KIG

INSTRUCTION MANUAL

INSTALLATION * OPERATION
MAINTENANCE

THINGS TO KNOW BEFORE INSTALLATION

1. **All systems must have a minimum of + 10°F freeze protection using inhibited Propylene Glycol. See page 8 for details.**

2. **See Product label for minimum circuit ampacity and maximum fuse size. See page 1 for label location.**

3. **Supply and Return pipe size is crucial. See page 7 for details.**

4. **Use copper or schedule 80 CPVC ONLY for supply and return lines.**

5. **DO NOT EXTEND CONTROL WIRE supplied with the digital temperature controller. Extending the control wire will create a voltage drop and chatter the compressor contactor(s). Refer to "Extending Control Module Cable" section if temperature module cable must be extended.**

PART NUMBER	MODEL	REVISION	OPTIONS	MOPD

006259	WCTSP523	O	NONE	40

KIG

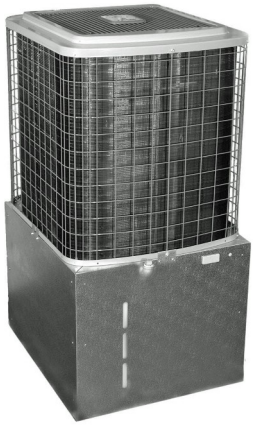
INSTRUCTION MANUAL

INSTALLATION * OPERATION MAINTENANCE

WATER CHILLER

Style: **TS Packaged**
Tons: **5**
Volt: **230V**
Phase: **3 Phase**
Refrigerant: **R-454B**

PART NUMBER	MODEL	REVISION	OPTIONS
006259	WCTSP523	0	NONE



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K I G P R O D U C T S I N S T R U C T I O N M A N U A L

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ATTACHMENT – ELECTRICAL DIAGRAM

Receiving And Unpacking

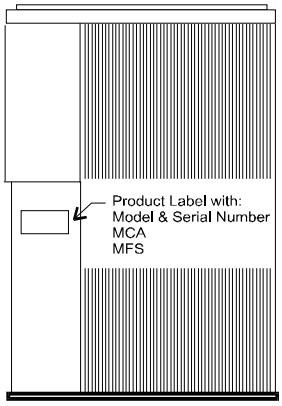
A. When delivered, the equipment should be carefully inspected. All visible damage and shortages **MUST** be properly noted on freight bill.

B. While uncrating, if evidence of concealed damage is discovered, set the equipment aside and notify the delivering transportation company immediately.

C. FREIGHT DAMAGE CLAIMS ARE THE RESPONSIBILITY OF THE PURCHASER. Transportation regulations require that transit damage claims be made within 48 hours after delivery.

Model & Serial Number

Record your Model and Serial Numbers on the Invoice or Sales Receipt.



5 Ton Unit Location

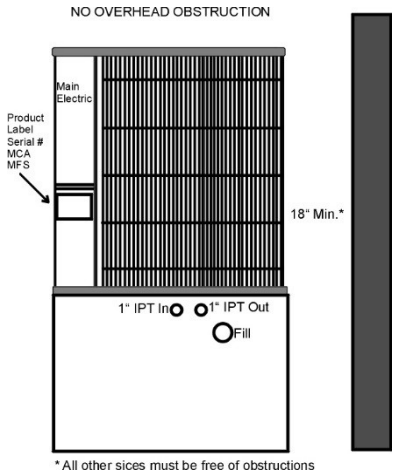
A. For the most efficient operation, locate the chiller in a clean and well ventilated environment.

B. Do **NOT** install unit in a confined area where recirculation of discharge air may occur. Condenser air is exhausted from top of unit. There must be no overhead obstruction.

