Technical Service and Replacement Parts Manual

Ice Equipment for 50 Hz. Applications

Models GB457, GB657, GB1257, GB1258, GT357, and GT557

KOLD·DRAFT

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SAFETY WARNINGS AND INFORMATION

KNOWLEDGE OF PROPER INSTALLATION AND SERVICE PROCEDURES IS ESSENTIAL TO THE SAFE OPERATION AND MAINTENANCE OF KOLD-DRAFT EQUIPMENT. REFER ALL INSTALLATION AND SERVICE WORK TO QUALIFIED TECHNICIANS.

ALWAYS DISCONNECT THE POWER SUPPLY BEFORE SERVICING THE EQUIPMENT OR WHEN THE EQUIPMENT WILL NOT BE USED FOR A PERIOD OF TIME. SOME CIRCUITS REMAIN ENERGIZED WHEN THE ICE MACHINE IS SWITCHED OFF.

NEVER OPERATE EQUIPMENT THAT HAS BEEN DAMAGED OR DOES NOT HAVE ALL THE PROTECTIVE COVERS IN PLACE.

NEVER OPERATE EQUIPMENT THAT HAS BEEN ALTERED FROM THE ORIGINAL KOLD-DRAFT SPECIFICATIONS.

SPECIAL ATTENTION SHOULD BE GIVEN TO POTENTIAL HAZARD LABELING ON THE EQUIPMENT AND THE SIGNAL WORDS AND SYMBOLS THAT ARE USED THROUGHOUT THIS MANUAL.

WARNING- Warning is used to indicate the presence of a hazard which can cause personal injury, death or substantial property or equipment damage, if the statement is ignored.

CAUTION- Caution is used to indicate the presence of a hazard which can cause minor personal injury or property damage, if the statement is ignored.

ELECTRICAL CAUTION- Used to indicate the presence of an electrical hazard which can cause personal injury or property damage, if the statement is ignored.

NOTE- Note is used to notify personnel of installation, operation or maintenance information which is important, but not a cause of personal injury or property damage.

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WARNING- USE ONLY GENUINE KOLD-DRAFT REPLACEMENT PARTS

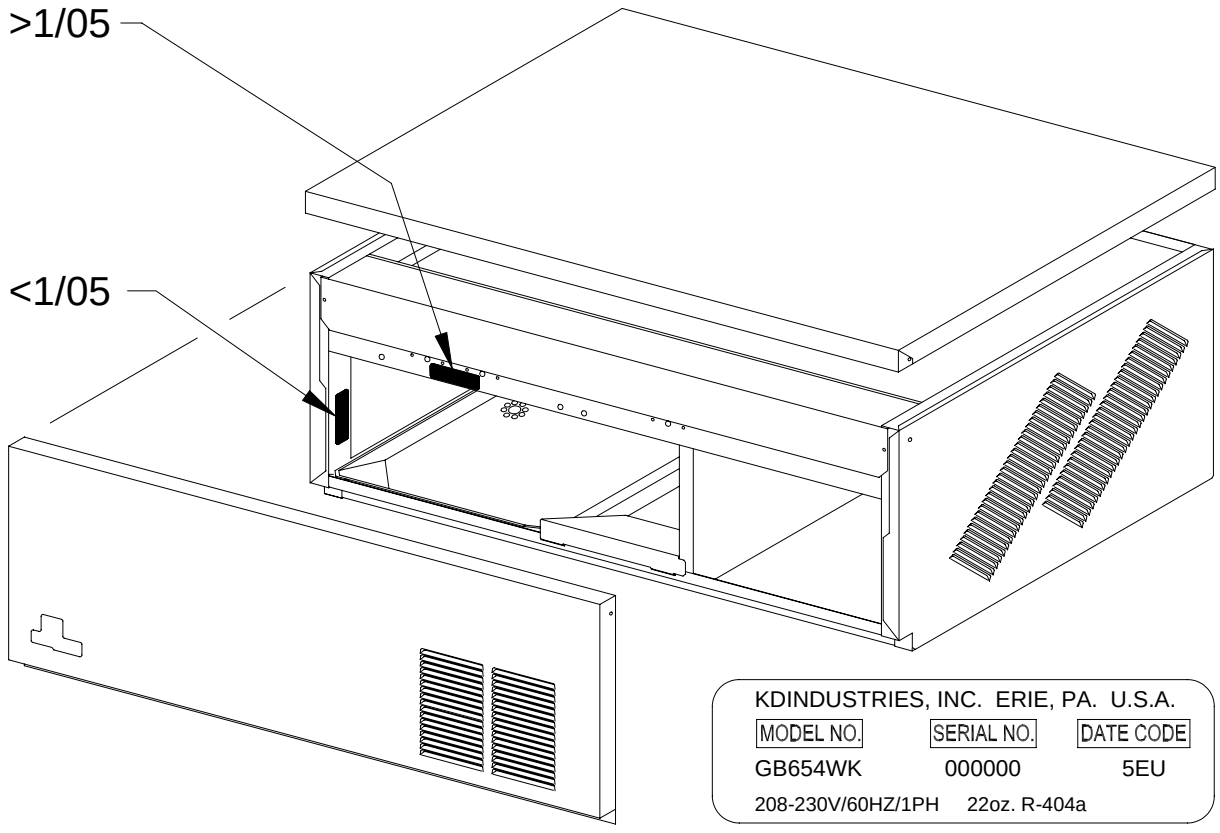
USE OF NON-APPROVED PARTS WHEN SERVICING KOLD-DRAFT EQUIPMENT MAY CREATE A SAFETY HAZARD OR CAUSE EQUIPMENT AND PROPERTY DAMAGE.

USE OF NON-APPROVED PARTS WHEN SERVICING KOLD-DRAFT EQUIPMENT WILL VOID THE EQUIPMENT WARRANTY.

SERIAL NUMBER PLATE LOCATION

NOTE- A COMPLETE MODEL NUMBER AND DATE CODE ARE ESSENTIAL FOR THE ACCURATE SELECTION OF REPLACEMENT PARTS.

SEE THE FOLLOWING FOR THE LOCATION OF THE SERIAL NUMBER PLATE.



Classic Model Number Key

GB 4 5 1 W HK

Cube Size
C = Full Cube
HK = Half Cube
K = Cube-Let

Condenser Type
A = Air cooled condenser-self contained
W = Water cooled condenser-self contained
R = Remote air cooled condenser

Electrical Characteristics
1 = 115 volt-60 hz.-1ph. (2-wire plus ground)
4 = 208/230 volt-60 hz.-1ph. (2-wire plus ground)
5 = 208/230 volt-60 hz.-3ph. (3-wire plus ground)
7 = 220/240 volt-50 hz.-1ph. (2-wire plus ground)
8 = 220V/380V-50 hz.-3ph. (4-wire plus ground)

Modification Code
2 = R-502, Copeland compressor except GB1224/25 Bristol
3 = R-502, Bristol compressor
4 = R-404-a, Bristol inertia compressor/POE lubricant except GT341/GT344 Bristol reed valve compressor/POE lubricant
5 = R-404a, Tecumseh compressor/POE lubricant

Series
3 = 300 Series
4 = 400 Series
5 = 500 Series
6 = 600 Series
12 = 1200 Series

Cabinet Width
GB = 42” Wide
GT = 28-1/2” Wide GT3XX models, 30” Wide GT55X models

DATE CODE KEY

YEAR KEY

4K = 1990	**5K** = 2000	**6K** = 2010	**7K** = 2020
4A = 1991	**5A** = 2001	**6A** = 2011	**7A** = 2021
4B = 1992	**5B** = 2002	**6B** = 2012	**7B** = 2022
4C = 1993	**5C** = 2003	**6C** = 2013	**7C** = 2023
4D = 1994	**5D** = 2004	**6D** = 2014	**7D** = 2024
4E = 1995	**5E** = 2005	**6E** = 2015	**7E** = 2025
4F = 1996	**5F** = 2006	**6F** = 2016	**7F** = 2026
4G = 1997	**5G** = 2007	**6G** = 2017	**7G** = 2027
4H = 1998	**5H** = 2008	**6H** = 2018	**7H** = 2028
4J = 1999	**5J** = 2009	**6J** = 2019	**7J** = 2029

MONTH KEY

M = JANUARY	**R** = APRIL	**U** = JULY	**X** = OCTOBER
N = FEBRUARY	**S** = MAY	**V** = AUGUST	**Y** = NOVEMBER
P = MARCH	**T** = JUNE	**W** = SEPTEMBER	**Z** = DECEMBER

EXAMPLE

4CN = FEBRUARY, 1993	**5ET** = JUNE, 2005

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NOTE!

CHECK FOR FREIGHT DAMAGE BEFORE PROCEEDING WITH THE EQUIPMENT INSTALLATION. BE SURE TO INSPECT THE EQUIPMENT CARFULLY FOR ANY DAMAGE THAT MAY NOT HAVE BEEN EVIDENT ON THE OUTSIDE OF THE CARTON. CONTACT THE FREIGHT CARRIER IMMEDIATELY TO REPORT ANY DAMAGE AND FILE A CLAIM.

WARNING

DO NOT OPERATE EQUIPMENT THAT HAS BEEN DAMAGED.

REFER ALL MAINTENANCE TO QUALIFIED PERSONNEL.

NEVER OPERATE THE ICE MAKER WITH ANY COVERS, PANELS OR OTHER PARTS REMOVED OR NOT PROPERLY SECURED.

INSTRUCT ALL PERSONNEL IN THE PROPER USE OF THE EQUIPMENT.

CLEAN UP ANY SPILLAGE IMMEDIATELY.

CAUTION

FAILURE TO COMPLY WITH ALL KOLD-DRAFT INSTALLATION GUIDELINES MAY CAUSE PERSONAL INJURY, EQUIPMENT OR PROPERTY DAMAGE AND MAY VOID THE PRODUCT WARRANTY.

WARNING

ALWAYS INSTALL THE ICE MAKER ON A STABLE AND LEVEL SURFACE.

ALWAYS ATTACH THE ICE MAKER TO THE ICE STORAGE BIN.

ALL MODELS ARE INTENDED FOR INDOOR USE ONLY. DO NOT INSTALL THE EQUIPMENT IN UNPROTECTED OUTDOOR AREAS.

DO NOT INSTALL THE EQUIPMENT IN WET AREAS.

DO NOT LOCATE THE EQUIPMENT NEAR ANY HEAT SOURCE, IN DIRECT SUNLIGHT, IN HIGH AMBIENT AREAS, OR WITHOUT PROPER CLEARANCE FOR VENTILATION. PLACING EQUIPMENT IN THESE LOCATIONS WILL RESULT IN REDUCED CAPACITIES, HIGH SYSTEM PRESSURES AND MAY CAUSE EQUIPMENT FAILURE.

AMBIENT OPERATING TEMPERATURES

Minimum 7°C (45°F) Maximum 32°C (90°F)

Ambient temperatures less than 15°C (60°F) may cause erratic bin thermostat operation.

Ambient temperatures higher than the maximum specification will result in reduced capacities and high system pressures, in air cooled models.

EQUIPMENT CLEARANCE REQUIREMENTS

Clearance must be provided for ventilation and access for service. Ventilation is especially important for models with air cooled condensers. Failure to provide adequate clearance may result in reduced capacities and high system pressures. See the installation instructions, provided with the ice machine, for proper minimum clearance dimensions for a particular model.

DRAINS

Separate drains must be provided for each ice maker and ice bin. An additional condenser drain is required for any liquid cooled ice maker, when the condenser coolant will not be re-circulated.

The size of the drain tubing must never be reduced along its length.

Make sure that the building drain system can accommodate all the drain water from the ice machine operation.

Individual drains must never be directly connected to a common manifold, drain or standpipe. If individual drains are to be discharged into a common manifold, drain or standpipe, a minimum 38mm (1.5") air gap must be provided at each connection. This is to prevent any backflow of drain water into the ice maker or ice bin.

Drain lines must be installed with a minimum drop of 2.5 cm per meter run (.3 inch drop per foot run).

Ice machine and bin drains may be insulated to prevent condensation.

COOLING TOWER APPLICATION

The ice machine does not need to be modified for use with a cooling tower provided the cooling tower is properly designed for the application. Information regarding the amount of heat rejection, as well as the pressure drop through the condenser and liquid valves is required to properly design a cooling tower application for an ice machine.

Coolant entering the condenser must not exceed 32.2°C (90°F).

Coolant exiting the condenser must not exceed 43.3°C (110°F).

Allow for a pressure drop of 48 kPa (7 psi) between the liquid coolant inlet and outlet of the condenser.

The condenser liquid control valve will regulate the flow of coolant through the condenser, thereby controlling the high side pressure in the ice machine.

POTABLE WATER SUPPLY

There are no specific requirements for water treatment provided that the water is potable, not laden with sediment and does not exhibit a residual chlorine level greater than 0.2 ppm. The use of water treatment, however, may increase the intervals between cleaning operations.

Do not connect the ice machine to a hot water supply line. Insulate the water line from sources of heat or to prevent condensation.

NOTE- Purge all water supply lines before connecting them to the ice machine.

CAUTION

HIGH RESIDUAL CHLORINE (MORE THAN 0.2 PPM) CAN CAUSE CORROSION OF ICE MAKER COMPONENTS AND EVEN THE 300 SERIES STAINLESS STEEL FRAME AND SKIN PANELS. HIGH CHLORINE LEVELS MUST BE REDUCED, IN THE ICE MAKER WATER SUPPLY, TO PROTECT THE EQUIPMENT AND PRESERVE THE PRODUCT WARRANTY.

Please contact your local water conditioning expert for recommendations, about your specific water supply, or consult the factory.

A minimum 0.2 Mpa (30 psig) dynamic water supply pressure is required for proper operation of the ice maker water valve. Please note that on liquid cooled ice machines, where the same water supply is used for both condenser cooling and the potable water supply, the demand for condenser coolant may cause the supply pressure to drop. This is most notable at the time of peak load, at the beginning of the freeze cycle.

Minimum water temperature 7°C (45°F) Maximum water temperature 32°C (90°F)

Water temperatures higher than the recommended maximum will cause reduced capacities.

Minimum water pressure 0.2 MPa (30 psig) Maximum water pressure 0.6 MPa (100 psig)

If a water pressure regulator is used, the recommended setting is 0.2 MPa to 0.3 MPa (30 to 50 psig) dynamic.

WARNING

ALL KOLD-DRAFT MODELS ARE INTENDED TO BE INSTALLED WITH A PERMANENT CONNECTION TO THE FIELD ELECTRICAL SUPPLY. DROP CORD CONNECTIONS SHOULD NEVER BE USED WITH THIS EQUIPMENT.

ALWAYS BE SURE THE POWER SUPPLY IS THE SAME AS THE ICE MACHINE SPECIFICATION. SEE THE ICE MACHINE ELECRICAL PLATE.

BRANCH CIRCUIT PROTECTION

PROPER PROTECTION MUST BE PROVIDED BY THE USE OF FUSES OR HACR TYPE CIRCUIT BREAKERS. EACH ICE MAKER MUST BE CONNECTED TO A SEPARATE PROTECTED CIRCUIT WITH NO OTHER LOADS. A FUSED DISCONNECT, INSTALLED ADJACENT TO EACH ICE MAKER, IS RECOMMENDED AND MAY BE REQUIRED BY LOCAL CODES.

Minimum ampacity does not indicate typical running current value. Refer to the equipment electrical plate. Use the minimum ampacity value for sizing branch circuit conductors up to 8 meters (26 feet) in length. For conductor length over 8 meters, increase the wire gauge as required.

Normal protector size is based on rated voltage and operation at lower than extreme temperature limits. Branch circuit conductors may be sized to allow increasing the protector value up to the specified maximum. This may avoid nuisance protector opening under harsh operating conditions.

VOLTAGE TOLERANCE

NOMINAL	NO-LOAD MAXIMUM	FULL-LOAD MINIMUM
220/240	250	210
380	420	360

ASSEMBLY

Remove the ice machine top-cover panel, front-cover panel and side-cover panels from the ice machine frame.

The ice storage bin surface must be level. Use the ice storage bin leg adjusters, if they are provided. If the bin will be mounted directly to the floor, use shims as required. Seal the bin to the floor using a sealant with a National Sanitation Foundation certification. If there are gaps larger than 3 mm install a cove molding around the bottom of the bin.

If not provided, a hole must be installed in the bin top corresponding to the ice drop zone. Holes are provided in the ice machine frame for the purpose of attaching the ice machine to the ice storage bin. Use the fasteners provided or other suitable non-corroding fasteners for this purpose.

Apply gasket material to the ice storage bin top. The gasket material must be positioned at the outside edge of the ice machine frame.

Carefully lift the ice machine and position it on the ice storage bin. Attach the ice machine to the ice storage bin.

Make all plumbing and electrical connections to the ice machine and ice storage bin.

Remove all shipping materials from the ice machine including the water plate shipping strap.

Install the bin thermostat capillary tube, into the ice storage bin, according to the instructions provided with the ice machine.

NOTE- Place the bin thermostat cap tube below any ice deflectors in the storage bin. If ice piles up, above these deflectors, it may bridge over and not feed down to the lower section of the bin.

START-UP

Be sure that the ice-off-wash switch is in the “off” (center) position.

Turn on the water supply and the electrical power and check all supply lines for leaks.

Make sure all pump and water tank hoses are connected, then pour .5 liter of clean potable water into the circulation system to lubricate the pump seal.

Move the ice-off-wash switch to the “wash” (right) position and observe the water filling the water tank and the pump running. Pinch the flexible hose, which connects the water valve to the water distributor tube, if the distributor tube holes do not produce full streams and it appears and sounds like air is flowing through the tube. The water fill is complete when the water level in the probe tube reaches the high-level probe. Observe that the water valve is de-energized, at this time and there are no water leaks from the hoses or water tank into the drain pan.

NOTE- For GB1220, 1240, and 1250 models observe that the water fill difference, between the upper and lower water tanks, is less than 6 mm for “K” models and 3 mm for “C” and “HK” models.

Pull down on the right side of the water plate, stretching the springs until the water pump stops and the actuator motor rotates the cam arms counter-clockwise. Allow the cam arms to rotate far enough so that the pump does not restart when the water plate is released. Observe that the cam arms continue to turn, opening the water plate fully, dumping the water in the tank. At this point, the cam arm rotation will reverse and close the water plate. The cam arm rotation will stop when the water plate is fully closed and the water fill process will repeat.

Move the ice-off-wash switch to the “ice” (left) position and observe that the compressor and the fan motor (air cooled only) begin to run. The refrigeration system operation should be checked and adjusted during the first few cycles. Consult the **“OPERATION”** section of this manual for the proper adjustments to the refrigeration system.

Test the bin thermostat operation by holding ice against it. Adjust the thermostat, if required, to shut off the ice machine within 30 seconds of contact between the ice and the thermostat capillary tube.

Make sure that the drain pan, ice chute and/or ice deflectors are properly installed. Replace and secure all the cabinet panels.

Discard all the ice from the start-up cycles, then clean and sanitize the ice storage bin according to the instructions provided with the bin.

Complete and mail the registration certificate to the factory. Leave all instructions with the owner/user.

NOTE- Emphasize all cautionary information to prevent personal injury, property and/or equipment damage.

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Note: See the Remote Air-Cooled Condenser section of the manual for additional components related to these ice machines.

REFRIGERANT COMPRESSOR: Provided to pump refrigerant through the refrigeration system. See the serial number plate for refrigerant specification and electrical characteristics.

CONDENSER: All air-cooled and liquid-cooled models are provided with a self-contained refrigerant condenser to remove heat from the refrigeration system. These condensers are designated in the model number as (“A”) air-cooled and (“W”) liquid-cooled. Remote air-cooled condensers are also available for some models. These are designated as (“R”) in the model number. (See the remote air-cooled section of the manual for information on these models.)

CONDENSER FAN AND MOTOR: Provided with all air-cooled (“A”) models to draw air through the condenser.

CONDENSER COOLANT REGULATOR VALVE: Provided with all water-cooled (“W”) models to regulate the flow of coolant through the condenser and maintain a specified refrigerant discharge pressure.

RECEIVER: Provided on liquid-cooled and remote air-cooled condenser models for storage of liquid refrigerant, as required during the operation of the ice machine.

HEAT EXCHANGER: Provided to sub-cool the refrigerant, ensuring that this refrigerant is liquid at the inlet of the expansion valve.

FILTER DRIER: Provided as insurance that all moisture and impurities are removed from the refrigeration system.

THERMOSTATIC EXPANSION VALVE: Maintains the proper flow of refrigerant, through the system, as the load changes during the ice making cycle.

EVAPORATOR: A plated copper evaporator is found in all models. The evaporator provides the five freezing surfaces for ice cube formation.
There are three different evaporators available for Kold-Draft models, depending on the ice size desired. These evaporators are designated in the model number as (“C”) full cube, (“HK”) half cube and (“K”) cube-let.

DEFROST VALVE: Directs compressor discharge gas to the evaporator, causing it to warm and release the ice cubes during the harvest cycle.

STRAINER-WATER INLET: Protects the water valve from particles in the water supply. This strainer can be cleaned without disconnecting any tubing. If the need for cleaning is frequent, an external water filter should be provided.

WATER TANK: Provided as a sump to hold the amount of water required to make one batch of ice cubes.

WATER SOLENOID VALVE: Opens to allow potable water to enter the ice machine and closes when the water tank is filled to the correct level.

WATER PLATE: Functions as a water manifold with a flat surface. This surface is positioned close to the evaporator and acts to form the sixth side of the ice cubes. The water plate surface has one spray hole for each cell in the evaporator, to provide water to the freezing surfaces. The water plate surface also has two drain holes under each cell, to allow unfrozen water to return to the water tank to be re-circulated. The water plate swings down during the harvest cycle to allow the ice cubes to fall out of the evaporator.
There are two different water plate configurations available for Kold-Draft models, depending on the ice size desired. One is used for (‘C”) full cube models and the other is used for (“HK”) half cube and (“K”) cube-let models.

WATER PUMP: Continuously circulates the water from the water tank, through the water plate during the ice making cycle. The water pump also operates during the wash cycle to circulate cleaning solution.

ACTUATOR MOTOR: Rotates counter-clockwise, at the beginning of the ice harvest cycle, to lower the water plate, so the ice can fall out of the evaporator. It then rotates clockwise, at the end of the harvest cycle, to close the water plate for the next ice making cycle.

CAPACITOR-ACTUATOR MOTOR: Installed between the two actuator motor windings, the function of this capacitor is to determine the direction of the rotation of the actuator motor.

CAM ARMS: These are attached to the actuator motor output shaft and function initially to separate the water plate from the evaporator and then to support the water plate as it opens fully.

SPRINGS-WATER PLATE: Function as the connection between the cam arms and the water plate. They also act as a safety mechanism, stretching if any ice remains on the water plate surface as it is closing against the evaporator.

Additional Component for GB1250 Series Ice Machines

CHECK VALVE-DEFROST: Installed in the defrost tubing to the master (upper) evaporator to prevent a flow of refrigerant from the master (upper) expansion valve to the slave (lower) evaporator. This could occur during the ice making portion of the cycle.

NOTE- See the Remote Air-Cooled Condenser section of the manual for additional controls, adjustments and considerations related to these ice machines.

BIN THERMOSTAT: Provides power to the ice-off-wash switch. This thermostat functions to shut off the ice machine, when the ice bin is full. Contact between the ice and the thermostat capillary tube will cause the thermostat switch to open.

ADJUSTMENT: While holding ice against the thermostat capillary tube, adjust the thermostat to shut off the ice machine within one minute. A warmer (CCW) adjustment will shut off the ice machine sooner. A colder (CW) adjustment will delay shut off.

ICE-OFF-WASH SWITCH: Controls the mode of operation of the ice machine.
The “Ice” position provides power to all control circuits including the contactor. (The contactor provides power to the compressor and also the condenser fan motor in self-contained air-cooled ice machines.)
The “Wash” position provides power to all control circuits except the contactor. This position is useful for cleaning the ice machine and for test procedures where operation of the compressor is not required or desired.
The “Off” position interrupts power to the control circuits.
Note: See the remote air-cooled condenser section of the manual for additional considerations for these ice machines.

WARNING

ALL ICE MACHINE CIRCUITS ARE NOT DE-ENERGIZED WHEN THIS SWITCH IS IN THE “OFF” POSITION. ALWAYS DISCONNECT THE POWER TO THE ICE MACHINE BEFORE SERVICING.

CONTROL STREAM: This is a small clear box, divided into two sections and located on the front face of the water plate. Water flowing into the left section of the box is returned to the water tank and recirculated through the system. Water flowing into the right section of the box is drained out of the system. The velocity of the stream flowing in the box, during the ice making cycle, is an indicator of the water pressure inside the water plate. This pressure will increase as the ice cubes fill out in the evaporator, covering the drain holes provided for each cell. This pressure increase will cause the stream, normally flowing into the left section of the box, to flow over the partition and into the right section, draining the system of excess water.

ADJUSTMENT: The stream of water should be adjusted to fall to the left of the control stream box partition, during the early portion of the ice making cycle, before the cubes are full.

LIQUID LEVEL CONTROL: This control mechanism is composed of a clear water level tube, three stainless steel water level probes and a control board.
The water level tube is mounted in front of the water tank and is connected to it by a hose. As water fills the tank, the water level is visible in the tube.
The water level probes are positioned in the water level tube. Continuity through the water, between the common probe and the high level probe, will de-energize the water fill circuit. A break in continuity between the common probe and the low level probe will initiate the harvest cycle when the evaporator is cold, or energize the water fill circuit when the evaporator is warm.

ADJUSTMENT: The common probe should be adjusted all the way down.
The low level probe should be adjusted so the tip is approximately 15 mm from the bottom of the probe tube.
The high level probe determines how much water is taken into the system at the beginning of a cycle. It is adjusted as required by the size of the cube (“C”, “HK” or “K”) and the desired fullness (dimple size) of each cube. Typically all cubes should have a small dimple at the end of the freeze cycle. Lack of a dimple in the cubes is an indicator that the water tank level is too high at the start of the cycle.
Note: Making cubes without a dimple will reduce ice machine capacity and may damage the water plate surface in extreme cases. If the control stream is draining water for more than 15 seconds, at the end of the ice making cycle, the water level in the tank is too high. Lower the high level probe slightly until proper operation is evident.

PUMP AND DEFROST SWITCH: This switch is actuated by the water plate and controls the operation of the water pump. The pump operates when the water plate is closed and the switch lever is pushed up. If this switch is not actuated when the water plate closes, because ice is remaining on the water plate surface, the actuator motor will reverse and reopen the water plate. This will continue until the surface is clear.

ADJUSTMENT: The switch should be actuated when front cam arm is between the 10 o’clock and 11 o’clock positions. Adjust the actuation point on GT350 series machines by adjusting the height of the actuation screw on the water plate. All other models have a tab on the water plate that can be easily adjusted by bending it up or down as required.
Note: Do not bend the switch lever to make this adjustment.

ACTUATOR THERMOSTAT: This thermostatic switch senses the temperature of the evaporator, during the ice making cycle and switches from its warm position to its cold position at approximately 3.3°C (coldest setting—maximum CW adjustment). No change in the ice machine operation will be noticed at this time. With this thermostat in its cold position, the circuitry is set up to start the defrost cycle when the cubes are formed and the system water level drops below the low level probe. After the ice cubes have fallen out of the evaporator and the evaporator warms to approximately 10°C, the thermostat returns to its warm position. This ends the defrost cycle and allows the water plate to close and begin a new ice making cycle.

ADJUSTMENT: The normal adjustment for this thermostat is fully CW (maximum cold) position. Adjust the thermostat warmer (CCW) only if the defrost time is insufficient to drop all the ice from the evaporator, before the water plate begins to close. The defrost time should be increased no more than is required to insure all the ice has fallen from the evaporator.
Note: Adjusting the thermostat fully CCW (warm) will lock it in its cold switch contact position. This will keep the water plate open until the thermostat is adjusted CW.

COLD WATER THERMOSTAT: This thermostatic switch is provided on all models, except the GT350 series and it senses the temperature of the evaporator. When the evaporator is cold, it connects the defrost valve to the water fill (blue) circuit. When the evaporator is warm, it connects the defrost valve to the defrost (red) circuit. The water fill (blue) circuit is energized from the harvest initiation until the water fill is complete. The defrost (red) circuit is energized whenever the water plate is not fully closed.
The cold water thermostat also acts to prevent false harvest cycles during the water fill portion of the cycle. If the incoming water is very cold or filling the system at an abnormally slow rate, the evaporator could become cold enough to switch the actuator thermostat to its cold position. If this occurs before the water fill is complete, the ice machine will start a defrost cycle. The water plate will open, dumping the water in the water tank and closing again to start a new cycle. The cold water thermostat prevents this by energizing the defrost valve, providing heat to the evaporator before the actuator thermostat can switch to its cold position.

ADJUSTMENT: The normal adjustment for this thermostat is fully CW (maximum cold) position. Adjust the thermostat warmer (CCW) only if ice is remaining on the surface of the water plate between cycles and not being rinsed off. This condition may be noticed when the supply water is cold and the water level is adjusted to fully form the cubes (small or no dimples evident in the ice). Adjusting the water level may improve this problem.
Note: A degraded water plate surface may also contribute to this problem.

ACTUATOR TOGGLE SWITCH: This switch acts to limit the travel of the actuator motor in both directions and sets up the circuitry to run the motor in the proper direction when energized. This is a two position switch that is operated by the output shaft of the actuator motor. When the motor shaft rotates clockwise, to raise the water plate, it pushes the switch lever up to stop the rotation when the front cam arm is in the 12 o'clock position (water plate fully closed). When the motor rotates counter-clockwise, to lower the water plate, it pushes the switch lever down to stop the rotation when the cam arm is in the 7 o'clock position (water plate fully open).

ADJUSTMENT: The switch operator, which is attached to the output shaft of the actuator motor, can be bent slightly to allow the front cam arm to stop in the proper positions. Bend this operator only if needed to allow the front cam arm to stop at the 12 o'clock position (water plate closed) and the 7 o'clock position (water plate open). Note: The front water plate spring must be on the left side of the cam hub when the water plate is fully closed (cam arm in the 12 o'clock position).

CONTACTOR: Provided with all models to carry the compressor load. On air-cooled models, the condenser fan motor is also connected to the contactor. The contactor coil is rated for line voltage and the contacts are rated for definite purpose applications (FLA and LRA).

HIGH PRESSURE CUTOFF: A manual reset pressure switch is provided, which will open the circuit to the contactor coil if the discharge pressure should reach 3 mPa (gauge) (435 psig).

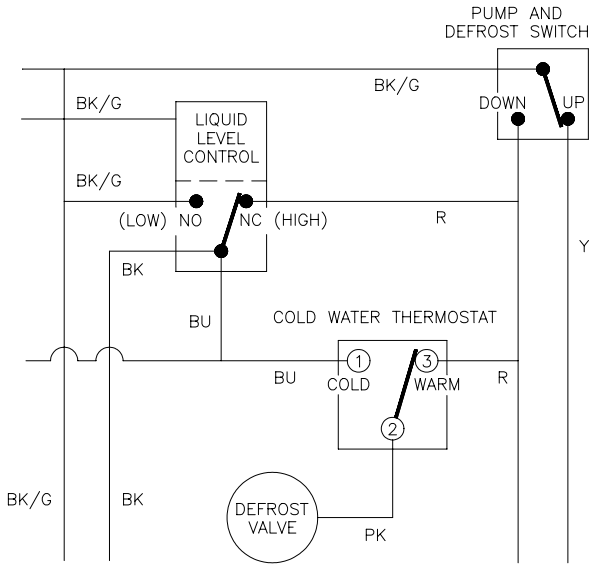
ADDITIONAL CONTROLS FOR GB1250 SERIES ICE MACHINES

DELAY TIMER-MASTER ACTUATOR MOTOR: This device is used to delay the master (upper) actuator motor for two seconds to ensure that the slave (lower) actuator motor will always run ahead of the master motor. The lower actuator toggle switch must always be actuated before the upper switch. This is required for reliable water plate synchronization.

