INSTALLATION AND OPERATING INSTRUCTIONS

(10 Through 20 Ton Air Cooled Two Stage Chillers)

PORTABLE WATER CHILLERS

COLD SHOT CHILLERS

MARRONE & CO., INC.

14020 INTERDRIVE WEST • HOUSTON, TEXAS 77032
TEL: (281) 227-8400
FAX: (281) 227-8404

IMPORTANT

The United States Environmental Protection Agency (EPA) has issued various regulations regarding the introduction and disposal of refrigerants in this unit. Failure to follow these regulations may harm the environment and can lead to the imposition of substantial fines. Because these regulations may vary due to the passage of new laws we suggest that, any work on this unit be done by a certified technician. Should you have any questions, please contact the local office of the EPA.

- **IMPORTANT MESSAGE TO OWNER:**

These instructions should be carefully read and kept near the product, for future reference. While these instructions are addressed primarily to the installer, useful maintenance information is included. To insure proper set up, operation, and performance it is recommended that a licensed service professional start this piece of equipment. Have your installer acquaint you with the operating characteristics of the product and periodic maintenance requirements.

CODES AND REGULTIONS

This product is designed and manufactured to permit installation in accordance with National Codes. It is the installer's responsibility to install the product in accordance with National Codes and/or prevailing local codes and regulations. The manufacturer assumes no responsibility for equipment installed in violation of any codes or regulations.

INSPECTION

This product has been inspected at the factory and released to the transportation agency without known damage. Inspect carton's exterior for evidence of rough handling in shipment. Unpack carefully; if damage is found, report immediately to the transportation agency.

REPLACEMENT PARTS

For information on replacement parts, contact Cold Shot Chillers. When ordering parts, give complete model and serial number as shown on the unit nameplate. Most parts will be available through local distributors.

CHILLER SECTION

A. UNPACKING

1. Inspect unit for damage. If found, report immediately to freight carrier and Cold Shot Chillers.
2. Carefully uncrate the machine and remove all banding and protective film wrap.
3. Open cabinets and loosen compressor feet bolts to allow it to “float” on rubber mounts.
4. Test the system service valves with refrigeration gauges to insure refrigerant pressure is present and no undetectable damage (i.e. dropping the unit) has occurred. Once it is established that the unit has positive pressure, proceed to installation and start-up.

B. INSTALLATION AND START-UP

1. Select a location for air-cooled units with adequate air circulation that is as dust free as possible. Allow three (3) feet of clearance around the unit and at least 8’ unobstructed clearance above the unit to allow for proper air flow and service access.
2. Connect piping or hoses to unit, making sure that the inside diameter (I.D.) of the pipe or hose is the same as or greater than unit connections. The total loop length of the system should be no longer than 60 feet. If the piping loop required is greater than 60 feet please contact factory to confirm the pump capacity on your chiller will provide at least 3 gpm/ton of water flow.
3. Connect electrical at terminals tagged in main control box. On 208/230/3Ø systems with high or stinger leg, connect this leg to L2 or middle terminal. Failure to do so will cause early control component malfunction. Be sure selector switch is in “off” position before applying power.
4. On tank equipped units, fill the tank with the desired solution to within 2 inches of the top of tank. On reverse flow units, fill system and bleed air from the highest point of piping. A 15% to 25% glycol mixture is recommended. For all standard units, low temperature, and units installed outdoors may require a higher concentration to prevent freezing. See unit nameplate for specific concentration requirements.

5. Quickly turn selector switch to “Pump Only” then to “Off” to rotate pump. Check for proper pump rotation (clockwise from motor end). The compressors and pump are wired in phase. Once proper rotation is confirmed, turn the selector to “Pump Only” and begin to circulate fluid and purge all entrapped air in the system

6. Operate in “Pump Only” for at least 15 minutes. Shut unit down and clean strainer to remove any debris that may have been in the system. Once all the air is purged from the circuit, the system is free from debris and proper flow of 3 GPM per ton of capacity is verified, set the controller to the desired set point (SV) by pushing the up and down scroll buttons on the controller to the desired temperature and the set button once. (Do not adjust the set point below the temperature listed on the unit nameplate). In addition to the “Set Value” (SV), the controller will also display “Present Value” (PV). “Present Value” is an indication of the current temperature of the fluid in the chiller tank, or “Leaving Fluid Temperature” depending on the specific chiller design.