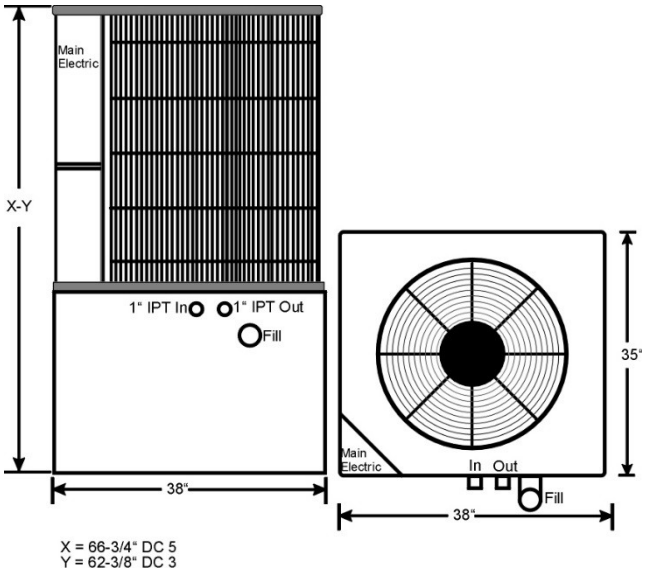
C. Air intake is from all sides of unit and air is top exhaust. No overhead obstruction is allowed. One side maybe within 18” of wall. All other sides must be clear of obstructions.

D. Do **NOT** locate unit where heat, lint or exhaust fumes are discharged on the unit.

E. Place unit in suitable location, level and stabilize unit.



5 Ton Unit Dimensions



Electrical Connection & Control Circuit

Use Copper Supply Wires Only
Use Conductors Suitable For At Least 75ºC or 167ºF

A. Provide a separate protected power source and equipment ground consistent with minimum circuit ampacity, maximum fuse, voltage and frequency requirements as stated on unit's data plate. **See Page 5, and Electrical Diagram Attachment.**

B. Customer to supply copper wire and conductor wire cable, fused disconnect. The fused disconnect should be sized and installed according to the unit's power supply requirements and local electrical codes.

C. ***IMPORTANT:*** This Water Chiller uses a scroll compressor. You must check the rotation of the compressor on initial start-up. If the compressor is noisy and does not cool or has equal suction and head pressure reverse leads on L1 and L3.

Temperature Control Module

A. This Chiller is equipped with a Remote Digital Temperature Control Module.

B. Do NOT extend the 30 foot supplied cable. Extending the cable beyond 30 feet will result in a control voltage drop causing compressor contactor chattering.

C. Mount the Temperature Control Module securely on the wall, so the temperature readings and the on/off switch are readily accessible.

D. Connect Temperature Control Module cable to terminal strip in electrical box. Be sure to match color codes wires. See Electrical Page 5.

E. Secure the lines between the Remote Temperature Control Module and the Chiller unit to walls or stationary supports.

Extending Control Module Cable

OPTION 1

A. The control module is supplied with 30 feet of color coded cable. Four wires of the cable are the 24 A.C. control circuit and two of the wires are for the temperature sensor. (See wiring diagram for color codes).

B. The two temperature sensor wires maybe extended up to 100 feet using 18 gauge copper wire. The temperature sensor is not polarity sensitive.