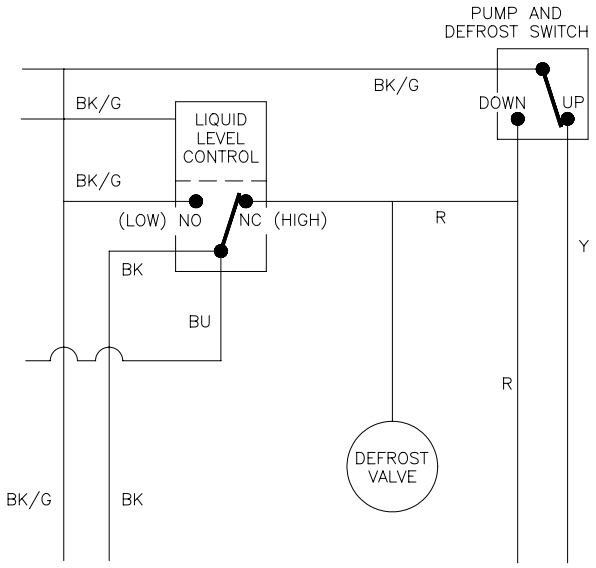
RELAY-WATER PLATE SYNCRONIZATION: The purpose of this relay, designated as Relay #1, is to connect the operation of the slave (lower) actuator motor to the position of the master (upper) actuator toggle switch. This is required for reliable water plate synchronization.

THE ELECTRICAL SCHEMATICS ON THE FOLLOWING PAGES DESCRIBE THE SEQUENCE OF OPERATION OF GB450, GB650 AND GT550 MODELS.

NOTE- The sequence of operation for GT350 models is similar except that these models do not employ a cold water thermostat. The illustrations below describe this variation.



GB450, GB650 AND GT550



GT350 VARIATION

The sequence of operation for GB1250 models is identical to the GB450, GB650 and GT550 models except additional circuitry is employed to assist in the synchronization of the dual water plates. This circuitry includes a relay and a delay timer. Also, two additional relays are used to remove the actuator motor loads from the contacts of the actuator toggle switches.

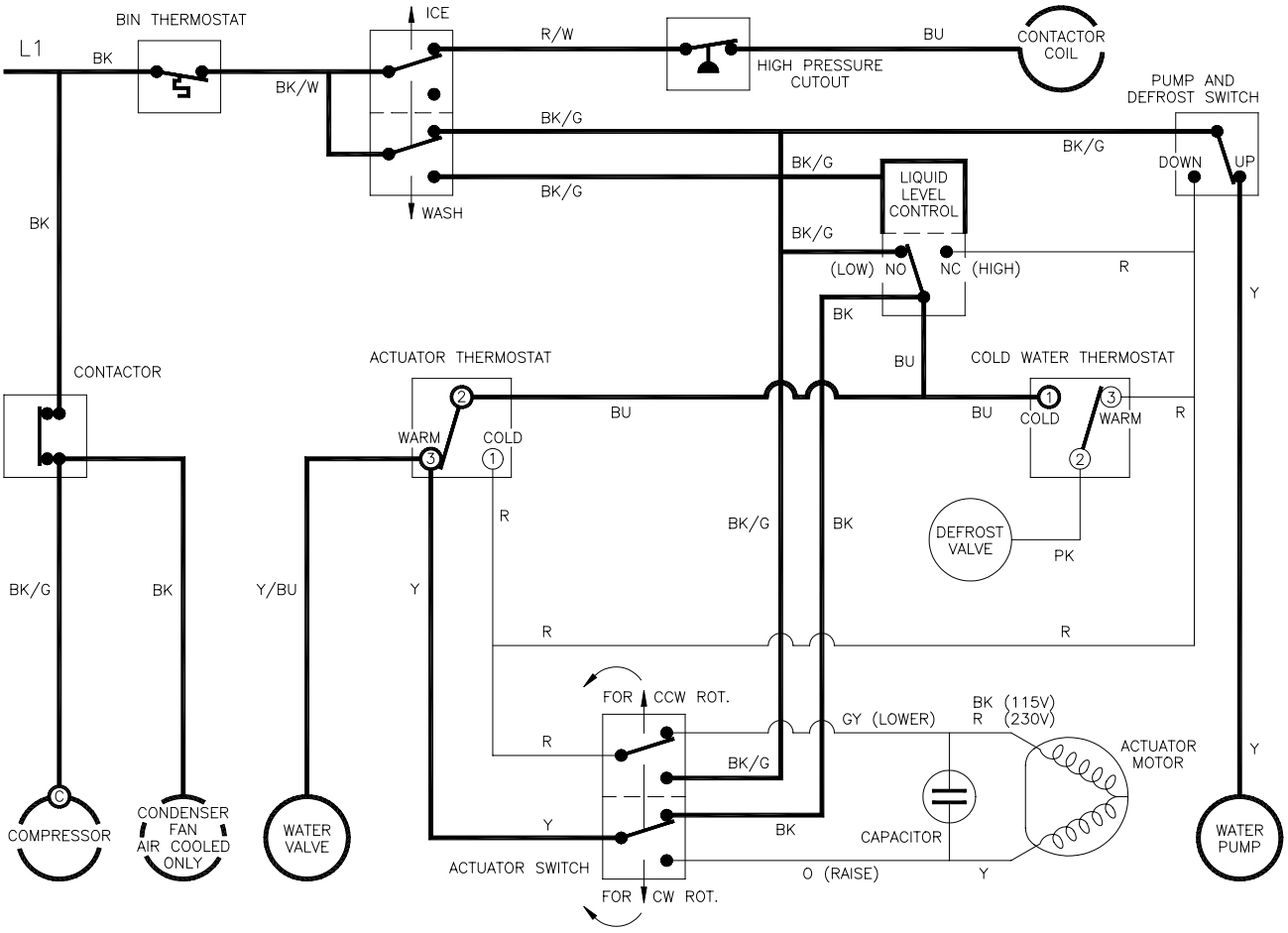
NOTE- GB1250 models employ two each of the following electrical controls and components:

Condenser Fan Motor (air cooled models only)
Water Pump
Pump and Defrost Switch
Water Valve
Actuator Motor
Actuator Toggle Switch

NOTE- See the Remote Air-Cooled Condenser section of the manual for additional considerations related to the operation of these ice machines.

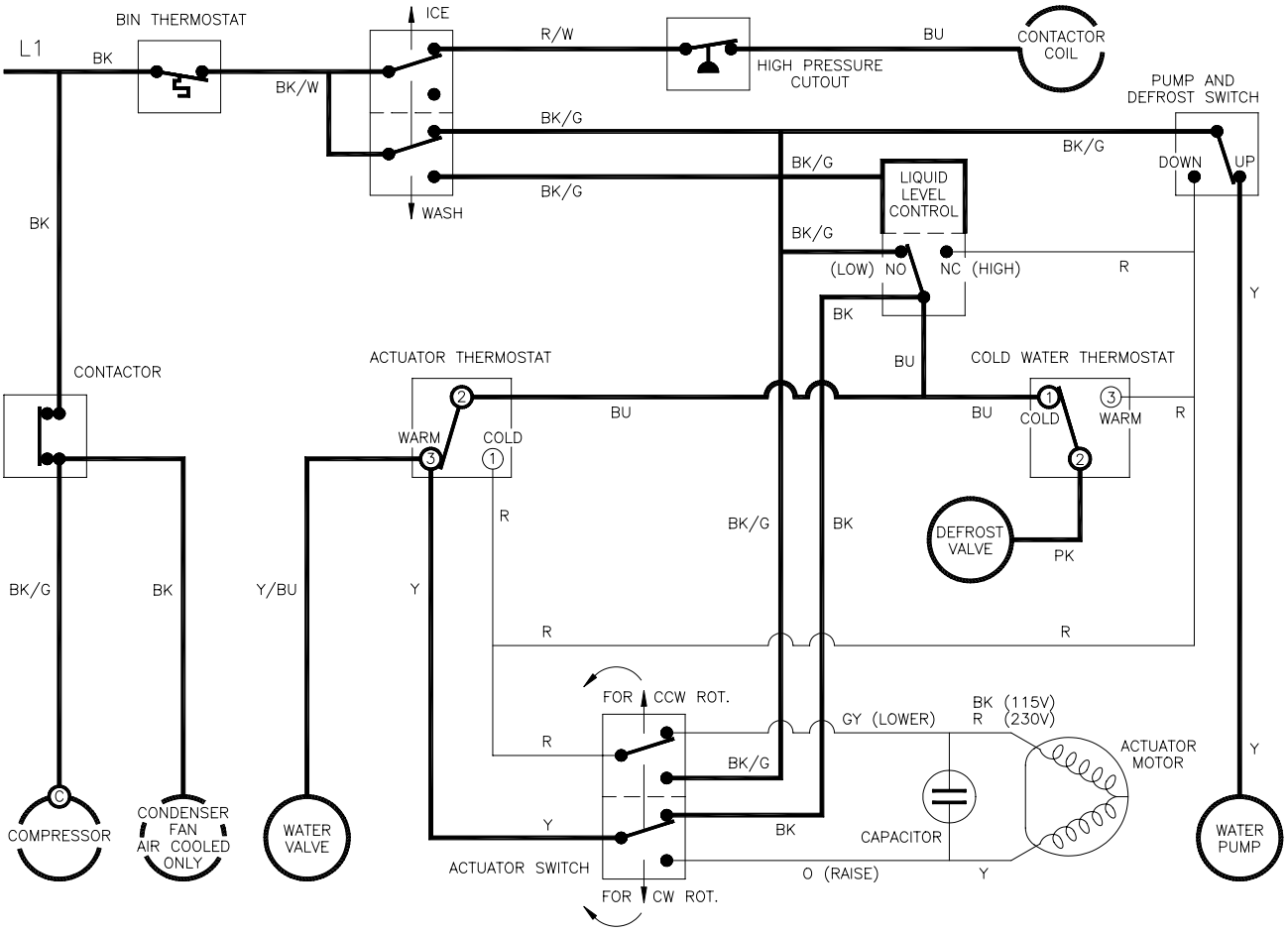
Wire Color Code for Sequence of Operation Schematics							
BK	Black	BU	Blue	PK	Pink	Y	Yellow
BK/G	Black/Green	GY	Gray	R	Red	━━━	Energized
BK/W	Black/White	O	Orange	R/W	Red/White	———	De-energized

#1 WATER FILL—EVAPORATOR TEMPERATURE ABOVE 10°C.



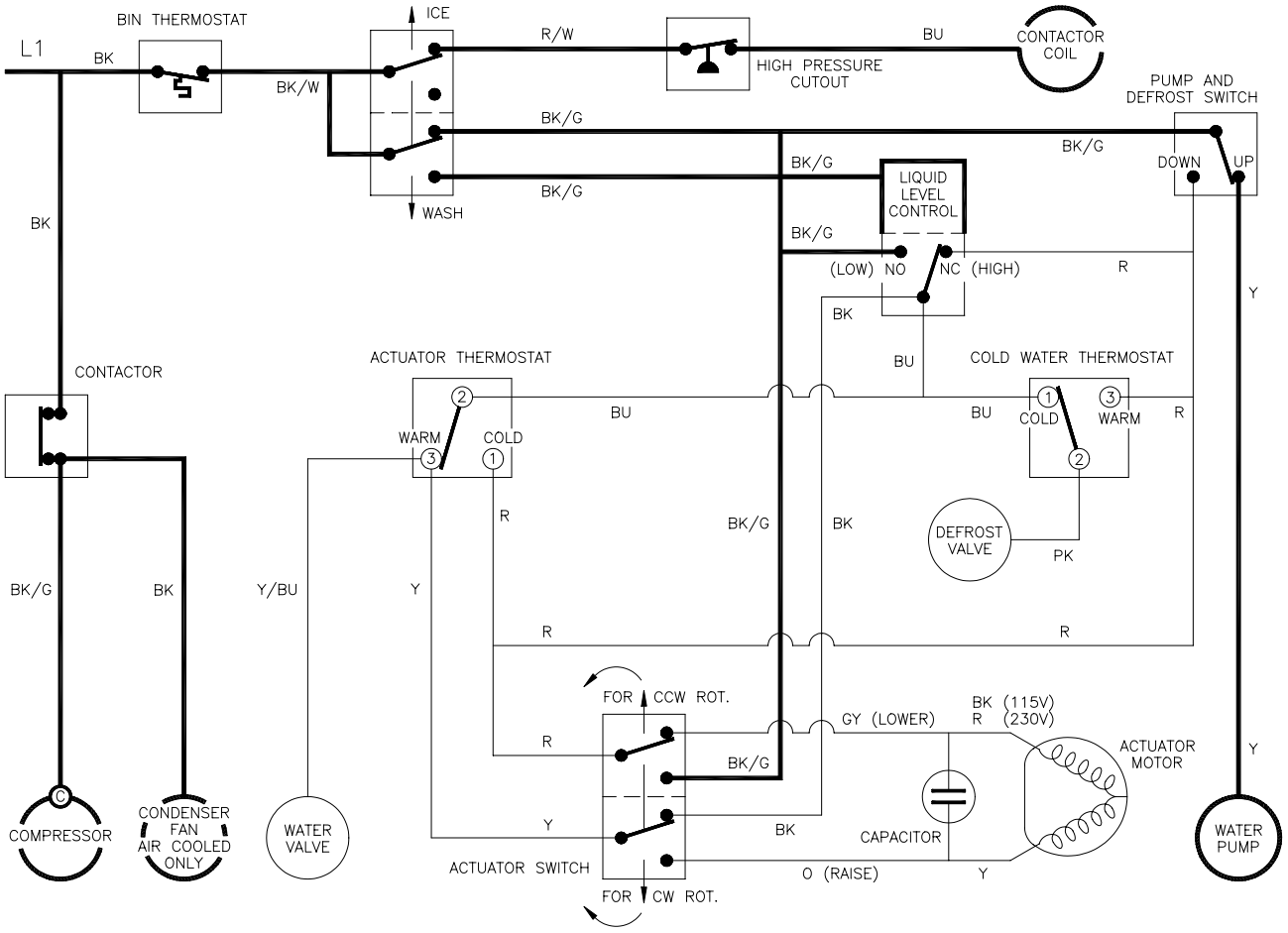
Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Ice		
Contactor	Closed	Compressor (Condenser Fan)	On
Water Plate	Closed		
Pump and Defrost Switch	Up	Water Pump	On
Cold Water Thermostat	Warm	Defrost Valve	Closed
Actuator Thermostat	Warm		
Water Level Control	Low/Level Rising	Water Valve	Open
Actuator Toggle Switch	Up	Actuator Motor	Off
Ice	None	Control Stream	Low

#2 WATER FILL WITH COLD WATER THERMOSTAT CYCLE



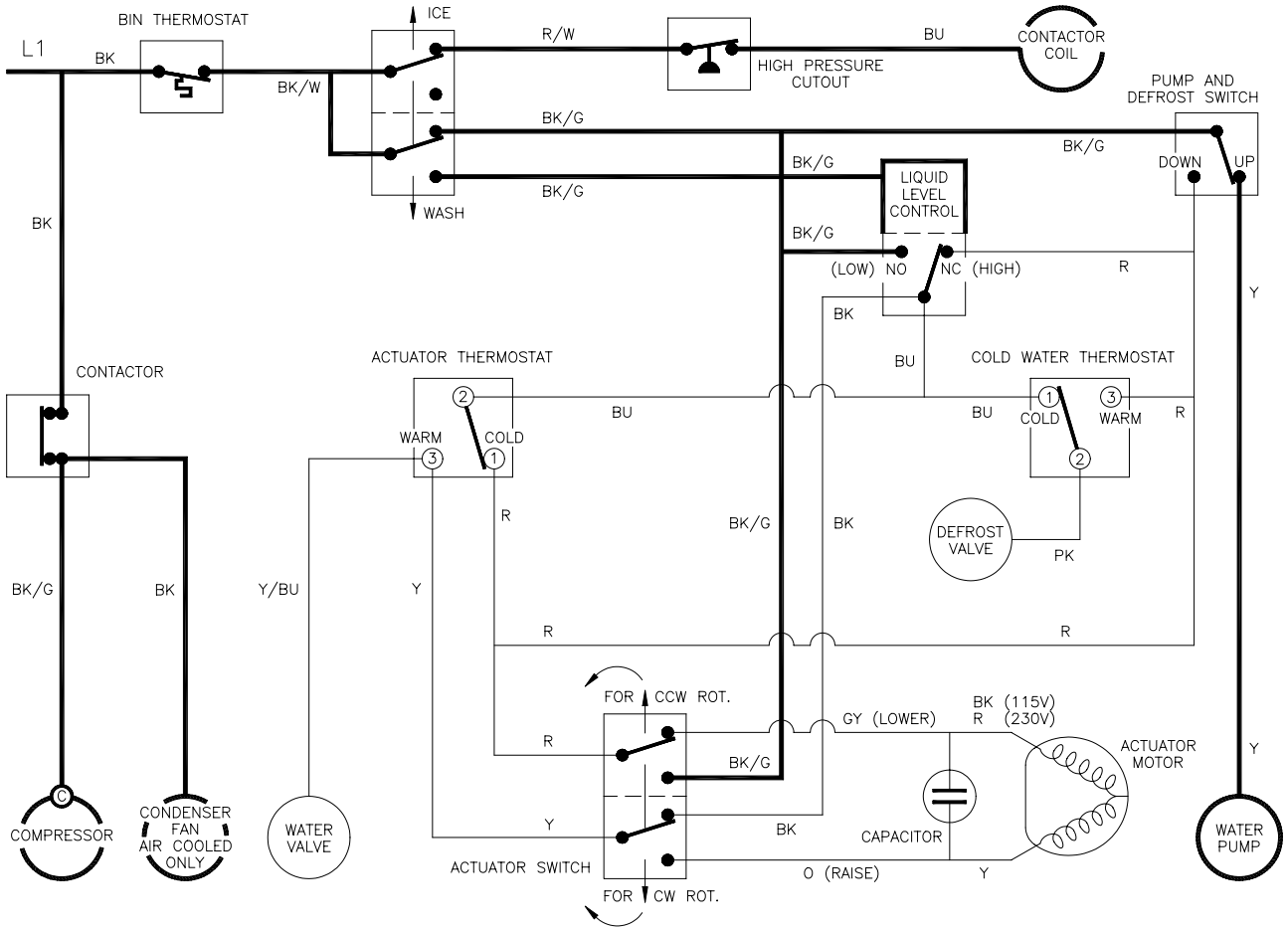
Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Ice		
Contactor	Closed	Compressor (Condenser Fan)	On
Water Plate	Closed		
Pump and Defrost Switch	Up	Water Pump	On
Cold Water Thermostat	Cold	Defrost Valve	Open
Actuator Thermostat	Warm		
Water Level Control	Low/Level Rising	Water Valve	Open
Actuator Toggle Switch	Up	Actuator Motor	Off
Ice	None	Control Stream	Low

#3 WATER FILL COMPLETE—ICE FORMING—EVAPORATOR TEMPERATURE > 3.3°C.



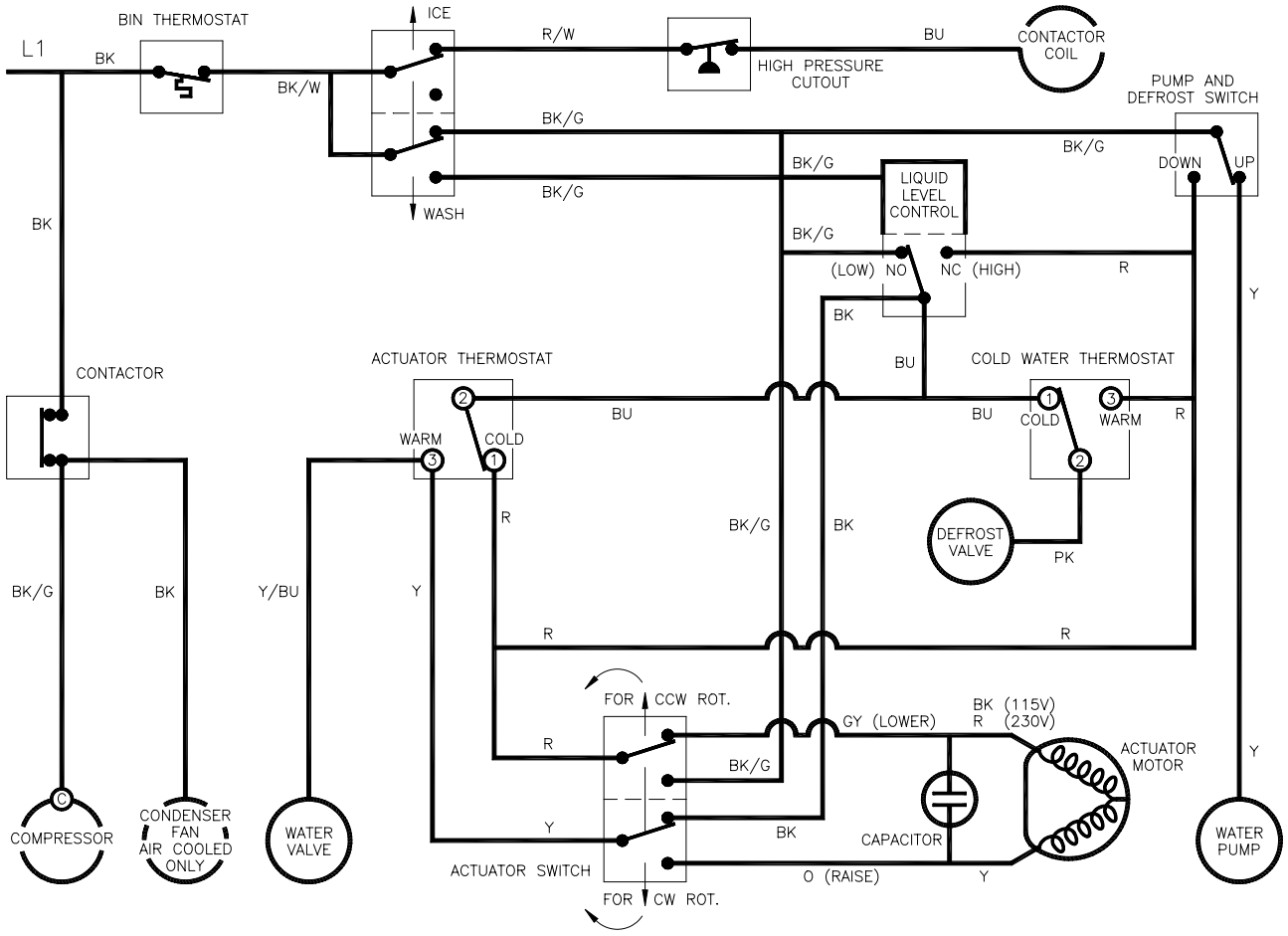
Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Ice		
Contactor	Closed	Compressor (Condenser Fan)	On
Water Plate	Closed		
Pump and Defrost Switch	Up	Water Pump	On
Cold Water Thermostat	Cold	Defrost Valve	Closed
Actuator Thermostat	Warm		
Water Level Control	High/Level Falling	Water Valve	Closed
Actuator Toggle Switch	Up	Actuator Motor	Off
Ice	Forming	Control Stream	Low

#4 ICE FORMING—EVAPORATOR TEMPERATURE < 3.3°C.



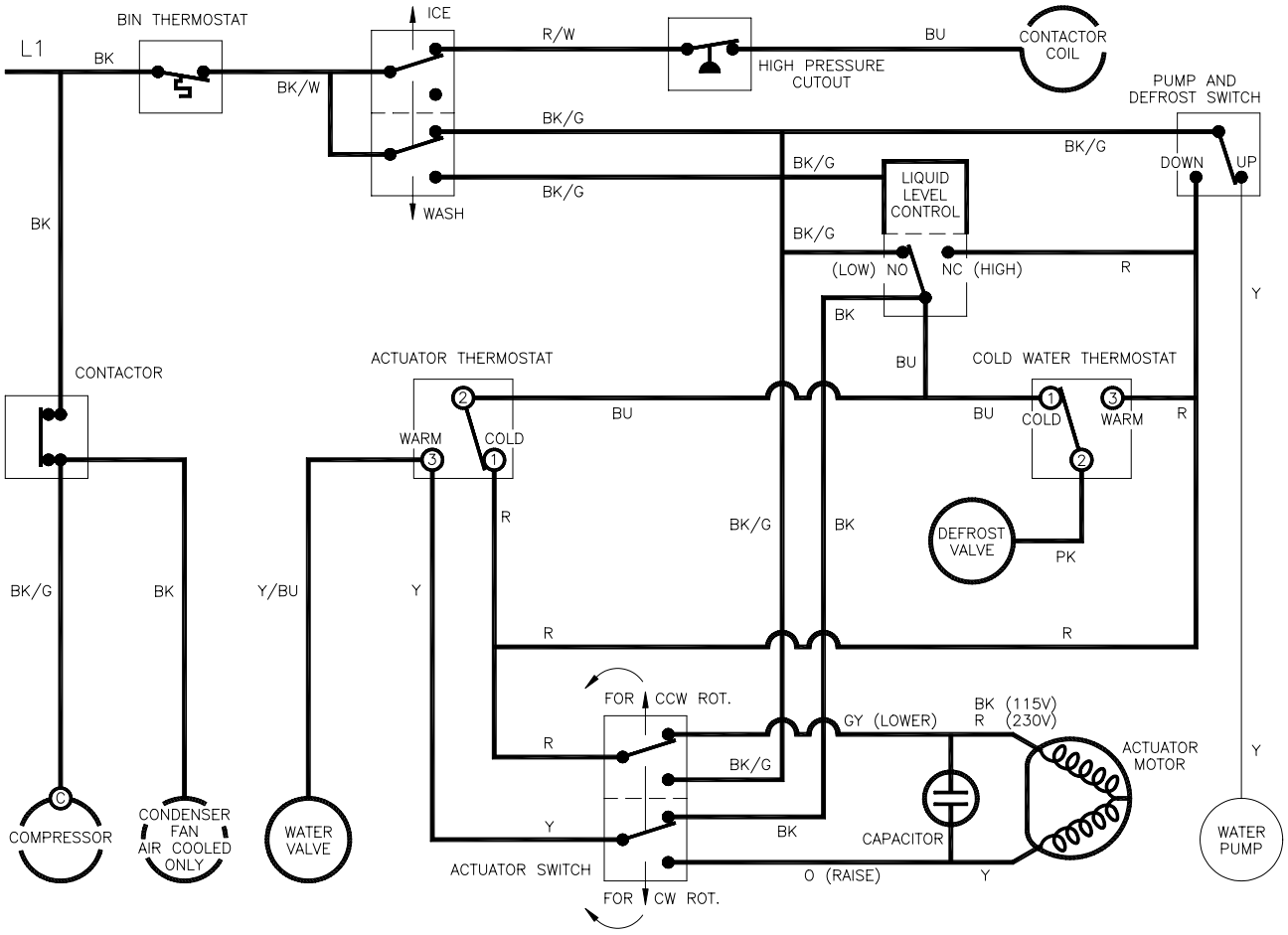
Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Ice		
Contactor	Closed	Compressor (Condenser Fan)	On
Water Plate	Closed		
Pump and Defrost Switch	Up	Water Pump	On
Cold Water Thermostat	Cold	Defrost Valve	Closed
Actuator Thermostat	Cold		
Water Level Control	High/Level Falling	Water Valve	Closed
Actuator Toggle Switch	Up	Actuator Motor	Off
Ice	Forming	Control Stream	Low

#5 DEFROST—START OF DEFROST



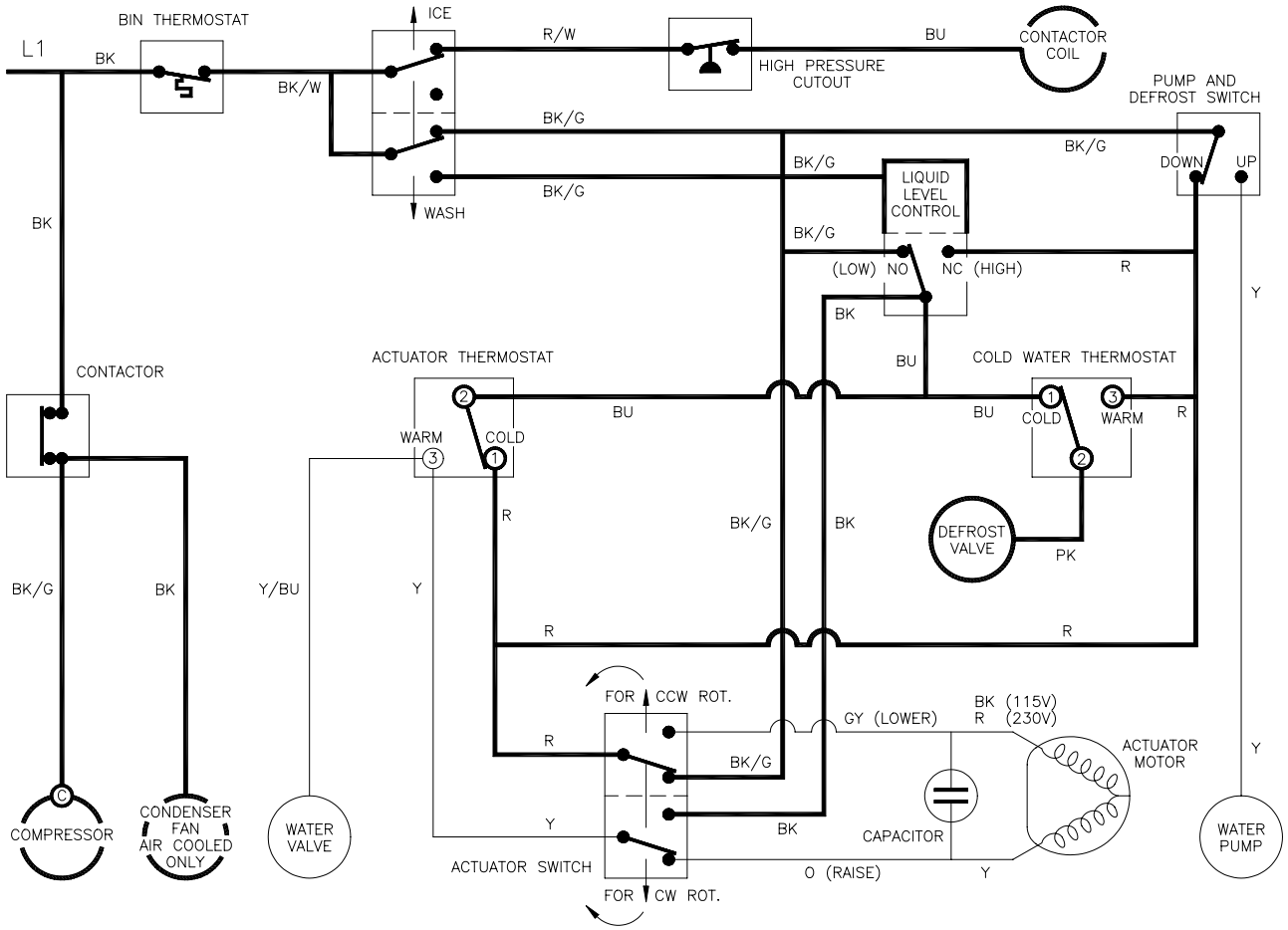
Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Ice		
Contactor	Closed	Compressor (Condenser Fan)	On
Water Plate	Starting to Open		
Pump and Defrost Switch	Up	Water Pump	On
Cold Water Thermostat	Cold	Defrost Valve	Open
Actuator Thermostat	Cold		
Water Level Control	Low	Water Valve	Open
Actuator Toggle Switch	Up	Actuator Motor	On/CCW Rotation
Ice	Fully Formed	Control Stream	High If Excess Water

