ICE CHIP

PORTABLE CHILLER

TM

INSTRUCTION MANUAL

- INSTALLATION
- OPERATION
- MAINTENANCE

ADVANTAGE®

ADVANTAGE ENGINEERING, INC.
525 EAST STOP 18 ROAD
P.O. BOX 407
GREENWOOD, IN 46142
317-887-0729 317-881-1277 (fax)

I.O.M. #017 3/96

ICE CHIP

PORTABLE CHILLER

™

INSTRUCTION MANUAL

AIR COOLED MODELS

SC SERIES 1/4 - 1 1/2 ton

INSTALLATION
OPERATION
MAINTENANCE

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1.0 GENERAL

1.1 SAFETY

A. It is important to become thoroughly familiar with this manual and the operating characteristics of the **ADVANTAGE SC** portable chiller.

B. It is the owner's responsibility to assure proper operator training, installation, operation, and maintenance of this chiller.

1.2 WARNING LABELS

A. Observe all warning and safety placards applied to the chiller. Failure to observe warnings can result in serious injury or death.

1.3 EFFICIENCY

A. Long term efficiency of operation is largely determined by proper maintenance of the mechanical parts of the unit, and the water quality. We recommend filtering where required to prevent solids from plugging critical parts (pumps, evaporators, condensers, etc.). We highly recommend the services of a competent water treatment specialist be obtained and his recommendations be followed. ADVANTAGE accepts no responsibility for inefficient operation, or damage caused by foreign materials of failure to use adequate water treatment.

1.4 CLEAN AIR ACT

A. THIS UNIT CONTAINS HCFC-22 (CHLORODIFLOROMETHANE). A CLASS II SUBSTANCE.

B. EFFECTIVE JULY 1, 1992, IT IS UNLAWFUL FOR ANY PERSON IN THE COURSE OF MAINTAINING, SERVICING, REPAIRING, OR DISPOSING OF REFRIGERATION EQUIPMENT TO KNOWINGLY VENT OR OTHERWISE RELEASE OR DISPOSE OF ANY CLASS II SUBSTANCE USED AS A REFRIGERANT IN A MANNER WHICH PERMITS SUCH SUBSTANCE TO ENTER THE ENVIRONMENT.

C. DE MINIMIS RELEASES ASSOCIATED WITH GOOD FAITH ATTEMPTS TO RECAPTURE, RECLAIM, OR RECYCLE SUCH SUBSTANCE SHALL NOT BE SUBJECT TO THE PROHIBITION SET FORTH IN THE PRECEDING SENTENCE.

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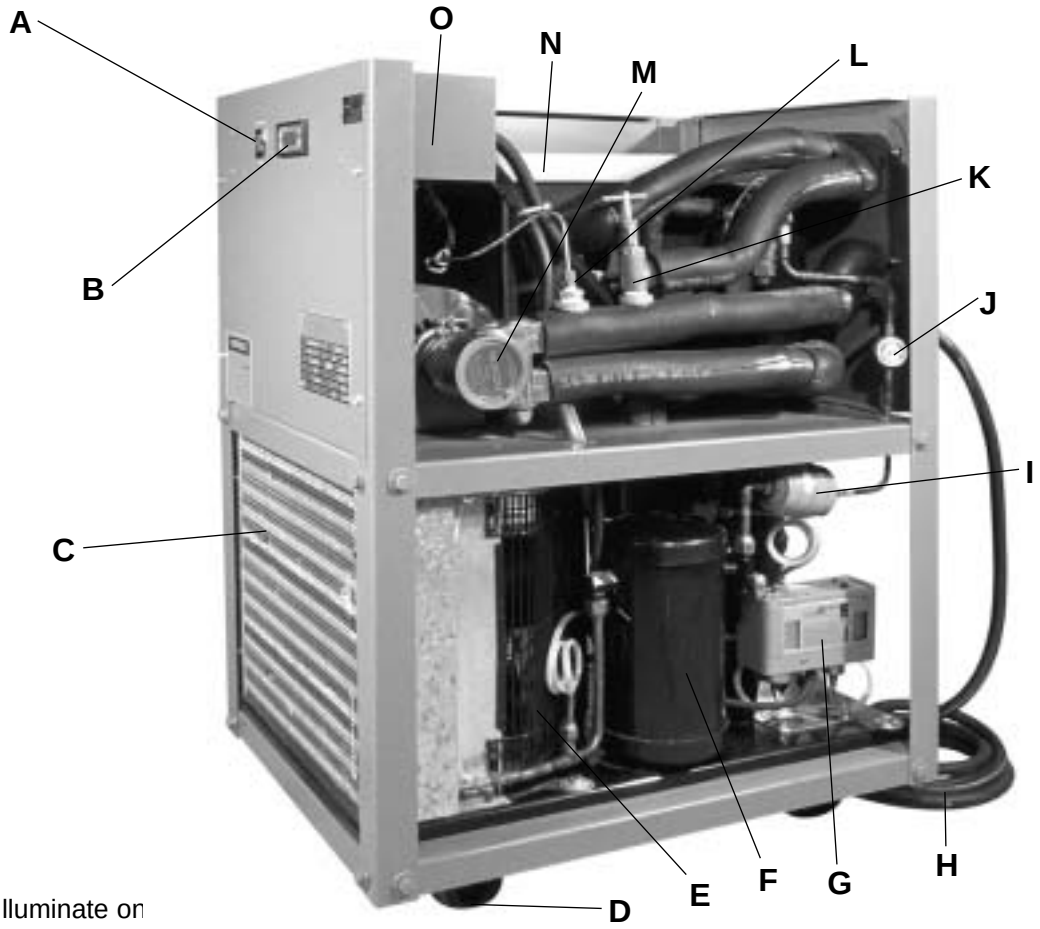
1.5 GENERAL

A. The purpose of your **ADVANTAGE SC** portable chiller is to circulate temperature stabilized fluid through your process, resulting in process temperature control.