7. Unit is now ready to turn on. Move the selector switch to “Cooling Cycle” setting and the unit will begin cooling.
8. During the cooling cycle, condenser fans may turn on and off. This should be expected during normal operation and occurs due to ambient temperature and the amount of heat being returned in the water chiller.

9. Adjust the set point using the “up” and “down” scroll buttons on the temperature controller. Two stage chillers are equipped with a two stage temperature controller. The controller is factory set to start and stop the second stage compressor.
10. While cooling at low load conditions, bubbles may become visible in the refrigerant sight glass. The charging procedure requires the unit to be under full load with 75°F or above water temperature with clear sight glass for optimum performance. Returning fluid temperature should not exceed 100°F on standard units or the chiller will cycle off on head pressure switch and not run. Should this occur, allow water to cool down by running pump only and restarting chiller once water is 100°F or colder.
11. Your new chiller is equipped with a Low Flow Temperature sensor that detects low temperature of the refrigerant. This condition can occur when the fluid in the evaporator nears freezing. This safety will automatically trip and requires manual resetting before the cooling cycle will resume. <u>Do not reset this control unless the exact cause for its tripping is determined</u>.

Generally the cause will be low or insufficient water flow caused by a clogged “Y” strainer or restricted flow in the process. This safety can also be tripped by low ambient conditions overnight or during shipping. <u>Resetting this control and not determining the cause for tripping can cause the evaporator to freeze and rupture.</u>

C. MAINTENANCE*

1. Periodically check condenser coils for dirt or airborne particle build-up. Check deep into the coils with a flashlight and, if dirty, flush coils with a water hose- being careful to disconnect the power first and cover pump to prevent water from entering the vent ports.
2. Set up a schedule to remove the screen from the tank return water line strainer and clean out. Some particles may pass through the screen and collect as sediment in bottom of the tank. Again, disconnect the power then remove the tank drain plug and flush out bottom with water hose.
3. Caster wheels and swivels may require frequent lubrication based on the amount of use. Use good quality bearing grease and pump it into the grease fittings on the axle and swivel.
4. Turn off power to the unit and check the condition of the contactor points for the compressor and pump. Replace them if the edges become jagged or splattered to avoid premature compressor and/or pump failure. Contactor points are consumable and their life is dependant on the amount of use and power characteristics at the unit.

NOTE: Not performing the above will cause early unit failure and considered abuse which is not covered by warranty.

CAPACITY ± 5% AT 50ºF CW / 95ºF AMBIENT	**10-TON 120,000 BTU/HR**		**15-TON 180,000 BTU/HR**		**20-TON 240,000 BTU/HR**	
MODEL	ACWC-120-E		ACWC-180-E		ACWC-240-E	
VOLTAGE / PHASE	208/230/3	460/3	208/230/3	460/3	208/230	460/3
MIMIMUM CIRCUIT AMPS	50.5	27.3	87.5	46.3	103	48
DIMENSIONS (APPROX)	40”Wx61”Lx75”H		40”Wx84”Lx75”H		40”Wx84”Lx75”H	
WEIGHT	1700 LBS		1900 LBS		2000 LBS	
PUMP – hp	1 ½		2		3	
PUMP OUTPUT	55 GPM @ 30 PSI		76 GPM @ 30 PSI		95 GPM @ 30 PSI	
TANK SIZE	41 GAL		80 GAL		80 GAL	
PIPE SIZE –NPT	1 ¼ ” IN, 1 ” OUT		2” IN, 1 ½ ” OUT		2” IN, 1 ½ ” OUT	

Controls:

Three Stage PLC temperature controller with constant leaving fluid temperature LED readout

Refrigeration Components:

Efficient scroll compressors, sight glass, moisture indicators, balance port expansion valves, filter drier, pump down valves, stainless steel brazed plate evaporator.

Process Fluid Components:

Stainless Steel centrifugal pump, bronze “Y” strainer with 20 mesh stainless steel screen, insulated stainless steel reservoir.

Safety Controls:

High/low pressure and freeze safeties, internal overloads for compressor and fan motors, safety fuses for pump, low water flow safety with manual reset.