#6 DEFROST—WATER PLATE DROPPING



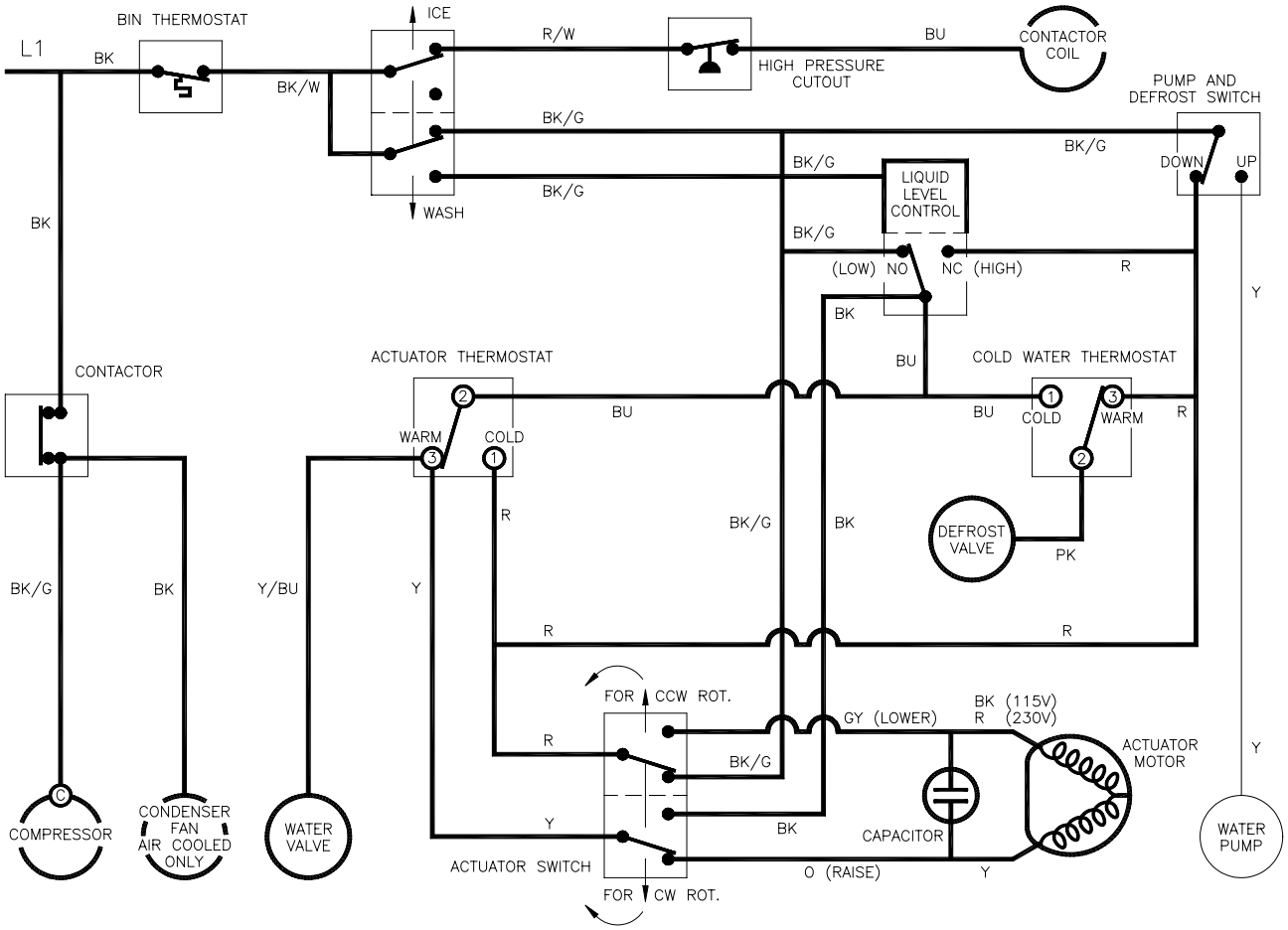
Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Ice		
Contactor	Closed	Compressor (Condenser Fan)	On
Water Plate	Opening		
Pump and Defrost Switch	Down	Water Pump	Off
Cold Water Thermostat	Cold	Defrost Valve	Open
Actuator Thermostat	Cold		
Water Level Control	Low	Water Valve	Open
Actuator Toggle Switch	Up	Actuator Motor	On/CCW Rotation
Ice	Fully Formed	Control Stream	Off

#7 DEFROST—WATER PLATE OPEN FULLY



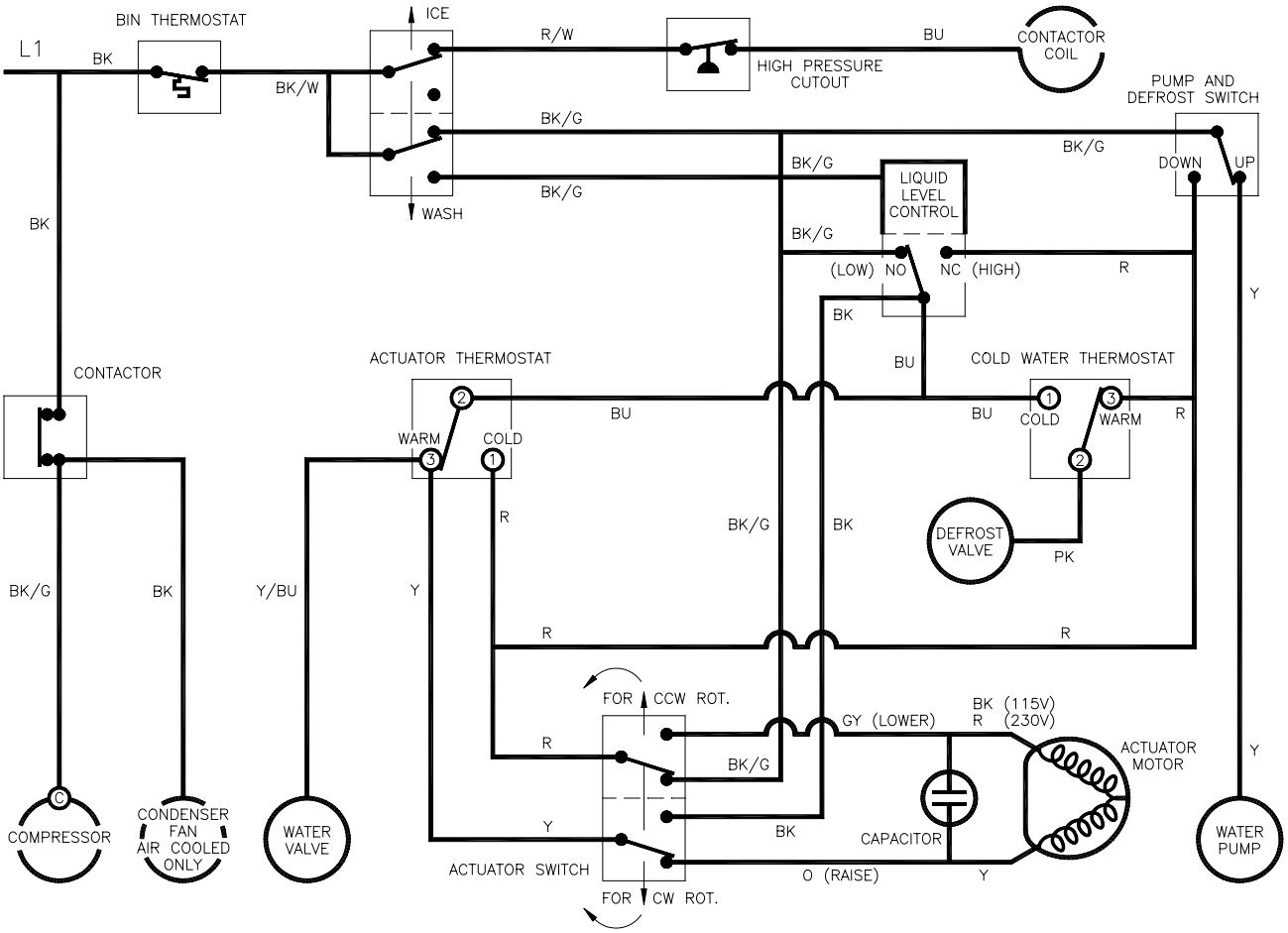
Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Ice		
Contactor	Closed	Compressor (Condenser Fan)	On
Water Plate	Open		
Pump and Defrost Switch	Down	Water Pump	Off
Cold Water Thermostat	Cold	Defrost Valve	Open
Actuator Thermostat	Cold		
Water Level Control	Low	Water Valve	Closed
Actuator Toggle Switch	Down	Actuator Motor	Off
Ice	Fully Formed	Control Stream	Off

#8 END OF DEFROST—WATER PLATE STARTS TO CLOSE



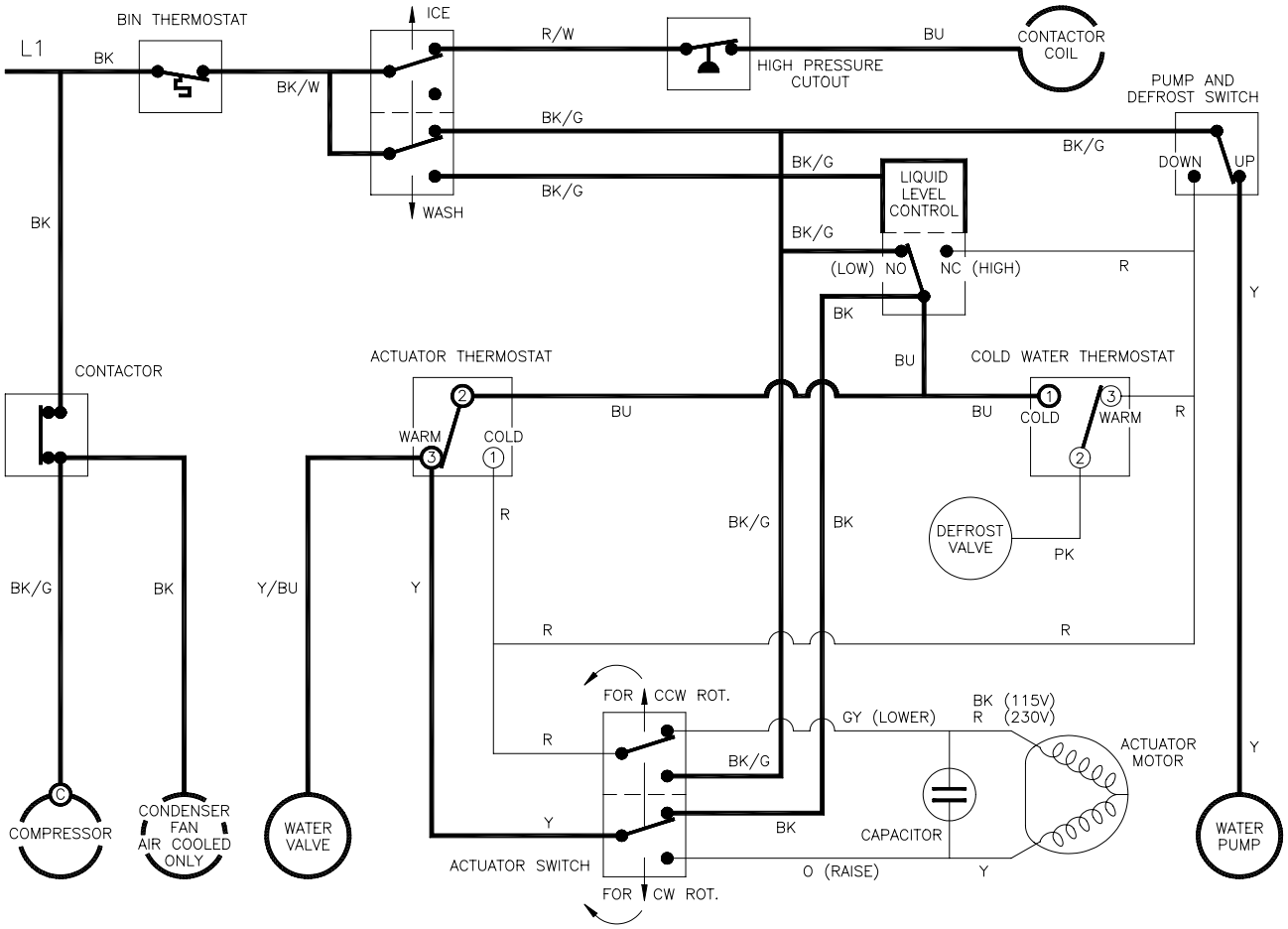
Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Ice		
Contactor	Closed	Compressor (Condenser Fan)	On
Water Plate	Starting to Close		
Pump and Defrost Switch	Down	Water Pump	Off
Cold Water Thermostat	Warm	Defrost Valve	Open
Actuator Thermostat	Warm		
Water Level Control	Low	Water Valve	Open
Actuator Toggle Switch	Down	Actuator Motor	On/CW Rotation
Ice	None	Control Stream	Off

#9 END OF DEFROST—WATER PLATE ALMOST CLOSED



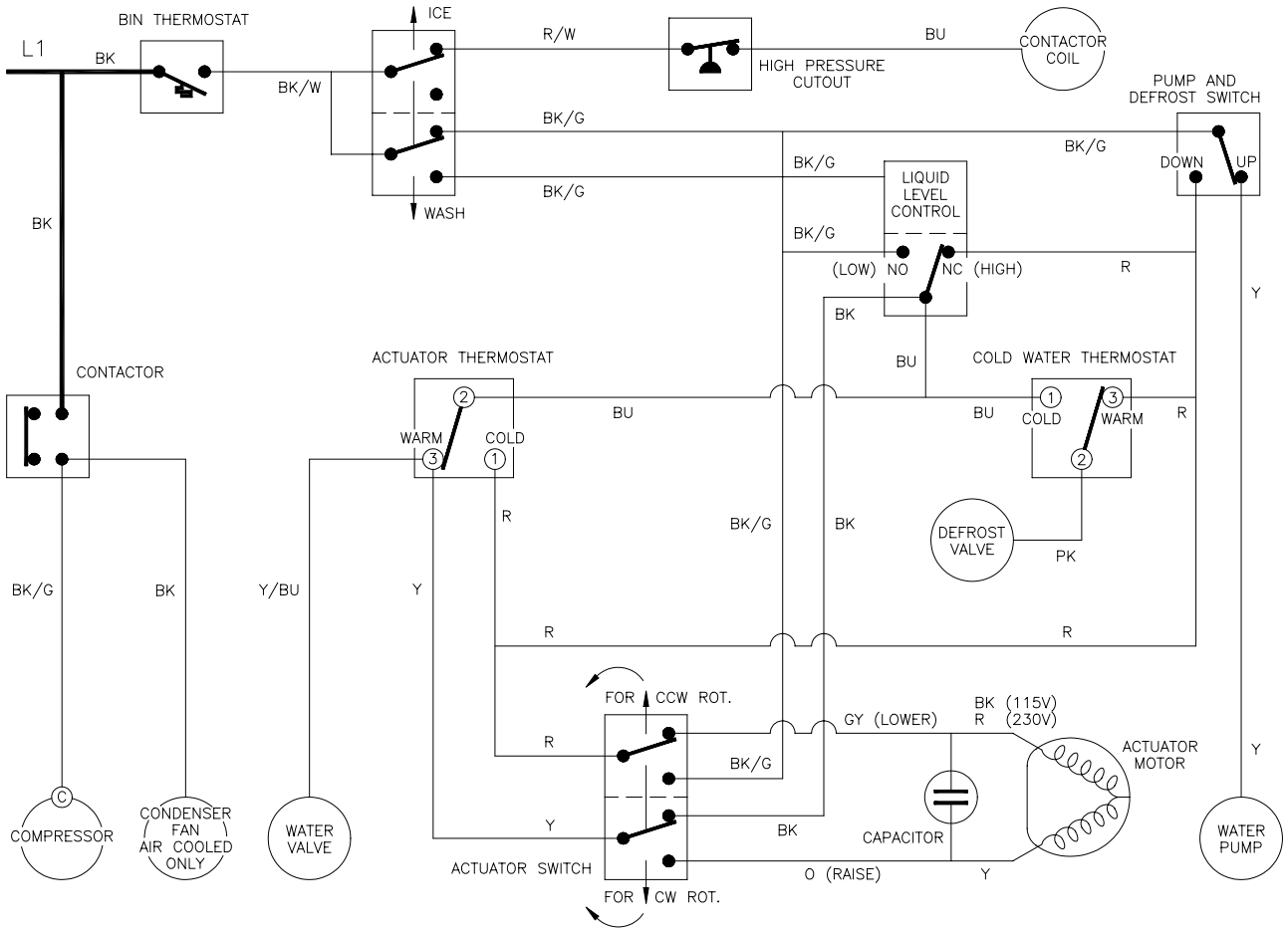
Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Ice		
Contactor	Closed	Compressor (Condenser Fan)	On
Water Plate	Almost Closed		
Pump and Defrost Switch	Up	Water Pump	On
Cold Water Thermostat	Warm	Defrost Valve	Open
Actuator Thermostat	Warm		
Water Level Control	Low	Water Valve	Open
Actuator Toggle Switch	Down	Actuator Motor	On/CW Rotation
Ice	None	Control Stream	Off

#10 END OF DEFROST—WATER PLATE CLOSED—START OF NEW CYCLE



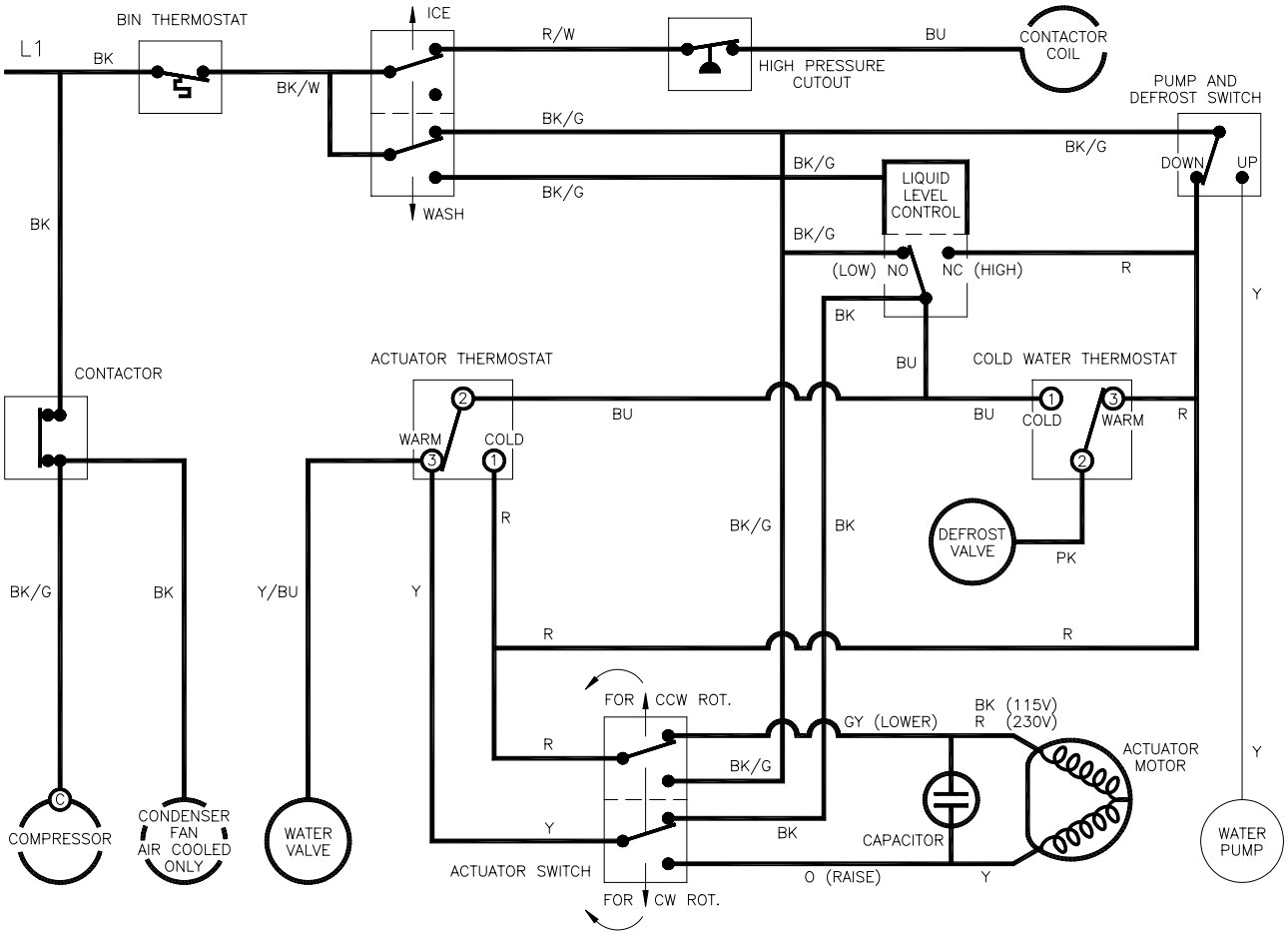
Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Ice		
Contactor	Closed	Compressor (Condenser Fan)	On
Water Plate	Closed		
Pump and Defrost Switch	Up	Water Pump	On
Cold Water Thermostat	Warm	Defrost Valve	Closed
Actuator Thermostat	Warm		
Water Level Control	Low/Level Rising	Water Valve	Open
Actuator Toggle Switch	Up	Actuator Motor	Off
Ice	None	Control Stream	Low

#11 ICE BIN FULL—BIN THERMOSTAT OPEN



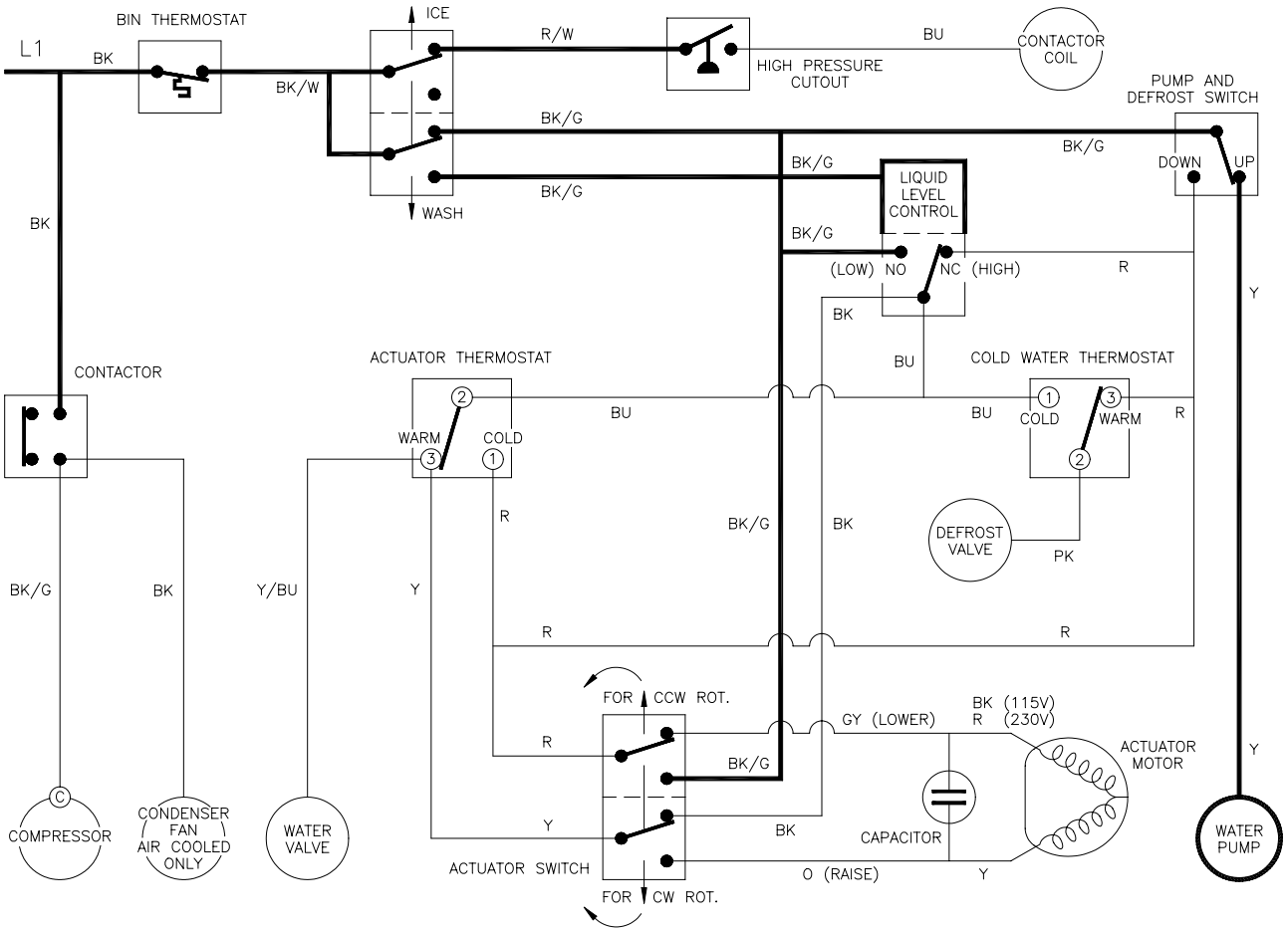
Control	Status	Component	Status
Bin Thermostat	Cold/Open		
IOF Switch	Ice or Wash		
Contactor	Open	Compressor (Condenser Fan)	Off
Water Plate	Any Position		
Pump and Defrost Switch	Up or Down	Water Pump	Off
Cold Water Thermostat	Warm or Cold	Defrost Valve	Closed
Actuator Thermostat	Warm or Cold		
Water Level Control	High or Low	Water Valve	Closed
Actuator Toggle Switch	Up or Down	Actuator Motor	Off
Ice	None to Fully Formed	Control Stream	Off

#12 WATER PLATE CLOSING BLOCKED—ICE REMAINS ON SURFACE



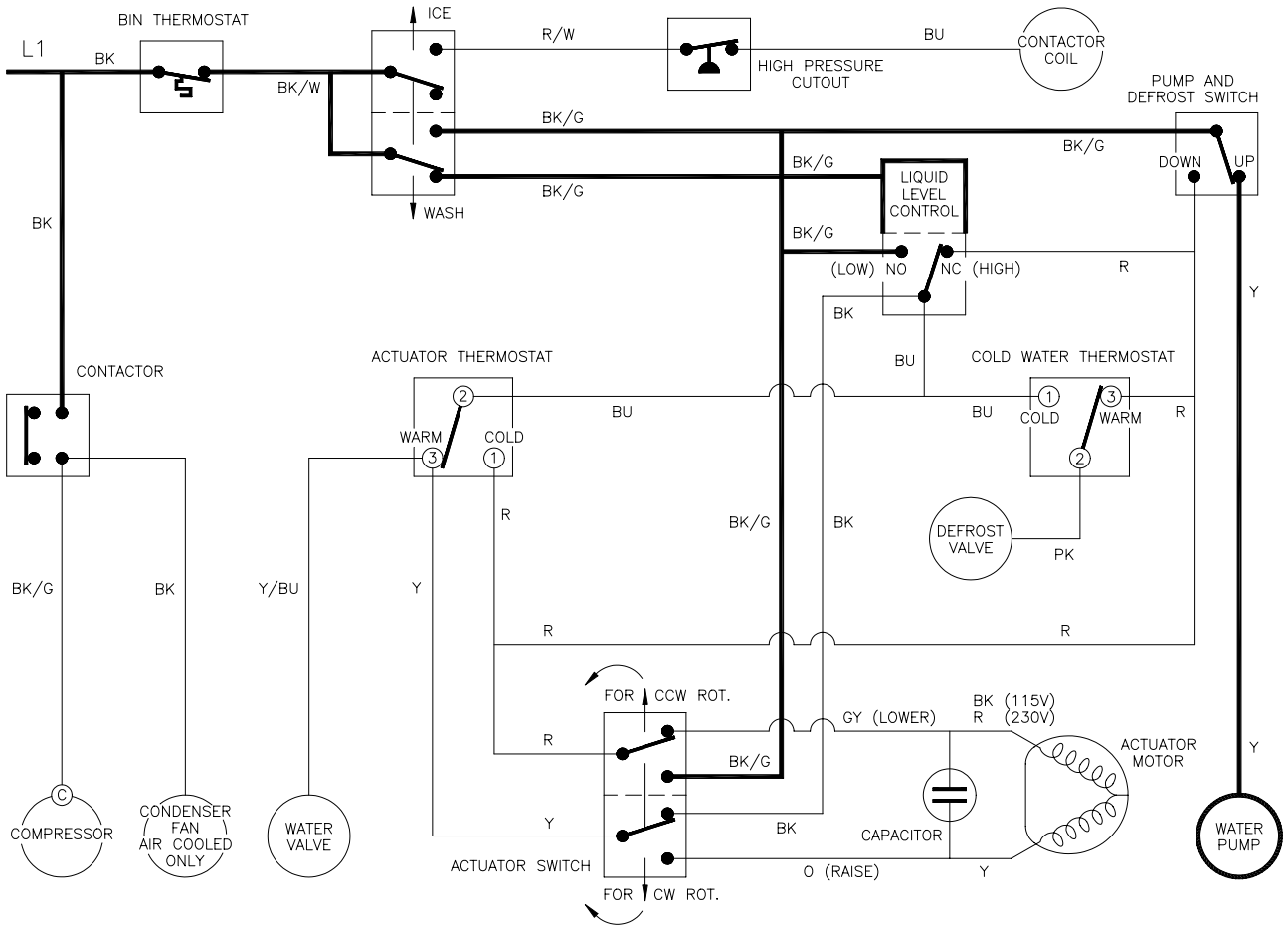
Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Ice		
Contactor	Closed	Compressor (Condenser Fan)	On
Water Plate	Closed		
Pump and Defrost Switch	Down	Water Pump	Off
Cold Water Thermostat	Warm	Defrost Valve	Open
Actuator Thermostat	Warm		
Water Level Control	Low	Water Valve	Open
Actuator Toggle Switch	Up	Actuator Motor	On/CCW Rotation
Ice	None	Control Stream	None

#13 HIGH PRESSURE CUT-OUT OPEN



Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Ice		
Contactor	Open	Compressor (Condenser Fan)	Off
Water Plate	Closed		
Pump and Defrost Switch	Up	Water Pump	On
Cold Water Thermostat	Warm	Defrost Valve	Closed
Actuator Thermostat	Warm		
Water Level Control*	High	Water Valve	Closed
Actuator Toggle Switch	Up	Actuator Motor	Off
Ice	None	Control Stream	Low

#14 WASH MODE



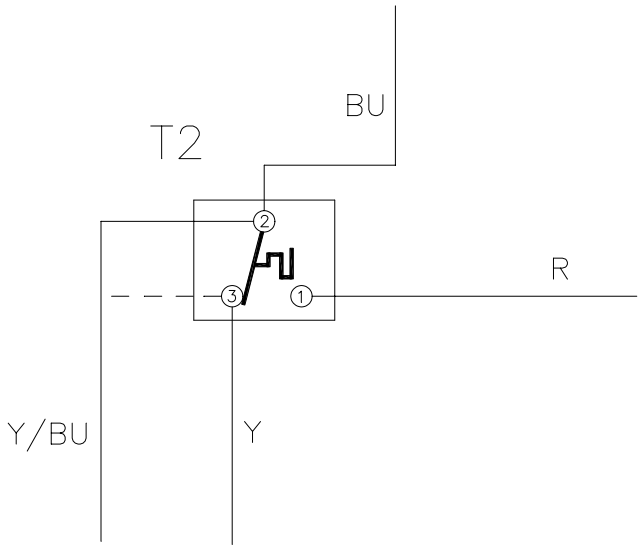
*NOTE- The low liquid level control position will open the water valve and fill the water tank.