B. The ability of the equipment to do this is significantly affected by the method of installation.



A - Illuminate on
B - Controller
C - Air cooled condenser
D - Caster
E - Condensing fans
F - Liquid receiver
G - Refrigerant safety
H - Power cord
I - Filter-drier
J - Refrigerant sight-glass
K - bypass valve
L - Thermocouple
M - Pump
N - Reservoir
O - Electrical panel

C. The above picture gives the reader a general overview of the major components of the **SC** portable chiller.

D. If you have any questions, please contact the **ADVANTAGE** service department at 317-887-0729 or by fax: 317-885-8683

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2.0 INSTALLATION

2.1 MATERIALS

A. All material used in process installation shall be rated for a minimum temperature of 150°F and a minimum pressure of 200 psi.

B. All material used in process installation shall have the equivalent or larger diameter of that connection.

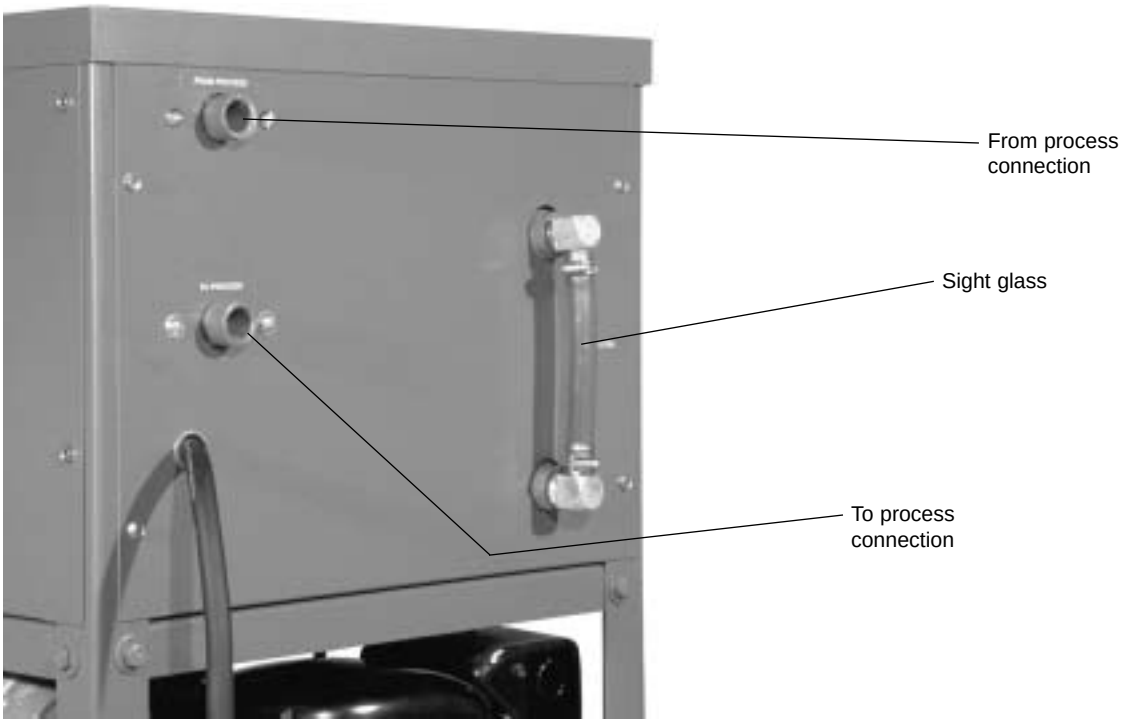
2.2 PROCESS CONNECTIONS:

A. Connect the chiller's "to process" connection to the "water in" manifold on the mold or process.

B. Connect the chiller's "from process" connection the "water out" manifold at the mold or process.

C. Piping circuitry should be designed to avoid an excessive use of elbows and/or lengths of pipe. If hose is the material of choice, avoid tight twists or curls.

D. Valves and filters may be installed to facilitate service and maintenance. Be certain that all such devices are open and clean during operation.



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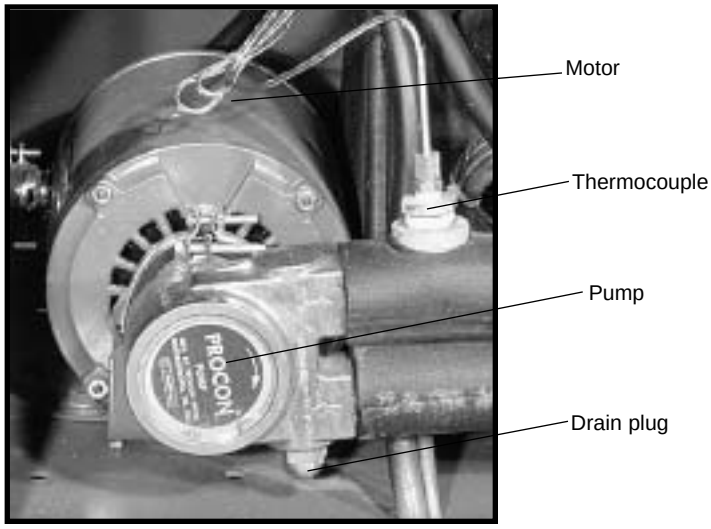
2.3 DRAINAGE

A. Drainage is performed by simply removing the pump volute plug (plug faces the tank) in the pump assembly.

B. Note: if chemical treatment of process fluid or additives are to be used, drainage shall be done according to local codes.

C. Important: drainage procedures must be performed prior to shipment or outdoor storage of unit. Freezing damage can occur.



2.4 AIR COOLED CONDENSER

A. Recommended ambient air temperature requirements 60°F - 85°F. (Maximum efficiency range).

B. Fan rotation is such that air is drawn in across the condenser coil and discharged out through the expanded metal.

C. A four (4) foot breathing space around the unit is recommended to insure adequate condensing.

2.5 ELECTRICAL CONNECTIONS

A. Electrical power supply requirements are identified on the equipment data plate.

B. Connect the 3 conductor power cord to a fused disconnecting means which shall be sized and installed to power requirements and local codes.

