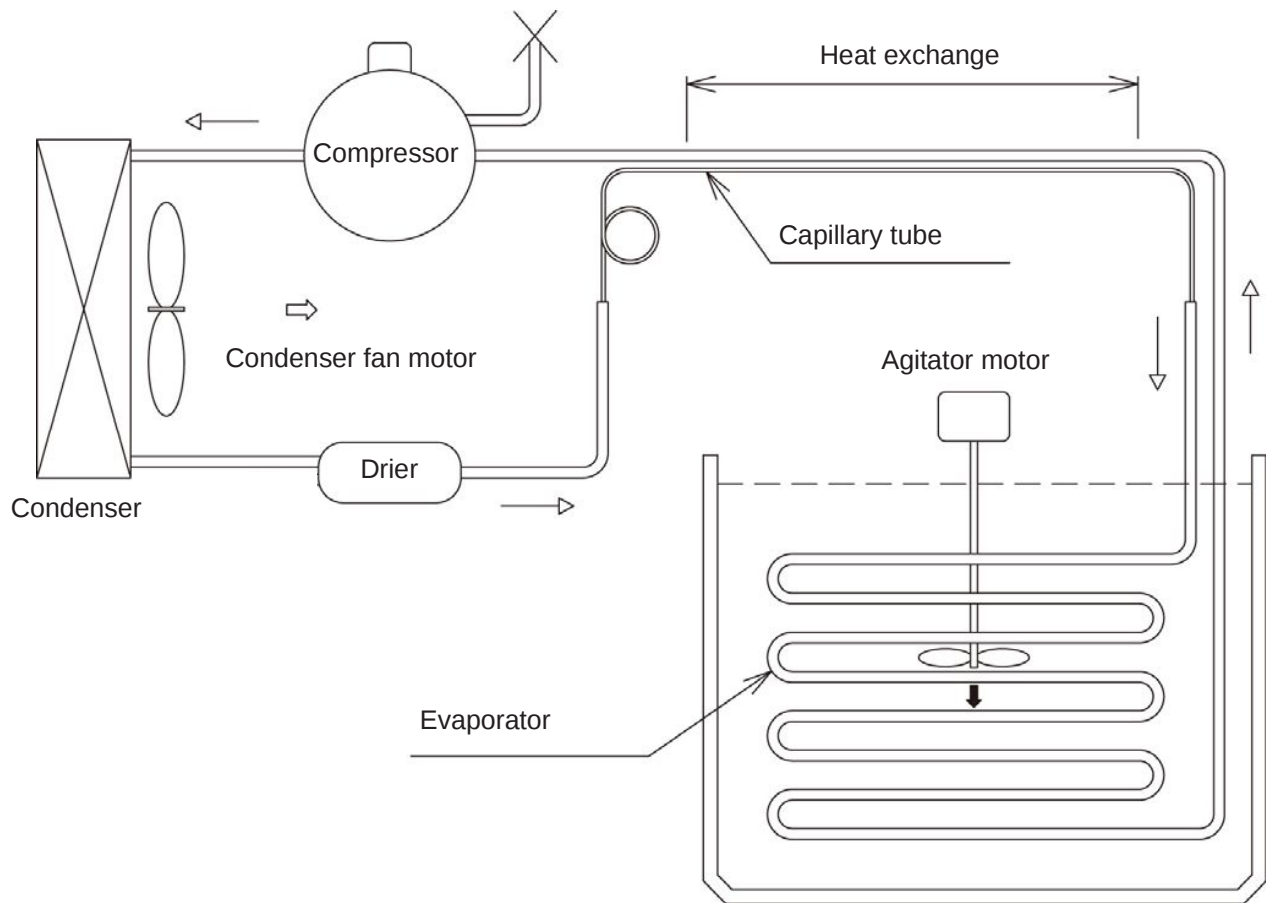
INPUT/OUTPUT CIRCUIT



(3) WIRING DIAGRAM



5. REFRIGERATION CIRCUIT



SERVICE INFORMATION

6. 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)

CO2 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) Instructions for handling controller board

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 Fuse blown out.	1-2 Replace with the extra fuse provided. (See page 29)
1-3 Low voltage	1-3 Check voltage at plug. If 198V or less, use thick cable for wiring from main power supply to unit.
1-4 Voltage drop by shared power supply.	1-4 Use separate power supply.
1-5 Overload relay damaged by low voltage.	1-5 Replace overload relay. Check voltage at plug. If 198V or less, use thick cable for wiring from main power supply to unit.
1-6 Open circuit.	1-6 Check open point.
1-7 Cooling water leaks.	1-7 Check and repair. Fill water tank until water starts leaking from overflow pipe.
1-8 Defective ice storage control.	
1-8-1 Scaled electrode.	1-8-1 Replace contaminated cooling water. If electrode is browned, blackened or dirty, polish electrode (do not change its location).
1-8-2 Electrode lead has open circuit or bad contact.	1-8-2 Repair.
1-8-3 Damaged controller board.	1-8-3 Replace. (See page 20)
1-8-4 Damaged transformer.	1-8-4 Replace.
1-9 Defective compressor	1-9 Replace.
1-10 Clogged condenser.	1-10 Clean condenser.
1-11 Condenser fan will not turn.	
1-11-1 Open circuit or unplugged.	1-11-1 Rewire or plug in.
1-11-2 Damaged fan motor.	1-11-2 Replace.
1-11-3 Blocked fan.	1-11-3 Unblock.
1-12 Poor ventilation.	1-12 Poor ventilation causes lower cooling capacity and longer ice storage time. Allow at least 2in. (50mm) clearance at both sides and 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 capillary tube and drier. If clogged, ice may start forming in the middle of capillary tube.
4. Cooling water quality	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 page 35)
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.	3-1 Replace cooling water with water having proper conductivity. (See page 35) 3-2 Replace cooling water twice a year.

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

Possible Cause	Remedy
1. Refrigeration circuit leaks refrigerant (evaporator will not refrigerate).	1. Locate and repair leaks. Evacuate refrigeration circuit and recharge. See nameplate for proper refrigerant charge. Note: Extend vacuum pump operation to raise vacuum.
2. Clogged capillary tube.	2. Replace heat exchanger and drier. If clogged, ice may start forming in the middle of capillary tube.
3. Poor ventilation.	3. Poor ventilation causes lower cooling capacity and longer ice storage time. Allow at least 2in. (50mm) clearance at both sides and rear of unit.

(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. 1-2 Burnt out agitator motor. 1-3 Defective agitator motor blade.	1-1 Repair. 1-2 Replace agitator motor. 1-3 Replace agitator motor blade.
2. Cooling water not circulating properly. Defective heat exchanger. 2-1 Dirty cooling water. 2-2 Clogged water tank filter. 2-3 Low cooling water level. (check water level below overflow level)	2-1 Clean water tank and replace cooling water. 2-2 Clean water tank and filter and replace cooling water. 2-3 Add cooling water. Cooling water must be with proper conductivity.

Beer

(2) No beer is dispensed

Possible Cause	Remedy
1. Beer circuit clogged with foreign matter. 1-1 Beer tap clogged with foreign matter. 1-2 Beer circuit clogged with foreign matter.	1-1 Disassemble and clean beer tap. 1-2 Flush from beer tap to unclog beer circuit.
2. Frozen beer cooling line. 2-1 Cooling water has improper conductivity. 2-2 Beer circuit clogged with cleaning sponge or foreign matter. 2-3 Empty beer keg. 2-4 Cooling water not replaced periodically. 2-5 Damaged controller board. 2-6 Electrode out of position. Electrode is too close to beer coil. 2-7 Dirty cooling water (mixture of beer in water tank causes freezing).	2-1 Replace cooling water with water having proper conductivity. (See page 35) 2-2 Flush from beer tap and unclog beer circuit. 2-3 Replace beer keg. 2-4 Replace cooling water twice a year. 2-5 See instructions for handling controller board. (See page 20) 2-6 Reposition electrode. (See page 26) 2-7 Cooling mixed with beer will be entirely frozen. Repair leaks and replace cooling water.
3. Beer tap will not move smoothly.	3. Disassemble and clean beer tap. If beer tap still will not move smoothly, replace.
4. No CO2 gas in beer keg. 4-1 Empty CO2 gas cylinder. 4-2 Closed main valve of CO2 gas cylinder. 4-3 Closed keg coupler handle. 4-4 Defective regulator.	4-1 Replace CO2 gas cylinder. 4-2 Open main valve of CO2 gas cylinder. 4-3 Open keg coupler handle. 4-4 Check for CO2 gas pressure and open shut off valve. Replace regulator.