Control	Status	Component	Status
Bin Thermostat	Warm/Closed		
IOF Switch	Wash		
Contactor	Open	Compressor (Condenser Fan)	Off
Water Plate	Closed		
Pump and Defrost Switch	Up	Water Pump	On
Cold Water Thermostat	Warm	Defrost Valve	Closed
Actuator Thermostat	Warm		
Water Level Control*	High	Water Valve	Closed
Actuator Toggle Switch	Up	Actuator Motor	Off
Ice	None	Control Stream	Low

WIRING DIAGRAMS-GENERAL INFORMATION

Wiring Diagram Color Code				
BK	Black		PK	Pink
B/G	Black/Green		R	Red
B/W	Black/White		R/BK	Red/Black
BR	Brown		R/W	Red/White
BU	Blue		W	White
GY	Gray		Y	Yellow
O	Orange		Y/BU	Yellow/Blue
O/BK	Orange/Black		Y/OR	Yellow/Orange

FULL RINSE WIRING MODIFICATION

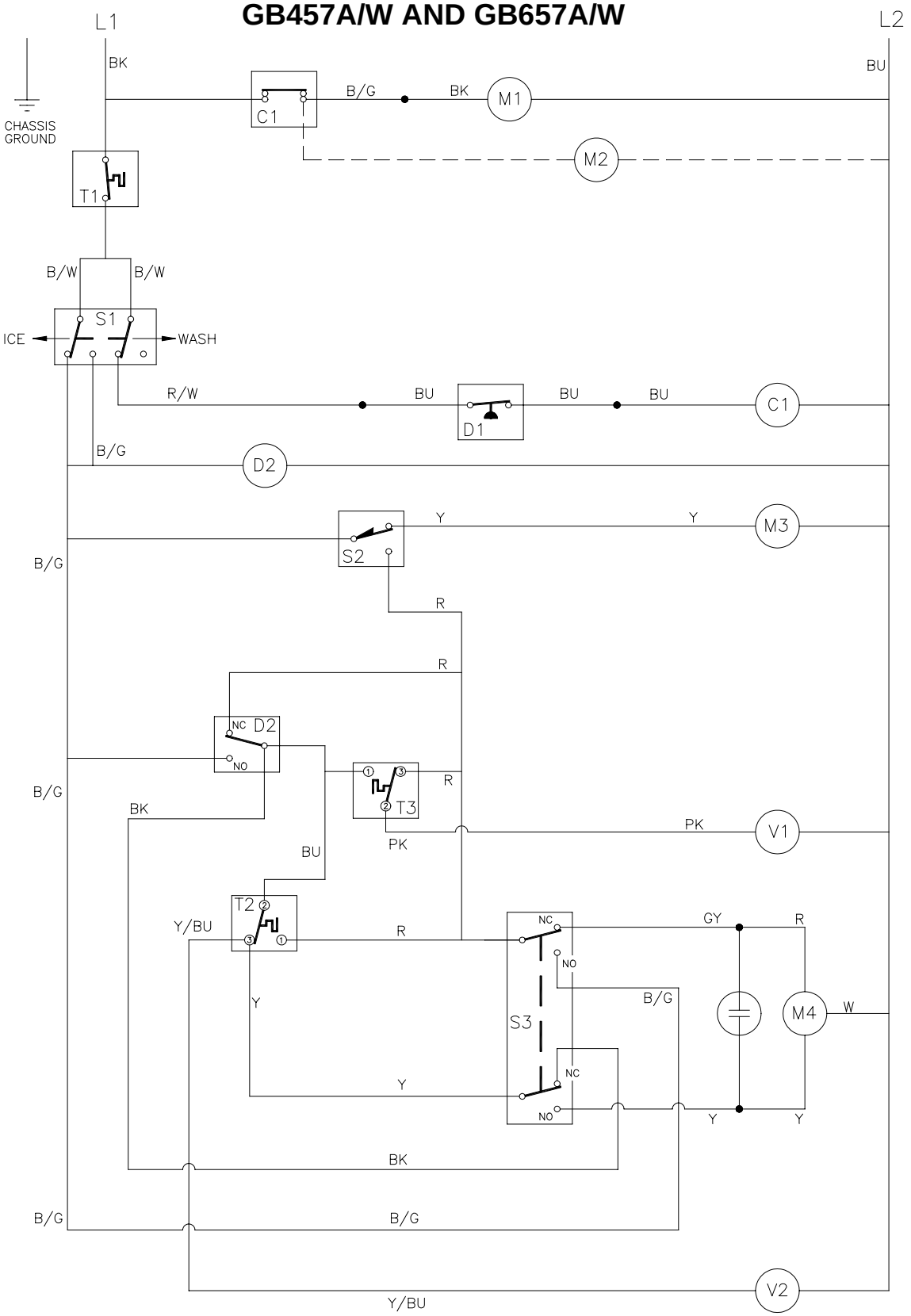


All models may be set up to rinse the water plate continuously during the defrost cycle. This is done by moving the Y/BU wire from terminal 3, on the actuator thermostat, to terminal 2.

NOTE- This modification will increase water usage. Make this modification only if ice remains on the water plate, after defrost, in sufficient quantities to interfere with ice cube formation during the following cycle. Significant Ice remaining on the water plate is an indication of an improperly adjusted ice machine. All possible adjustments should be tried before making this modification. See chapter 4 for other adjustments.

NOTE- See the Remote Air-Cooled Condenser section of the manual for wiring diagrams for these models.

GB457A/W AND GB657A/W

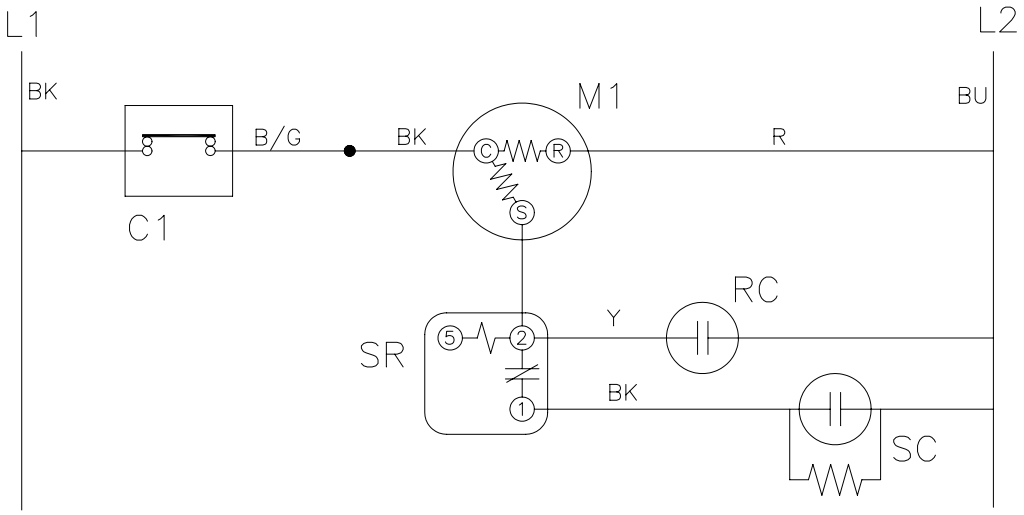


GB457A/W AND GB657A/W 220-240V/50HZ/1PH

Item	Description
C1	Contactor
D1	High Pressure Cutout
D2	Liquid Level Control
M1	Compressor
M2	Condenser Fan Motor
M3	Water Pump
M4	Actuator Motor

Item	Description
S1	Ice-Off-Wash Switch
S2	Pump and Defrost Switch
S3	Actuator Switch
T1	Bin Thermostat
T2	Actuator Thermostat
T3	Cold Water Thermostat
V1	Hot Gas Valve
V2	Water Valve

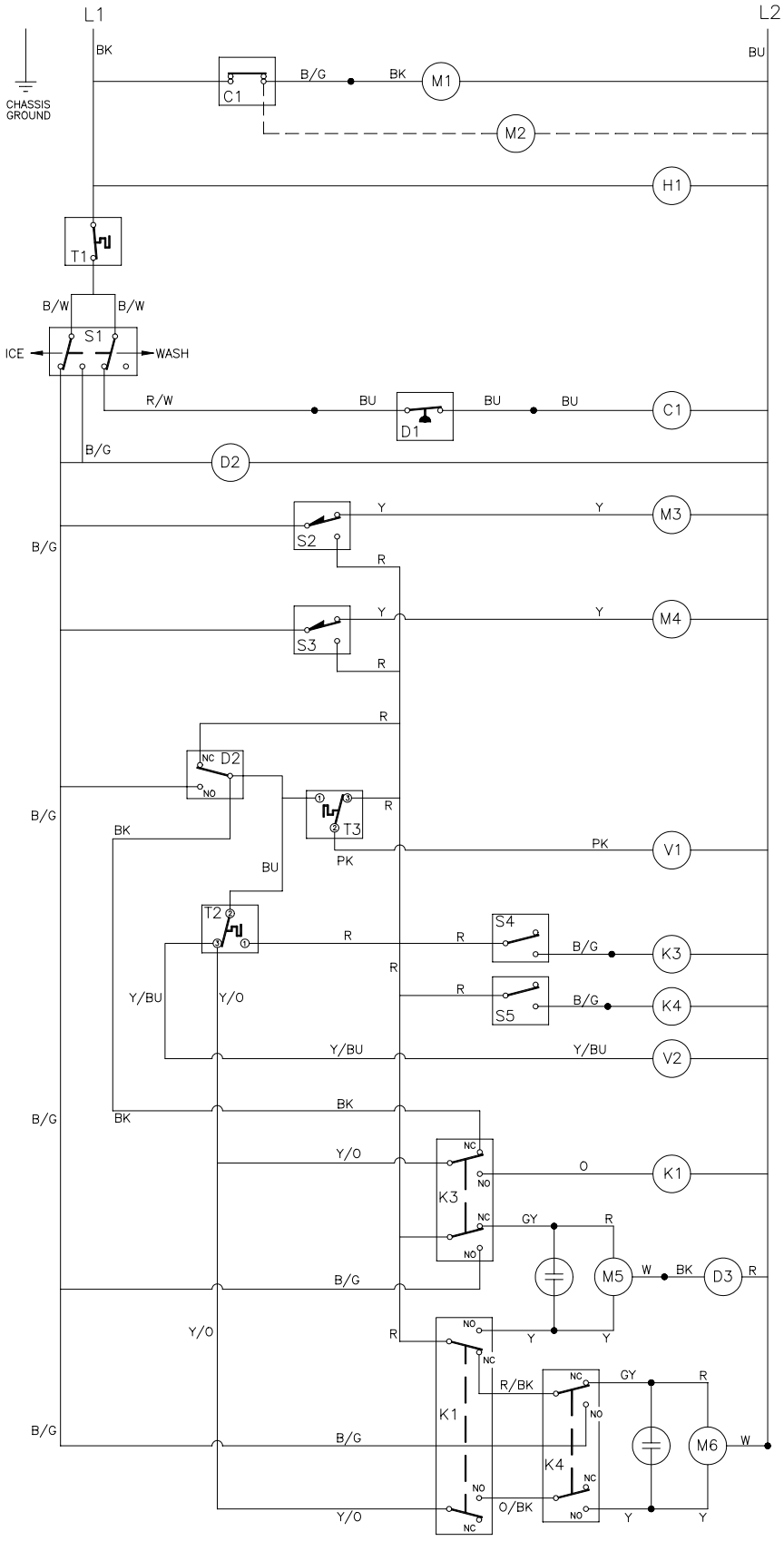
COMPRESSOR WIRING



Item	Description
C1	Contactor
M1	Compressor
RC	Run Capacitor

Item	Description
SC	Start Capacitor
SR	Start Relay

GB1257A/W

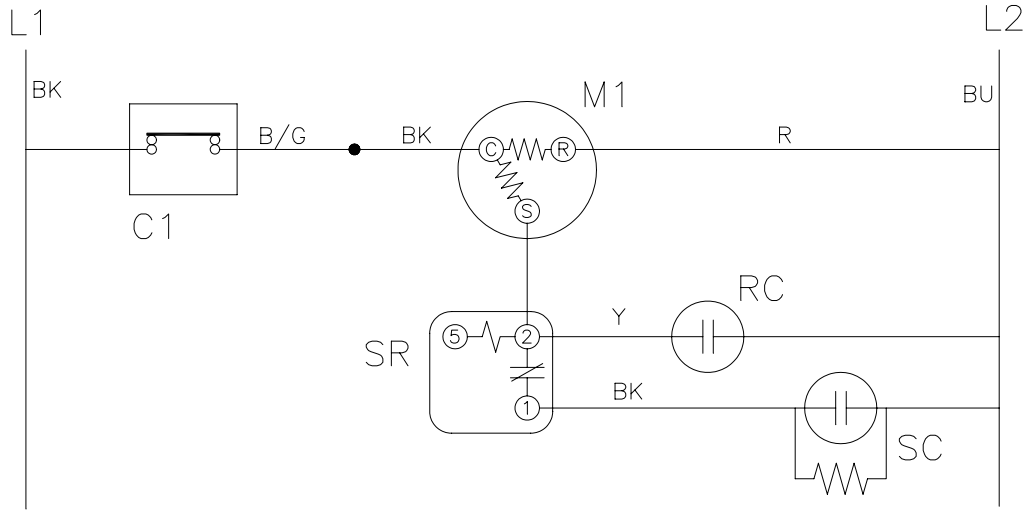

L1
L2
BK
BU
CHASSIS GROUND
C1
B/G
BK
M1
M2
H1
T1
B/W
B/W
S1
ICE
WASH
R/W
BU
D1
BU
BU
C1
B/G
D2
S2
Y
Y
M3
B/G
R
S3
Y
Y
M4
R
R
NC D2
NO
B/G
BK
T3
R
PK
PK
V1
BU
T2
S4
R
R
B/G
K3
R
S5
R
B/G
K4
Y/BU
Y/O
Y/BU
Y/BU
V2
BK
B/G
BK
Y/O
NC
NO
K3
O
K1
NC
NO
GY
R
M5
W
BK
D3
R
B/G
Y/O
NO
NC
R
Y
Y
K1
R/BK
NC
NO
GY
R
K4
M6
W
B/G
B/G
NO
NC
O/BK
NC
NO
Y
Y
Y/O

GB1257A/W 220-240V/50HZ/1PH

Item	Description
C1	Contactor
D1	High Pressure Cutout
D2	Liquid Level Control
D3	Delay Timer
H1	Crankcase Heater
K1	Relay #1
K3	Relay #3
K4	Relay #4
M1	Compressor
M2	Condenser Fan Motor (2)
M3	Water Pump-Upper
M4	Water Pump-Lower

Item	Description
M5	Actuator Motor-Master
M6	Actuator Motor-Slave
S1	Ice-Off-Wash Switch
S2	Pump and Defrost Switch-Upper
S3	Pump and Defrost Switch-Lower
S4	Actuator Switch-Master
S5	Actuator Switch-Slave
T1	Bin Thermostat
T2	Actuator Thermostat
T3	Cold Water Thermostat
V1	Hot Gas Valve
V2	Water Valve (2)

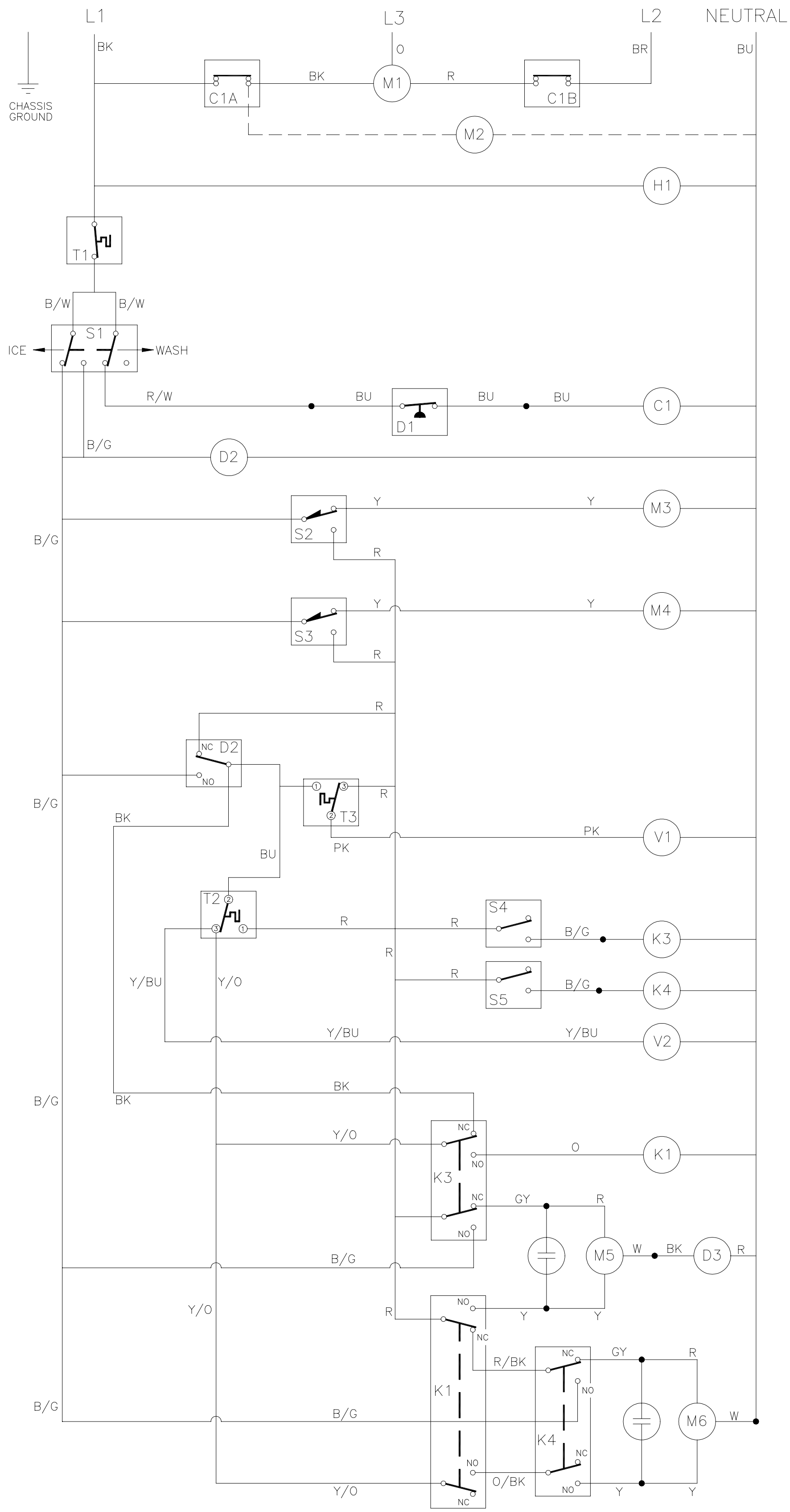
COMPRESSOR WIRING



Item	Description
C1	Contactor
M1	Compressor
RC	Run Capacitor

Item	Description
SC	Start Capacitor
SR	Start Relay

GB1258A/W

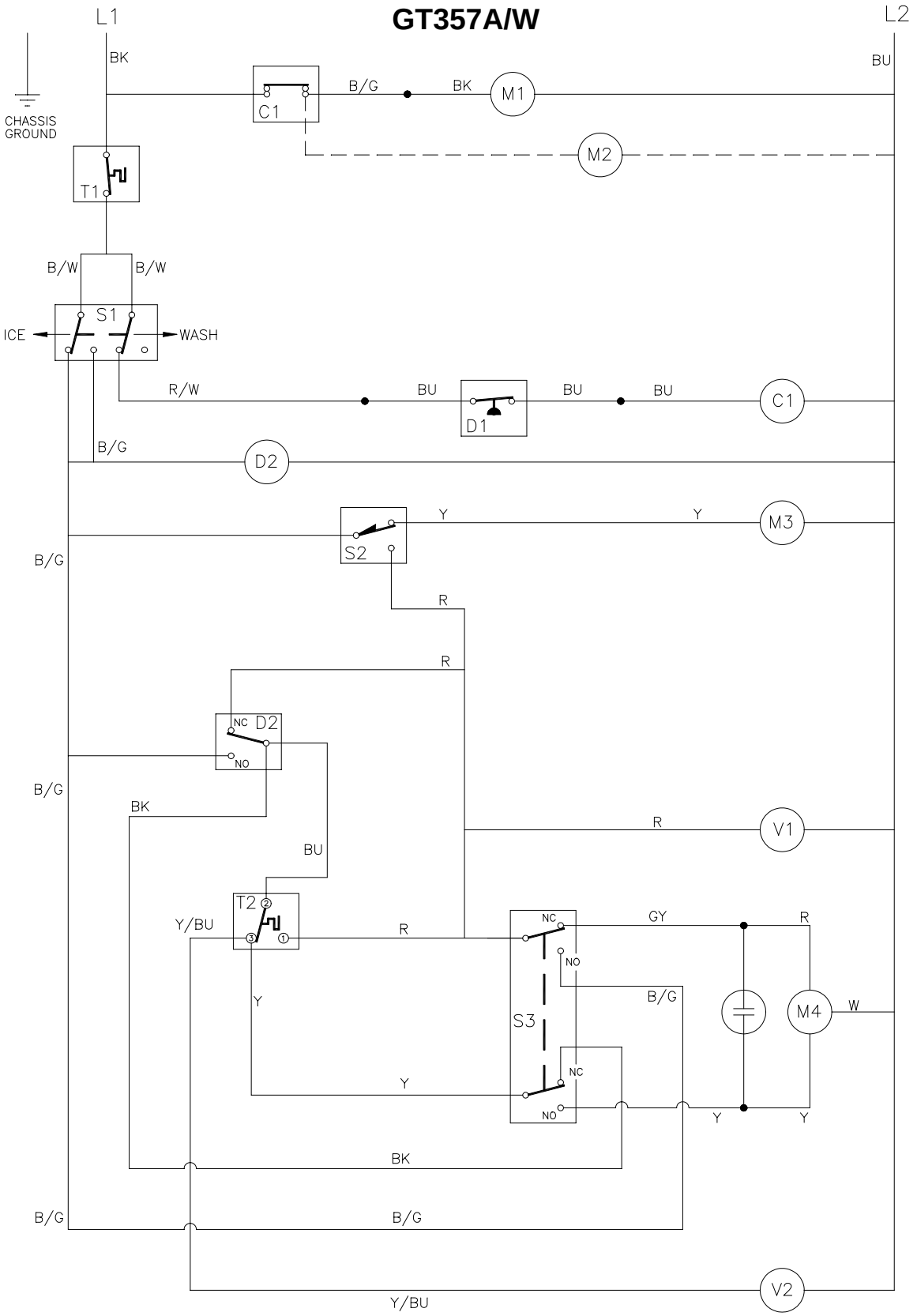

L1
L3
L2
NEUTRAL
CHASSIS GROUND
BK
O
BR
BU
C1A
M1
R
C1B
M2
H1
T1
B/W
S1
ICE
WASH
R/W
D1
C1
B/G
D2
S2
Y
M3
S3
M4
NC
NO
T3
PK
V1
T2
S4
K3
S5
K4
Y/BU
Y/O
V2
K1
GY
M5
W
D3
R/BK
NC
NO
O/BK
M6

GB1258A/W 380V/50HZ/3PH

Item	Description
C1	Contactor
D1	High Pressure Cutout
D2	Liquid Level Control
D3	Delay Timer
H1	Crankcase Heater
K1	Relay #1
K3	Relay #3
K4	Relay #4
M1	Compressor
M2	Condenser Fan Motor (2)
M3	Water Pump-Upper
M4	Water Pump-Lower

Item	Description
M5	Actuator Motor-Master
M6	Actuator Motor-Slave
S1	Ice-Off-Wash Switch
S2	Pump and Defrost Switch-Upper
S3	Pump and Defrost Switch-Lower
S4	Actuator Switch-Master
S5	Actuator Switch-Slave
T1	Bin Thermostat
T2	Actuator Thermostat
T3	Cold Water Thermostat
V1	Hot Gas Valve
V2	Water Valve (2)

GT357A/W

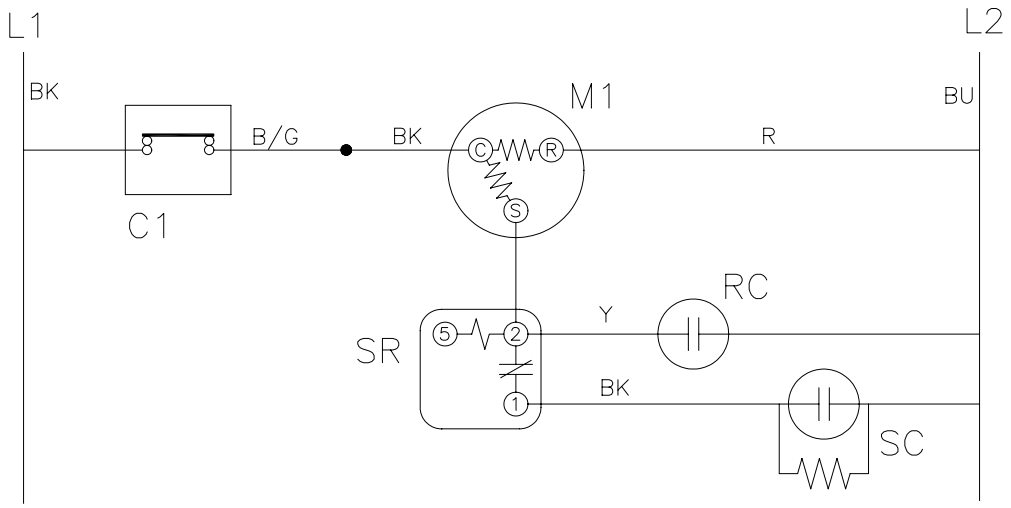

L1
L2
BK
BU
CHASSIS GROUND
B/G
BK
M1
C1
M2
T1
B/W
B/W
S1
ICE
WASH
R/W
BU
BU
BU
D1
C1
B/G
D2
Y
Y
M3
S2
B/G
R
R
NC
D2
NO
B/G
BK
R
V1
BU
T2
Y/BU
R
NC
GY
R
NO
B/G
Y
S3
M4
W
NC
Y
NO
Y
Y
BK
B/G
B/G
V2
Y/BU

GT357A/W 220-240V/50HZ/1PH

Item	Description
C1	Contactor
D1	High Pressure Cutout
D2	Liquid Level Control
M1	Compressor
M2	Condenser Fan Motor
M3	Water Pump
M4	Actuator Motor

Item	Description
S1	Ice-Off-Wash Switch
S2	Pump and Defrost Switch
S3	Actuator Switch
T1	Bin Thermostat
T2	Actuator Thermostat
V1	Hot Gas Valve
V2	Water Valve

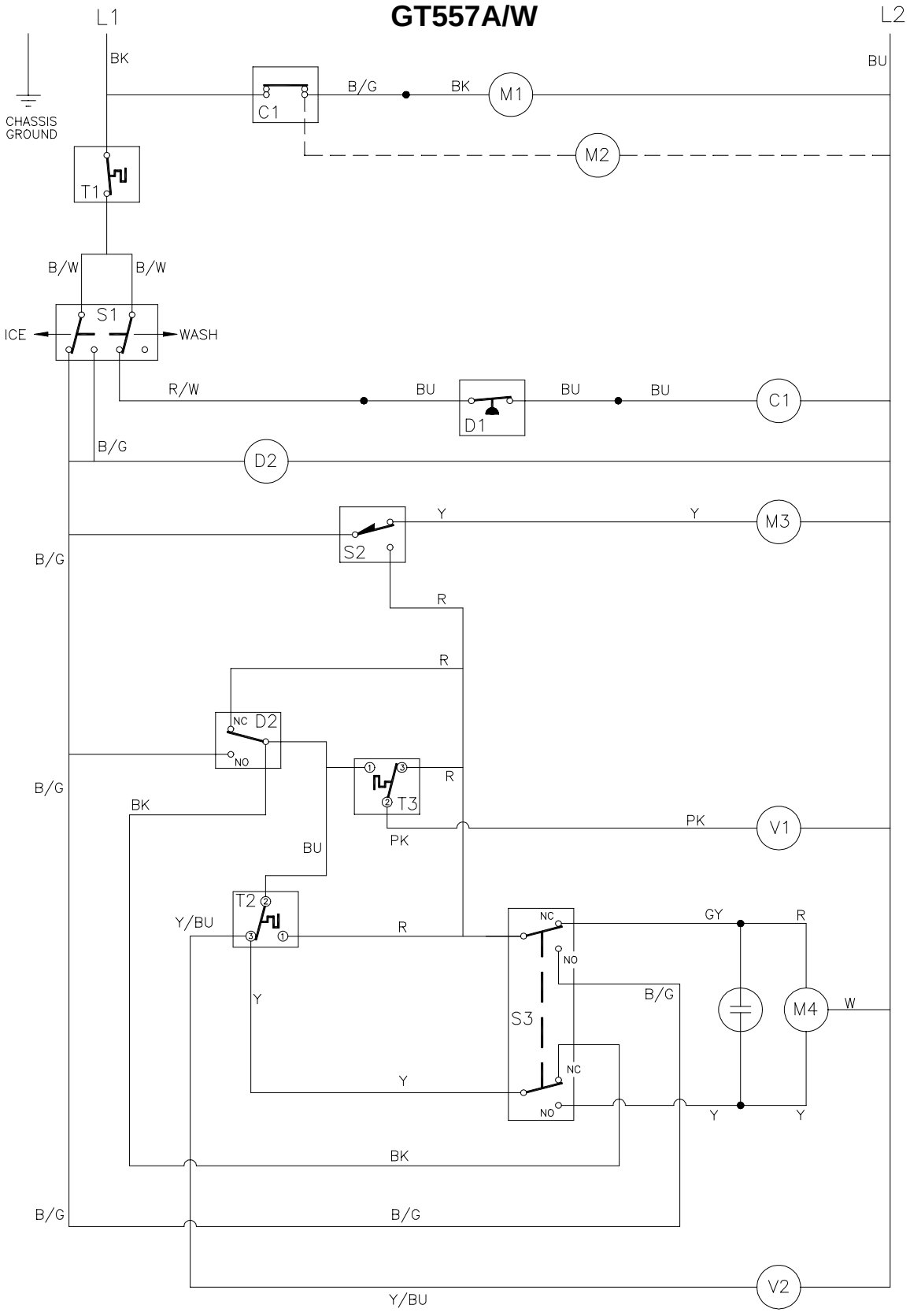
COMPRESSOR WIRING



Item	Description
C1	Contactor
M1	Compressor
RC	Run Capacitor

Item	Description
SC	Start Capacitor
SR	Start Relay

GT557A/W

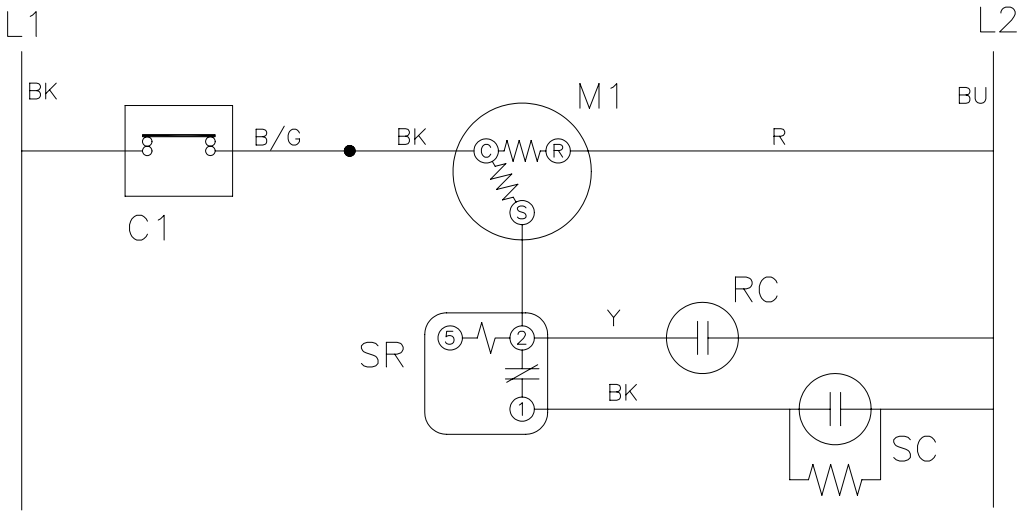

L1
L2
BK
BU
CHASSIS GROUND
B/G
BK
M1
C1
M2
T1
B/W
B/W
S1
ICE
WASH
R/W
BU
BU
BU
D1
C1
B/G
D2
Y
Y
M3
S2
B/G
R
R
NC D2
NO
B/G
BK
R
T3
PK
PK
V1
BU
T2
Y/BU
R
NC
NO
GY
R
B/G
S3
M4
W
Y
NC
NO
Y
Y
Y
BK
B/G
B/G
Y/BU
V2

GT557A/W 220-240V/50HZ/1PH

Item	Description
C1	Contactor
D1	High Pressure Cutout
D2	Liquid Level Control
M1	Compressor
M2	Condenser Fan Motor
M3	Water Pump
M4	Actuator Motor

Item	Description
S1	Ice-Off-Wash Switch
S2	Pump and Defrost Switch
S3	Actuator Switch
T1	Bin Thermostat
T2	Actuator Thermostat
T3	Cold Water Thermostat
V1	Hot Gas Valve
V2	Water Valve

COMPRESSOR WIRING



Item	Description
C1	Contactor
M1	Compressor
RC	Run Capacitor

Item	Description
SC	Start Capacitor
SR	Start Relay

WATER FILL LEVELS, CYCLE TIMES AND HARVEST WEIGHTS

Parameter	Model Group and Cube Type														
	GB450			GB650			GB1250			GT350			GT550		
	C	HK	K	C	HK	K	C	HK	K	C	HK	K	C	HK	K
Water Fill Level (mm) (see note)	6.99	6.99	9.21	6.99	6.99	9.21	6.99	6.99	9.21	6.67	6.67	7.62	6.99	6.99	9.21
Approximate Cycle Time (Minutes)	33	26	15	26	21	13	23	18	12	31	21	14	31	24	16
Approximate Harvest Weight (kg)	3.49	3.22	1.81	3.49	3.22	1.81	6.99	6.44	3.63	1.77	1.59	0.91	3.49	3.22	1.81
Note- Rough measurement from top edge of water tank to water level in control tube after water fill is complete. Additional fine adjustments may be required.															