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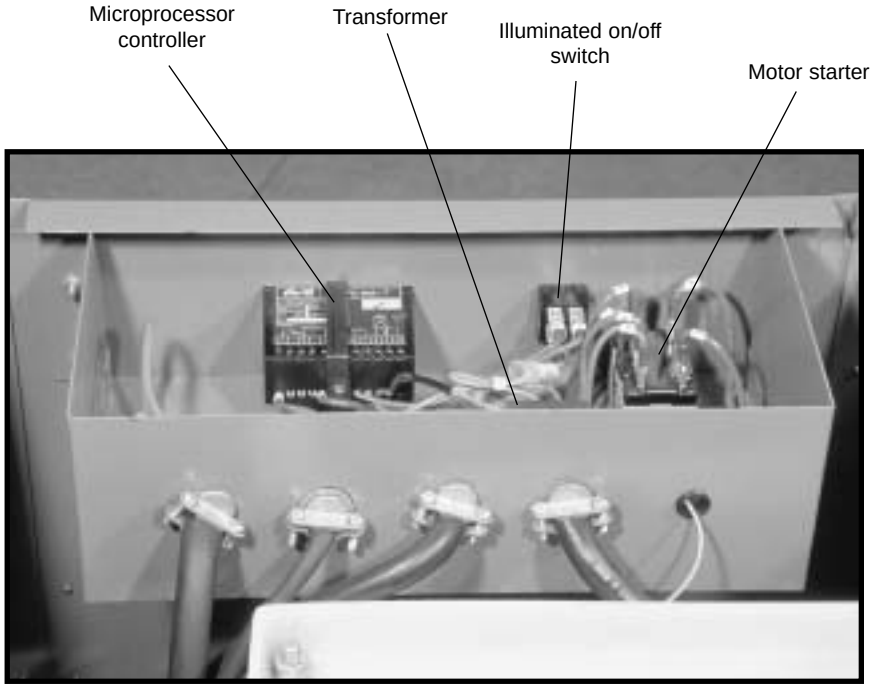
C. General:

1. Make all ground connections

2. Check conductor, disconnecting means and fusing for proper sizing.

3. Make sure all electrical connections are fixed firmly in place.

4. Check for the absence of moisture anywhere associated with the electrical system.



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3.0 START-UP SEQUENCE

3.1 VERIFY PIPING INSTALLATION

A. Verify that unit piping installation is correct. Refer to section 2.2 for more information.

3.2 VERIFY ELECTRICAL INSTALLATION

A. Verify that unit electrical installation is correct. Refer to section 2.5 for more information.

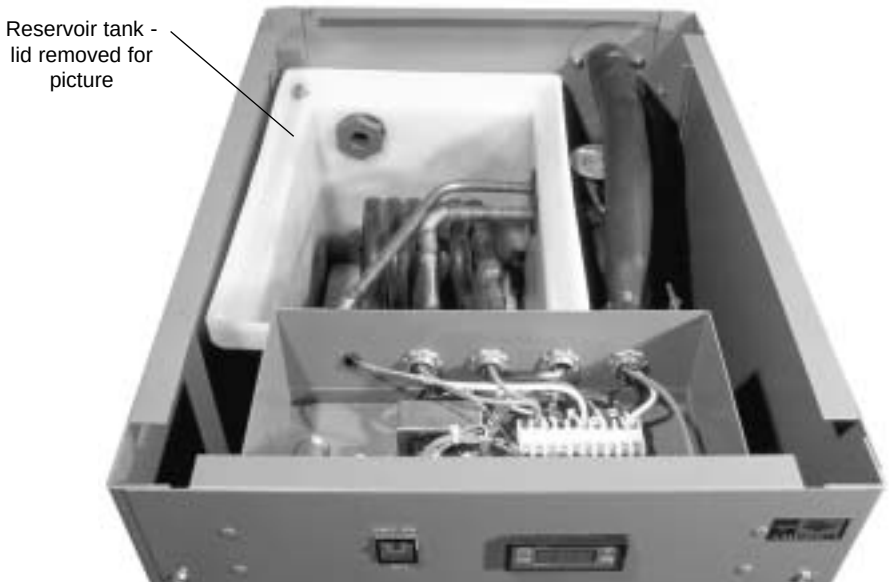
3.3 SYSTEM FILL

A. The **ADVANTAGE** “Ice Chip” series must be filled manually.

B. The filling is accomplished by simply removing the lift-off top on the unit.

C. The reservoir is located at the rear of the machine. Fill with water until reservoir is at least 3/4 full. This procedure must be repeated when the pump is operating to insure a totally filled system with no pump cavitation. Coils within reservoir must be covered at all times.

D. Once the reservoir is full with no cavitation, the unit is ready to operate.



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5.4 OPERATIONS

A. Turn thermostat to highest setting.

B. Shift illuminated toggle switch to the “on” position.

C. Pump will begin operation. Add water to reservoir until 3/4 full.

D. Check for leaks throughout the system. Repair any that are found.

E. Adjust temperature thermostat as required for the process.

G. Compressor will start. Listen for any knocking or other unusual noise. Cease start and contact **ADVANTAGE** service department.

H. **Note:** do not operate the unit with sheet metal enclosure panels removed.

5.6 PROCESS FLOW

A. Process flow is adjusted according to pump motor amperage. This rating can be found on the pump motor.

B. **Note:** all process valves should be fully open at this time.

C. With unit operating, check amp draw with an amp meter and note findings.

D. Compare amp draw with pump motor rating.

5.7 SHUT DOWN SEQUENCE

A. The chilling unit operates under pressure, therefore, caution is required when the unit is to be disconnected or shut down from the process.

B. To shut down without disconnecting from the process:

1. Shift illuminated toggle switch to the “off” position.

2. Turn electrical power supply off at the disconnecting means.

C. To shut down and disconnect from the process:

1. Shift illuminated toggle switch to the “off” position.

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2. Close process valves and condenser valves if installed.

3. Turn electrical power supply off at the disconnecting means.

4. Drain unit.

5. Disconnect process lines, some water will be discharged; however, this water should not be under pressure at this time.

4.0 INSTRUMENT CONTROLLER

4.1 GENERAL DESCRIPTION

A. The EWPC 902/T/R/P controller is a new series of microprocessor based and fully programmable process controllers for single point applications.

B. The front keypad of this controller offers several alpha-numeric menu prompts to configure the controller for each specific application (see further).

4.2 FRONT KEYPAD

A. **SET:** push to display the setpoint value. The setpoint can be changed with 3 seconds with the “up” or “down” button. The control will automatically switch back to normal operating mode within 3 seconds. The last entered setpoint will stay in memory.

B. **UP:** used to increase the setpoint value, as well as the parameter when in programming. When held down for a few seconds, the change rate accelerates.