(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. (See page 33)								
2. Beer tap valve shaft cannot return to original position.	2. Disassemble and clean beer tap. If beer tap still cannot return to original position, replace.								
3. CO2 gas pressure too low.	3. Adjust CO2 gas pressure to proper level. The chart below is a general example. Adjust to gas pressure specified by beer manufacturers. <table border="1"> <thead> <tr> <th>Temperature of beer keg</th><th>CO2 gas pressure</th></tr> </thead> <tbody> <tr> <td>50°F(10°C)</td><td>22-29PSIG (0.15-0.20Mpa)</td></tr> <tr> <td>68°F(20°C)</td><td>32-36PSIG (0.15-0.20Mpa)</td></tr> <tr> <td>86°F(30°C)</td><td>46-51PSIG (0.32-0.35Mpa)</td></tr> </tbody> </table>	Temperature of beer keg	CO2 gas pressure	50°F(10°C)	22-29PSIG (0.15-0.20Mpa)	68°F(20°C)	32-36PSIG (0.15-0.20Mpa)	86°F(30°C)	46-51PSIG (0.32-0.35Mpa)
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86°F(30°C)	46-51PSIG (0.32-0.35Mpa)								

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. (See page 33)
2. Damaged beer tap valve seat.	2. Replace valve body.
3. Loosened rubber seal in valve shaft.	3. Disassemble beer tap and fix rubber seal.
4. Clogged air vent hole.	4. Clean air vent hole.
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 a general example. Adjust to gas pressure specified by beer manufacturers. <table><tr><td>Temperature of beer keg</td><td>CO2 gas pressure</td></tr><tr><td>50°F(10°C)</td><td>22-29PSIG(0.15-0.20Mpa)</td></tr><tr><td>68°F(20°C)</td><td>32-36PSIG(0.15-0.20Mpa)</td></tr><tr><td>86°F(30°C)</td><td>46-51PSIG(0.32-0.35Mpa)</td></tr></table>	Temperature of beer keg	CO2 gas pressure	50°F(10°C)	22-29PSIG(0.15-0.20Mpa)	68°F(20°C)	32-36PSIG(0.15-0.20Mpa)	86°F(30°C)	46-51PSIG(0.32-0.35Mpa)
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86°F(30°C)	46-51PSIG(0.32-0.35Mpa)								
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 keep temperature of beer keg above 50°F (10°C).								
4. Foam circuit in beer tap clogged with dirt or foreign matter.	4. Disassemble and clean beer tap. If problem still occurs, replace valve shaft.								

Beer

(6) Overfoaming

Possible Cause	Remedy
1. Beer has not been led to tap.	1. Lead beer to tap before dispensing beer.
2. Beer keg temperature too high.	2-1 Refrigerate keg below 86°F (30°C). 2-2 Check that keg is free from exhausted heat from refrigerator. If not, avoid heat.
3. CO2 gas pressure too high or too low.	3-1 Adjust CO2 gas pressure to proper level. 3-2 In winter, gas easily dissolves in beer resulting in supersaturation. Be sure to close main valve of CO2 gas cylinder after operating hours.
4. Too much vibration on beer keg.	4. Replace beer keg.
5. Beer cannot be dispensed properly 5-1 Mug positioned too far from nozzle end. 5-2 Beer tap not fully open. 5-3 Beer is dispensed with foam remaining in mug 5-4 Dirty mug.	5-1 Tilt mug and contact its inner wall with nozzle end to let beer run down wall. 5-2 Instruct user on proper dispensing operation (fully open tap). 5-3 Foam in mug causes overfoaming. Use mug without foam. 5-4 Use clean mug.
6. Dispensing operation exceeds unit's capacity.	6. Instruct user to operate unit within its specified capacity.
7. Dirty beer circuit.	7. Clean beer circuit using sponge.
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.

Beer

(7) Large bubbles

Possible Cause	Remedy								
1. Beer circuit and beer tap not washed thoroughly.	1. Rinse thoroughly with tap water.								
2. Little gas dissolved in beer.	2. Adjust CO2 gas pressure to proper level. The chart below is a general example. Adjust to gas pressure specified by beer manufacturers. <table><tr><td>Temperature of beer keg</td><td>CO2 gas pressure</td></tr><tr><td>50°F (10°C)</td><td>22-29PSIG (0.15-0.20Mpa)</td></tr><tr><td>68°F (20°C)</td><td>32-36PSIG (0.15-0.20Mpa)</td></tr><tr><td>86°F (30°C)</td><td>46-51PSIG (0.32-0.35Mpa)</td></tr></table>	Temperature of beer keg	CO2 gas pressure	50°F (10°C)	22-29PSIG (0.15-0.20Mpa)	68°F (20°C)	32-36PSIG (0.15-0.20Mpa)	86°F (30°C)	46-51PSIG (0.32-0.35Mpa)
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86°F (30°C)	46-51PSIG (0.32-0.35Mpa)								
3. Mug soiled with grease.	3. Use clean mug. Wash mug thoroughly with detergent. Instruct user to store mugs in clean place.								
4. Improper dispensing manner (e.g. let beer directly hit mug bottom).	4. Tilt mug and let beer run down its inner wall to minimize inclusion of air.								

(8) Beer tastes strange (watery)

Possible Cause	Remedy								
1. Little gas dissolved in beer.	1. Adjust CO2 gas pressure to proper level. The chart below is a general example. Adjust to gas pressure specified by beer manufacturers. <table><tr><td>Temperature of beer keg</td><td>CO2 gas pressure</td></tr><tr><td>50°F (10°C)</td><td>22-29PSIG (0.15-0.20Mpa)</td></tr><tr><td>68°F (20°C)</td><td>32-36PSIG (0.15-0.20Mpa)</td></tr><tr><td>86°F (30°C)</td><td>46-51PSIG (0.32-0.35Mpa)</td></tr></table>	Temperature of beer keg	CO2 gas pressure	50°F (10°C)	22-29PSIG (0.15-0.20Mpa)	68°F (20°C)	32-36PSIG (0.15-0.20Mpa)	86°F (30°C)	46-51PSIG (0.32-0.35Mpa)
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86°F (30°C)	46-51PSIG (0.32-0.35Mpa)								
2. Beer circuit and beer tap not washed thoroughly.	2. Wash beer tap and beer circuit thoroughly. Dump beer remaining in beer circuit after leading beer to tap.								
3. Mug not dried completely.	3. Use dry mug.								

CO2 cylinder

(9) Cylinder runs out of gas easily

Reference: Approx. 900L of beer is available with a 22lb (10kg) CO2 at 43PSIG (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. 1-2 Loose or incorrect hose bands on both ends of gas hose. 1-3 Defective gasket in keg coupler 1-4 Loose gas hose joint.	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 Check correct hose band type and insert gas hose deep into quick gas hose joint. 1-3 Replace gasket. 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 O-ring 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 everyday.
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.	1-1 Check for power supply voltage of 198 to 242V 1-2 Check for inadequate rotation and replace agitator motor (ensure proper installation and wiring).
2. Overheated or burnt out condenser fan motor.	2-1 Check for power supply voltage of 198 to 242V. 2-2 If fan is blocked, unblock and check fan for proper movement. 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 damaged by voltage drop.	2. Do not share power supply, but use separate power supply.
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.