CUBE INFORMATION

Cube Type	Cube Dimensions (mm)	Cube Weight (g)	Cubes per Cycle				
			GB450	GB650	GB1250	GT350	GT550
C (Full Cube)	31 x 31 x 31	32.6	108	108	216	54	108
HK (Half Cube)	31 x 31 x 15	15.0	216	216	432	108	216
K (Cube-let)	31 x 15 x 15	8.5	216	216	432	108	216

TYPICAL REFRIGERANT OPERATING PRESSURES

Measurement Point	Low Side (Suction Pressure)	High Side(Discharge Pressure) (R-404a)	
		Air Cooled	Liquid Cooled
Beginning of Freeze Cycle	345 kPa	See note 1	1720 kPa (See note 3)
Just Before Defrost Cycle Begins	80 to 140 kPa	See note 2	1720 kPa (See note 3)
During Defrost Cycle	480 to 1030 kPa	Approx. 1030 kPa	Approx. 1030 kPa
Note 1- High side pressure in air cooled models, at the beginning of the freeze cycle, is likely to be higher than 1720 kPa.			
Note 2- High side pressure in air cooled models, at the end of the freeze cycle, is likely to be lower than 1720 kPa.			
Note 3- 1720 kPa is equivalent to 40°C condensing temperature			

REFRIGERANT CHARGE INFORMATION

Parameter	Model Group and Ice Size														
	GB450			GB650			GB1250			GT350			GT550		
	C	HK	K	C	HK	K	C	HK	K	C	HK	K	C	HK	K
Refrigerant Charge	Refer to Serial Number Plate for Refrigerant Type and Weight of Charge														

WARNING

REFER ALL SERVICE WORK TO QUALIFIED TECHNICIANS.
KNOWLEDGE OF PROPER INSTALLATION AND SERVICE PROCEDURES IS ESSENTIAL TO THE SAFE MAINTENANCE OF KOLD-DRAFT EQUIPMENT.

ALWAYS DISCONNECT THE POWER SUPPLY BEFORE SERVICING THE EQUIPMENT. SOME CIRCUITS REMAIN ENERGIZED WHEN THE ICE MACHINE IS SWITCHED OFF.

DO NOT OPERATE EQUIPMENT THAT HAS BEEN DAMAGED.

NEVER OPERATE THE ICE MAKER WITH ANY COVERS, PANELS OR OTHER PARTS REMOVED OR NOT PROPERLY SECURED.

NEVER MODIFY THE CIRCUITRY OF KOLD-DRAFT EQUIPMENT FROM THE ORIGINAL SPECIFICATIONS.

USE ONLY GENUINE KOLD-DRAFT REPLACEMENT PARTS.
USE OF NON-APPROVED PARTS WHEN SERVICING KOLD-DRAFT EQUIPMENT MAY CREATE A SAFETY HAZARD OR CAUSE EQUIPMENT AND PROPERTY DAMAGE.

USE OF NON-APPROVED PARTS, WHEN SERVICING KOLD-DRAFT EQUIPMENT, WILL VOID THE EQUIPMENT WARRANTY.

NOTE

WHEN SERVICING KOLD-DRAFT ICE MACHINE REFRIGERATION SYSTEMS, ALL WORK PERFORMED MUST BE CONSISTANT WITH THE BEST REFRIGERATION SERVICE PRACTICES. THESE SYSTEMS MUST REMAIN CLEAN, DRY AND PROPERLY CHARGED WITH REFRIGERANT, IN ORDER FOR THE ICE MACHINE TO OPERATE AS DESIGNED.

CAUTION

FAILURE TO COMPLY WITH ALL KOLD-DRAFT SERVICE GUIDELINES MAY CAUSE PERSONAL INJURY, EQUIPMENT OR PROPERTY DAMAGE AND VOIDING OF THE PRODUCT WARRANTY.

NOTE- See the Remote Air-Cooled Condenser section of the manual for additional service information related to these ice machines.

Problem	Possible Cause	Solution
Ice machine is not operating.	Ice-Off-Wash switch in "off" position	Move switch to "Ice" position.
	No power at ice machine. Circuit protector open.	Replace fuse or reset breaker. Check circuit for overload condition.
	Ice machine off on bin thermostat. Bin full of ice.	Use ice or move ice away from bin thermostat capillary tube.
	Ice machine off on bin thermostat. Bin thermostat defective.	Replace bin thermostat.
	Ice machine off on bin thermostat. Ambient temperature below 10°C.	Ambient temperature must be 15°C minimum.
		1
Compressor is not operating. Water pump and other components are operating normally. **See compressor test procedure for more information.**	Ice-Off-Wash switch in "wash" position.	Move switch to "Ice" position.
	High pressure cut-out open on air cooled models. Condenser dirty.	Clean condenser and reset high pressure cut-out. Confirm proper operating pressures.
	High pressure cut-out open on air cooled models. Air circulation through condenser is Insufficient or hot air is recirculating through the condenser.	Provide adequate spacing between the ice machine and walls, ceilings or other equipment. See installation instructions for spacing requirements. Confirm proper operating pressures.
	High pressure cut-out open on liquid cooled models. Coolant liquid interrupted or insufficient	Restore adequate coolant liquid supply and reset high pressure cut out. Confirm proper operating pressures
	High pressure cut-out open on liquid cooled models. Interior of condenser has a mineral build-up.	Clean or replace condenser.
	High pressure cut-out open. Refrigeration system is overcharged.	System is overcharged with refigerant. Remove refrigerant and recharge the system to specifications.
	Compressor thermal protector open because of low voltage condition.	Allow thermal protector to reset. Measure voltage at contactor while compressor is running. Correct power supply problem if voltage is lower than specified on the ice machine electrical plate. **See compressor test procedure for more information.**
	Compressor thermal protector open because of defective run capacitor.	Replace run capacitor. **See compressor test procedure for more information.**
	Contactor is defective.	Check for voltage at coil terminals. Replace contactor if it does not close when the coil is energized.
	Compressor start capacitor or relay defective.	Test and replace these parts if defective. **See compressor test procedure for more information.**
	Compressor is defective.	Replace compressor. **See compressor test procedure for more information.**

Problem	Possible Cause	Solution
Condenser fan motor is not operating on air-cooled models. Compressor is	Fan motor protector open.	Replace motor if it does not run when cool or at normal operating conditions.
	Fan motor defective	Replace motor.
		2
Defrost performance slow.	Condenser sub-cooling >11°C at the middle point of the freeze cycle on liquid-cooled models.	System is overcharged with refigerant. Remove refrigerant and recharge the system to specifications.
	Condenser liquid regulating valve not closing fully during defrost on liquid-cooled models.	Adjust, repair or replace liquid regulating valve.
	Air cooled ice machine installed in a low ambient temperature location.	Ambient temperature must be 15°C minimum.
	Ice frozen into the water plate surface. Thick web between ice cubes.	Adjust web thickness to specifications.
	Ice frozen into the water plate surface. Cubes are fully formed without small dimples.	Reduce the water fill level until ice cubes are produced with small dimples.
	Ice cubes have large dimples or are hollow at the end of the freeze cycle. Batch weight is too light.	Increase the water level until ice cubes are produced with small dimples.
	Evaporator grids are distorted.	Carefully straighten grids or replace evaporator if the damage is severe.
Water plate re-opens immediately after closing.	Pump and defrost switch lever is not being pushed up completely.	Adjust pump and defrost switch actuator on water plate until it pushes up the switch lever completely.
	Water plate is prevented from closing by some obstruction such as ice remaining on the water plate surface.	Eliminate obstruction. Adjust the actuator thermostat so all ice is out of the evaporator before the water plate begins to close.
Water plate closes but re-opens before water fill is completed.	Water plate springs are stretched or weak and allow the water plate to drop slightly as the water fills the tank. The pump and defrost switch lever is allowed to drop and re-open the water plate.	Replace defective springs.
	A water plate spring is broken or disconnected from the cam arm or the water plate.	Replace broken spring or reattach disconnected spring.

Problem	Possible Cause	Solution
Water plate will not close after defrost.	Actuator thermostat will not reset "warm". Actuator thermostat may be adjusted fully counter-clockwise (switch contacts locked in cold position)	Adjust actuator thermostat clockwise to unlock switch contacts.
	Actuator thermostat will not reset "warm". Actuator thermostat is defective or capillary tube is broken.	Replace actuator thermostat.
	Actuator motor output shaft is tuning but front cam is not turning.	Cam pin is broken or missing.
	Actuator motor will not run. No voltage measured at actuator motor. Defective actuator switch.	Replace actuator switch.
	Actuator motor will not run. Voltage measured at actuator motor. Actuator motor or capacitor defective.	Replace defective actuator motor or capacitor. **See actuator motor test procedure for additional information.**
	Actuator motor will not run. Voltage measured at actuator motor. Actuator motor overheated. Open thermal overload.	Let motor cool and determine why motor is running continuously.
		3
Defrost does not initiate when water level drops below low water level probe.	Actuator thermostat will not switch "cold". Poor contact between the actuator thermostat capillary tube and the evaporator.	Be sure the actuator thermostat capillary tube is fully inserted into the evaporator capillary tube holder.
	Actuator thermostat will not switch "cold". Actuator thermostat is defective.	Replace actuator thermostat.
	Water level control does not switch when water level is below the low water level probe.	Be sure there is no continuity path between the probes through water or mineral deposits on the probe cap. Make sure the cap is clean and dry especially after cleaning the ice machine. **See water level control test procedure for additional information.**
Defrost cycle ends and water plate closes before all ice is out of the evaporator.	Actuator thermostat resets "warm" and terminates defrost too early. Poor contact between the actuator thermostat capillary tube and the evaporator.	Be sure the actuator thermostat capillary tube is fully inserted into the evaporator capillary tube holder.
	Actuator thermostat resets "warm" and terminates defrost too early. Improper actuator thermostat adjustment.	Adjust actuator thermostat counter-clockwise to a warmer position to extend defrost time.
	Evaporator grids are distorted.	Carefully straighten grids or replace evaporator if the damage is severe.

Problem	Possible Cause	Solution
Defrost valve opens during water fill.	Cold water thermostat switches "cold" because of slow water fill.	The water supply pressure must be a mininmum of 138 kPa dynamic at the water valve. Be sure that the supply line is of adequate size. This is especially important for liquid cooled models where the potable water and condenser coolant water are supplied by the same water line. Check for restrictions in the water supply line including clogged filters. Check the water line strainer and clean it if needed.
	Cold water thermostat switches "cold" because of very cold potable water supply.	This is normal operation of the cold water thermostat. Adjust the cold water thermostat fully clockwise to reduce occurances.
	Cold water thermostat switches "cold" because of improper adjustment.	Adjust the cold water thermostat fully clockwise to reduce occurances.
		4
Ice remains attached to the water plate surface at the end of defrost.	Ice frozen into the water plate surface. Thick web between ice cubes.	Adjust web thickness to specifications.
	Ice frozen into the water plate surface. Cubes are fully formed without small dimples.	Reduce the water level until ice cubes are produced with small dimples.
	A full sheet of ice cubes is on the surface of the water plate as it opens and the opening of the water plate is delayed at the start of the defrost cycle. The front cam is not properly positioned on the motor shaft.	Remove the front cam pin, rotate the cam 180° and replace the pin. Be sure that the relationship between the front cam, the actuator motor paddle, the actuator switch and the water plate spring is correct. **See actuator motor paddle, switch and water plate spring relationship illustration for more information.**
Water valve will not close. Potable water level continues to rise after contacting the tip of the high water level probe, during the fill cycle. **See water level control test procedure for additional information.**	No voltage measured at water valve coil. Water valve remains open because of water supply problem.	The water supply pressure must be a mininmum of 138 kPa dynamic at the water valve. Be sure that the supply line is of adequate size. This is especially important for liquid cooled models where the potable water and condenser coolant water are supplied by the same water line. Check for restrictions in the water supply line including clogged filters. Check the water line strainer and clean it if needed.
	No voltage measured at water valve coil. Water valve remains open because of dirty or defective water valve.	Disassemble and clean water valve if needed. Make sure the bleed holes in the valve diaphram are open. Replace or rebuild water valve if defective.
	Line voltage measured at water valve coil. Water valve remains open.	Test for continuity through the high level probe. Replace the probe if the continuity is broken.

Problem	Possible Cause	Solution
Water valve will not open. Potable water level never reaches the high water level probe, during the fill cycle. **See water level control test procedure for additional information.**	No voltage measured at water valve coil because of an abnormal probe continuity path.	Be sure there is no continuity path between the probes through water or mineral deposits on the probe cap. Make sure the cap is clean and dry especially after cleaning the ice machine.
	No voltage measured at water valve coil because of a defective water level control.	Check the water level control output for line voltage between the COM (common) terminal and the blue neutral wire. Replace the control if line voltage is not measured.
	Water valve closes when water contacts the tip of the low water level probe, because the low and high water level probes are reversed on the water level control.	Reinstall low and high water level probe wires on the proper terminals of the water level control.
		5
Poorly formed or cloudy ice cubes.	Water plate pressure is low. Pump operating improperly because of low supply voltage.	Measure the supply voltage with the ice machine running. Be sure voltage is within the specified tolerances.
	Water plate pressure is low. Improper pump installed in ice machine.	Be sure the pump voltage specification matches the ice machine voltage specification.
	Water plate pressure is low. Water plate is cracked or leaking	Repair or replace water plate.
	Ice cubes have large dimples or are hollow at the end of the freeze cycle.	Increase the water level until ice cubes are produced with small dimples.
	Water plate is out of alignment with evaporator.	Re-align water plate. **See water plate alinment illustration for additional information**
	Ice cubes do not break apart after defrost because of thick web between cubes.	Adjust spacing between evaporator and water plate. **See web thickness adjustment illustration for additional information.**
	Ice cubes have uneven dimples. Dimples are larger on right side of evaporator because of low refrigerant charge.	Remove refrigerant and recharge the system to specifications.
	Ice cubes have uneven dimples. Dimples are larger on right side of evaporator because of high evaporator superheat.	Adjust the expansion valve to decrease the evaporator superheat.
	Ice cubes have uneven dimples. Dimples are larger on left side of evaporator and ice may freeze into the right side surface of the water plate because of low evaporator superheat.	Adjust the expansion valve to increase the evaporator superheat.
Actuator motor turns clockwise at start of defrost.	Actuator motor paddle is not in proper relationship with actuator toggle switch.	Re-establish proper relationship between the actuator motor paddle and the actuator toggle switch. **See actuator motor paddle, switch and water plate spring relationship illustration for more information.**

ACTUATOR MOTOR TEST PROCEDURE

The following procedure is used to solve problems with the actuator motor and its related circuitry. Use a voltmeter set for AC voltage and the proper range. Voltages listed on the chart are to be measured across the actuator motor capacitor (red and yellow motor lead wires).

If there is no ice in the evaporator and the water plate is not fully closed—with the water pump running and the actuator switch tripped up—the actuator motor should be running. If it is not, be sure there is power to the motor and also that the motor is not overheated and off due to an open high temperature cut-off. Allow the motor to cool down before starting the test procedure.

When servicing actuator motor problems in GB1250 models, be sure you understand the synchronization circuit.

NOTES-
When diagnosing electrical problems, always refer to the proper wiring diagram for the model you are servicing.

Information in the chart only applies to "new style" actuator motors. These motors can be identified by the rectangular shaped gearbox and visible motor windings. Contact the factory for test parameters for "old style" actuator motors.

Actuator Motor Test Parameters			
Voltage Reading	Capacitor	Motor	Remedy
290 - 370	Good	Good	Tap gear case to align bearings
Line voltage	Open	Good	Replace capacitor
Line voltage in one actuator switch position and 0 volts in the other position.	Open and >	One motor winding open	Replace capacitor and motor
290 - 370 volts in one actuator switch position and 0 volts in the other position.	Good	One motor winding open	Replace motor
0 volts in both actuator switch positions. Be sure there is power to the motor (line voltage) by leaving one probe on either capacitor lead and placing the other probe on the white motor lead.	Shorted or >	Both motor windings open	Disconnect the actuator motor from the circuit and test the winding resistance. If approximately 400 ohms from white to red or yellow, replace the capacitor. If the resistance is erratic, replace the motor.

LIQUID LEVEL CONTROLLER TEST PROCEDURE

The following procedure is used to solve problems with the liquid level control and its related circuitry. This control senses electrical conductivity, through the water, between its probes. Even very pure water is somewhat conductive and adjusting the control sensitivity from the middle range, should not be required.

It is important to note, that this control does not directly energize the water fill valve, while the actuator thermostat is in the “cold” position. The water plate rinse is powered through the actuator switch, while the water plate is opening. The rinse water flow stops, when the water plate is fully open and the actuator switch is pushed down. The water fill for next cycle starts when the actuator thermostat switches to its “warm” position and the water plate begins to close.

NOTE- Although the three probe terminals at the top of the control board operate at low voltage (12 volts AC), all other control board terminals carry line voltage with the obvious potential for electrical shock. Do not allow the control board to get wet and use caution when checking voltages.

Before testing the water level control, be sure that there is line voltage at the input terminals. Also, the Ice-Off-Wash switch should be in the “Wash” position—the water supply must be turned on—the water plate must be fully closed with the pump and defrost switch lever up—there must be no ice in the evaporator so the actuator thermostat is in the “warm” position.

The water valve should be energized if none of the water level probes is touching water. If the valve will not open, measure the voltage at the valve coil. If zero volts, check for possible conductive path through water or mineral deposits on the probe tube cap. Clean and dry the cap and measure the valve coil voltage again. If zero volts, check the control output between the N.O. (normally open) terminal and the brown input wire. Replace the water level control if line voltage is not measured between these two points.

If the water valve closes when the water level reaches the low level probe, make sure the high and low level probes are not reversed on the control board terminals. If the probes are properly attached, replace the water level control.

If the water valve does not close when the water level reaches the high level probe, place the Ice-Off-Wash switch in the “Off” position. If the water valve remains open, confirm that the water supply pressure is adequate (138 kPa dynamic at the water valve. Be sure that the supply line is of adequate size. This is especially important for liquid cooled models where the potable water and the condenser coolant water are supplied by the same water line. Check for restrictions in the water supply line, including clogged filters. Check the water line strainer and clean it, if needed. If the water supply is adequate, clean, repair or replace the water valve. If cleaning the water valve, make sure that the bleed holes in the diaphragm are open.

If the water valve closes when the Ice-Off-Wash switch is placed in the “Off” position, place the switch in the “wash” position. Unplug the common probe wire and short between the common and high probe terminals on the control board. The relay contacts, on the control board, should open and close when the terminals are shorted and opened. If they do not, replace the control board.

If the relay appears to be working properly, but the water valve will not close, compare the control output wire connections (bottom terminals on control board). If the wiring is correct, replace the control board.

If the probe reaction time is erratic or delayed, clean the probes and/or adjust the sensitivity dial clockwise.

Note: When replacing the board, be sure the voltage of the new board matches the voltage specification of the ice machine. Check the label on the control board relay for the correct operating voltage.

Note: The water fill should be completed within 1.5 minutes for a GB or GT550 “K” model, 2.0 minutes for a GB or GT550 “C” or “HK” model, 1.0 minute for a GT350 “K” model or 1.5 minutes for a GT350 “C” or “HK” model. Long fill times, caused by low dynamic water pressure supplied to a GB or GT550 ice machine, may cause the cold water thermostat to switch to the “cold” position, during the water fill cycle. This will open the defrost valve to warm up the evaporator in order to prevent a false harvest. Cold water thermostat cycles will reduce the ice making capacity of the ice machine and should be avoided.

ADDITIONAL CONSIDERATION FOR GB1250 MODELS

If there is a fill level difference between the “master” and “slave” water tanks and the difference is greater than 6 mm for “K” models or 3 mm for “C” or “HK” models, it should be corrected. If no defect is found in the controller circuit, be sure that the water supply pressure is adequate (minimum 138 kPa dynamic) and that there are no restrictions in the water lines. If the fill level difference remains, one of the water valves could defective or a wrong valve may be installed in the ice machine.

COMPRESSOR TEST PROCEDURE

WARNING

DISCONNECT ALL ELECTRICAL POWER BEFORE REMOVING THE PROTECTIVE TERMINAL COVER.

NEVER ENERGIZE THE SYSTEM UNLESS THE PROTECTIVE TERMINAL COVER IS SECURELY FASTENED.

NEVER ENERGIZE THE SYSTEM UNLESS THE COMPRESSOR IS PROPERLY CONNECTED TO GROUND.

NEVER RESET A CIRCUIT BREAKER OR REPLACE A FUSE WITHOUT CHECKING FOR A SHORT CIRCUIT TO GROUND. AN OPEN FUSE OR TRIPPED CIRCUIT BREAKER IS AN INDICATION OF A GROUND FAULT. ENERGIZING A COMPRESSOR WITH A GROUND FAULT MAY CAUSE TERMINAL PIN EJECTION, WHICH WILL ALLOW OIL AND REFRIGERANT TO SPRAY OUT OF THE SYSTEM. THIS OIL SPRAY, COMBINED WITH AN ELECTRICAL SPARK, CAN IGNITE CAUSING HARM TO PERSONNEL AND PROPERTY.

DISCHARGE ALL CAPACITORS WITH A 20,000 OHM RESISTER BEFORE WORKING WITH THEM OR REMOVING THEM FROM THE ICE MACHINE. THIS MUST BE DONE TO AVOID DAMAGE TO MEASURING DEVICES AND THE RISK OF ELECTRICAL SHOCK.

NOTE- All Kold-Draft ice machine models utilize CSR (capacitor start/capacitor run) compressors. Each model includes a potential start relay, a start capacitor and a run capacitor, in the compressor circuitry, to start and operate these compressors properly and with maximum efficiency. All compressors also include thermal protectors—external on GB450, GT350 and GT550 models and internal on GB650 and GB1250 models. This procedure will help diagnose problems with these compressors and all related components.

If you suspect that there is an electrical problem with a compressor:

1- Test for a short circuit to ground (ground fault).

2- Test the motor windings for proper continuity and resistance.

3- Test the compressor electrical components.

1- Test procedure for a short circuit to ground (ground fault):

Disconnect all electrical power to the system, making sure all power legs are open.

Remove the protective terminal cover. Inspect for evidence of overheating at any connection. Overheating is an indication that a compressor motor problem exists. Disconnect all leads from the terminal pins.

Check the compressor for a ground fault using an ohm meter or a high potential ground tester. Connect one lead to the copper suction line and connect the other lead to one of the terminal pins. Repeat this procedure for the two remaining terminal pins. If the instrument indicates any resistance less than 2 megohms between any pin and the suction line (compressor housing), a ground fault exists.

If a ground fault exists, replace the compressor. Do not reconnect the compressor or re-use any leads or terminal connectors that exhibit signs of overheating.

2- Test procedure for continuity and proper resistance:

If no ground fault has been found, determine if there is an open or short circuited motor winding or if the thermal protector is open.

Allow time for the thermal protector to reset. This may take as long as an hour for internal type thermal protectors.

For single phase compressors, test the continuity of the start winding by measuring between terminal pins C and S. Test the continuity of the main winding by measuring between terminal pins C and R. If there is no continuity in either winding, replace the compressor.

For three phase compressors, test the continuity of the windings by measuring between each pair of terminal pins: 1-2, 2-3 and 1-3. If there is no continuity between any set of terminal pins, replace the compressor.

If continuity is found in all motor windings, measure the resistance (ohms) of the windings.

For single phase compressors, measure between each pair of terminal pins: C-S, C-R and S-R. The sum of the resistance measured between C-S and C-R should equal the resistance measured between S-R, plus or minus a small deviation. Proper resistance may be confirmed by comparing the measured resistance to the resistance specifications for specific compressor models. If the resistance is not correct, replace the compressor. If the specifications are not found on the ice machine, please contact the factory.

For three phase compressors, measure between each pair of terminal pins: 1-2, 2-3 and 1-3. The resistance measured between each pair of pins should always be greater than zero and within 10% of one another. Proper resistance may be confirmed by comparing the measured resistance to the resistance specifications for specific compressor models. If the resistance is not correct, replace the compressor. If the specifications are not found on the ice machine, please contact the factory.

3- Test procedure for compressor electrical components:

TESTING THE POTENTIAL RELAY:

Before testing the relay, be sure it is the one specified for use with the ice machine compressor and the mounting position of the relay is correct.

Measure for continuity between terminals 5 and 2—if there is no continuity, replace the relay.

Measure for continuity between terminals 2 and 1—if there is no continuity, the contacts are open and the relay must be replaced.

The relay may also malfunction if the supply voltage is 10% higher or lower than the rated voltage or if the relay is loosely mounted, allowing it to vibrate or if it is used in conjunction with an incorrect start capacitor.

TESTING THE RUN CAPACITOR:

Before testing the run capacitor, be sure it is the one specified for use with the ice machine compressor.

After making sure the capacitor is discharged, disconnect it and test the value with a capacitance meter. If the measured value is more than 10% higher or lower than the rated value, replace the run capacitor.

The capacitor may also malfunction if the supply voltage is more than 10% higher than the rated voltage.

TESTING THE START CAPACITOR:

Before testing the start capacitor, be sure it is the one specified for use with the ice machine compressor.

After making sure the capacitor is discharged, disconnect it and test the value with a capacitance meter. If the measured value less than the rated value or more than 20% higher than the rated value, replace the start capacitor.

As an alternative, test the run capacitor by determining if there is continuity across the terminals. Use a meter set to the R x 1 scale. If there is continuity the capacitor is shorted and must be replaced.

Another alternative is to set the meter to the R x 100,000 scale. If there is no needle deflection on an analog meter when placing the probes across the capacitor terminals or if infinite resistance is indicated on a digital meter, the capacitor is open and needs to be replaced.

The capacitor may also malfunction if the relay contacts are not working properly, or if the capacitor is subjected to prolonged operation of the start cycle, because the start relay is incorrect, the starting load is too high, or the supply voltage is more than 10% lower than the rated voltage.

TESTING THE EXTERNAL THERMAL PROTECTOR:

After allowing sufficient time for the thermal protector to reset, disconnect it and test for continuity across the terminals. If there is no continuity, replace the thermal protector.

ADDITIONAL INFORMATION

Disconnect and test the compressor wiring by confirming that there is continuity between relay terminal 5 and compressor terminal C and also between terminals 2 and S as well as 4 and R.

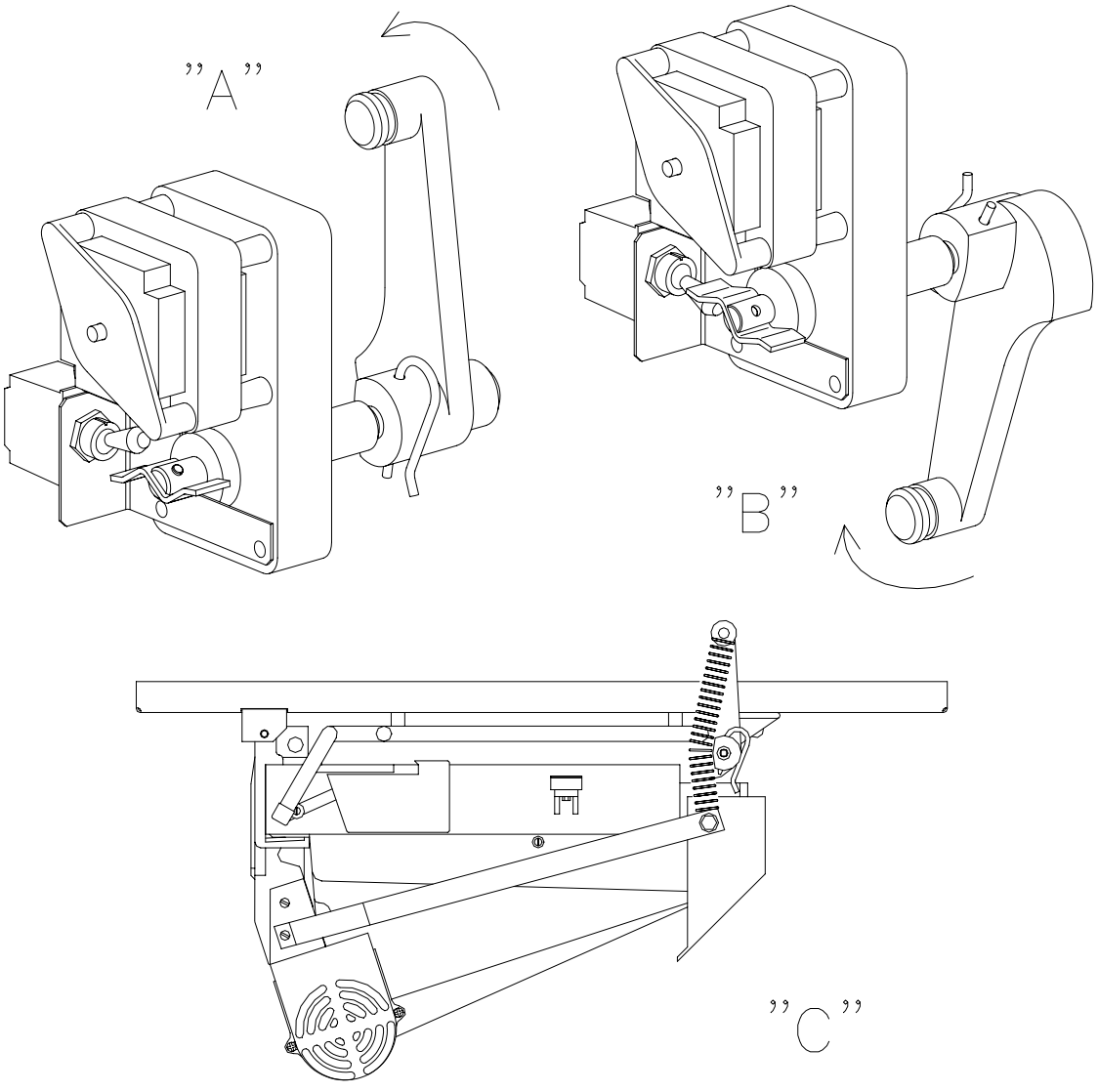
Replace the potential relay if all other tests do not reveal the problem. A new relay will eliminate any electrical problems that cannot be determined with the previous testing. If a new relay does not correct the operation, the compressor may have a mechanical problem.