C. The 24 A.C. control circuit wires may be extended up to 100 feet using 14 gauge stranded copper wire.

OPTION 2

A. The temperature control module is a Nema 4X box.

B. The module may be mounted in the water chiller cabinet.

C. <u>DO NOT MOUNT TEMPERATURE MODULE TO THE MAIN ELECTRICAL BOX.</u>

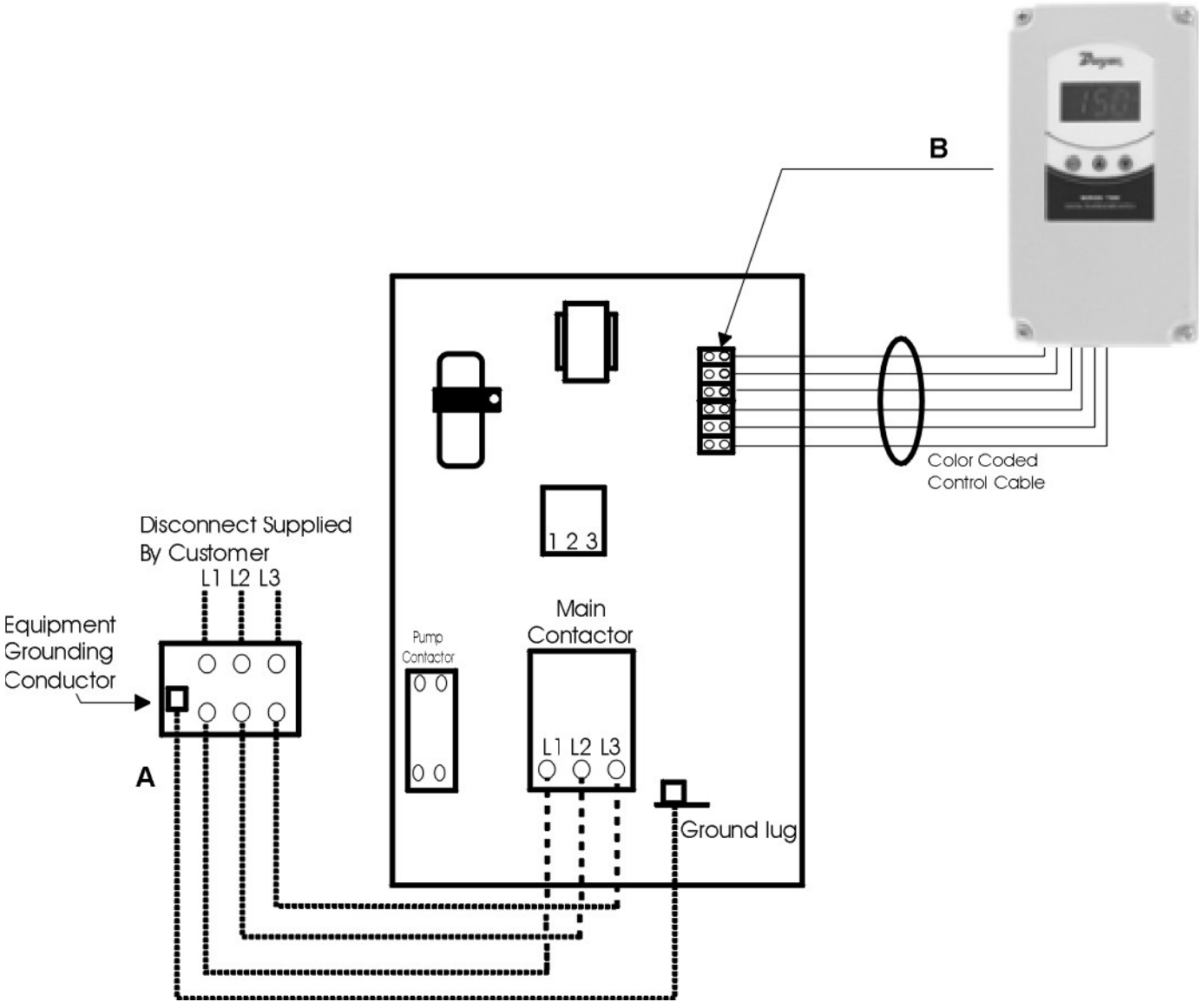
Temperature Control Module Adjustment

A. DO NOT HOLD SET BUTTON. Holding this set button for more than 3 seconds will re-program the temperature control causing the Water Chiller to **MALFUNCTION.**

B. To display “CUT-OUT WATER TEMPERATURE” push set button and release immediately. The display should show **SP**. Press set button once to display cut out temperature. To change cut out press the up or down button. When desired setting is reached press set button to enter setting. **SP** will appear. Press the SET and DOWN button simultaneously to return module to normal function.