(17) 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 again after 30 seconds. This will reset the controller, and in some cases normal operation will resume.

b. Servicing

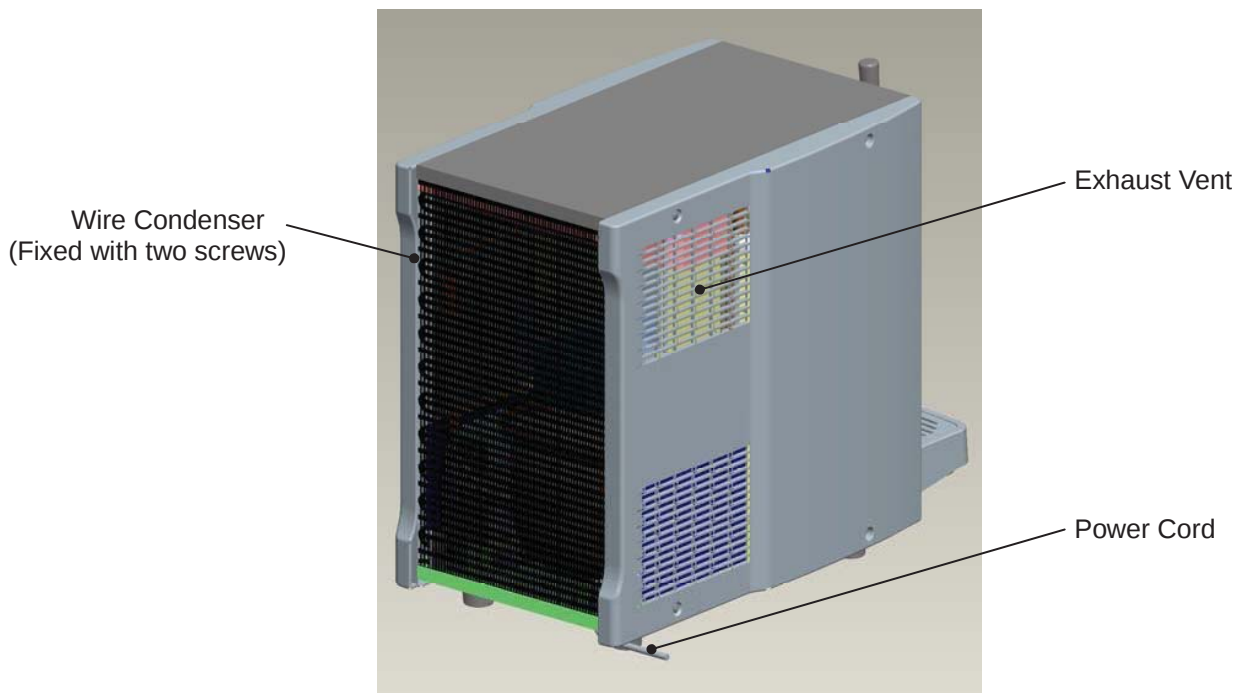
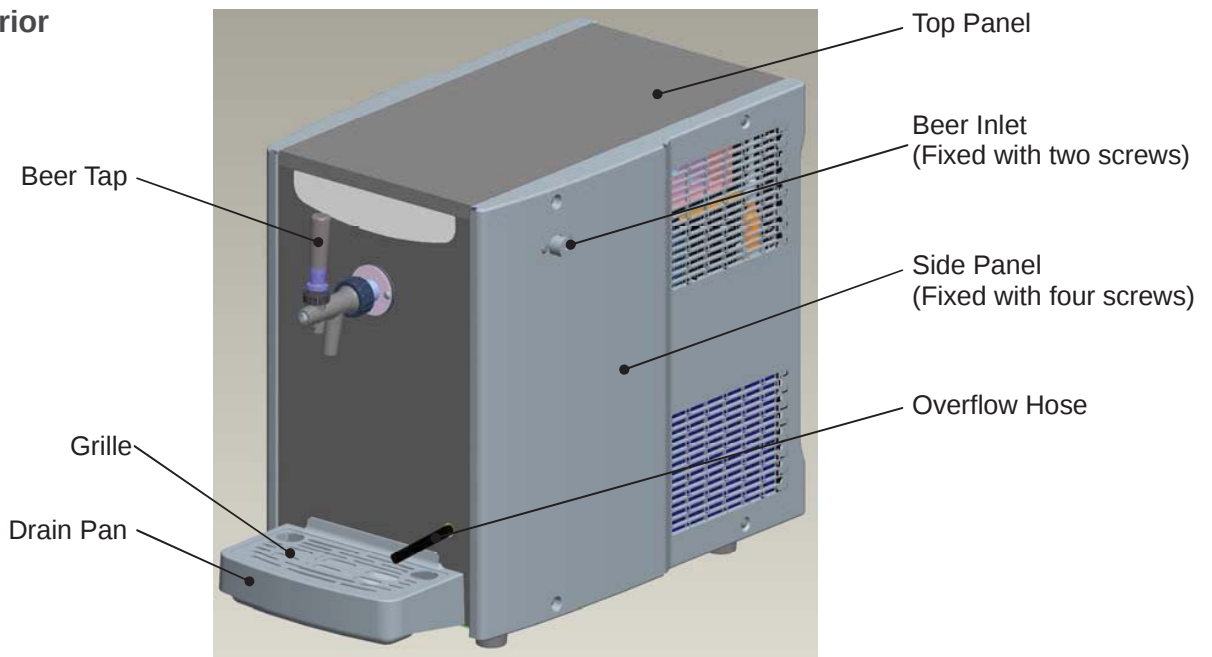
- 1) Check that the unit has been earthed properly. If not, the controller board will not work properly.
- 2) To get static free, always touch the metal part of the unit before servicing. Electrostatic discharge will cause severe damage to the controller board. Also, keep things that produce static electricity (e.g. vinyl bag or plastic product) away from controller board.
- 3) Do not touch the electronic devices on the controller board or the back of the controller board.