C. **DOWN:** used to decrease the setpoint value, as well as the parameter when in programming. When held down for a few seconds, the change rate accelerates.

D. **OUT:** status light of the output. blinks when in setpoint display/change mode or during programming.

4.3 DESCRIPTION OF PARAMETERS

A. **D1:** setpoint differential. The switching differential (hysteresis) can be set with positive value (make on rise) or with negative value

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(make on fall). See parameter “HC1”.

B. **LS1:** lower set. This is the lower limit below which the user cannot change the setpoint; normally set at the lowest value recommended for the sensor.

C. **HS1:** higher set. Similar to “LS1”, however setting an upper limit for the setpoint.

D. **od:** output delay. This provides a delay selection for the outputs in applications where noise may cause brief erroneous signals from the sensor to the controller. Factory set at “0”.

E. **Lci:** lower current input (for EWPC 902/R, EWPC 902/P and EWPC 902/T with current input only). Read-out corresponding to 4 mA input signal (factory set at 20 %R.H for EWPC 902/R).

F. **Hci:** high current input (for EWPC 902/R, EWPC 902/P and EWPC 902/T with current input only). Read-out corresponding to 20 mA input signal (factory set at 100 %R.H for EWPC 902/R).

G. **CAL:** CALibration. This offers an adjustment up or down of the read-out, if needed. Factory set at “0”.

H. **PSE:** Probe SElection. Input type (for RTD or Thermocouples only). RTD models: Ni = Ni100; Pt = Pt100. T/C models: FE = TcJ; Cr = TcK; rh = TcS.

I. **HC1:** Heating/Cooling. Relay switch function. H = heating (humidification; reverse action); C = cooling (dehumidification; direct action).

J. **rP1:** relay Protection 1. Determines the status of the relay in case of sensor defect. Factory set at “ro”. ro = relay open; rc = relay closed.

K. **LF1:** Led Function 1. Determines whether the status light in ON or OFF in relation to output 1. di = direct = light ON when output 1 is energized; in = reverse = light OFF when output 1 is energized.

L. **dP:** decimal Point. Choose whether the resolution is required with or without decimal point. oF = without decimal point; on = with decimal point.

M. **Notes:** (a) the decimal point of models with current or voltage input is shifted: the actual value of parameters “Lci” and “Hci” must be multiplied by 10. (b) On all versions, if a unit is changed from without decimal point to with decimal point, all parameter values expressed in degrees will automatically be divided by 10, including the setpoint! (c) The decimal point selection is not available on models for thermocouple input.

N. **hdd:** half digit display. The right-most digit can be set to read-out in

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0 or 5 only, or in all 10 digits. hdd = n : e.g. 070, 071, 072 etc (if without decimal point) or 70.0, 70.1, 70.2 etc (if with decimal point.); hdd = y : e.g. 070, 075, 080, etc. (if without decimal point) or 70.0, 70.5, 80.0 etc, (if with decimal point). Useful when measuring values varying rapidly (e.g. %R.H.)

O. **tAb:** tAble of parameters. This shows the configuration of the parameters as set in the factory; can not be modified (for factory identification and diagnostic purposes only).

4.4 PARAMETER PROGRAMMING

A. Programming is easily accessed by holding the “SET” button down for more than 4 seconds.

B. The first parameter is displayed while the status light Led “out” remains blinking during the programming period.

C. Other parameters are accessed with the “UP” and “DOWN” button. With the “SET” button, the actual setting of each parameter is displayed. To change a parameter setting, push the “SET” plus the “UP” (or “DOWN”).

D. The system will automatically return to its normal operating mode a few seconds after the programming procedure is completed or interrupted.

DEFAULT SETTING - STANDARD MODLES

PARAMETER	DECRIPTION	RANGE	UNIT	FACTORY
d1	differential	min / max	°C / °F	4
LS1	Lower Set	min / max	°C / °F	40
HS1	Higher Set	min / max	°C / °F	70
od	output delay	min / max	seconds	60
Lci	Low current input	min / max	various	0
Hci	High current input	min / max	various	0
CAL	CALibration	min / max	°C / °F	0
PSE	Probe SElection	Ni / Pt / Fe / Cr / rh	/	Fe
HC1	Heating / Cooling	H / C	flag	C
rP1	relay Protection	ro / rc	flag	RO
LF1	Led Function	di / in	flag	OF
dp	decimal Point	on / oF	flag	N
hdd	half digit display	n / y	flag	
tAb	tAble of parameter	/	flag	

4.5 ERROR ANNUNCIATION

A. Any sensor input defect will be displayed as follows: “ - - - ” in case of shorted sensor - “ EEE ”; in case of sensor break or sensor absence. The “ EEE ” error message also appears in the event of overrange of underrange of the system temperature.

B. It is recommended to double check the sensor wiring before diagnosing a probe as defective.

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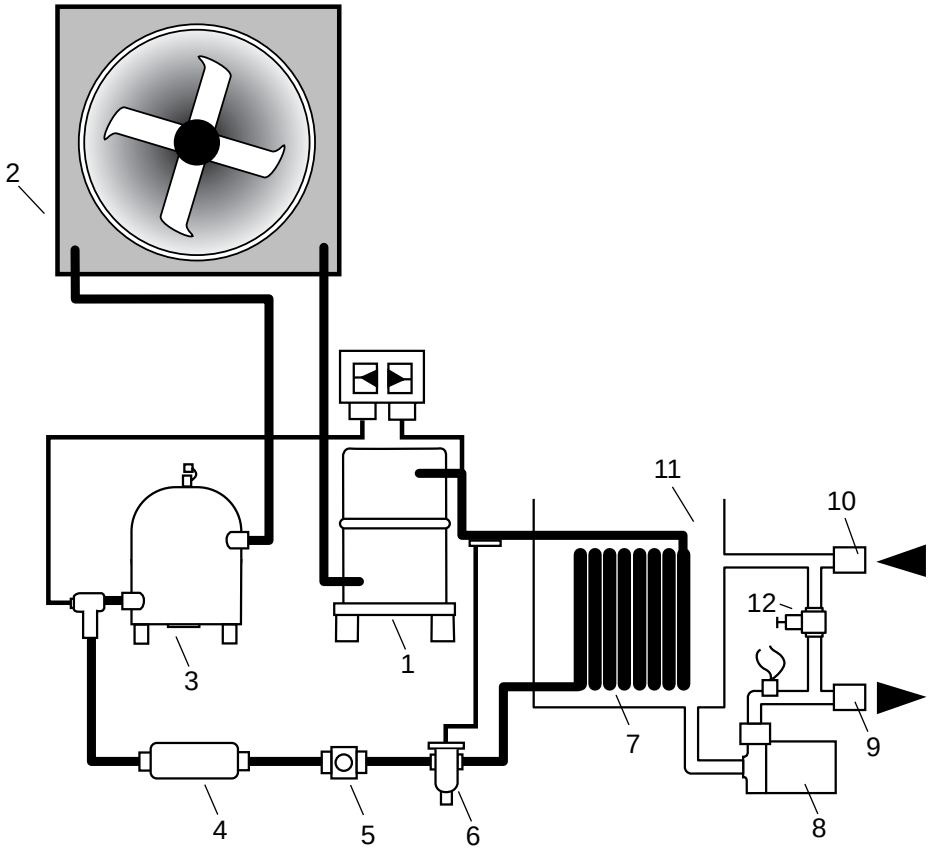
5.0 TYPICAL CYCLE