Note: Excessive short cycling may be caused by a faulty thermal protector, but it also may be caused by other malfunctioning system components such as the bin thermostat, Ice-Off-Wash switch, contactor or high pressure cut-out.

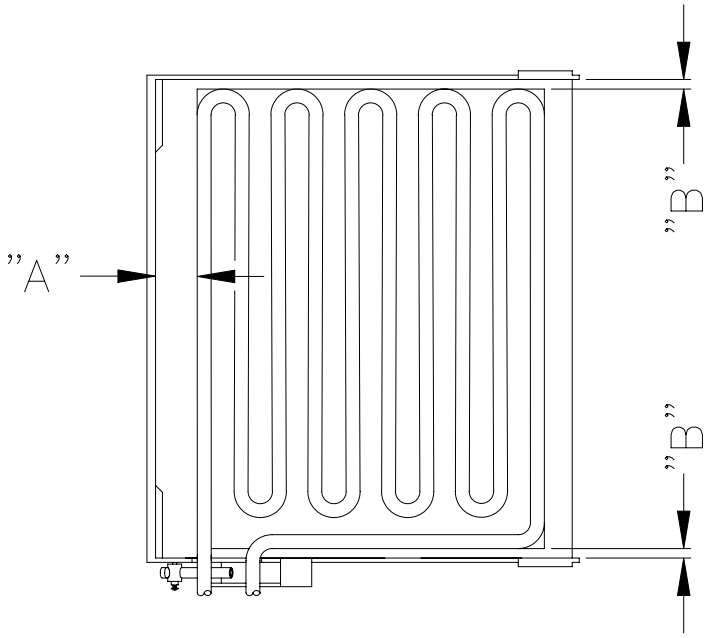
ACTUATOR MOTOR PADDLE, SWITCH, CAM ARM AND WATER PLATE SPRING RELATIONSHIP ILLUSTRATIONS

When the water plate is closed, the cam arm must be in the twelve o'clock position and the actuator switch lever is up. See illustration "A". To open the water plate, the motor turns counter clockwise until the motor paddle pushes the actuator switch lever down. The cam arm is in the seven o'clock position when the water plate is fully open. See illustration "B". When closing the motor turns clockwise, from the seven o'clock position to the twelve o'clock position. The front spring is on the left side of the front cam hub when the water plate is closed. See illustration "C".

NOTE: Component relationships and operation other than described here indicate actuator switch failure or improper reassembly when servicing the ice machine.



WATER PLATE ALIGNMENT ILLUSTRATION



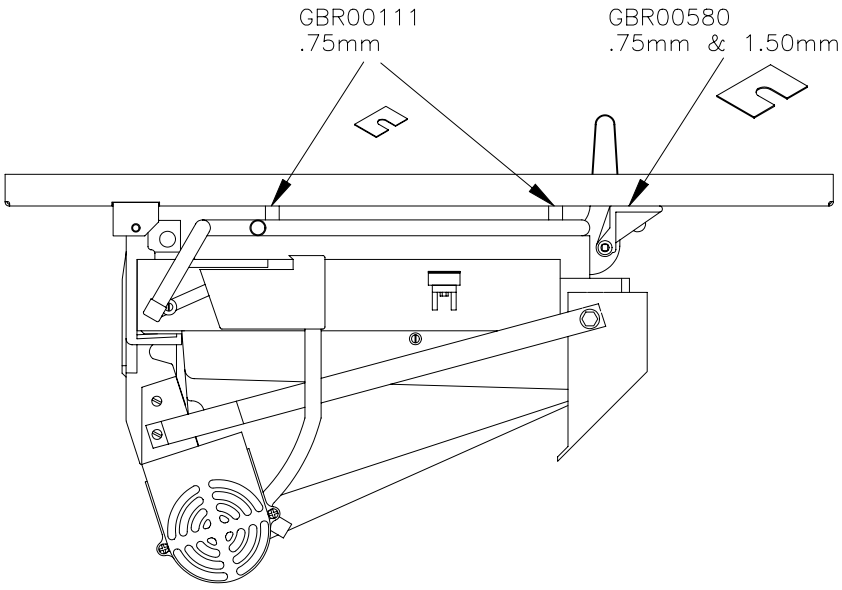
If the water plate is not aligned with the evaporator, the cubes may appear cloudy or misshapen.

Dimension “A” is not adjustable. If this dimension is out of tolerance, the evaporator or water plate mounting components may be damaged.

Adjustments to dimension “B” can be made by sliding the front and rear hinges along the left edge of the water plate. Lightly tap the hinges as required to align the water plate with the evaporator. Alignment is correct when the space between the evaporator and the water plate is equal in front and in back.

“A” = 38 +/- 2.5 mm **“B” = 8 +/- 1.5 mm**

WEB THICKNESS ADJUSTMENT



The web thickness between cubes (the gap between the bottom of the evaporator and the water plate surface) can be adjusted by inserting or removing shims between the support channels and the evaporator support posts or the cam shaft bearing brackets. Loosen the actuator motor mounting screws before inserting or removing shims between the channels and cam shaft bearing brackets. The web thickness specification is as follows:

“C” and “HK” models = 2.0 mm **“K” models = 1.3 mm**

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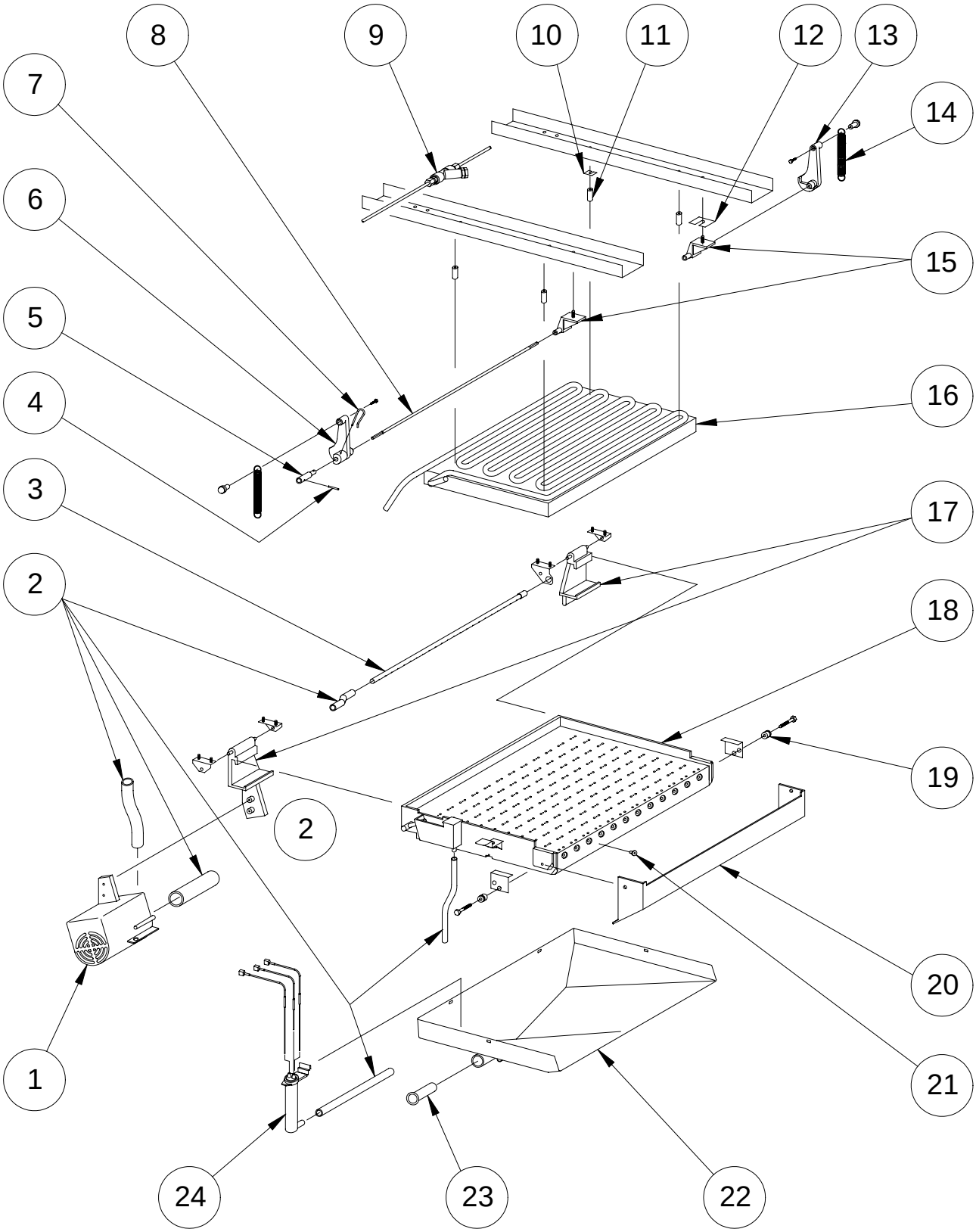
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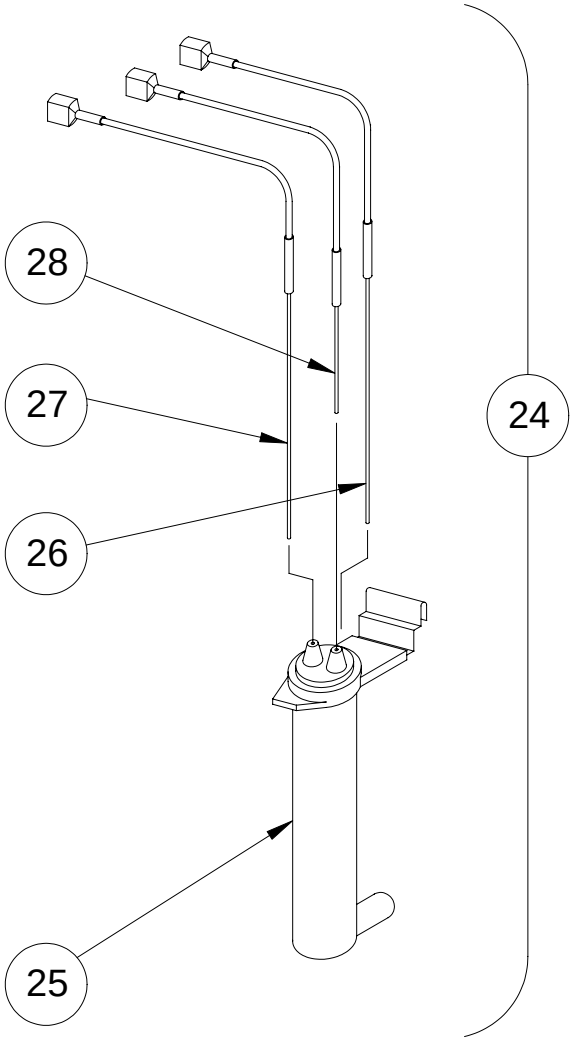
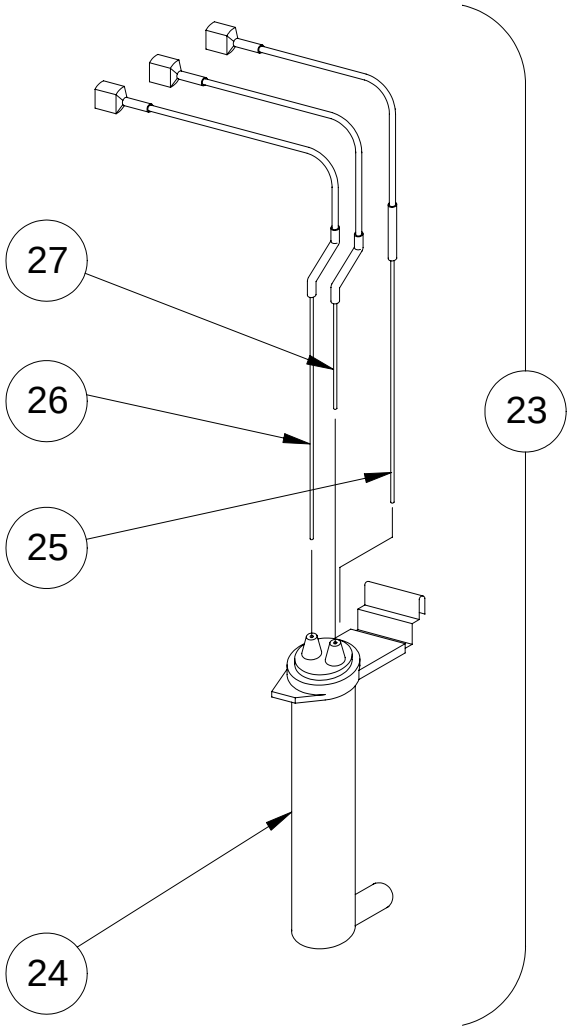
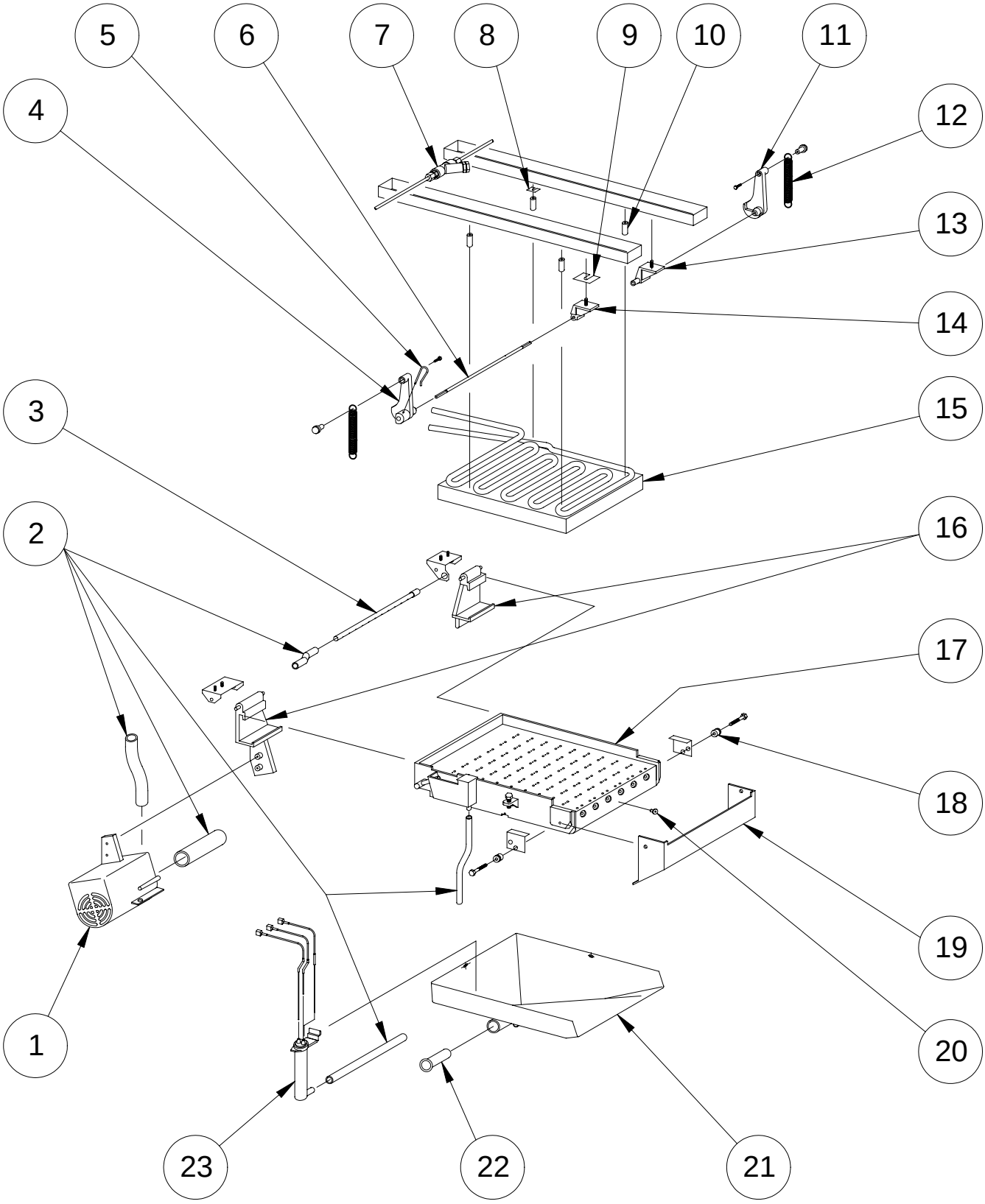
Item	Description	Number
1	Water Pump	See Control and Electrical Components
2	Hose Kit	GBR 02087
3	Water Distributor Tube	GBR 00403
4	Roll Pin	GBR 00959
5	Motor Shaft Extension	102 1209 01
6	Front Cam	GBR 00969
7	Front Cam Pin	102 1210 01
8	Cam Shaft	GBR 00942
9	Water Strainer	GBR 01379
10	Evaporator Shim Set	GBR 00111
11	Evaporator Spacer Set "C"/"HK"	GBR 00113
	Evaporator Spacer Set "K"	GBR 00126
12	Cam Shaft Shim Set	GBR 00580
13	Rear Cam	GBR 00949
14	Spring	GBR 00909
15	Cam Shaft Bracket	GBR 00937
16	Evaporator "C"	GBR 00148
	Evaporator "HK"	GBR 00167
	Evaporator "K"	GBR 00153
17	Water Plate Hinge Set	GBR 00282 06
18	Water Plate "C"	GBR 00200
	Water Plate "HK"/"K"	GBR 00270
19	Spring Boss	GBR 00951
20	Water Deflector	GBR 00202
21	Water Plate Plug Set	GBR 00223
22	Water Tank	GAR 00203
23	Water Tank Screen	GBR 00245
24	Probe Tube Assembly	102 1216 01



Item	Description	Number
24	Probe Tube Assembly	102 1216 01
25	Probe Tube	GBR 03172
26	Probe-Common	102 1281 01
27	Probe-Long	102 1281 01
28	Probe-Short	102 1280 01



Item	Description	Number
23	Probe Tube Assembly	102 1216 02
24	Probe Tube	GBR 03172
25	Probe-Common	102 1281 01
26	Probe-Long	102 1283 01
27	Probe-Short	102 1282 01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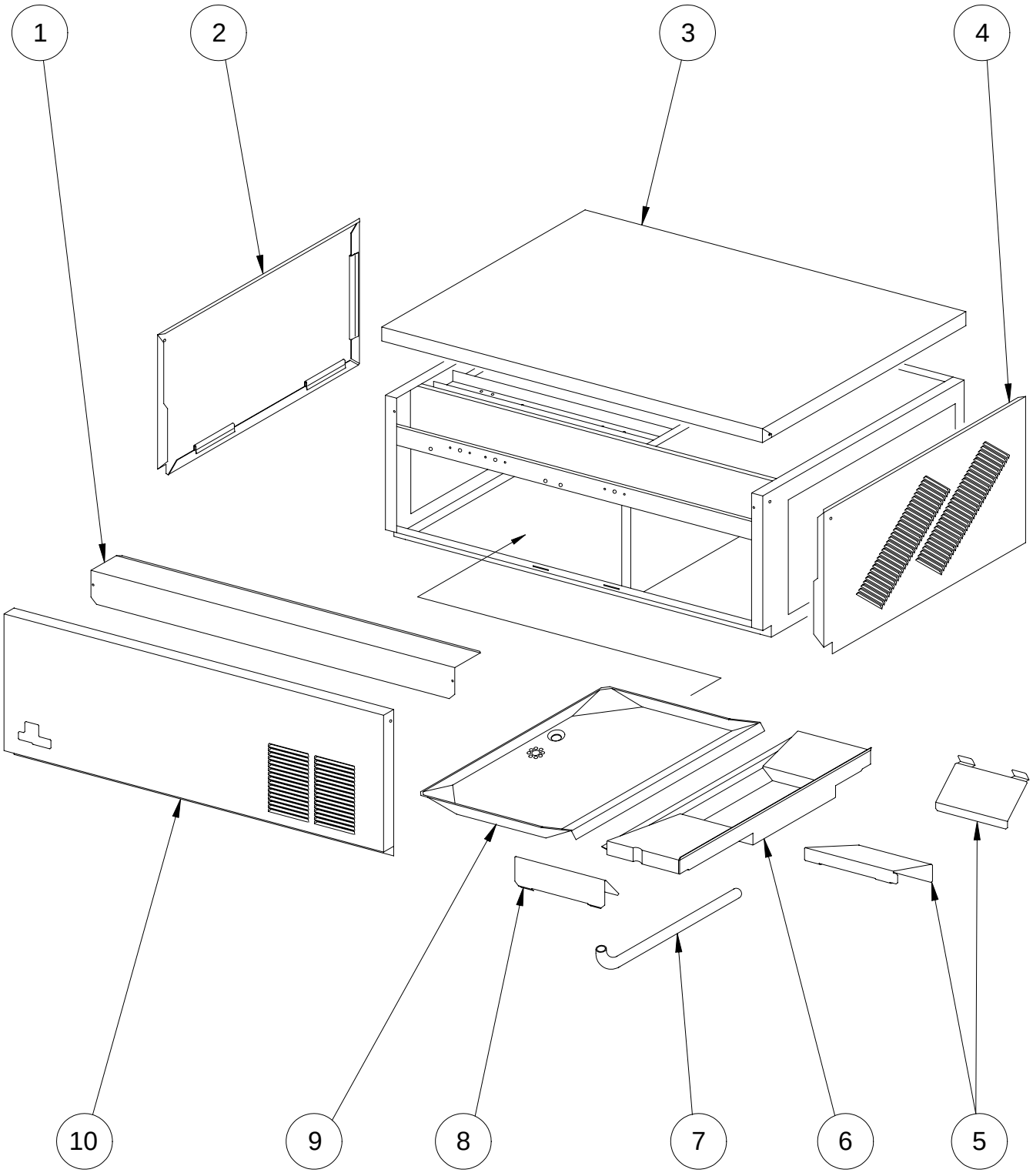
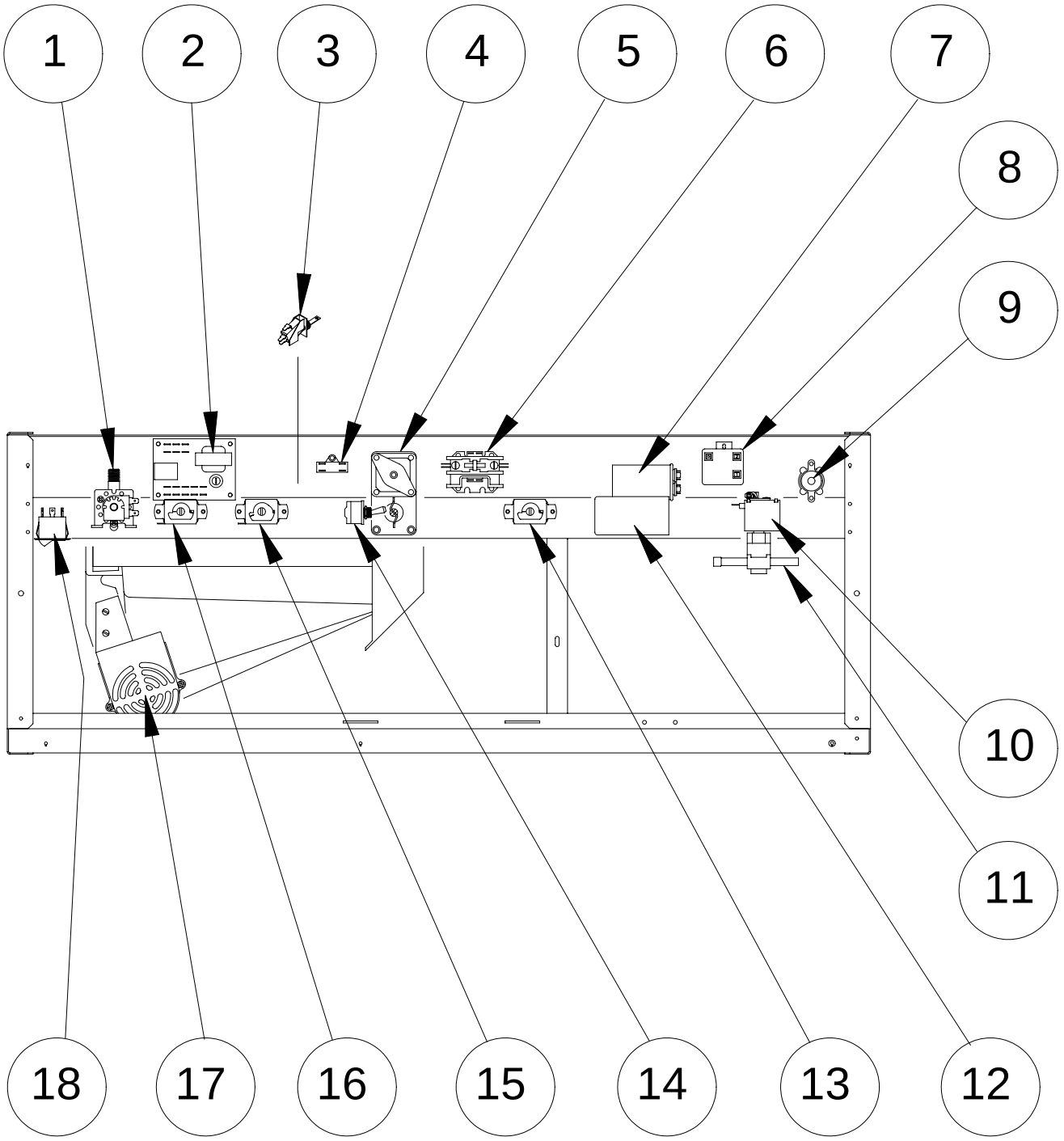
Item	Description	Number
1	Water Pump	See Control and Electrical Components
2	Hose Kit	GBR 02087
3	Water Distributor Tube	102 1154 02
4	Front Cam	GBR 00969
5	Front Cam Pin	102 1210 01
6	Cam Shaft	102 1221 01
7	Water Strainer	GBR 01379
8	Evaporator Shim Set	GBR 00111
9	Cam Shaft Shim Set	GBR 00580
10	Evaporator Spacer Set "C"/"HK"	GBR 00113
	Evaporator Spacer Set "K"	GBR 00126
11	Rear Cam	GBR 00949
12	Spring	GBR 00909
13	Cam Shaft Bracket-Rear	GBR 00937
14	Cam Shaft Bracket-Front	102 1222 01
15	Evaporator "C"	102 1025 02
	Evaporator "HK"	102 1025 03
	Evaporator "K"	102 1025 04
16	Water Plate Hinge Set	GBR 00282 06
17	Water Plate "C"	GTR 00221
	Water Plate "HK"/"K"	GTR 00222
18	Spring Boss	GBR 00951
19	Water Deflector	GYR 00202
20	Water Plate Plug Set	GBR 00223
21	Water Tank	GYR 00201
22	Water Tank Screen	GYR 00219
23	Probe Tube Assembly	102 1216 02