- 4) Handle the controller board by the edges only. Do not touch the electric parts and wiring.
- 5) Do not drop the controller board on the floor. The controller board is fragile.
- 6) Put controller board on a flat surface and prevent damage to electric parts and devices.
- 7) Do not pull wires having thin insulation to prevent damage.
- 8) Do not short the relay output.
- 9) Do not pull connectors to prevent connectors from coming off of wires from damage. Check that the connectors are fixed after servicing.

7. PARTS DESCRIPTION AND REPLACEMENT

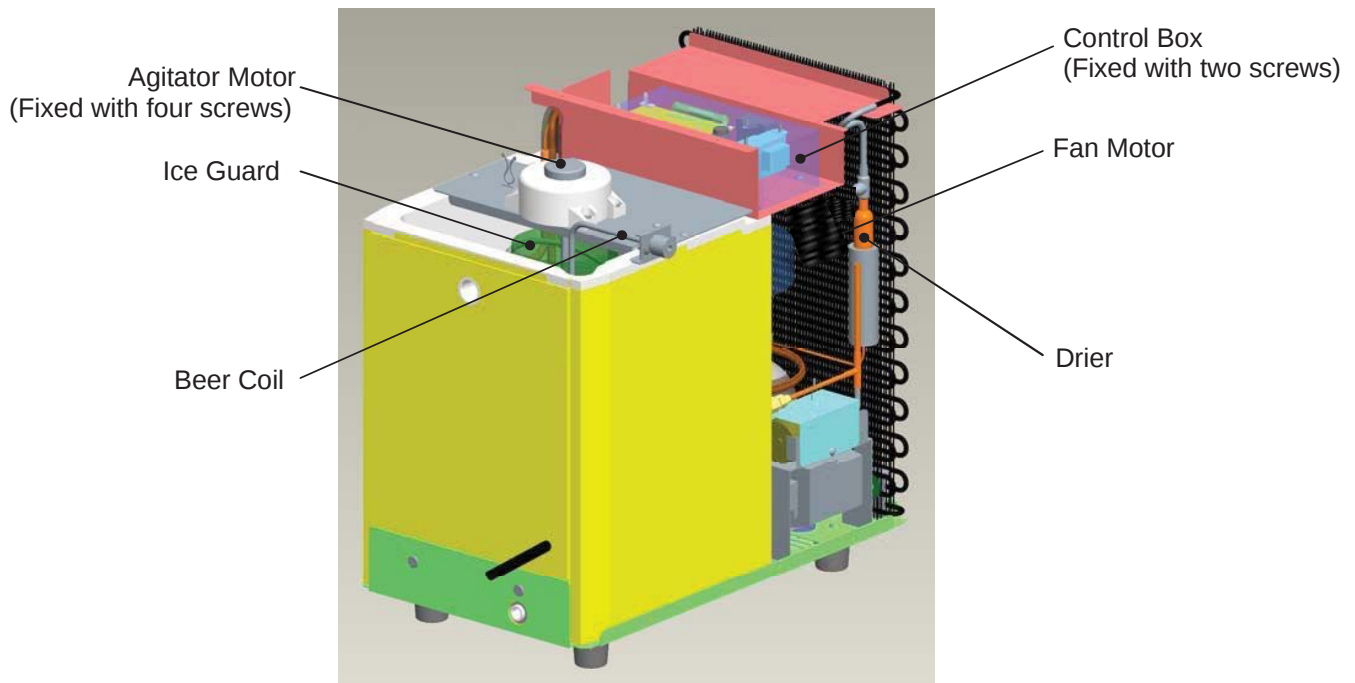
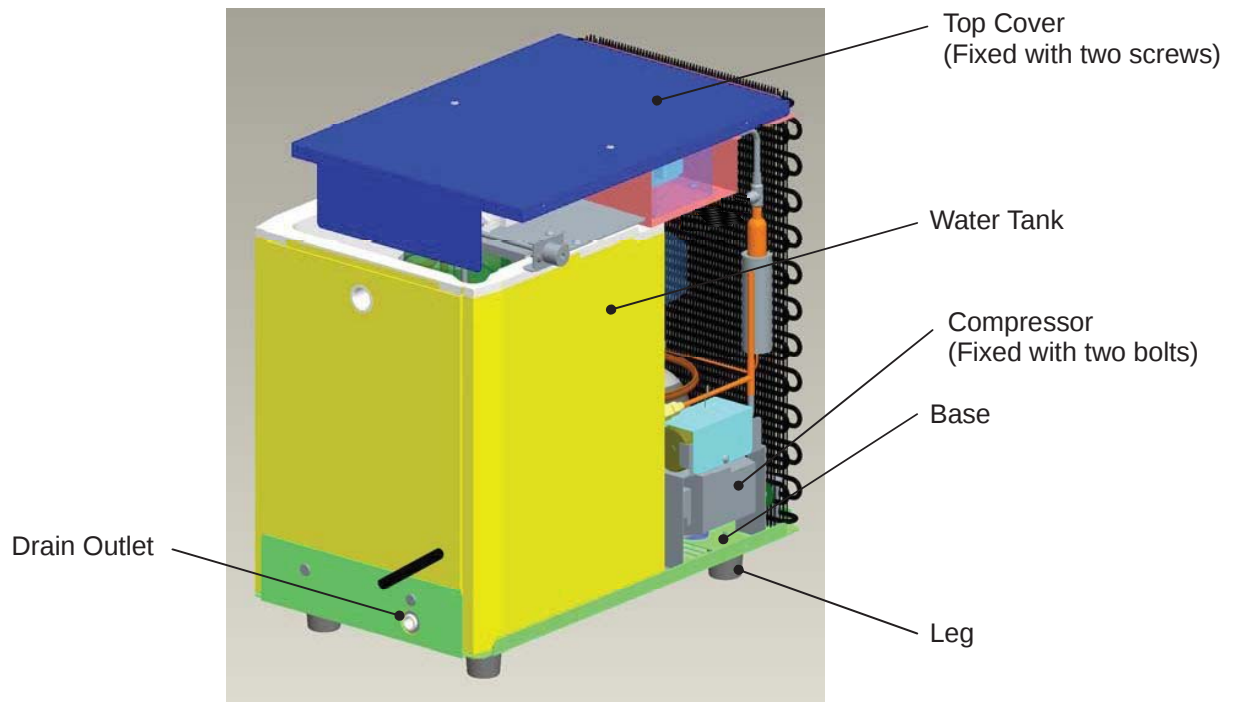
* Notes:

- (1) When replacing parts, be sure to unplug the unit or disconnect the main power supply.
- (2) Do not pinch wiring when installing parts.
- (3) When rebinding wiring, keep wiring away from the fan and piping.
- (4) Do not damage piping to avoid CO2 gas leak from the refrigerant pipe connections.
- (5) Before welding the evaporator, fill the water tank with water to prevent deformation caused by heating.

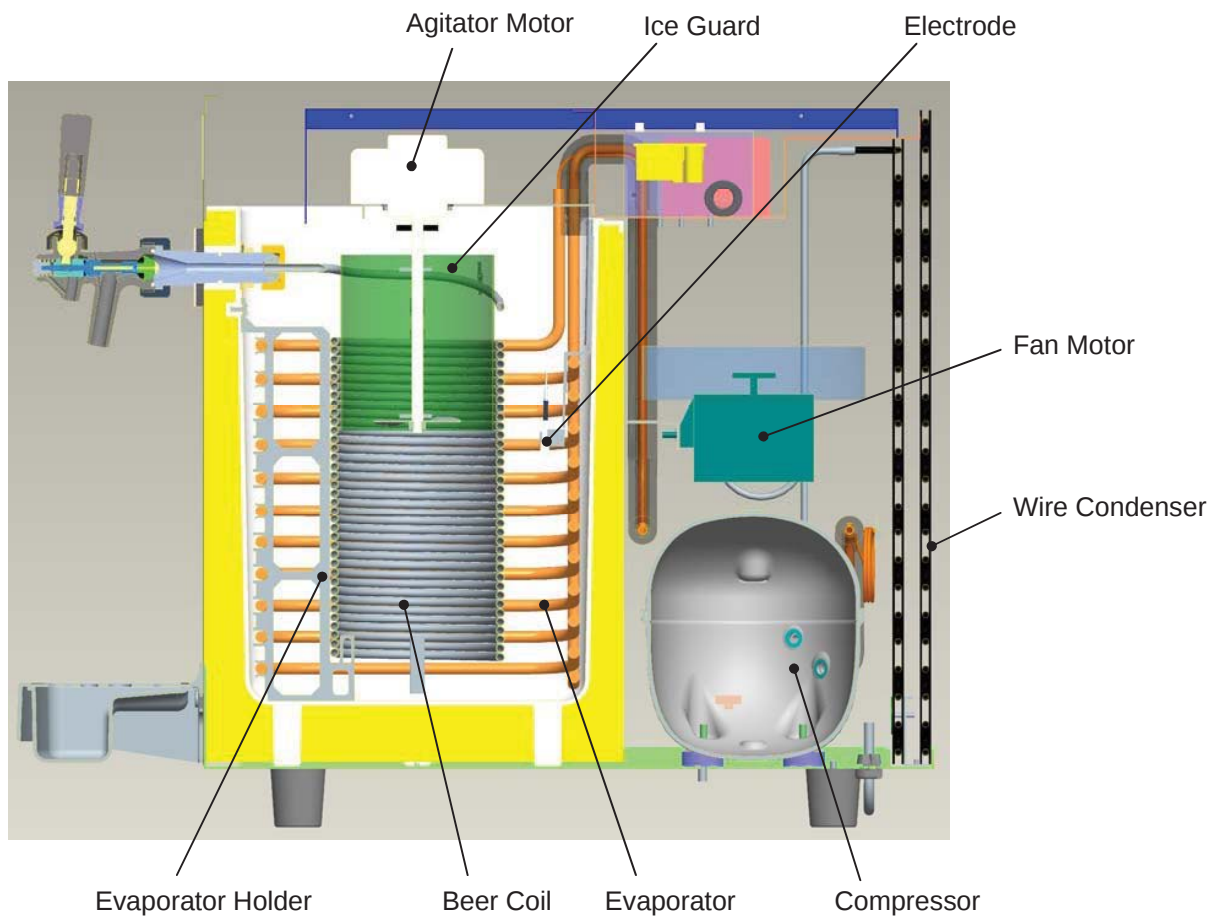
1) Exterior



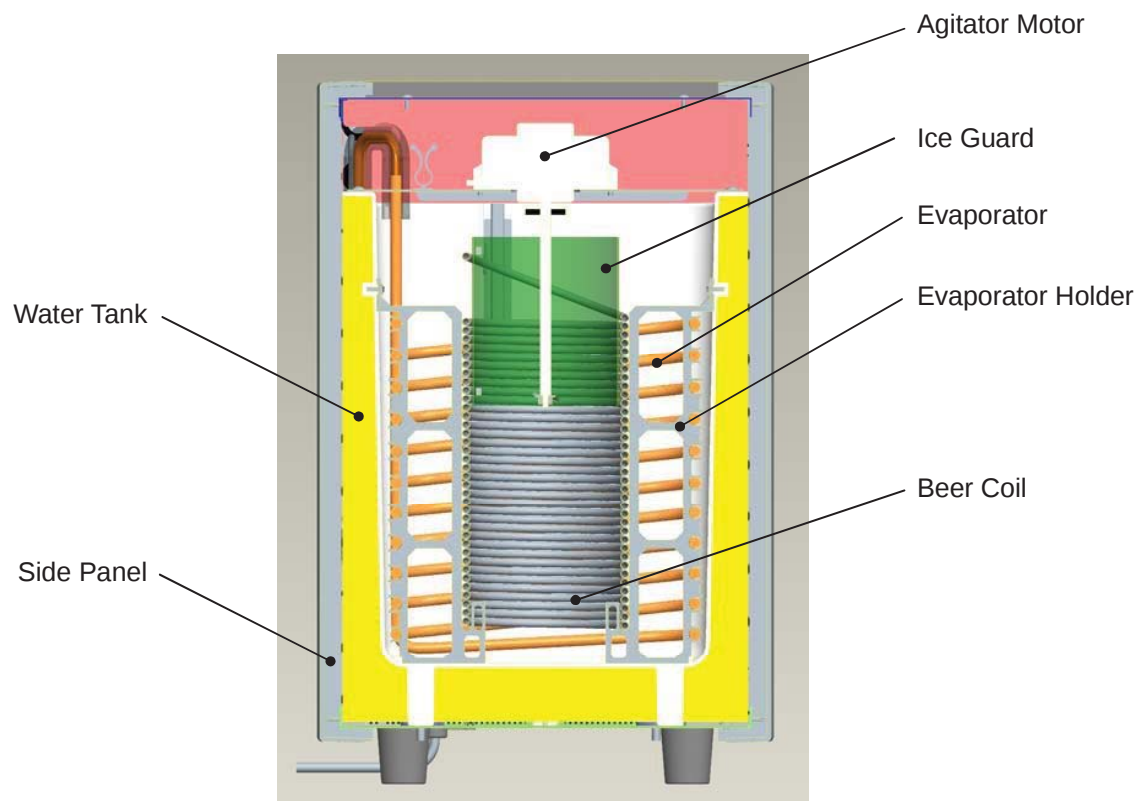
2) Unit without cabinet



3) Sectional side view



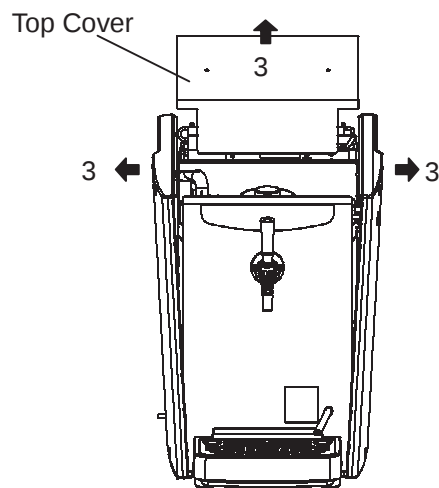
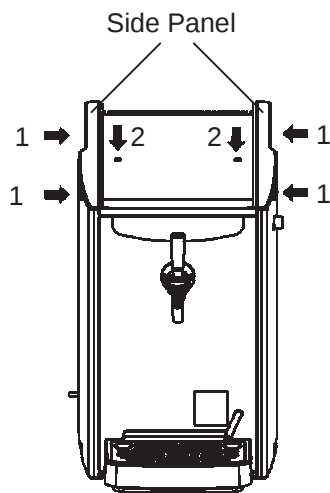
4) Sectional front view



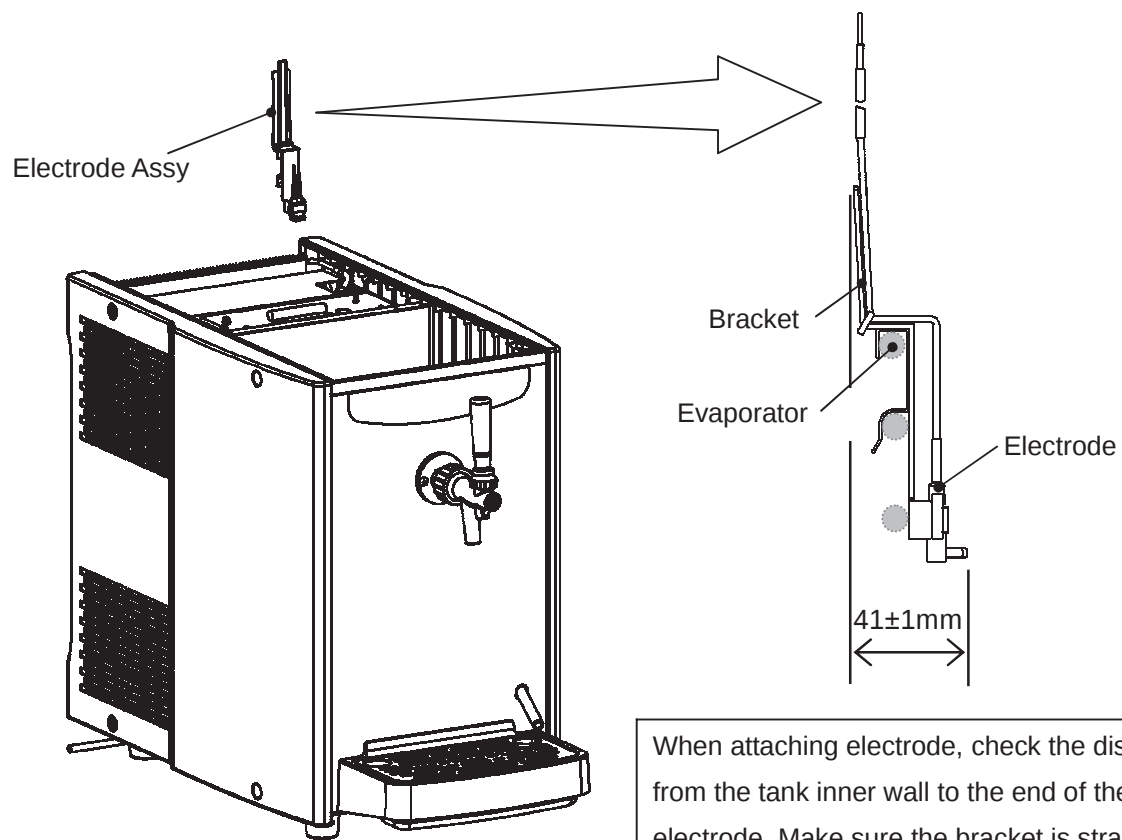
5) Top cover removal

To service or replace parts, follow the instructions below to remove the top cover.

- 1) Remove the two upper screws each securing the left and right side panels.
- 2) Remove the two screws securing the top cover.
- 3) Lift up and remove the top cover by opening the side panels to both sides. To prevent damage, do not open the side panels more than necessary.
- 4) After service or replacement, reattach the top cover in the reverse order.