5.1 PRELIMINARY

A. The following is a description of the refrigeration cycle. Refer to the diagram on page 23 for reference.

B. The “power on” light should be illuminated at this time.

5.2 COMPRESSOR CYCLE

A. The **compressor** (1) draws low pressure-low temperature gas in on the suction side. The gas is compressed and discharged out of the compressor at high pressure and high temperature.

B. The refrigerant gas is pumped through the **condenser** (2) where BTU’s (heat) are removed from the gas. At this time, the refrigerant

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gas condenses into a liquid state, thus lowering the refrigerant temperature.

C. The liquid refrigerant, still under high pressure, collects in the **liquid receiver** (3) and then flows through the **filter-drier** (4), the **refrigerant sight glass** (5), and the **expansion valve** (6).

D. The expansion valve throttles the flow of liquid refrigerant into the **evaporator** (8) based on the suction line temperature. The expansion valve creates a pressure drop. The change in pressure from high to low allows the liquid refrigerant to boil into a gas inside the evaporator. The evaporation process (changing liquid into a gas) absorbs BTU's (heat) from the fluid circulating on the water side of the evaporator. The low pressure-low temperature gas is returned to the compressor suction.

E. This cycle is continuous while the compressor is functioning.

5.3 TYPICAL COOLANT CYCLE

A. The process fluid (water or water/inhibited propylene glycol solution) is pumped by the **centrifugal pump** (8) **to process** (9). The fluid flows through the process where BTU's (heat) are absorbed.

B. The fluid is pumped back to the chiller **from process** (10) and into the **reservoir tank** (11) where the BTU's are rejected and absorbed by the evaporating refrigerant liquid.

C. The fluid is drawn from the tank into the suction of the pump and is discharged out to process. To maintain proper flow, a **bypass valve** (12) is placed in the pump discharge line.

D. This cycle is continuous while the unit is operating.

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6.0 TROUBLESHOOTING

6.1 UNIT WILL NOT START

A. Blow fuse at power supply - isolate open fuse and replace. Double check fuse sizes against nameplate amperage.

B. Low voltage - measure incoming voltage with meter, voltage must be within 10% of nameplate voltage or warranty will be voided.

6.2 PUMP WILL NOT START

A. Impeller bound or frozen shaft bearing in motor.

B. Open motor winding.

C. Internal overload tripped.

D. Loose wire connection or defective start capacitor.

E. On/off circuit breaker tripped.

6.3 COMPRESSOR WILL NOT START

A. Safety switch open - unsafe condition exists (consult safety switch section in this manual).

B. /Windings overheated - over temperature switch on compressor tripped.

C. Circuit breaker tripped - reset and check amperage. Verify voltage is correct, check for loose wire connection at motor. Defective circuit breaker.

D. Bad or defective start capacitor.

6.4 UNIT SHUTS DOWN ON HIGH PRESSURE SWITCH

A. Low air flow across condenser. Check for dirty condenser fins.

B. Fan not operating. Check for loose fan blade or open/grounded motor winding.

C. High ambient air temperature (above 95°F).

D. Insufficient clear space around unit.

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6.5 UNIT SHUTS DOWN ON LOW REFRIGERANT PRESSURE SWITCH

A. Attempting to operate below 40°F.

B. Low refrigerant charge.

C. Restriction to refrigerant flow in refrigeration circuit.

D. Poor heat transfer in evaporator tank because (1) percentage of glycol to water is too high and (2) scaled tubes in evaporator tank (chemically descale).

E. Low flow through evaporator tank due to (1) process flow restricted or (2) glycol foaming.

7.0 COMPONENT DESCRIPTIONS

7.1 SYSTEM COMPONENTS

A. **Hermetic compressor:** takes low pressure/low temperature refrigerant gas and compresses it into high pressure/high temperature gas.

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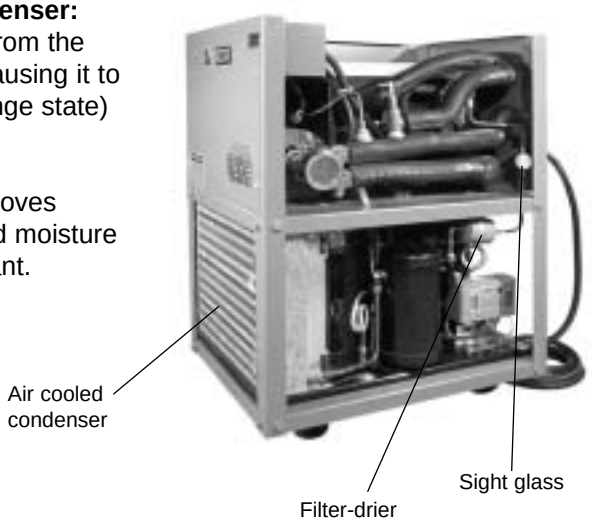
B. **Air cooled condenser:** removes BTU's from the refrigerant gas causing it to "condense" (change state) into a liquid.