Construction:

Welded steel powder coated frame and cabinet

Warranty:

One year parts / five year compressor

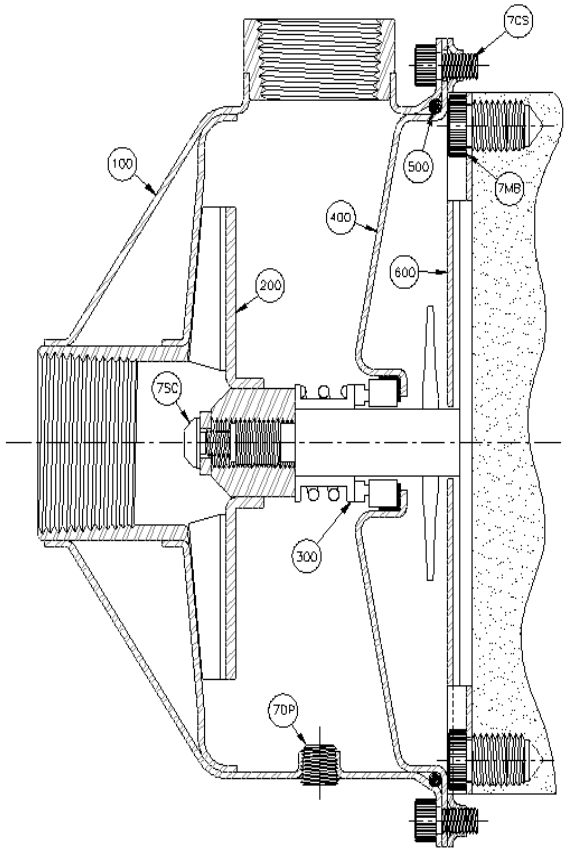
http://www.delta.com.tw/industrialautomation/