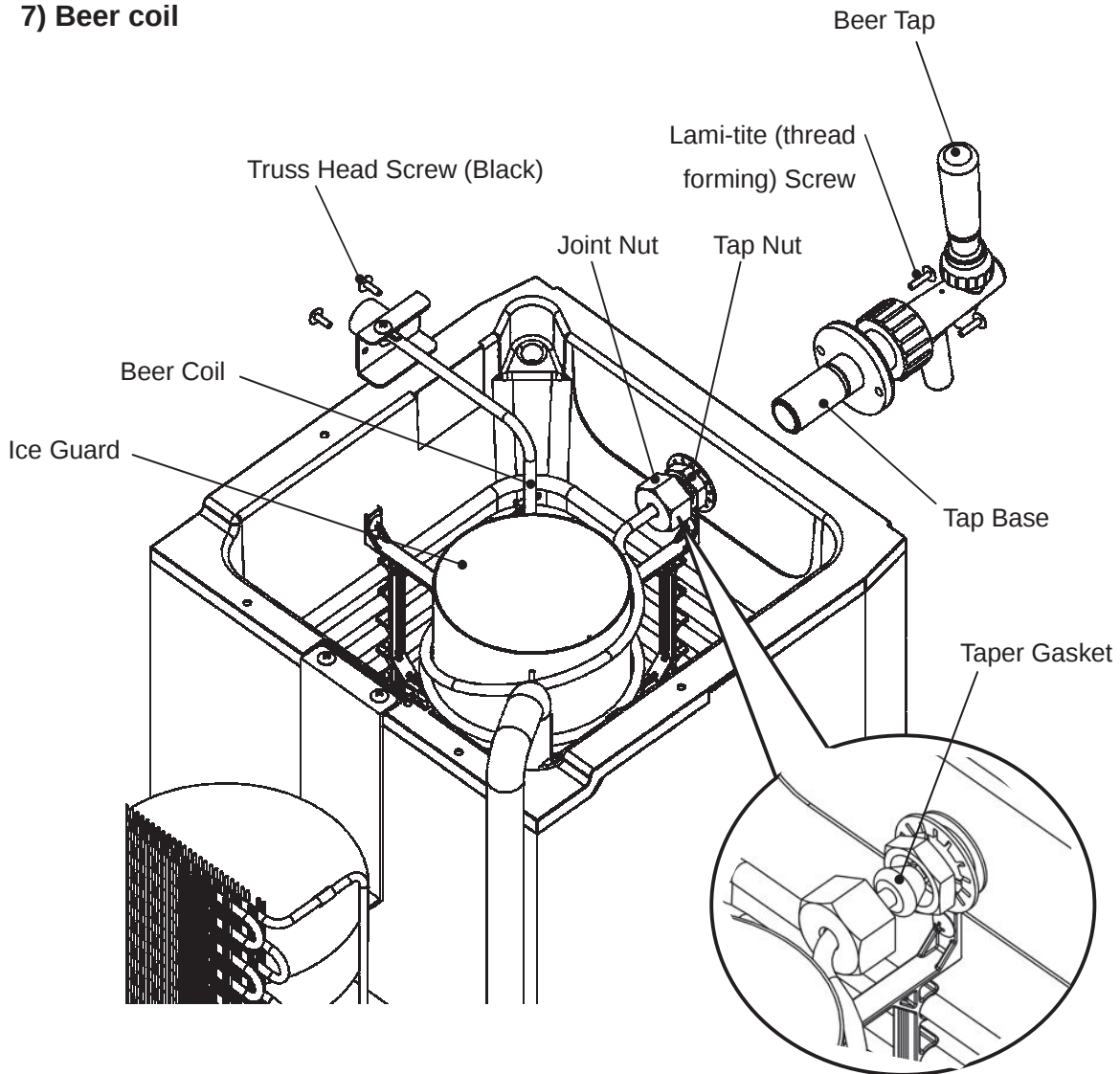


6) Electrode positioning



When attaching electrode, check the distance from the tank inner wall to the end of the longer electrode. Make sure the bracket is straight.

7) Beer coil



Recommended screw tightening torque

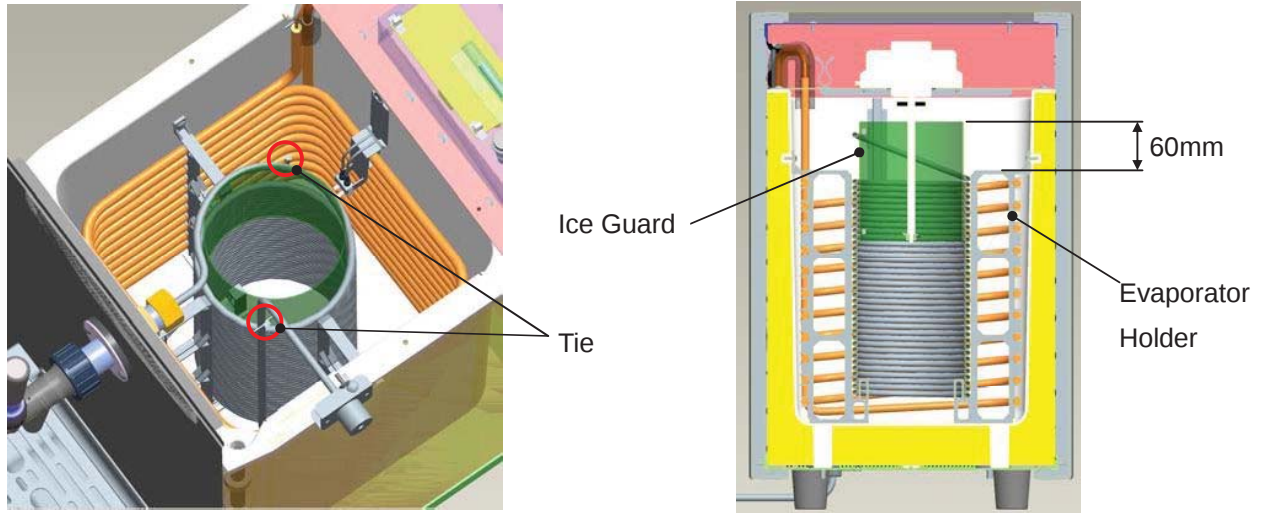
Screw type (part number)	Recommended torque
Joint Nut (467878-01)	4.9N•m (50kgf•cm)
Tap Nut (458286-01)	7N•m (71kgf•cm)
Truss Head Screw (FST0410F1)	1.2N•m (12kgf•cm)

Do not tighten the joint nut and the tap nut more than necessary to prevent damage to the tap base. Check for beer leakage after tightening the nuts.

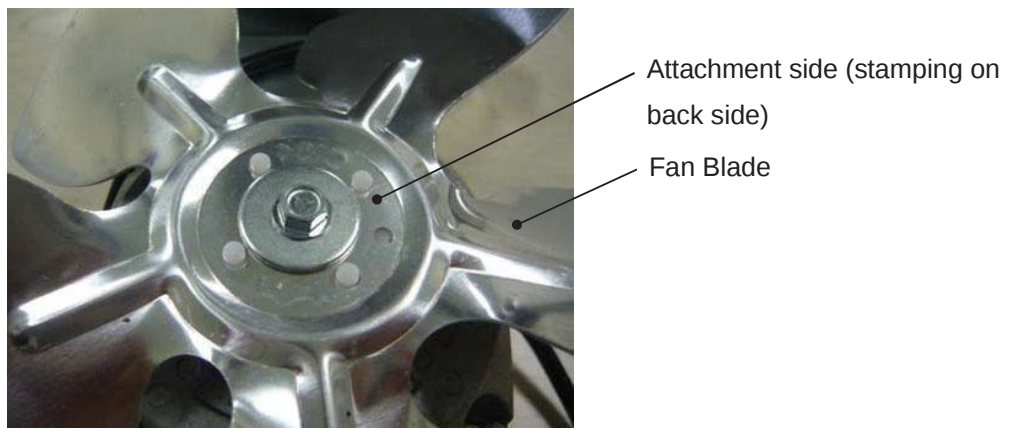
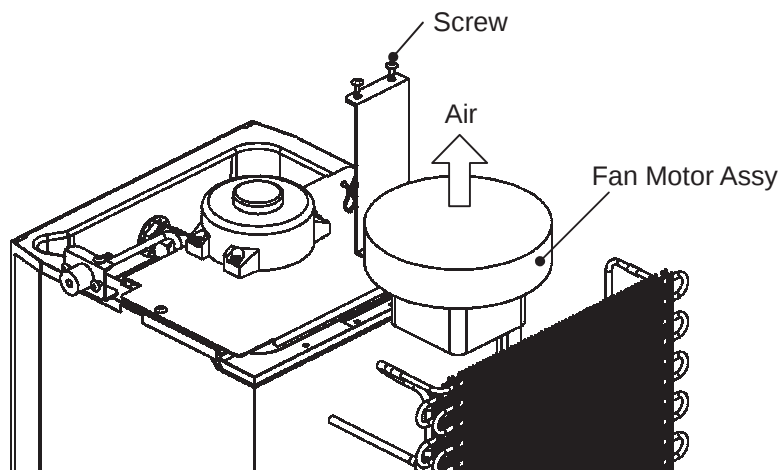
When removing the joint nut, replace the taper gasket (4Y8219R01) to prevent beer leakage. When tightening the joint nut, have the joint nut straight against the central axis of tap base, and tighten the joint nut about 10 mm by hand first and then fully by tool. If tightened at a slant, the nut can have stripped threads or be tightened loosely causing beer leakage.

For easy detachment of the beer tap, turn it around in place and then pull it out.

After removing the ice guard, fix it back to the beer coil using ties at two positions.
The top of ice guard must be positioned 60 mm above the top of evaporator holder.



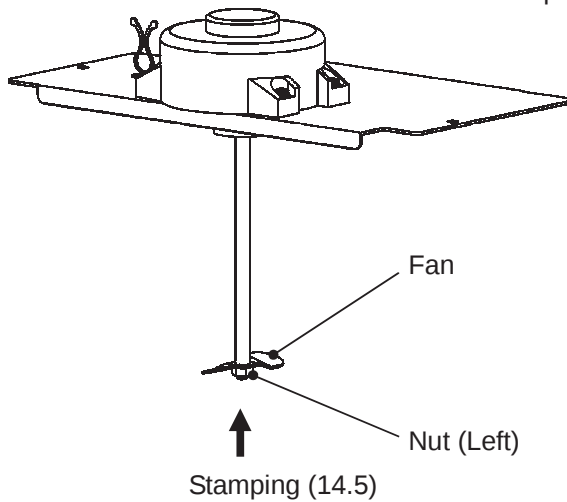
8) Fan motor



Attach the fan blade with attachment side stamping and rotating direction stamping to the motor side (on back side of the above picture).

9) Agitator motor

Stamping (14.5) on fan must be facing down.