C. **Filter-drier:** removes contaminants and moisture from the refrigerant.



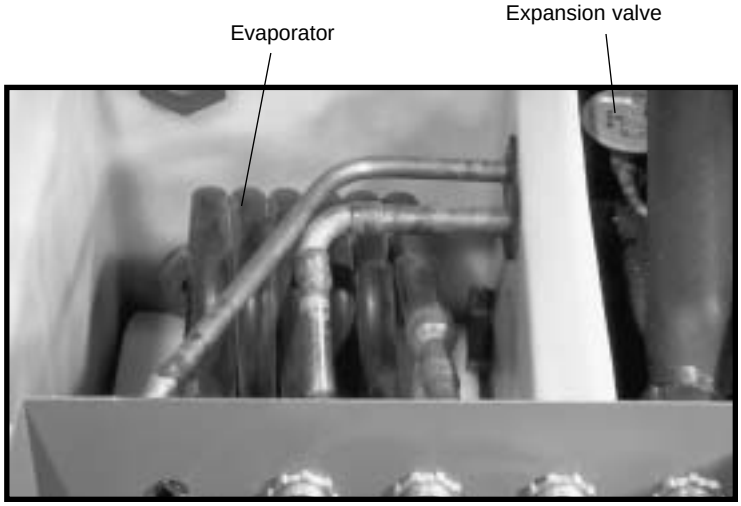
E. **Refrigerant sight glass:** indicates refrigerant charge and moisture content.

1. Refrigerant charge is determined by a clear liquid flow. Bubbles indicate low refrigerant.

2. Moisture content is indicated by the color of the element. Element color is normally green. If the color is chartreuse or yellow, the system has been contaminated with moisture. The filter-drier must be replaced. The replacement shall be done by qualified refrigerant service technician.

F. **Expansion valve:** throttles flow of refrigerant into the evaporator and creates a pressure drop in the system.

G. **Evaporator:** the heat exchanger where the refrigerant is allowed to evaporate and absorb BTU's from the process fluid.



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H. **Liquid receiver:** located after the condenser. This component receives and stores liquid refrigerant leaving the condenser.

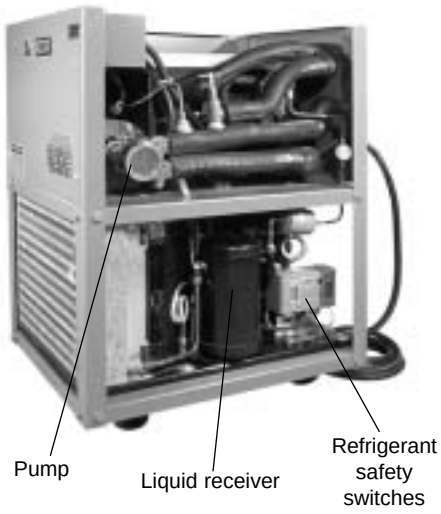
I. **High/low pressurestat switches:** protects the refrigeration system from unsafe operating levels.

1. High pressure switch: factory set to open at 325 psi. Protects the refrigeration components and personnel from potential damage or harm from high pressure. This safety shall not be readjusted for any reason.

2. Low pressure switch: factory set to open at 40 psi and to close at 55 psi. This switch protects the chiller from possible damage due to low operating pressure. For correct settings when operating at temperatures below 48°F, refer to page 22.

The switch will automatically reset when the pressure rises above the cut-in setting. If this does not occur, contact the **ADVANTAGE** service department for instructions.

J. **Process pump:** delivers fluid to process.



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8.0 OPERATION BELOW 48°F

8.1 WATER SUPPLY CONNECTION:

A. This port shall be plugged when operating the chiller below 48°F or anytime the system utilizes a water/inhibited propylene glycol solution. The system must be manually filled and the mix shall be checked for the proper ratio on a regular basis.

8.2 FREEZE PROTECTION

OPERATING TEMPERATURE	ANTI-FREEZE MIXTURE	
	GLYCOL	WATER
40°F	20%	80%
35°F	25%	75%
30°F	30%	70%

A. Addition of an inhibited propylene glycol solution is required. The ratio shall be according to the chart above.

B. **Caution:** too much glycol can cause capacity and control problems. Do not use automotive anti-freeze (see section 13.2 on page 39 for more information).

C. The freezestat and low pressurestat settings shall be adjusted according to the following chart:

OPERATING TEMPERATURE	LOW CUT IN	LOW CUT OUT	FREEZESTAT SETTING
48°F	55#	40#	38°F
40°F	50#	35#	30°F
35°F	45#	30#	25°F
30°F	40#	25#	20°F

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9.0 MAINTENANCE

9.1 PERIODIC PREVENTATIVE MAINTENANCE

A. Lubricate all motors. **Note:** some motors are supplied with sealed bearings.

B. Tighten all wire terminations.

C. Clean/check motor starter and contactor contacts.

D. Check safety switch settings.

E. Clean condenser fins of dust/dirt.

F. Flush evaporator tank.

G. Check glycol/water ratio for operating temperature.

H. Check system for leaks.

I. Refrigerant sight glass: check for bubbles when compressor is operating at 100%. Check the moisture indicator for a color other than green.

J. Clean unit.

9.2 SPECIAL MAINTENANCE

A. The following items shall be done by a qualified refrigeration service technician:

B. Vacuum check the compressor.

C. Addition of refrigerant.

D. Repair of a refrigerant leak.

E. Adjustment of the super heat.

F. Changing of the filter-drier.

G. Any procedure requiring contact of refrigerant system to atmosphere.

9.3 PUMP REPAIR

A. The positive displacement pump in the Ice Chip chiller is not field serviceable. To arrange for repair contact:

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Contact:

PROCON PUMPS
910 RIDGELY ROAD
MURFEESBORO, TN 37310
615-890-5710

10.0 TECHNICAL INFORMATION

10.1 INHIBITED PROPYLENE GLYCOL

A. To operate liquid chillers below 48°F it is necessary to add inhibited propylene glycol to the circulating system to lower the freeze point and prevent damage to the cooling system.

B. Inhibited propylene glycol contains corrosion inhibitors which are compatible with most industrial heat transfer surfaces. Inhibited propylene glycol is manufactured by a number of companies: DowFrost, Monsanto FS-1, for example.

C. Automotive anti-freeze shall not be used in industrial heat transfer applications.

D. Automotive anti-freeze contains silicate type corrosion inhibitors designed to be compatible with automotive components. In an industrial application the silicates will form a gel on the heat transfer surfaces which will result in substantial reduction in cooling capacity and which is virtually impossible to remove from system.