Code	Display Messages
000	Open probe
- - -	Short-circuited probe
Err	Memory reading error

Electrical & Temperature Control Module Connections



Electrical Diagram

SEE ELECTRICAL DIAGRAM ON LAST PAGE OF THIS MANUAL

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OPTIONS
NONE

Chiller Water Piping Connections

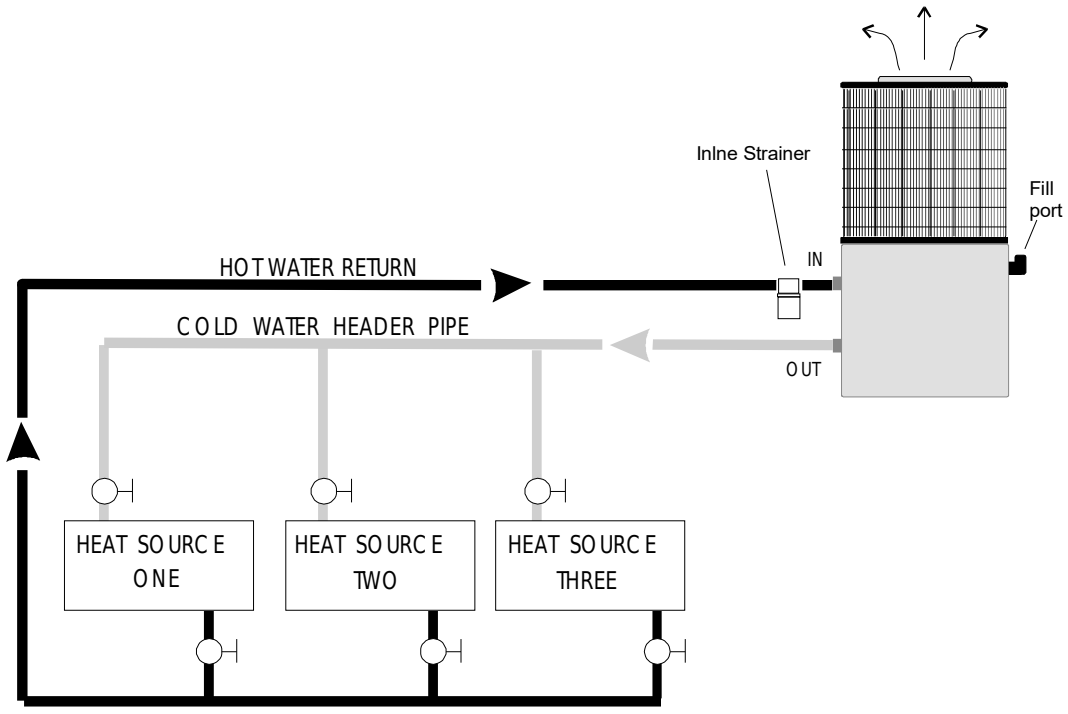
A. KIG Products Chillers require 2.4 gallons per minute (± 20%) per rated ton. Example: 5 ton Chiller x 2.4 gpm = 12 gpm. Select proper size pipe based on chart below. In this case 1" pipe would be the minimum pipe size. Pipe runs more than 50 feet require a larger pipe size.

SIZING PIPE CHART

PIPE	GPM	PIPE	GPM	PIPE	GPM
1/2"	2	1-1/2"	30	4"	320
3/4"	5	2"	50	5"	600
1"	10	2-1/2"	90	6"	900
1-1/4"	20	3"	160	8"	2000

B. Install provided INLINE STRAINER on inlet side of chiller.

C. Use copper or Schedule 80 CPVC pipe to connect water lines as shown in piping diagram.



Chiller Water Piping Connections Continued

F. Support all pipes from sagging to prevent any breakage or leaks.

D. To ensure proper control and ease of maintenance, make sure there is a valve at the water entrance and exit of each piece of equipment being chilled.

E. Thermometers should be placed in exit water lines to check the amount of cooling taking place in the equipment being chilled.

F. Insulate all chilled water lines to prevent sweating and efficiency loss.

G. FREEZE-DAMAGE DUE TO IMPROPER INSTALLATION PIPING AND/OR LACK OF INHIBITED PROPYLENE GLYCOL IS NOT COVERED BY THE WARRANTY.

H. **DO NOT OPERATE PUMP WITHOUT WATER. FILL CHILLER WATER TANK WITH THE PROPER INHIBITED PROPYLENE GLYCOL WATER MIXTURE**. Observe water level through front water tank wall.

Regardless Of Ambient Conditions All Chillers Require An Inhibited Propylene Glycol Solution Protection.