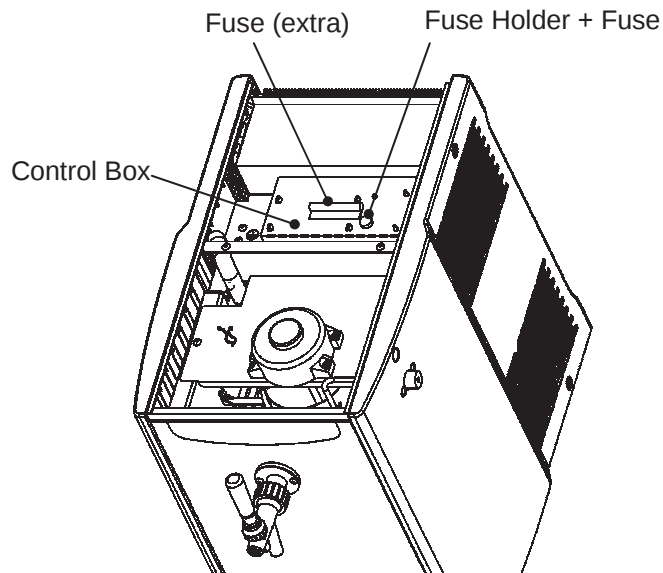


10) Fuse

- 1) Use a phillips head screwdriver to remove the fuse holder cap and take out the fuse.
- 2) Install the new fuse in the reverse order of the removal procedure.

11) Fuse holder

- 1) Disconnect the tab terminal and remove the nut securing the fuse holder.
- 2) Install the new fuse holder in the reverse order of the removal procedure.



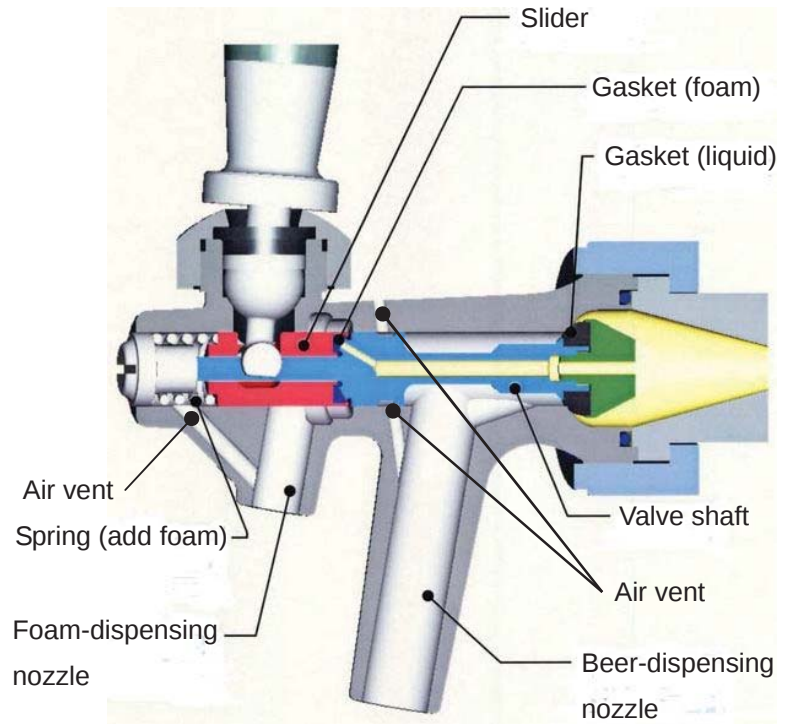
12) Wire condenser

For wire condenser replacement, use silver solder (SG301, 30% silver contained) and handy flux to braze pipes.

Disconnect the two brazed parts of pipes at the top of wire condenser and replace with a new wire condenser. Then, eliminate the flux residue by using Scotch Brite or sandpaper and apply black coating (DAI NIPPON TORYO, ACLOSE SUPER ECO, 80% gloss, HOSHIZAKI BLACK) to prevent corrosion.

13) Beer tap

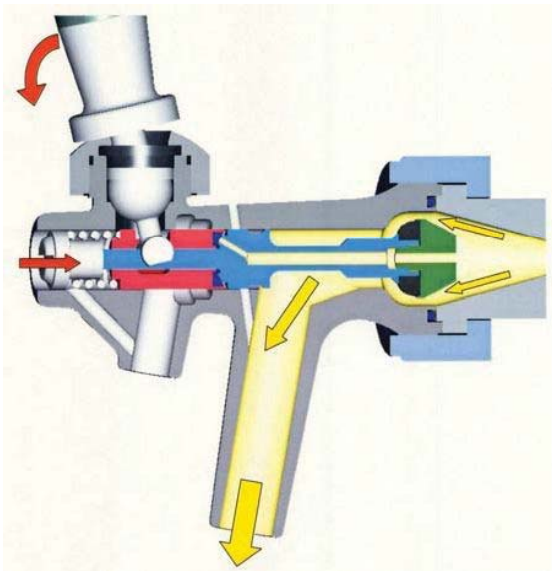
Beer tap (2 nozzle type)



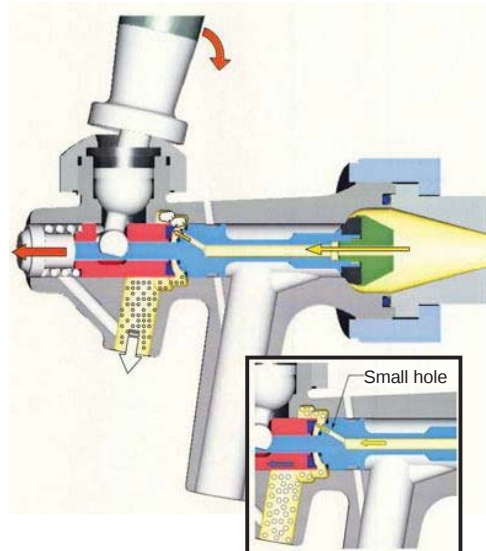
Beer Tap Cross Section

Flow of beer and foam

<When dispensing beer>



<When dispensing foam>



When dispensing foam, beer goes through the small hole and is discharged quickly. CO₂ gas in beer foams and beer becomes fine foam.

<When dispensing beer>

To dispense beer, move the lever toward you. The valve shaft slides backward to create a gap between the gasket (liquid) and the beer tap body. Then beer is dispensed from the nozzle.

<When dispensing foam>

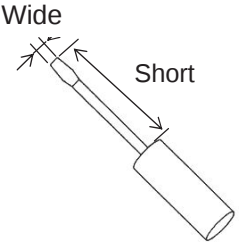
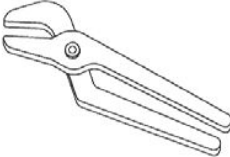
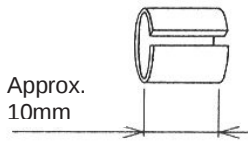
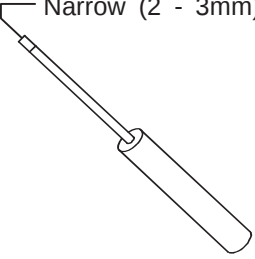
To dispense foam, push the lever toward the unit. The spring shrinks to create a gap between the gasket (foam) and the slider. Beer goes through the hole in the valve shaft and becomes foam by going through the small gap. Then beer foam is dispensed from the nozzle.

*This beer tap has separate nozzles for dispensing beer and foam so “draining foam” (move the lever quickly toward you and back to the original position to drain foam from the nozzle) is not necessary.

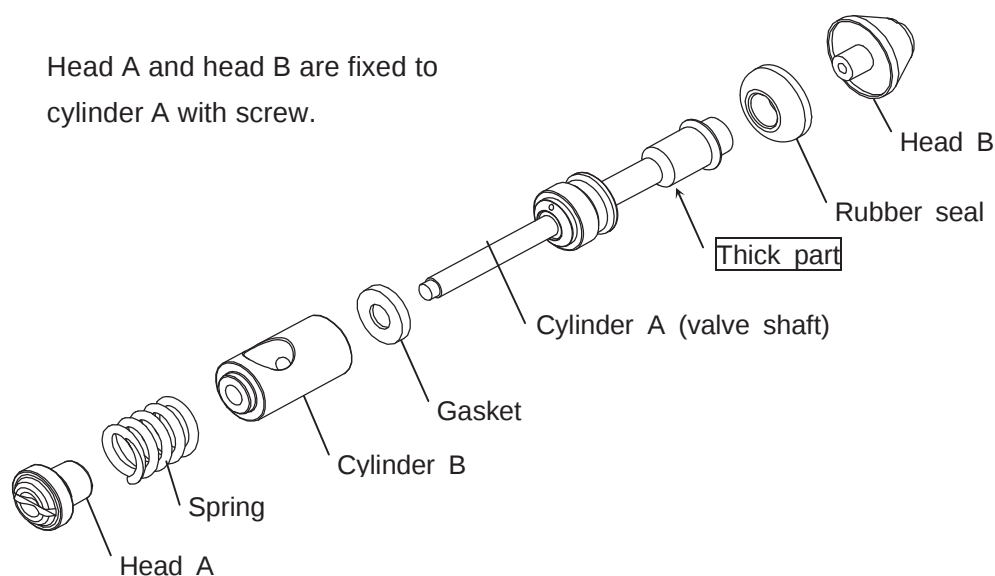
8. DISASSEMBLING AND CLEANING VALVE SHAFT

Disassemble valve shaft following the procedures below.