CHASSIS COMPONENTS-GB4(2,3,4,5)0



Item	Description	Number
1	Electrical Box Cover	102 1251 01
2	Left Side Panel	102 1203 01
3	Top Panel	102 1205 01
4	Right Side Panel	102 1204 01
5	Ice Deflector Set	102 1336 01
6	Ice Chute-Plastic	GBR 00668
7	Drain Tube	102 1201 01
8	Front Deflector	102 1211 01
9	Drain Pan	102 1100 01
10	Front Panel	102 1202 01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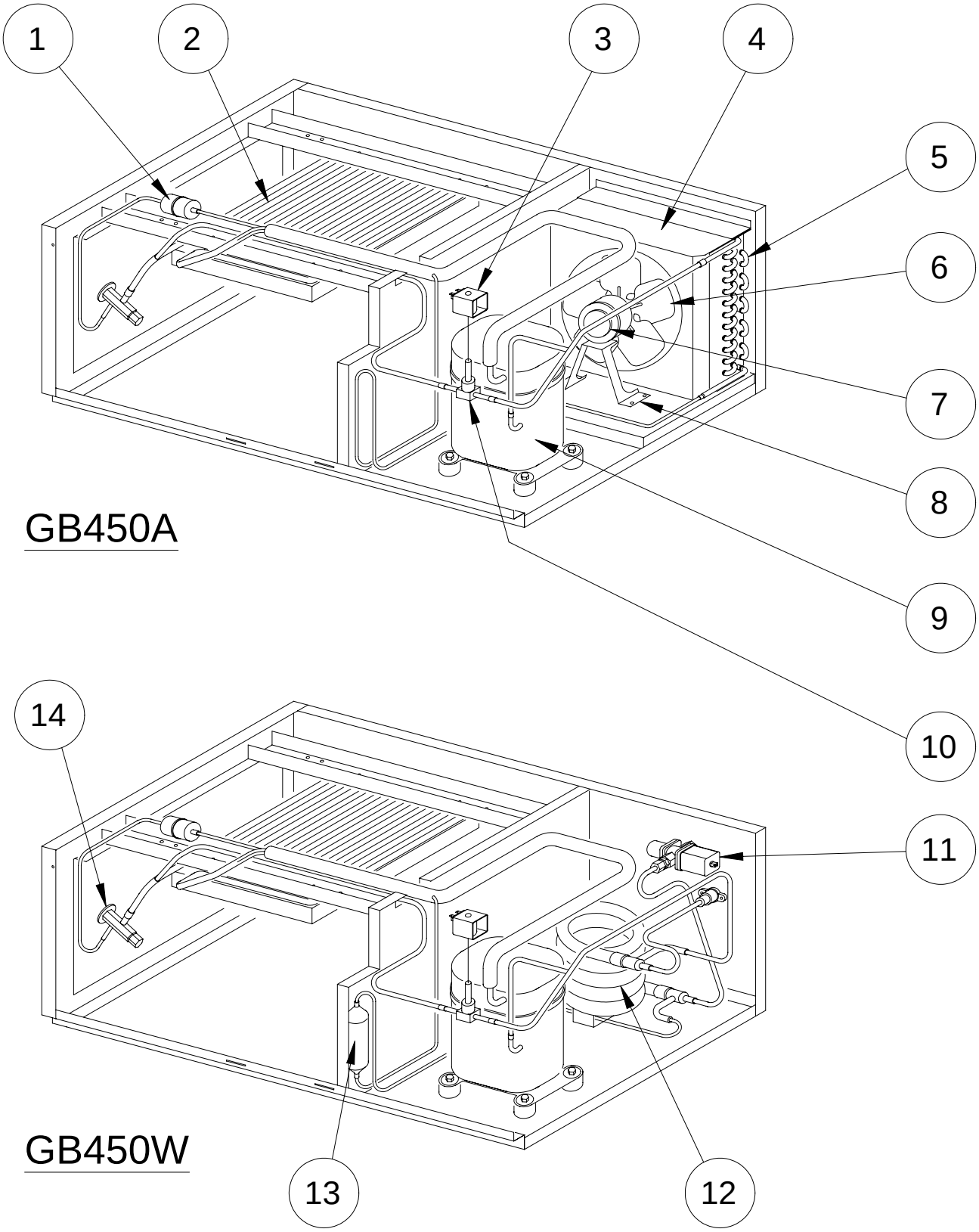
Item	Description	Model	Number
1	Water Valve		GBR 01376 FF
2	Liquid Level Control		102 1142 01
3	Pump and Defrost Switch		102 1217 01
4	Actuator Motor Capacitor-1.0 mF (New Style Motor)		102 1241 02
	Actuator Motor Capacitor-1.5 mF (Old Style Motor)		GBR 00826
5	Actuator Motor		102 1292 02
6	Contactor-Single Pole		102 1036 01
7	Run Capacitor	GB427	N/A
		GB437	102 1197 04
		GB447	102 1197 01
		GB457	102 1044 01
8	Start Relay	GB427	102 1194 01
		GB437	102 1047 03
		GB447	102 1047 07
		GB457	102 1047 11
9	High Pressure Cut Off-Manual reset		102 1055 01
	High Pressure Cut Off-Automatic reset		GBR 02354
10	Defrost Valve Coil		102 1012 01
11	Defrost Valve Body		102 1010 01
12	Start Capacitor	GB427	102 1195 01
		GB437	102 1196 01
		GB447	102 1195 03
		GB457	102 1195 02
13	Bin Thermostat-Standard Capillary Tube		GBR 00856
	Bin Thermostat-Long Capillary Tube		GBR 00813
14	Actuator Toggle Switch		GBR 00897
15	Actuator Thermostat		GBR 00814
16	Cold Water Thermostat		GBR 00837
17	Water Pump		Click Here
18	Ice-Off-Wash Switch		102 1053 01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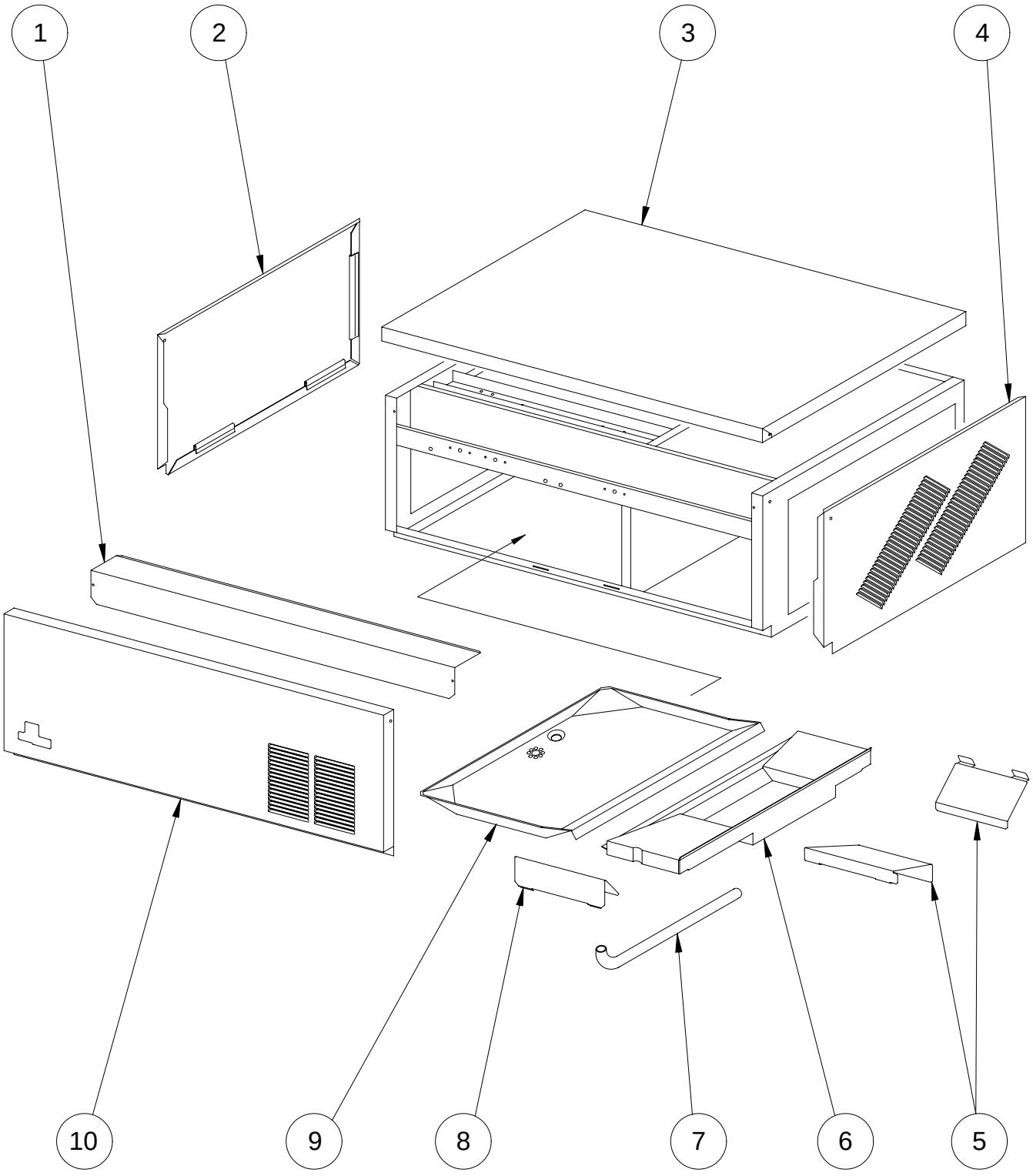
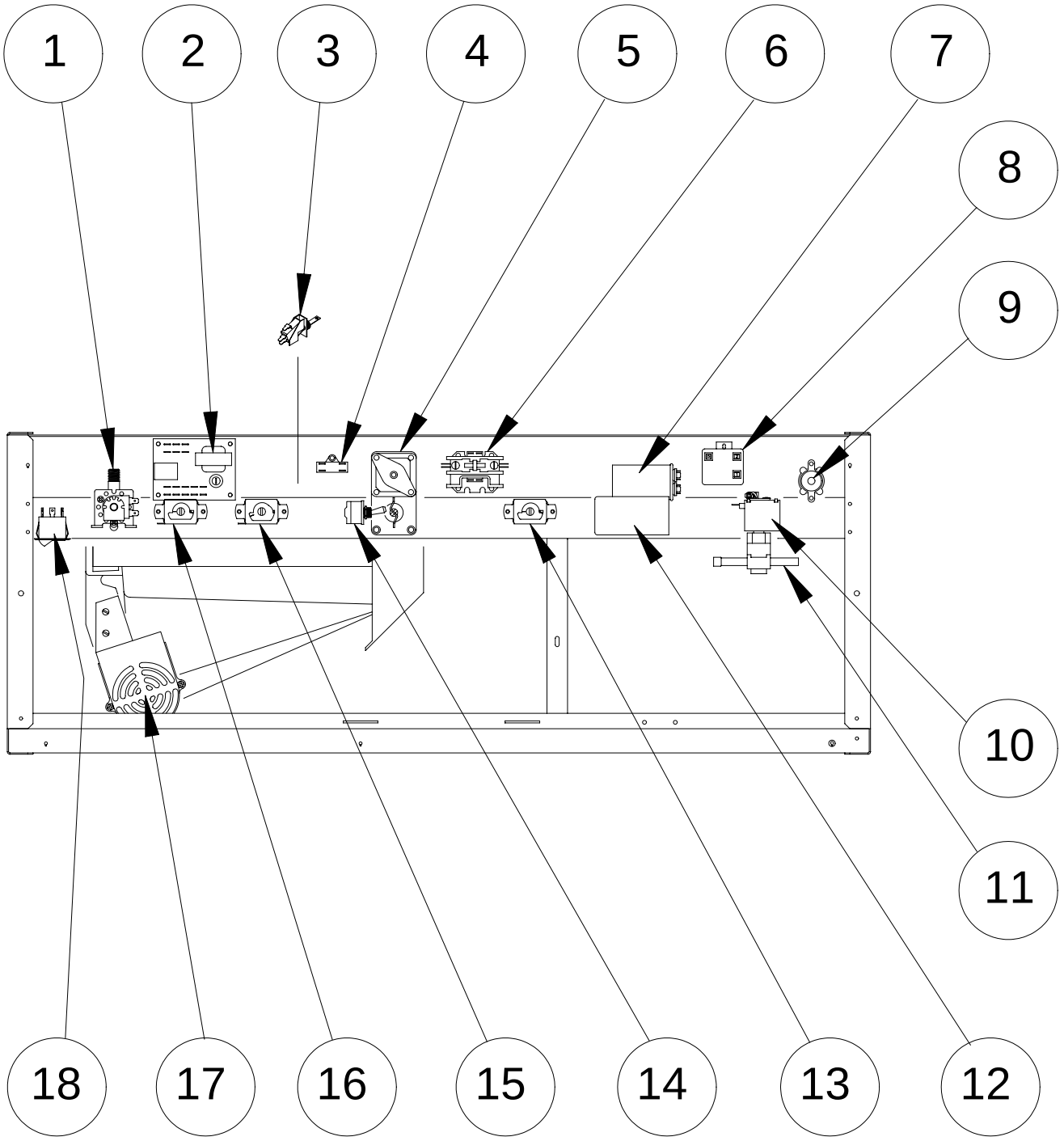
Item	Description	Model	Number
1	Drier		GBR 02750
2	Evaporator "C"		GBR 00148
	Evaporator "HK"		GBR 00167
	Evaporator "K"		GBR 00153
3	Defrost Valve Coil		102 1012 01
4	Shroud-Fan	GB427	GBR 01363
		GB437	GBR 01363
		GB447	GBR 01363
		GB457	102 1215 03
5	Condenser-Air Cooled	GB427	GBR 01353
		GB437	GBR 01353
		GB447	GBR 01353
		GB457	GBR 01353
6	Fan Blade	GB427	GBR 01360
		GB437	GBR 01360
		GB447	GBR 01360
		GB457	102 1016 02
7	Fan Motor	GB427	102 1212 01
		GB437	102 1212 01
		GB447	102 1212 01
		GB457	102 1014 02
8	Support-Fan Motor	GB427	102 1213 01
		GB437	102 1213 01
		GB447	102 1213 01
		GB457	102 1214 02
9	Compressor	GB427	102 1242 17
		GB437	102 1242 17
		GB447	102 1242 17
		GB457	102 1191 29
10	Defrost Valve Body		102 1010 01
11	Liquid Regulator Valve		GAR 00701 D
12	Condenser-Liquid Cooled	GB427	GTR 00705
		GB437	102 1020 01
		GB447	102 1020 01
		GB457	102 1020 01
13	Receiver		102 1066 01
14	Expansion Valve	GB427	GBR 02359
		GB437	GBR 02359
		GB447	GBR 02359
		GB457	102 1188 02

CHASSIS COMPONENTS-GB6(2,3,4,5)0



Item	Description	Number
1	Electrical Box Cover	102 1251 01
2	Left Side Panel	102 1203 01
3	Top Panel	102 1205 01
4	Right Side Panel	102 1204 01
5	Ice Deflector Set	102 1336 01
6	Ice Chute-Plastic	GBR 00668
7	Drain Tube	102 1201 01
8	Front Deflector	102 1211 01
9	Drain Pan	102 1100 01
10	Front Panel	102 1202 01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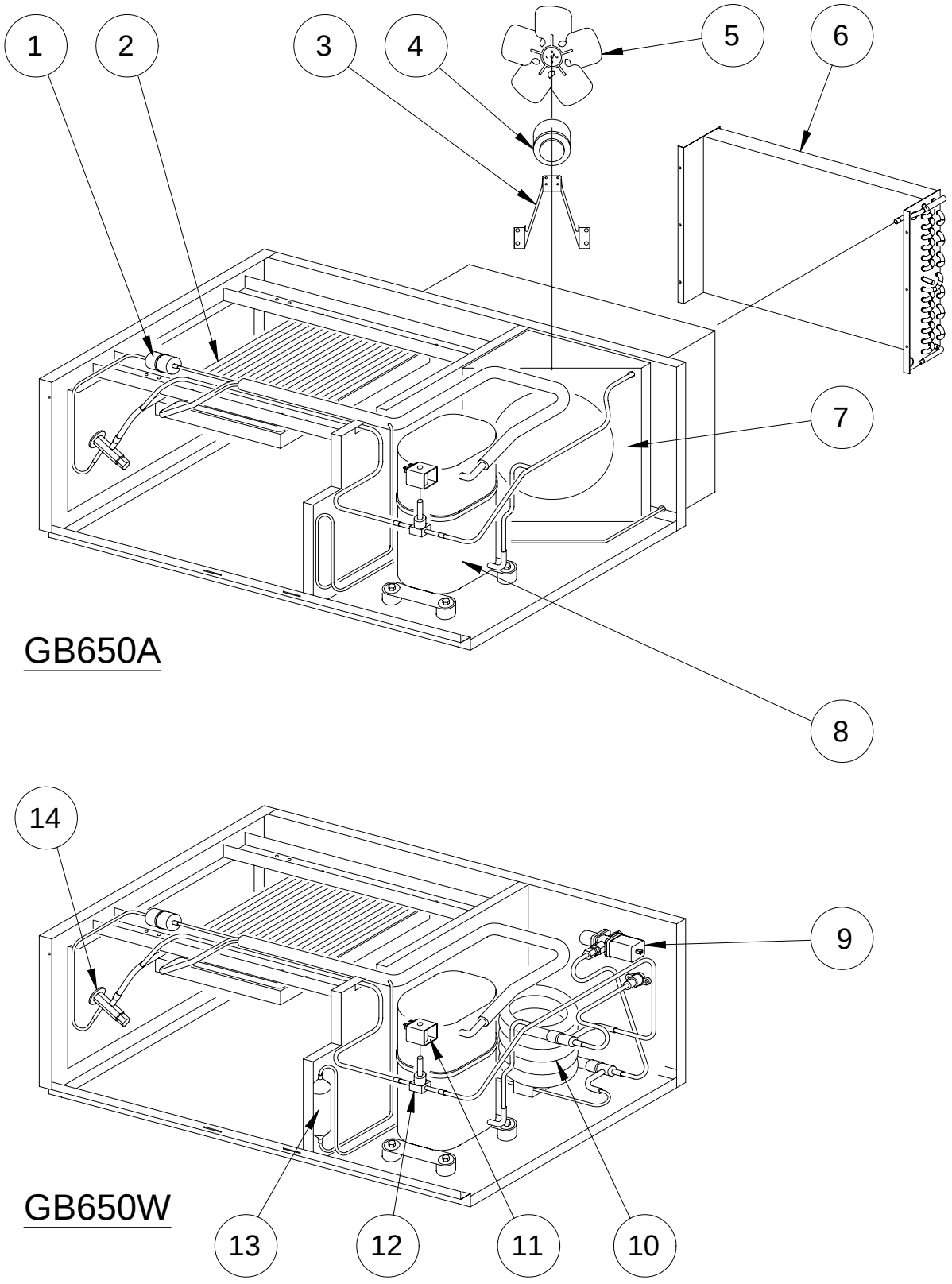
Item	Description	Model	Number
1	Water Valve		GBR 01376 FF
2	Liquid Level Control		102 1142 01
3	Pump and Defrost Switch		102 1217 01
4	Actuator Motor Capacitor-1.0 mF (New Style Motor)		102 1241 02
	Actuator Motor Capacitor-1.5 mF (Old Style Motor)		GBR 00826
5	Actuator Motor		102 1292 02
6	Contactor-Single Pole		102 1036 01
7	Run Capacitor	GB627	102 1197 02
		GB637	GBR 01385 03
		GB647	GBR 01385 03
		GB657	102 1197 02
8	Start Relay	GB627	GBR 01385 01
		GB637	102 1047 03
		GB647	102 1047 03
		GB657	102 1047 12
9	High Pressure Cut Off-Manual reset		102 1055 01
	High Pressure Cut Off-Automatic reset		GBR 02354
10	Defrost Valve Coil		102 1012 01
11	Defrost Valve Body		102 1010 01
12	Start Capacitor	GB627	102 1195 02
		GB637	102 1195 04
		GB647	102 1195 04
		GB657	102 1195 10
13	Bin Thermostat-Standard Capillary Tube		GBR 00856
	Bin Thermostat-Long Capillary Tube		GBR 00813
14	Actuator Toggle Switch		GBR 00897
15	Actuator Thermostat		GBR 00814
16	Cold Water Thermostat		GBR 00837
17	Water Pump		Click Here
18	Ice-Off-Wash Switch		102 1053 01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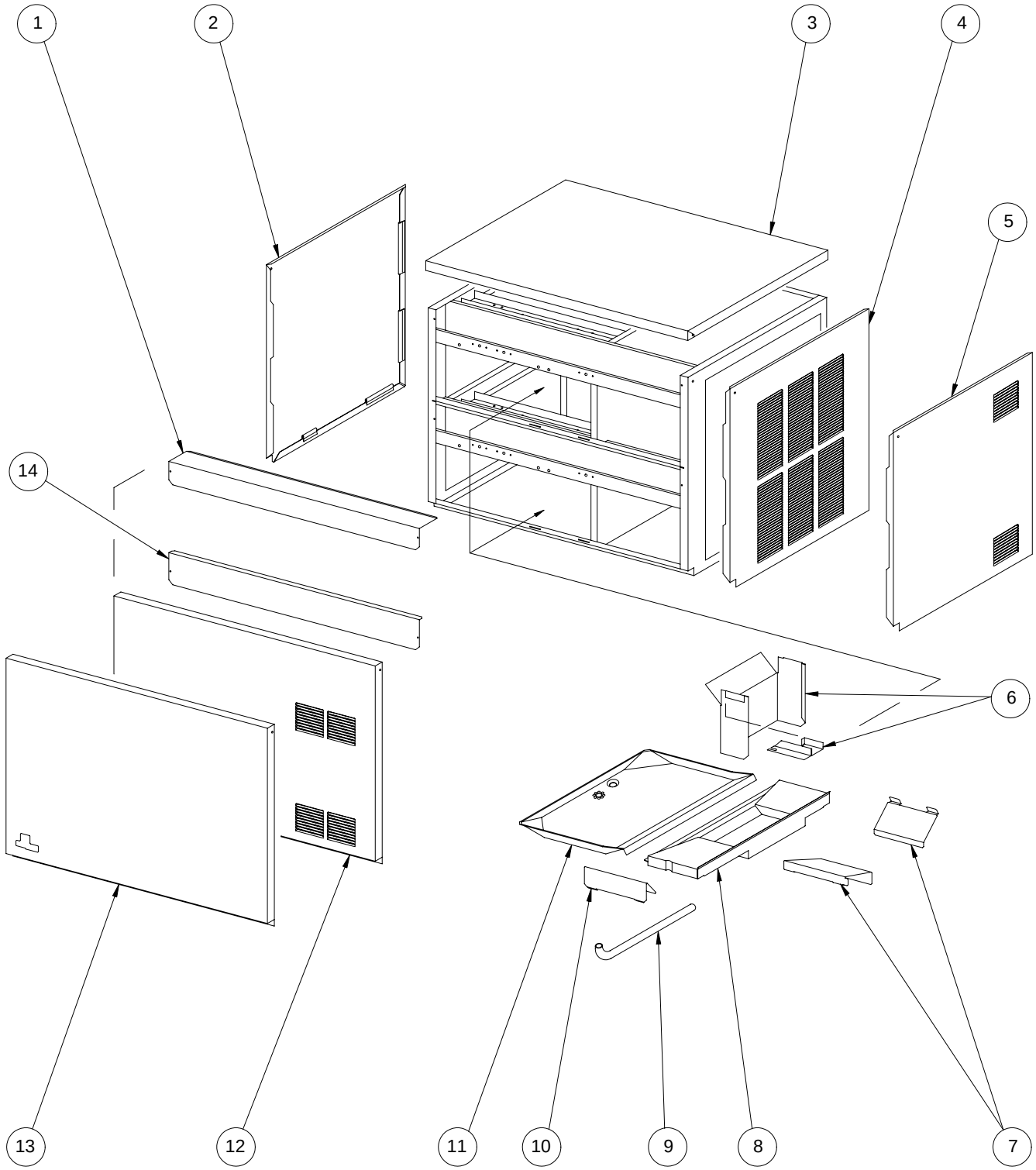
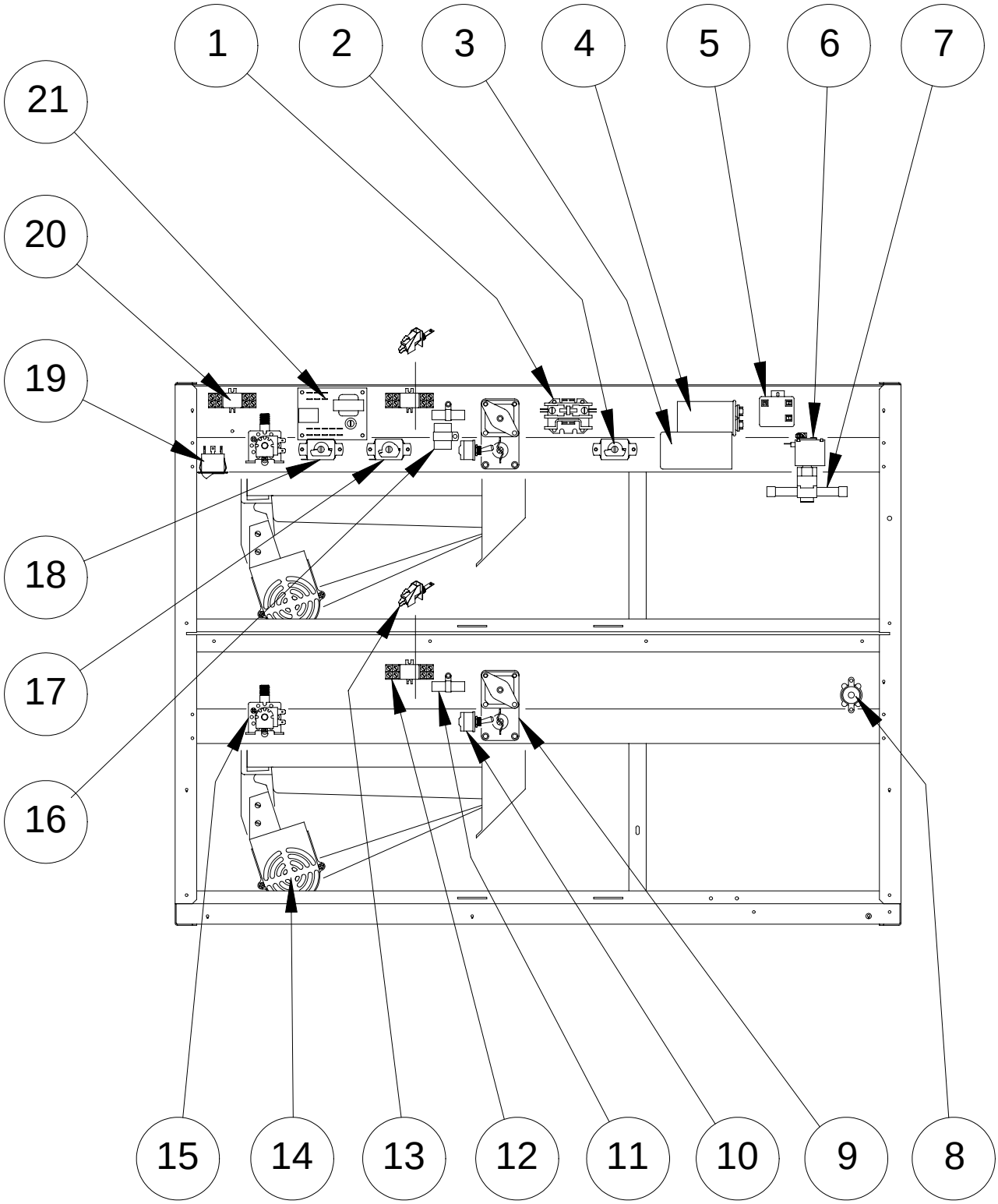
Item	Description	Model	Number
1	Drier		GBR 02750
2	Evaporator "C"		GBR 00148
	Evaporator "HK"		GBR 00167
	Evaporator "K"		GBR 00153
3	Support-Fan Motor	GB627	102 1214 01
		GB637	102 1214 01
		GB647	102 1214 01
		GB657	102 1214 04
4	Fan Motor	GB627	102 1212 01
		GB637	102 1212 01
		GB647	102 1212 01
		GB657	102 1014 02
5	Fan Blade	GB627	GBR 01360
		GB637	GBR 01360
		GB647	GBR 01360
		GB657	102 1016 02
6	Condenser-Air Cooled	GB627	GBR 03347
		GB637	102 1018 02
		GB647	102 1018 02
		GB657	102 1018 02
7	Shroud-Fan	GB627	102 1215 01
		GB637	102 1215 02
		GB647	102 1215 02
		GB657	102 1215 02
8	Compressor	GB627	102 1242 16
		GB637	102 1242 16
		GB647	102 1242 16
		GB657	102 1191 27
9	Liquid Regulator Valve		GAR 00701 D
10	Condenser-Liquid Cooled	GB627	GTR 00705
		GB637	102 1021 01
		GB647	102 1021 01
		GB657	102 1021 01
11	Defrost Valve Coil		102 1012 01
12	Defrost Valve Body		102 1010 01
13	Receiver		102 1066 01
14	Expansion Valve	GB627	GBR 02359
		GB637	GBR 02359
		GB647	GBR 02359
		GB657	GBR 02359

CHASSIS COMPONENTS-GB12(2,4,5)0



Item	Description	Number
1	Electrical Box Cover	102 1251 01
2	Left Side Panel	102 1203 02
3	Top Panel	102 1205 01
4	Right Side Panel (A)	102 1204 05
5	Right Side Panel (W/R)	102 1204 02
6	Stacking Chute	102 1248 01
7	Ice Deflector Set	102 1336 01
8	Ice Chute-Plastic	GBR 00668
9	Drain Tube	102 1201 01
10	Front Deflector	102 1211 01
11	Drain Pan	102 1100 01
12	Front Panel (A)	102 1343 01
13	Front Panel (W/R)	102 1202 02
14	Electrical Box Cover-Lower	102 1338 01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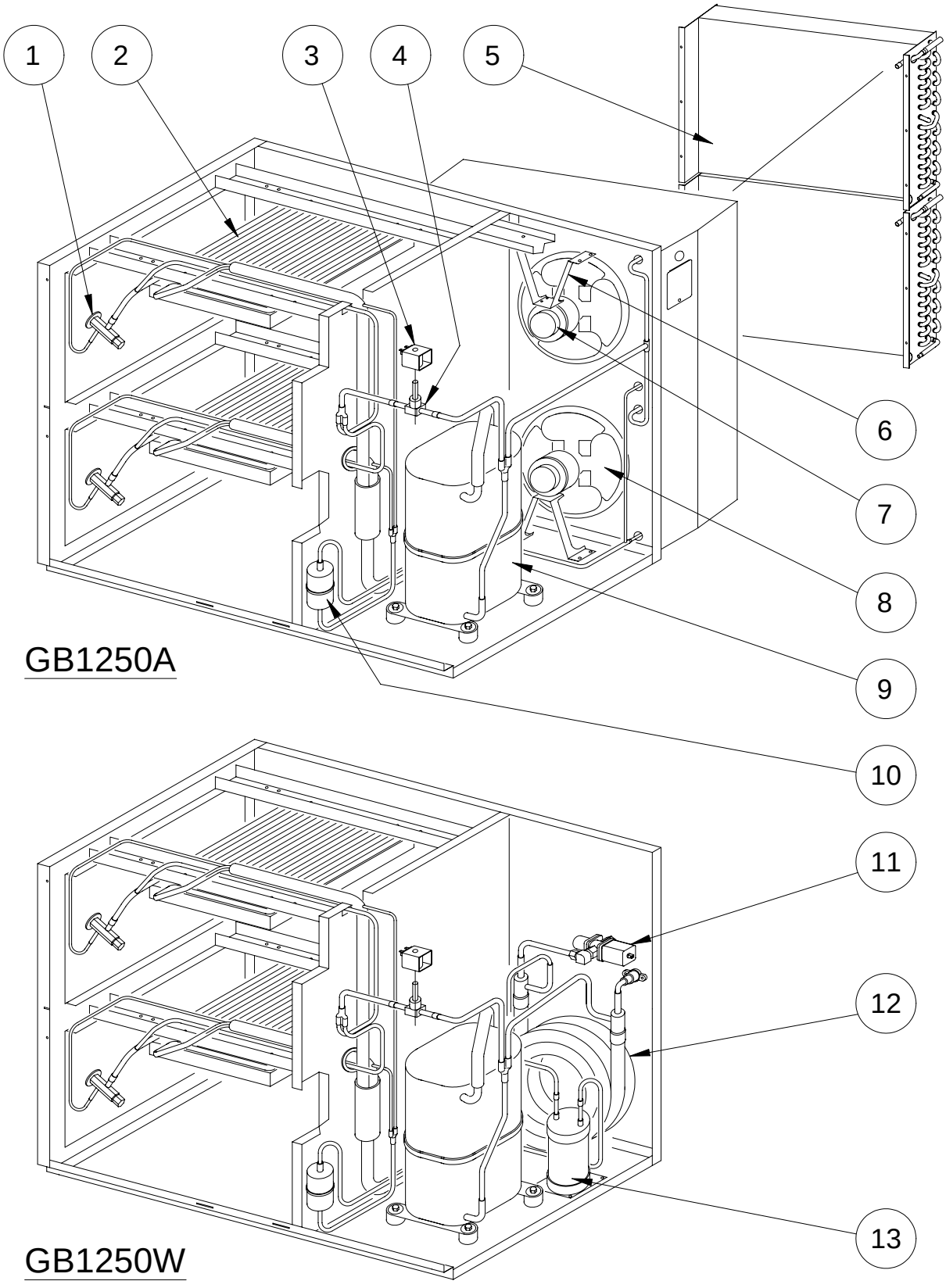
Item	Description	Number
1	Contactor-Double Pole	102 1036 02
2	Bin Thermostat-Standard Capillary Tube	GBR 00856
	Bin Thermostat-Long Capillary Tube	GBR 00813
3	Start Capacitor	N/A
4	Run Capacitor	N/A
5	Start Relay	N/A
6	Defrost Valve Coil	102 1012 01
7	Defrost Valve Body	102 1010 02
8	High Pressure Cut Off-Manual reset	102 1055 01
	High Pressure Cut Off-Automatic reset	GBR 02354
9	Actuator Motor	102 1292 02
10	Actuator Toggle Switch	GBR 00897
11	Actuator Motor Capacitor-1.0 mF (New Style Motor)	102 1241 02
	Actuator Motor Capacitor-1.5 mF (Old Style Motor)	GBR 00826
12	Relay Socket	102 1007 01
13	Pump and Defrost Switch	102 1217 01
14	Water Pump	Click Here
15	Water Valve	GBR 01376 FF
16	Timer-Master Actuator Motor	102 1239 02
17	Actuator Thermostat	GBR 00814
18	Cold Water Thermostat	GBR 00837
19	Ice-Off-Wash Switch	102 1053 01
20	Relay-Plug In	102 1038 01
21	Liquid Level Control	102 1142 01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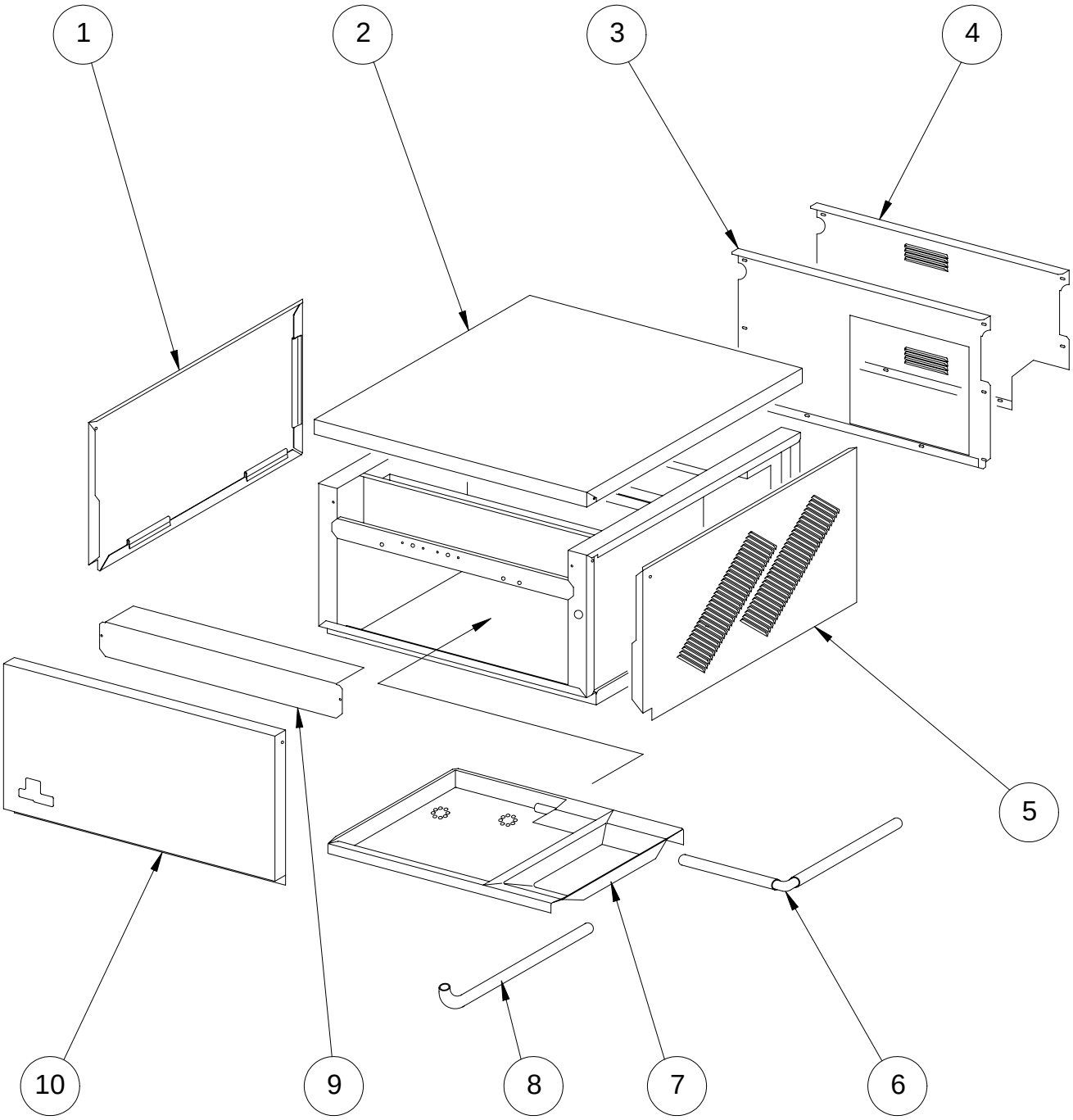
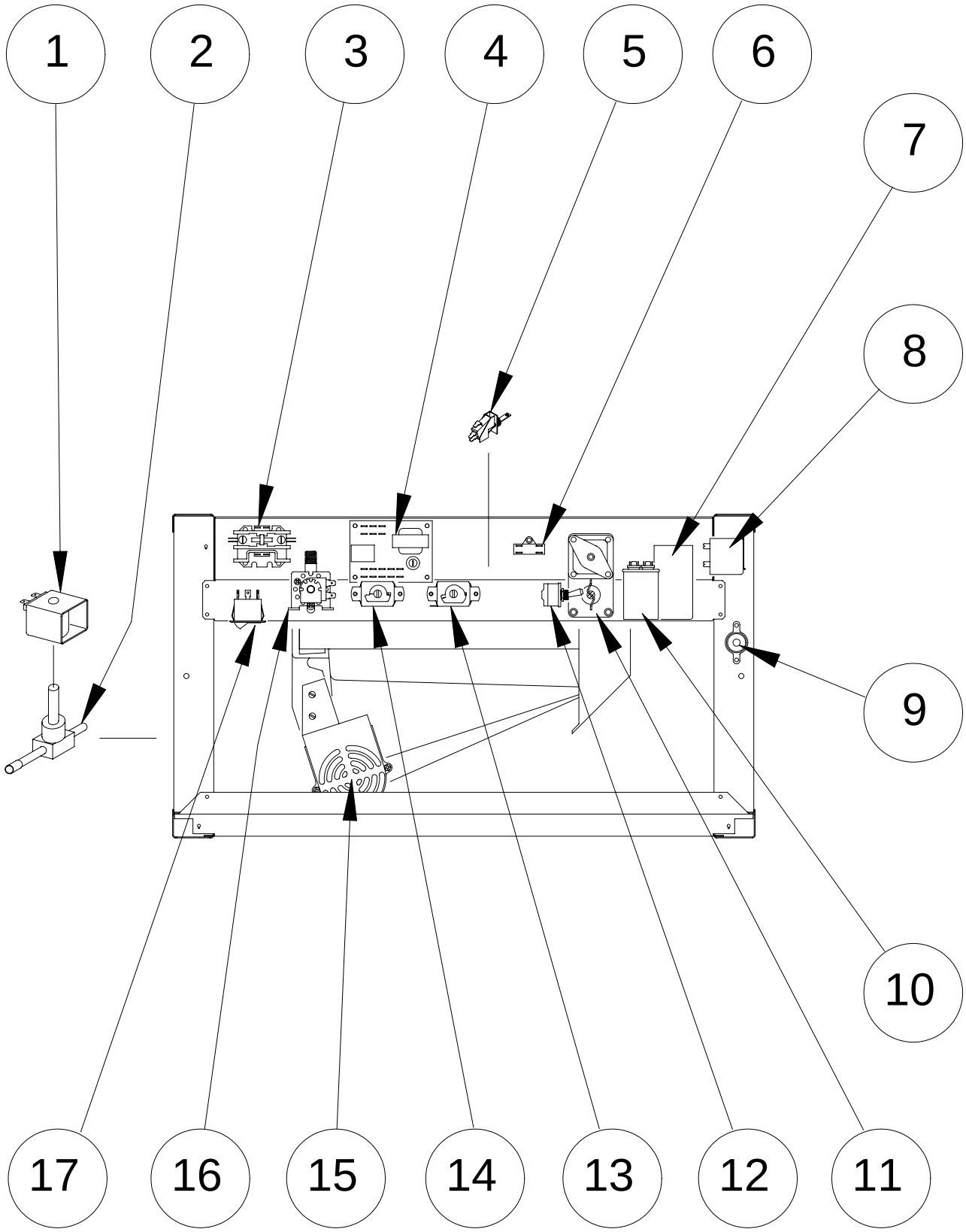
Item	Description	Number
1	Expansion Valve	GBR 02359
2	Evaporator "C"	GBR 00148
	Evaporator "HK"	GBR 00167
	Evaporator "K"	GBR 00153
3	Defrost Valve Coil	102 1012 01
4	Defrost Valve Body	102 1010 02
5	Condenser-Air Cooled	102 1018 02
6	Support-Fan Motor	102 1214 04
7	Fan Motor	102 1274 02
8	Fan Blade	102 1275 01
9	Compressor	102 1191 30
10	Drier	102 1071 01
11	Liquid Regulator Valve	GAR 00701 D
12	Condenser-Liquid Cooled	102 1020 02
13	Receiver	GBR 02343