I. A minimum of 30% inhibited propylene glycol and 70% water solution is required for all chillers regardless of ambient conditions. This solution will help protect the internal piping and heat exchanger from rusting and contamination. In addition, the solution will prevent damage to the heat exchanger if the compressor contactor sticks in the closed position.

J. Chillers exposed to low ambient conditions require an increased percentage of inhibited propylene glycol.

CHART BELOW IS BASED ON A "25" GALLON INHIBITED PROPYLENE GLYCOL WATER SOLUTION

Percentage Of Inhibited Propylene Glycol Mixture For 5 Ton Water Chiller

Percentage Of Inhibited Propylene Glycol Mixture	Gallons Of Inhibited Propylene Glycol	Gallons Of Water	Ambient Freeze Protection ° F
30%	7.5	17.5	+ 10 ° F
40%	10	15	- 5 ° F
44%	11	14	- 11° F

DO NOT EXCEED 50% INHIBITED PROPYLENE GLYCOL

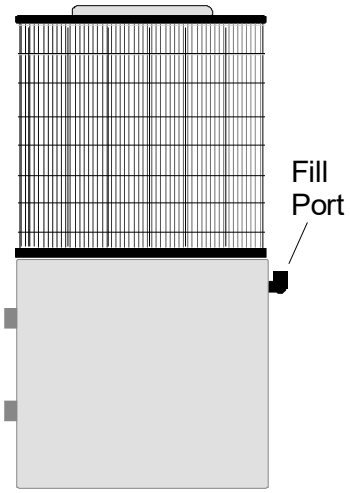
Water Supply Tank

A. Make sure pump water tank has adequate supply of water before starting pump. Note water level through tank wall.

B. **Manual make-up of water is required. Additional ANTI-FREEZE must be added to the system to prevent any dilution by make-up water**.

C. **Automotive Antifreeze has the wrong inhibitors** for water chiller systems. It contains silicate-based inhibitors, which tend to coat heat exchange surfaces and reduce energy efficiency. The Automotive antifreeze can gel or plug the system and reduce the life of pump seals. KIG Products recommends our P/N: 002653 Antifreeze, designed specifically for use in water cooling systems.

E. The KIG Products Chiller is equipped with a safety water flow switch. If the water flow is restricted due to a plugged INLINE strainer screen or freezing conditions, the unit will automatically shut-down. De-energize unit. Determine cause of condition and correct it before restarting unit.



Inhibited Propylene Glycol Protection

A. Freeze-damage due to improper installation piping and/or lack of anti-freeze is NOT covered by the warranty. The WATER CHILLER Unit **ABSOLUTELY REQUIRES FREEZE PROTECTION.**

B. **Automotive Antifreeze has the wrong inhibitors** for water chiller systems. It contains silicate-based inhibitors, which tend to coat heat exchange surfaces and reduce energy efficiency. The Automotive antifreeze can gel or plug the system and reduce the life of pump seals. KIG Products recommends our part number 002653 Antifreeze, designed specifically for use in water cooling systems.

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CHART BELOW IS BASED ON A "25" GALLON INHIBITED PROPYLENE GLYCOL WATER SOLUTION

Percentage Of Inhibited Propylene Glycol Mixture For 5 Ton Water Chiller

Percentage Of Inhibited Propylene Glycol Mixture	Gallons Of Inhibited Propylene Glycol	Gallons Of Water	Ambient Freeze Protection ° F
30%	7.5	17.5	+ 10 ° F
40%	10	15	- 5 ° F
44%	11	14	- 11° F

DO NOT EXCEED 50% INHIBITED PROPYLENE GLYCOL

Operation – Start / Shut-Down

A. Chiller system must be filled with proper amount of Inhibited Propylene Glycol mixture. Do not run pump dry. See Page 10.

B. **STARTING-UP OPERATIONS** - the power supply to unit must be on 24 hours prior to compressor start-up.

C. Compressor is equipped with auto-reset current overload protector. If unit kicks out on overload it may require one-half hour to three hours to cool and reset.

D. When **STARTING-UP OR SHUTTING-DOWN** the unit for the day use the SWITCH on the TEMPERATURE CONTROL MODULE. Remember the Water Chiller must remain energized except for servicing.