1. Tools

1) Screw driver x 1  Wide Short	2) Pliers x 1 	3) Braided hose x 1 (ID: 8mm)  Approx. 10mm * Slit vertically	4) Precision screw driver x 1 Narrow (2 - 3mm)  * Use this when removing gasket
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2. Valve shaft assembly



CAUTIONS FOR DISASSEMBLING VALVE SHAFT

- Be sure to cover the thick part of the cylinder A when holding the valve shaft with a pliers.
- Do not reuse deformed or damaged parts.

Pinching other parts or valve shaft without covering with braided hose may cause deformation or damages.

Reusing deformed or damaged parts may cause beer leak, slow movement of the tap lever or the entrance of the shaved portion of inner surface of the tap.

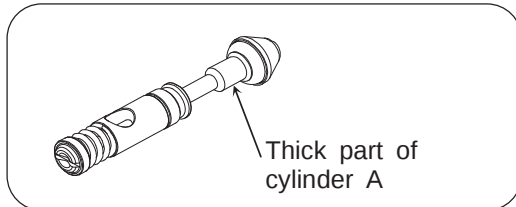
- Do not reuse gasket.

Gasket will be deformed or damaged when removed from the cylinder B. Do not reuse. If the gasket is reused, there is a possibility of beer leak.

Disassembling valve shaft

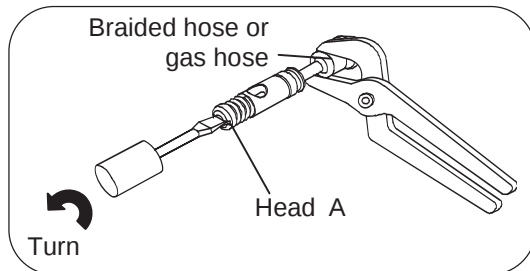
1. Cover cylinder A with braided hose.

To prevent damage during assembling, cover the thick part of cylinder A with a braided hose.



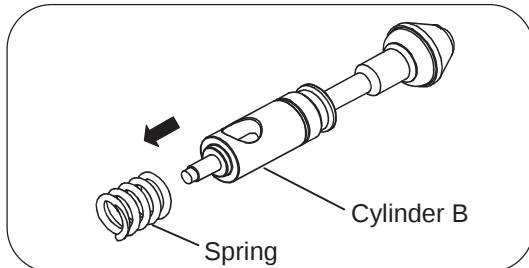
2. Remove head A.

Hold the cylinder A at the part covered with braided hose with a pliers. Turn the end of the head A with a slotted screwdriver to remove.



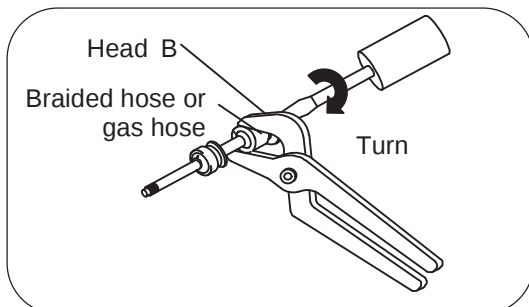
3. Remove spring and cylinder B.

Pull out the spring and cylinder B by hand.



4. Remove head B.

Hold cylinder A at the part covered with a braided hose with a pliers. Turn the end of the head B with a slotted screwdriver to remove.

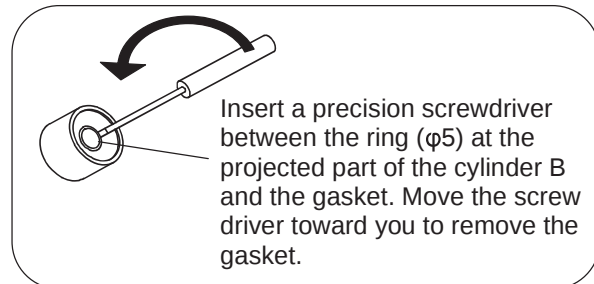


Replacing gasket

1. Remove gasket.

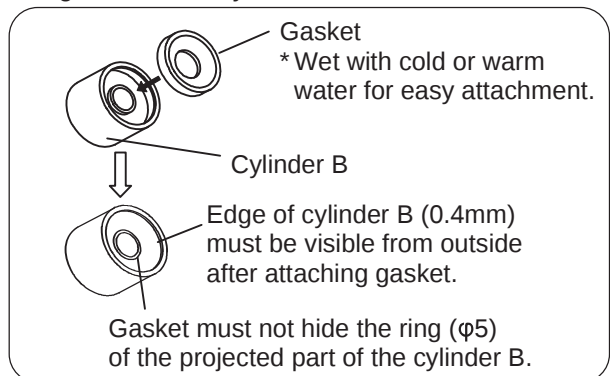
Use a precision screwdriver to remove the gasket from the cylinder B as shown below.

* Gasket will be deformed or damaged when removed. Replace with the new one.



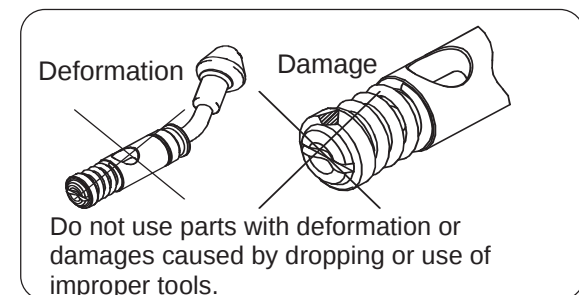
2. Attach gasket.

Follow the instructions below when attaching the gasket to the cylinder B.



Assembling valve shaft

Be sure to hold the cylinder A at the part covered with braided hose with a pliers and reverse the above procedures for assembling.



After assembling, install the valve shaft to the beer tap to check for the smooth movement or liquid leak. Beer or foam may not be dispensed properly if the valve shaft has not tightly fixed.

9. MAKING AND REPLACING COOLING WATER

1) How to make cooling water

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

Do not use tap water.

Fill the water tank with water having 100-300 $\mu\text{S}/\text{cm}$ 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 $\mu\text{S}/\text{cm}$:

Compressor may not work resulting in poor cooling performance.

Above 300 $\mu\text{S}/\text{cm}$:

Excessive ice may build up on evaporator and freeze beer inside beer coil preventing beer from being dispensed properly.

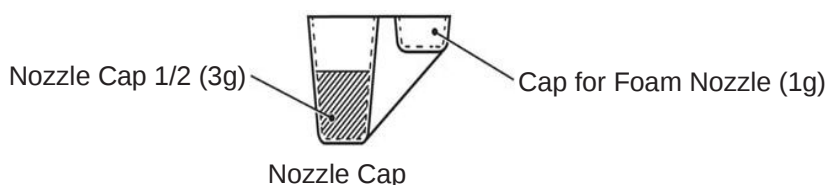
How to make cooling water with 100-300 $\mu\text{S}/\text{cm}$ of E.C.

The capacity of the water tank of this unit is approx. 16 L.

Make the cooling water by dissolving 3 g of pure baking soda in approx. 16 L of distilled water.

Step 1

Measure 3 g of pure baking soda with nozzle cap (accessory).

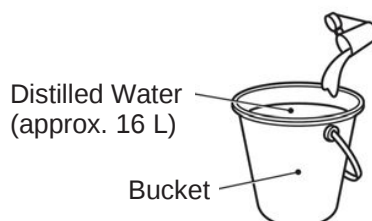


Step 2

Fill a bucket with approx. 16 L of distilled water and stir well after adding the 3 g of baking soda measured in step 1.

Use a conductivity meter if measuring E.C.

Rinse the nozzle cap after use.



2) Replacing cooling water

Replace the cooling water twice a year.