10.2 CHECKING THE REFRIGERANT CHARGE

A. All standard **ADVANTAGE** chillers are manufactured with thermostatic expansion valves as the metering device to the evaporator.

B. All chillers have a liquid refrigerant receiver which is part of the condenser on water cooled chillers and a separate tank on air cooled units.

C. This receiver provides a storage area for liquid refrigerant to assure a full stream of liquid refrigerant is always available to the expansion valve under various operating conditions.

D. All chillers have a refrigerant sight glass with a moisture indicator. To check the refrigerant charge under normal operating conditions:

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1. Remove the plastic cap covering the sight glass.

2. Start the chiller, allow the system pressures and temperatures to stabilize.

3. With the unit operating at 100% capacity (not in the 50% or cylinder unloading mode) the sight glass should appear clear with no foam or bubbles. If foam or bubbles are present, the chiller has suffered a loss of refrigerant and should be checked by a qualified refrigeration technician.

4. The dot in the middle of the glass is the moisture indicator. It should appear green at all times. A white or yellow color indicates moisture has entered the refrigeration system which is detrimental to the life of the compressor. The filter-drier needs to be replaced by a qualified refrigeration technician.

10.3 WARRANTY SERVICE PROCEDURE

A. In the event of a problem with a machine which cannot be resolved by normal troubleshooting procedures, the customer must obtain the correct model number and serial number of the machine.

B. They should then contact the **ADVANTAGE** service department at 317/887-0729. The service department will then attempt to determine the problem with the machine.

C. Many times with the customer's input and with the machine diagnostics the problems can be resolved over the telephone. If not, the service department will then check the records to determine warranty status of the problem machine.

D. If the machine is still covered by our warranty, we will contact our authorized service contractor and give them authorization to determine the problem and repair the machine.

E. If the machine is not covered by our warranty, we will advise the customer of the nearest authorized service contractor and offer our continued assistance until the problem is resolved.

F. **Important: ADVANTAGE** manufactures a complete line of heat transfer equipment. It is of the utmost importance that we have the correct model number and serial number of the machine in question. This will allow us to obtain the correct manufacturing records which will help our service department to properly troubleshoot the problem and obtain the proper replacement parts when they are required. This information is stamped on the metal data tag attached to the electrical enclosure of each machine.

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G. The **ADVANTAGE** service department must be notified prior to any repair or service of a warranty nature. Warranty claims will not be honored without prior notification.

10.5 CHILLED WATER FLOW

A. The evaporators in all liquid chillers are flow sensitive. The efficiency of operation is directly related to the flow of liquid.

B. Maximum efficiency is obtained at approximately 2.4 gpm per ton of rated capacity. Low liquid flow can reduce efficiency and in some cases allow ice to form in the evaporator which can damage the evaporator.

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10.5 PARTS LIST - SC-1A 21HF 230-1-60

A. Note: this is a typical parts list. Please obtain exact model # and serial # before contacting our parts department to assure an exact replacement part.

PART #	DESCRIPTION
800000	Caster - 3” swivel
810000	Caster - 3” rigid
895010	Coil - Chax 3100
1527475	Condensing unit #F3AHA101CFV-201 230-1-60 R-22
2169475	Filter drier - C-052S
2971475	Expansion valve - #EVGE-1-CP100
4345900	Controller - #EWPC 902T Type J
4714350	Pump motor - 1/2 HP 1725 RPM 230-1-60V #3K090
6206498	Thermocouple - Type J ungrounded #SP-498J A4 B48
6214050	Procon pump - #CB2507XH AMP #1113
6648300	Relay - #GL7-2A-TUBJ-CB 230 volt
7550000	Pressure switch - P70MA-1
7591075	Rocker switch - #2600A21E
7732200	Reservoir tank - #06299
8213775	Transformer - #44F3095
8828995	Bypass valve - #5300A 1/2”

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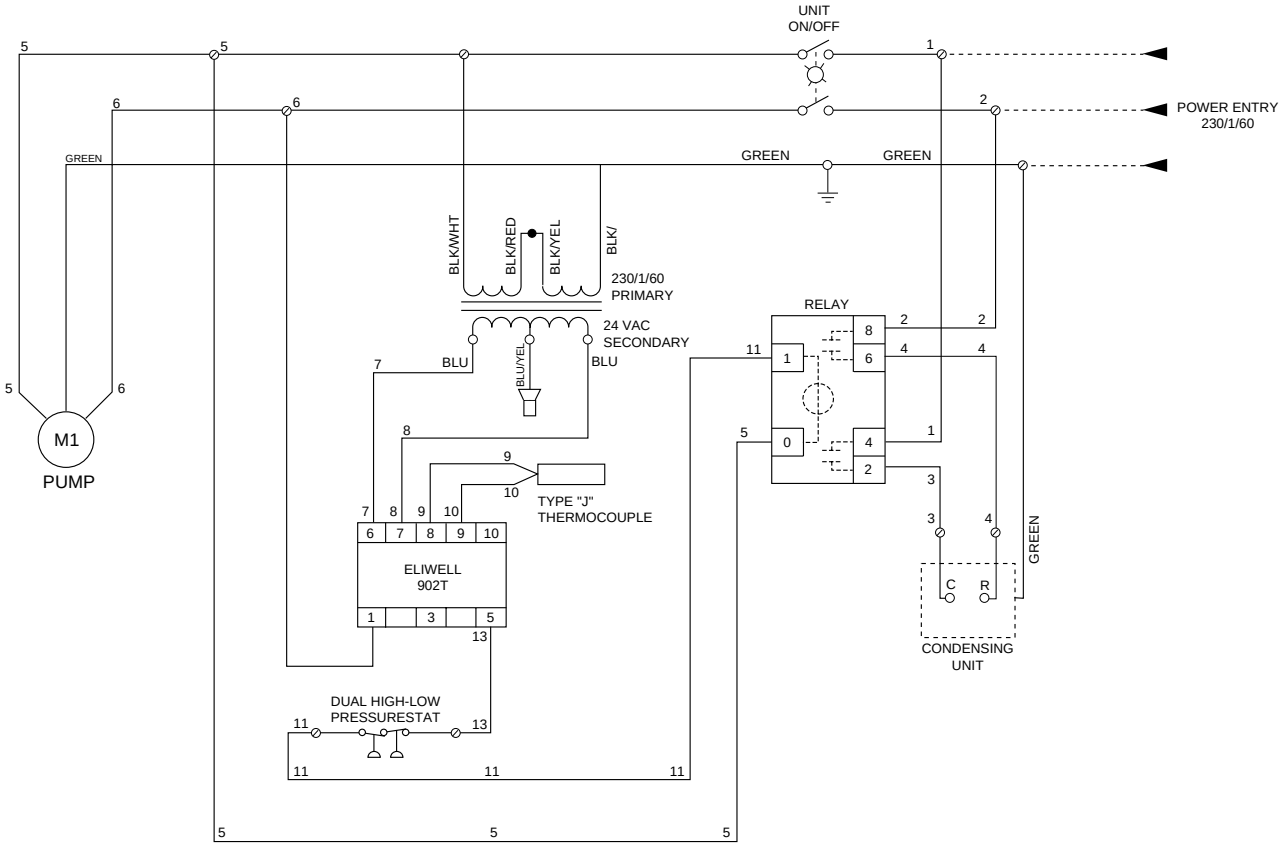
10.7 ELECTRICAL DRAWING (TYPICAL)