E. Clean lint from condenser often. Lack of proper cleaning will reduce efficiency and can cause compressor to kick out on overload, particularly on hot days.

Refrigeration System

A. This unit is pre-piped, pre-charged and tested at KIG Products.

B. To avoid High Head Pressure on the water chiller check items below:

1. Very Hot Ambient Temperatures
2. Clogged or Blinded Condenser Coils
3. Overcharge of Refrigerant
4. Undersized Chiller

D. When unit is operation at 100% capacity the sight glass should appear clear with no foam or bubbles evident. If foam or bubbles appear after the compressor has cycled this indicates low refrigerant charge. A qualified refrigeration technician should check this.

E. The “dot” in the center of the sight glass is a moisture indicator. It should appear green at all times. A white or yellow color indicates presence of moisture. If the sight glass “dot” is **not** green turn the unit off immediately. Have the unit serviced by a qualified refrigeration technician.

Controls And Safety Devices

A. WATER FLOW SAFETY SWITCH

The KIG Products Chiller is equipped with a Safety Water Flow Switch in the OUTLET water line. If the water flow is restricted due to a plug or freezing conditions, the unit will automatically shut-down.

B. HIGH PRESSURE REFRIGERATION SAFETY

This Chiller has an automatic reset high head pressure switch. The purpose of this switch is to break the 24 volt control circuit in the event of excessive refrigerant pressure cause by clogged or blinded condenser coils, overcharge refrigerant or undersized chiller.

C. ELECTRONIC WATER TEMPERATURE CONTROL MODULE

KIG Products Chiller Digital Temperature Control Module is factory pre-set at 50^{O}F. Unit will automatically shut-down at this temperature. It will normally restart when water temperature rises above 58^{O}F.

D. INLINE STRAINER

The Inline Strainer is provided to protect the Plate Seal Heat Exchanger from clogging. If the chiller fails to run check strainer for trapped particles. Clean Inline Strainer Screen and restart unit. Note: Pipe dope and thread filings can cause screen to plug prematurely on a new system.

E. PRE-SET SPRING LOADED WATER BY-PASS VALVE

Factory Set

F. LOW PRESSURE FAN CONTROL

This KIG Products Chiller is equipped with a Low Pressure Fan Control. This control is intended to cycle the condenser fan to maintain the high side refrigeration pressure between 300 and 400 p.s.i.

G. LOW PRESSURE SWITCH

The Chiller has a low-pressure switch. The low pressure switch will shut down the Chiller in the event of refrigerant loss.

H. WARNING LIGHT WITH BUZZER

The warning light with buzzer activates when insufficient water flow is detected. Check pump operation and inline water strainer.

Periodic Preventative Maintenance

A. Tighten all wire terminals.

B. Clean and check motor starter and contactor contacts.

C. Check Condenser fins for dust and dirt.

D. Clean Condenser filter.

E. Check glycol/water solution ratio for operating temperature.

F. Check and clean the water inline strainer.

G. Check systems for water leaks.

H. Check refrigerant sight glass for bubbles or foaming.

Warranty

KIG Products wants you to be pleased with the performance of your unit and backs this product with an exceptional parts/service warranty.

WARRANTY PROCEDURE:

1. Be prepared to furnish the following information:
   A. Complete Model and Serial Number of Unit
   B. An accurate description of the problem.