CHASSIS COMPONENTS-GB3(3,4,5)0



Item	Description	Number
1	Left Side Panel	102 1203 01
2	Top Panel	102 1205 02
3	Back Panel (A)	102 1340 01
4	Back Panel (W)	102 1341 01
5	Right Side Panel	102 1204 01
6	Drain Assembly-Rear	102 1339 01
7	Drain Pan and Chute	102 1291 01
8	Drain Tube	102 1201 01
9	Electrical Box Cover	102 1234 01
10	Front Panel	102 1202 03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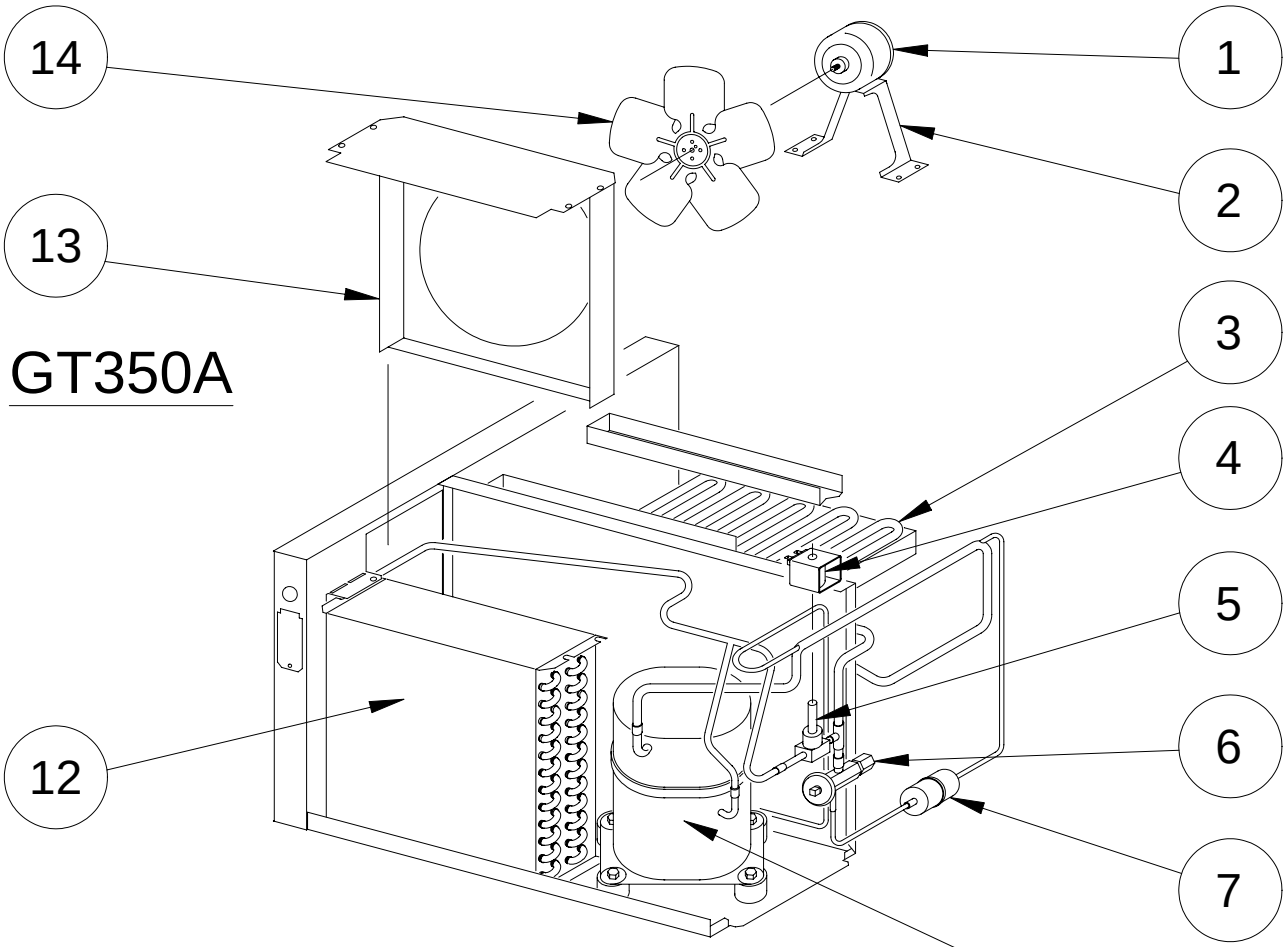
Item	Description	Model	Number
1	Defrost Valve Coil		102 1012 01
2	Defrost Valve Body		102 1008 01
3	Contactor-Single Pole		102 1036 01
4	Liquid Level Control		102 1142 01
5	Pump and Defrost Switch		102 1217 01
6	Actuator Motor Capacitor-1.0 mF (New Style Motor)		102 1241 02
	Actuator Motor Capacitor-1.5 mF (Old Style Motor)		GBR 00826
7	Start Capacitor	GB337	102 1195 03
		GB347	102 1195 03
		GB357	102 1195 02
8	Start Relay	GB337	102 1047 03
		GB347	102 1047 07
		GB357	102 1047 10
9	High Pressure Cut Off-Manual reset		102 1055 01
	High Pressure Cut Off-Automatic reset		GBR 02354
10	Run Capacitor	GB337	102 1197 04
		GB347	102 1197 01
		GB357	102 1044 01
11	Actuator Motor		102 1238 02
12	Actuator Toggle Switch		GBR 00897
13	Actuator Thermostat		GBR 00814
14	Bin Thermostat-Standard Capillary Tube		GBR 00856
	Bin Thermostat-Long Capillary Tube		GBR 00813
15	Water Pump		Click Here
16	Water Valve		GYR 00362 FF
17	Ice-Off-Wash Switch		102 1053 01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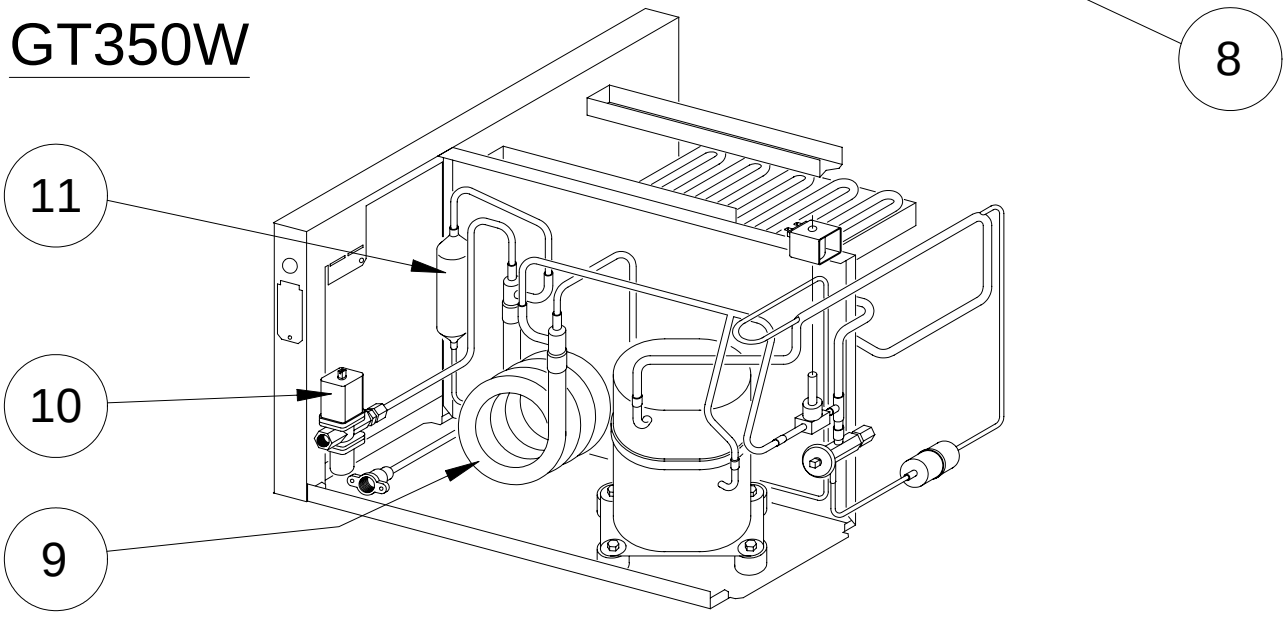
GT350W
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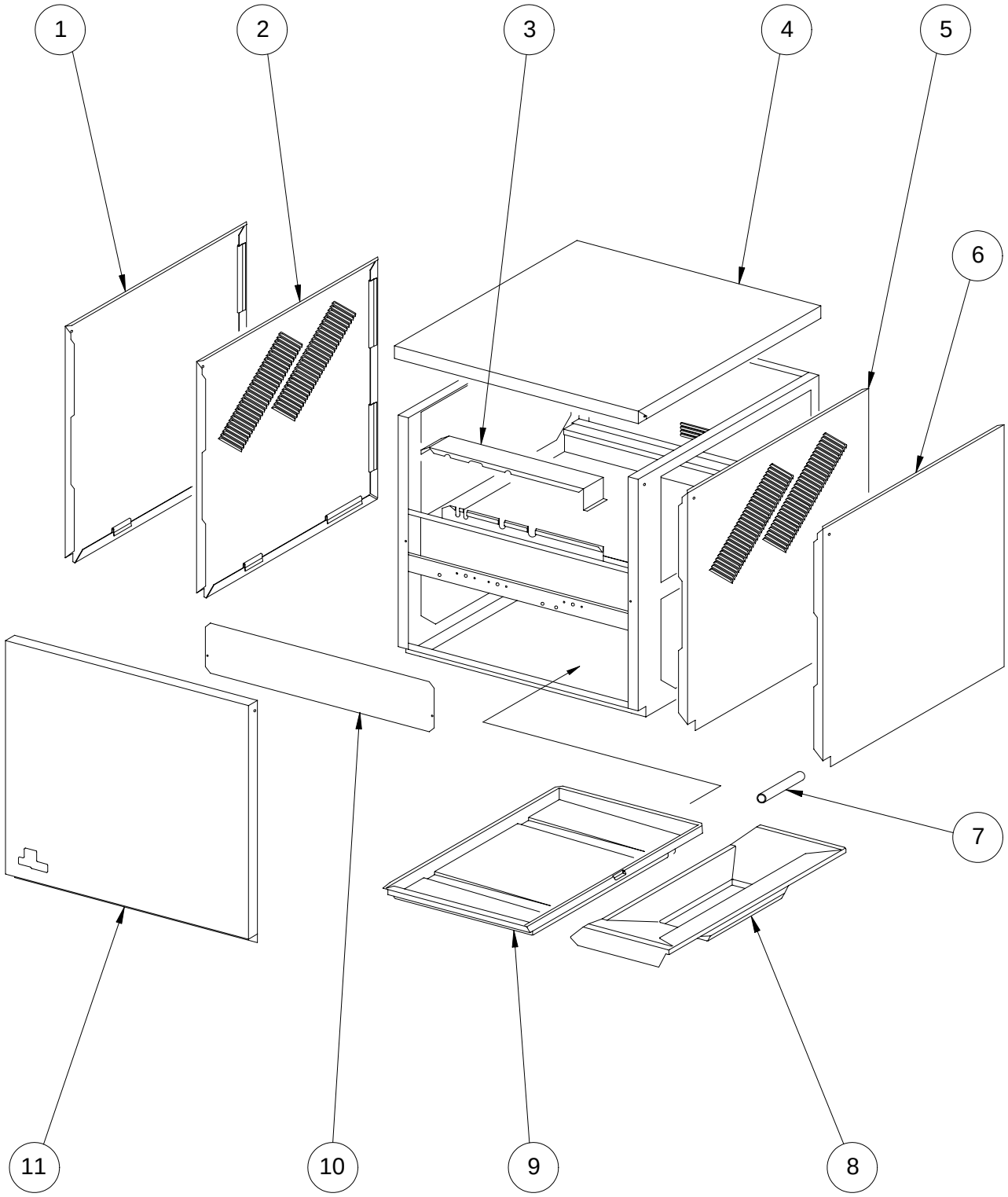
Item	Description	Model	Number
1	Fan Motor		102 1014 02
2	Support-Fan Motor		102 1214 02
3	Evaporator "C"		102 1025 02
	Evaporator "HK"		102 1025 03
	Evaporator "K"		102 1025 04
4	Defrost Valve Coil		102 1012 01
5	Defrost Valve Body		102 1008 01
6	Expansion Valve		102 1188 02
7	Drier		GBR 02750
8	Compressor	GT337	102 1242 13
		GT347	102 1242 13
		GT357	102 1198 04
9	Condenser-Liquid Cooled		102 1020 03
10	Liquid Regulator Valve		GAR 00701 D
11	Receiver		102 1066 01
12	Condenser-Air Cooled		GBR 01353
13	Shroud-Fan		102 1215 03
14	Fan Blade		102 1016 02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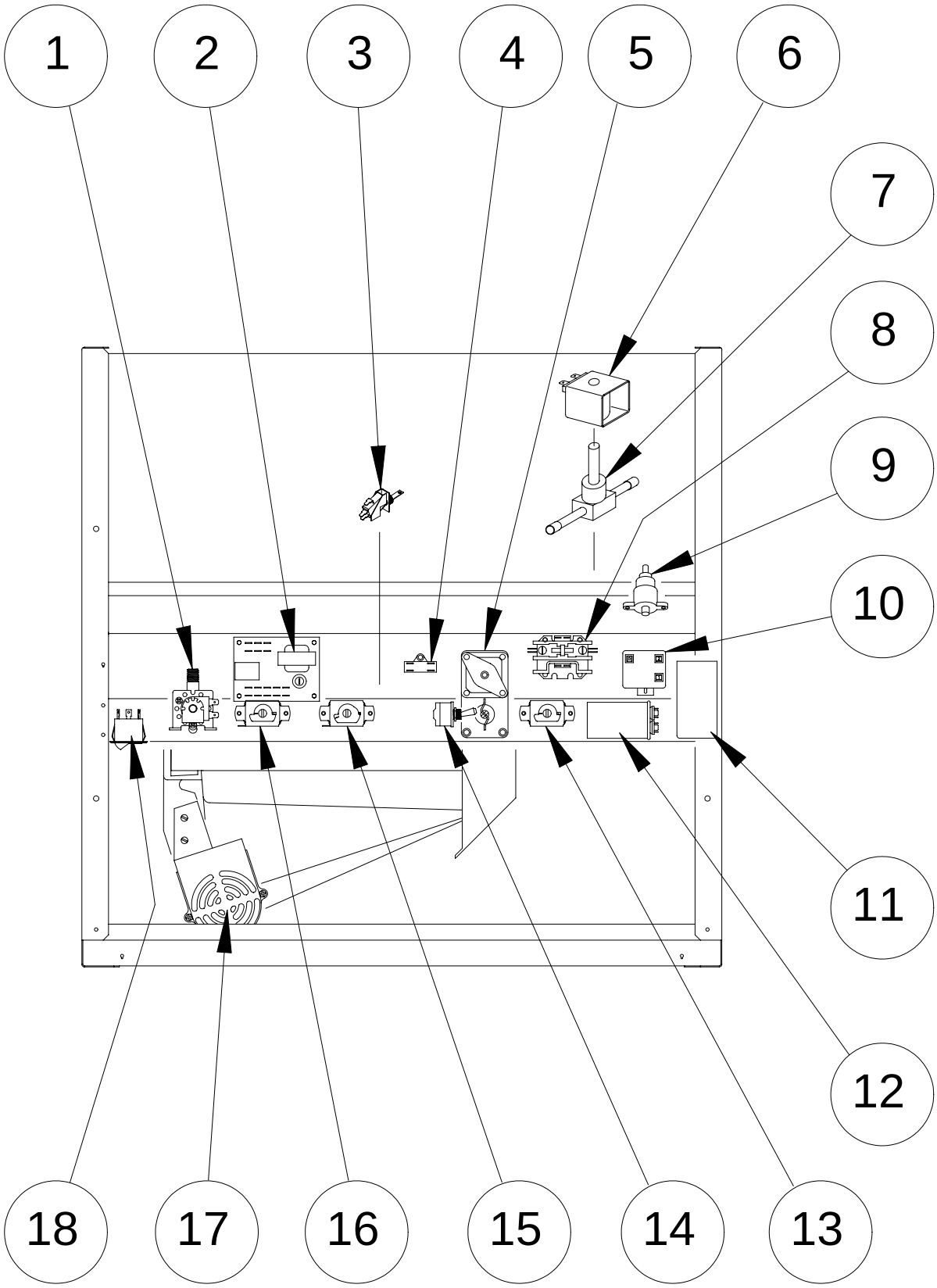
Item	Description	Number
1	Left Side Panel (W/R)	102 1203 04
2	Left Side Panel (A)	102 1203 03
3	Support Cap	102 1343 01
4	Top Panel	102 1205 03
5	Right Side Panel (A)	102 1204 03
6	Right Side Panel (W/R)	102 1204 04
7	Drain Tube	102 1268 01
8	Ice Chute-Plastic	102 1100 05
9	Drain Pan	102 1100 04
10	Electrical Box Cover	102 1342 01
11	Front Panel	102 1202 07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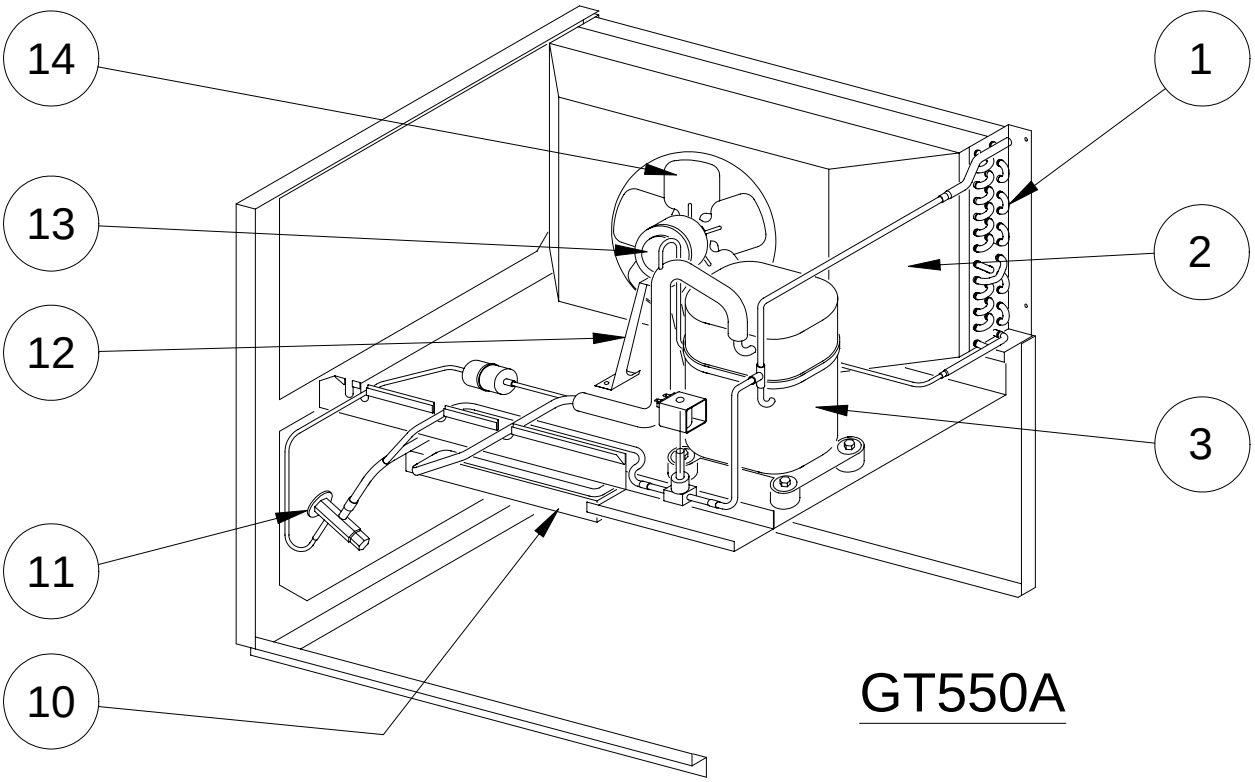
Item	Description	Number
1	Water Valve	GBR 01376 FF
2	Liquid Level Control	102 1142 01
3	Pump and Defrost Switch	102 1217 01
4	Actuator Motor Capacitor-1.0 mF (New Style Motor)	102 1241 02
5	Actuator Motor	102 1292 02
6	Defrost Valve Coil	102 1012 01
7	Defrost Valve Body	102 1010 01
8	Contactor-Single Pole	102 1036 01
9	High Pressure Cut Off-Manual reset	102 1055 01
10	Start Relay	N/A
11	Start Capacitor	N/A
12	Run Capacitor	N/A
13	Bin Thermostat-Standard Capillary Tube	GBR 00856
14	Actuator Toggle Switch	GBR 00897
15	Actuator Thermostat	GBR 00814
16	Cold Water Thermostat	GBR 00837
17	Water Pump	Click Here
18	Ice-Off-Wash Switch	102 1053 01



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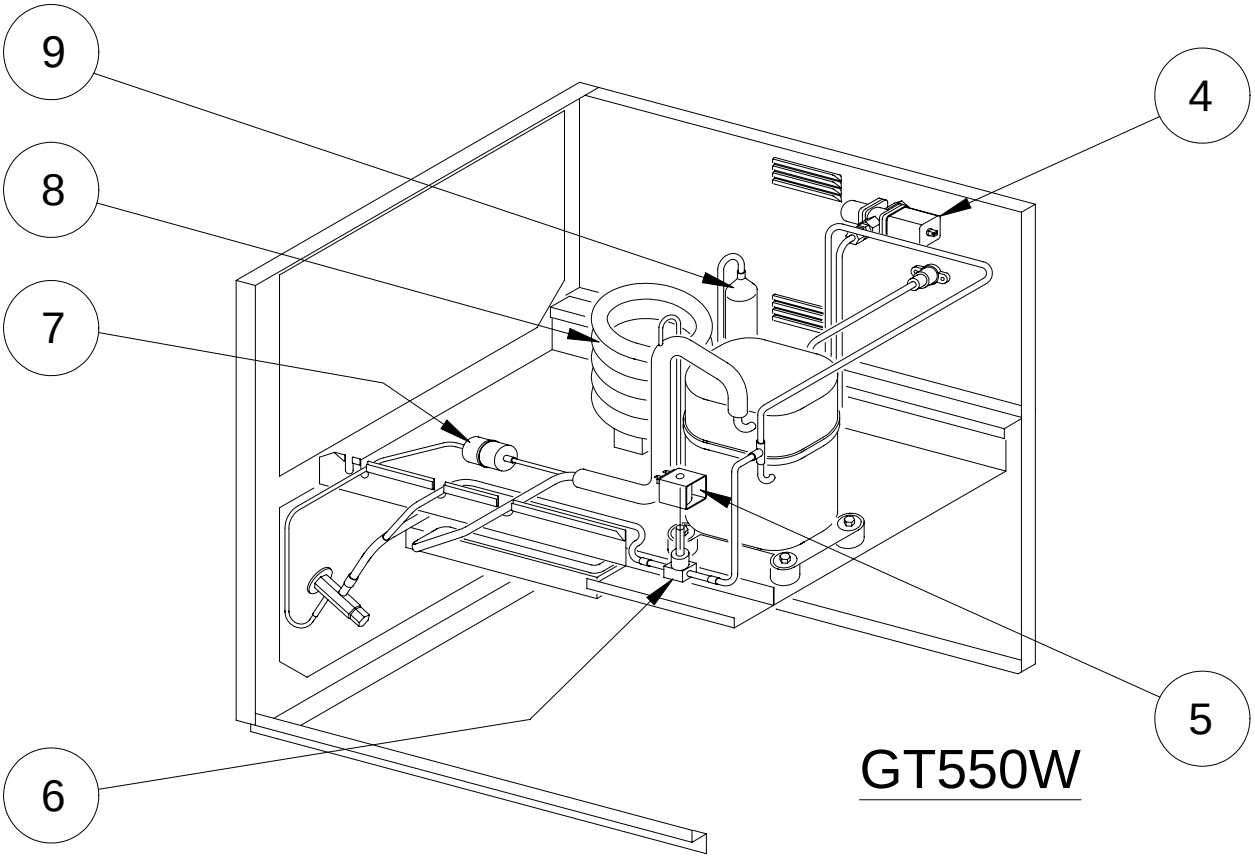

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Item	Description	Number
1	Condenser-Air Cooled	102 1018 03
2	Shroud-Fan	102 1215 04
3	Compressor	N/A
4	Liquid Regulator Valve	GAR 00701 D
5	Defrost Valve Coil	102 1012 01
6	Defrost Valve Body	102 1010 01
7	Drier	GBR 02750
8	Condenser-Liquid Cooled	102 1020 02
9	Receiver	102 1066 01
10	Evaporator "C"	GBR 00148
	Evaporator "HK"	GBR 00167
	Evaporator "K"	GBR 00153
11	Expansion Valve	GBR 02359
12	Support-Fan Motor	102 1214 01
13	Fan Motor	102 1014 02
14	Fan Blade	102 1016 02

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