DELTA Temperature Controller

DTB Series

User Manual

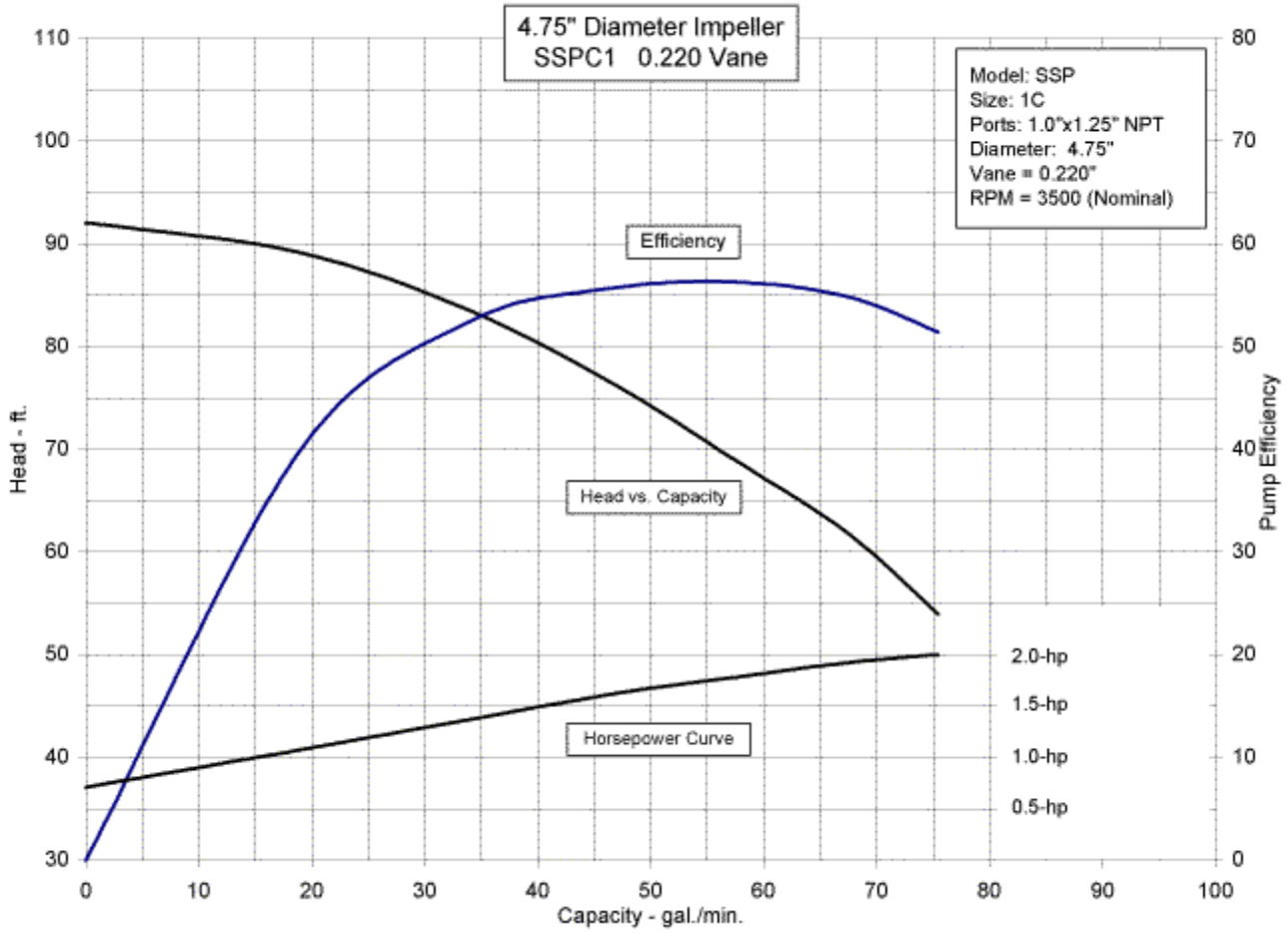
PUMP CROSS SECTION ALL MODELS

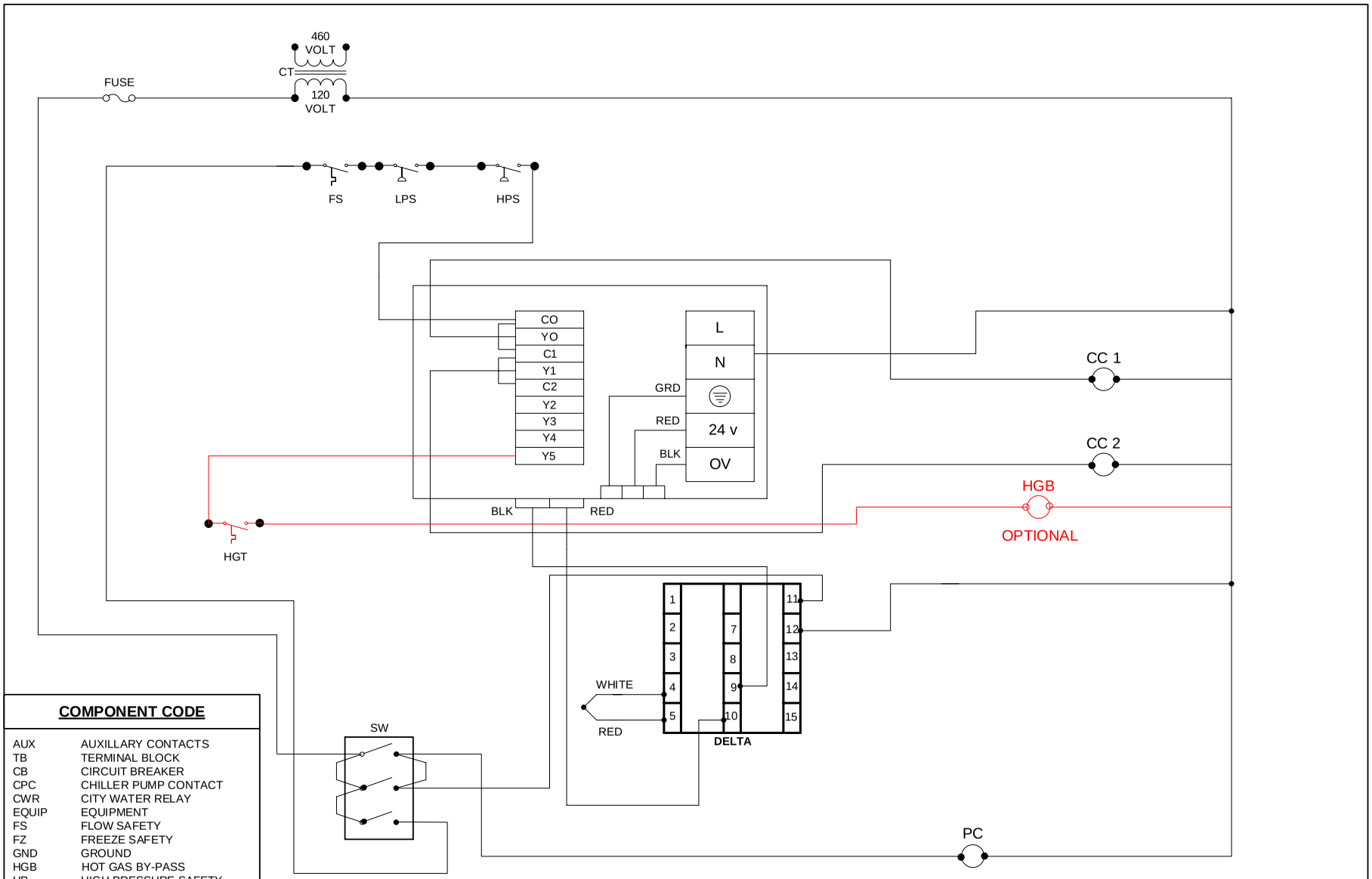


100	CASING	
200	OPEN IMPELLER	
300	MECHANICAL SEAL	
400	SEAL PLATE	
500	CASING O-RING	
600	MOTOR ADAPTER PLATE	
7CS	CASE SCREW	
7DP	DRAIN PLUG 1/8 NPT	
7SC	IMPELLER SCREW, LH THREAD	
7MB	MOTOR BOLT	

PUMP PERFORMANCE CURVE

1 ½ HP – Models, ACWC-90-E, ACWC120-E & ACWC-120-D





COMPONENT CODE

AUX	AUXILLARY CONTACTS
TB	TERMINAL BLOCK
CB	CIRCUIT BREAKER
CPC	CHILLER PUMP CONTACT
CWR	CITY WATER RELAY
EQUIP	EQUIPMENT
FS	FLOW SAFETY
FZ	FREEZE SAFETY
GND	GROUND
HGB	HOT GAS BY-PASS
HP	HIGH PRESSURE SAFETY
HPS	HIGH PRESSURE SWITCH
LLSV	LIQUID LINE SOLENOID
LP	LOW PRESSURE SAFETY
LPS	LOW PRESSURE SWITCH
OL	OVERLOAD
OP	OIL PRESSURE SAFETY
PC	PUMP CONTACTOR
PPC	PROCESS PUMP CONTACTOR
SW	SWITCH
TB	TERMINAL BLOCK
TC	THERMOCOUPLE
UL	UNLOADER

NOTES:

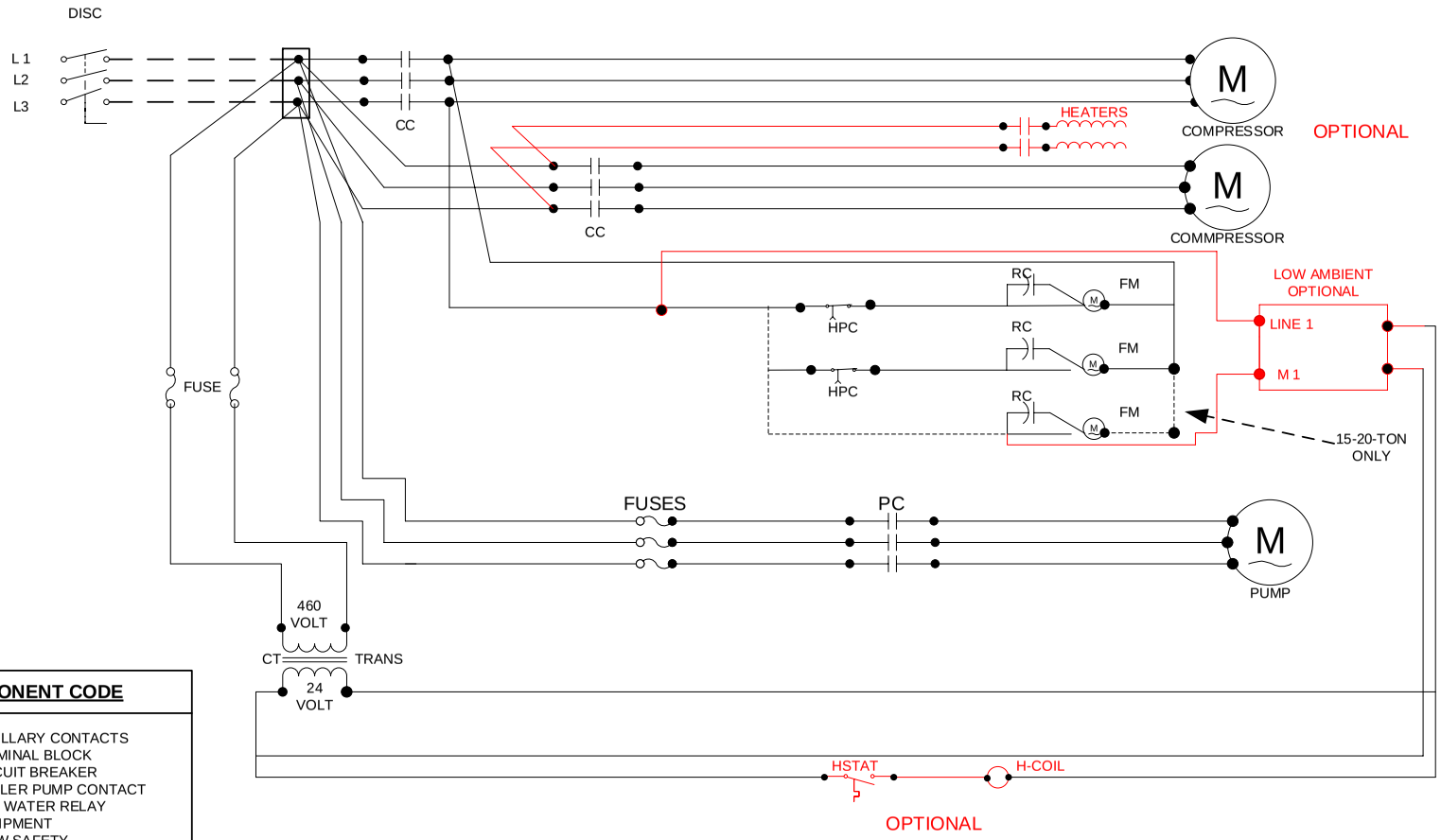
1. REPLACEMENT WIRE AND FUSES MUST BE THE SAME SIZE AS ORIGINAL
2. UNIT MUST BE PERMANENTLY GROUNDED AND CONFORM TO N.E.C. & LOCAL CODES
3. MINIMUM WIRE SIZE BASED ON 75 DEGREES C INSULATION COPPER WIRE

COLD SHOT CHILLERS

DESCRIPTION

WIRING DIAGRAM:

MODEL: ACWC-120-E
ACWC-180-E
ACWC-240-E



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ACWC-180-E
ACWC-240-E

START-UP CHECK LIST *** 2 thru 20-TON**

1.	Is there any physical damage?	□ Yes □ No
	Will this prevent start-up?	□ Yes □ No
	Description:_____	
	_____	
2.	Unit is installed level as per the installation instructions.	□ Yes □ No
3.	Power supply agrees with the unit nameplate.	□ Yes □ No
4.	Electrical power wiring is installed properly.	□ Yes □ No
5.	Unit is properly grounded.	□ Yes □ No
6.	Electrical circuit protection has been sized & installed properly.	□ Yes □ No
7.	All terminals are tight.	□ Yes □ No
8.	All plug assemblies are tight.	□ Yes □ No
9.	Crankcase heaters energized for 24 hours before start-up.	□ Yes □ No
10.	All chilled water valves are open.	□ Yes □ No
11.	All piping is connected properly.	□ Yes □ No
12.	All air has been purged from the system.	□ Yes □ No
13.	Chilled water pump is operating with the correct rotation.	□ Yes □ No
14.	Water loop volume greater than 6/gal/ton.	□ Yes □ No
15.	Proper loop freeze protection provided to _____˚F (˚C)	
	Antifreeze type_____ Concentration_____%	
16.	Outdoor piping wrapped with electric heater tape.	□ Yes □ No

Measure the following:

Discharge Pressure: _____
Suction Pressure: _____
Suction Line Temp: _____
Entering Fluid Temp: _____
Leaving Fluid Temp: _____