2. Call your local KIG Products Distributor.

3. If your distributor is unable to help you then contact KIG Products, Inc.

Replacement Parts – 5 Package Chiller

001161	Strainer, Inline 1” 40 Mesh SS & Gasket

001163	Gasket, 1” Viton For Inline Strainer

003058	Bowl, 1” For Inline Strainer P/N: 001161

005214	Switch, Low Press SPST

005075	Switch, Fan

005564	Control, Module Temperature 24V

005040	Sensor, Water Temp Extended Probe

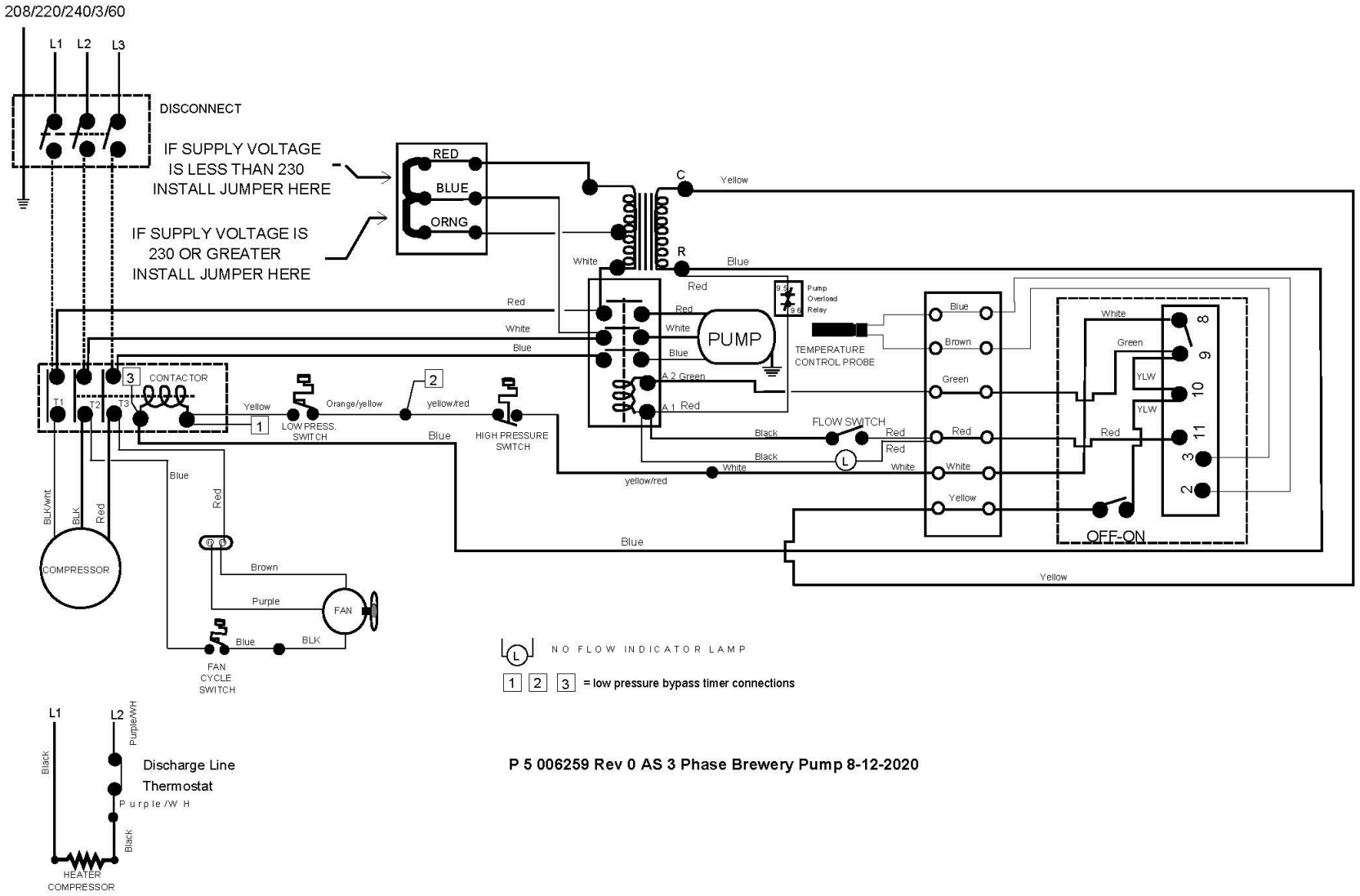
003717	Switch, Flow 10 Amps 4.5-10.4 Activate 240VAC

001190	Contactor, 3P 24V Coil

00253	Switch, Off/On

003600	Heat-Exchanger CH4

KIG PRODUCTS, INC. **TS PACKAGED 5 TON 230V 3PH R-454B** **P/N: 006259**



P 5 006259 Rev 0 AS 3 Phase Brewery Pump 8-12-2020