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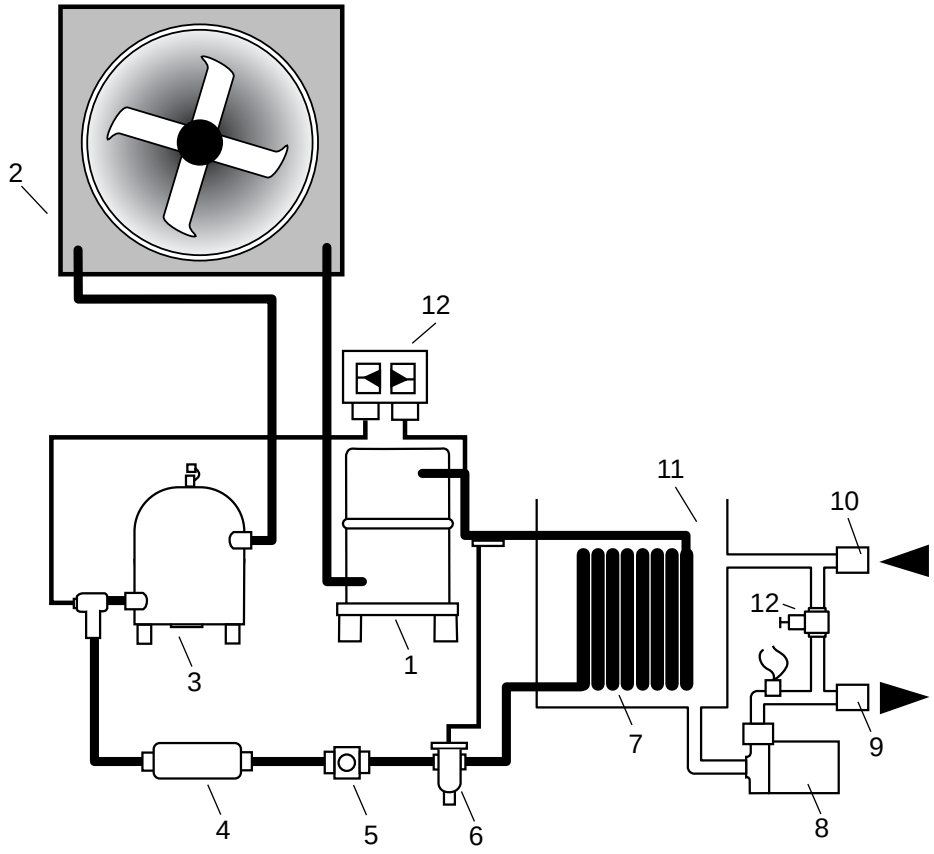
10.8 ICE CHIP CIRCUIT SCHEMATIC



ITEM	DESCRIPTION
1	Compressor
2	Air cooled condenser
3	Liquid receiver
4	Filter-drier
5	Refrigerant sight glass
6	Expansion valve
7	Evaporator
8	Pump
9	To process connection
10	From process connection
11	Reservoir tank
12	Refrigerant safety switch

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10.9 ICE CHIP TECHNICAL SPECIFICATIONS

FEATURES:

- Power cord
- Nema 1 electrics
- Microprocessor control
- Type J thermocouple
- Illuminated off/on switch
- Refrigerant sight glass
- Refrigerant filter-drier
- Refrigerant high/low pressure switch
- Polyethylene tank with lid
- Non-ferrous pump
- Casters
- Low flow by-pass valve (1/2 to 1 1/2 ton models)

SC-1A shown

OPTIONS:

- Crankcase pressure regulating valve
- Pressure gauges
- High pressure pump (standard on 1/2 to 1 1/2 ton models)

SPECIFICATIONS

MODEL	SC-1/4A	SC-1/3A	SC-1/2A	SC-3/4A	SC-1A	SC-1.5A
COMPRESSOR						
HP	1/4	1/3	1/2	3/4	1	1.5
CAPACITY (TONS)	.25	.32	.41	.70	.98	1.35
PUMP						
HP	1/25	1/25	1/4	1/4	1/2	1/2
GPM	.60	.80	.9	1.7	2.4	3.6
PSI	8	8	60	60	60	60
FULL LOAD AMPS @ 115/1/60	11	12	14	22	24	n/a
FULL LOAD AMPS @ 220/1/60	n/a	n/a	8	11	12	15
REFRIGERANT	HCFC-22	HCFC-22	HCFC-22	HCFC-22	HCFC-22	HCFC-22
TANK CAPACITY (GAL)	4	4	4	4	4	4
PROCESS PIPE SIZE (inches)	1/2	1/2	1/2	1/2	1/2	3/4
DIMENSIONS (INCHES)						
HEIGHT	33	33	33	33	37	37
WIDTH	18	18	18	18	19	19
DEPTH	24	24	24	24	25	25
WEIGHT (LBS - Net/Shipping)	150/175	150/175	170/195	205/230	210/235	220/245

Capacities are based on 90°F ambient, 50°F process water and 40°F evaporating temperatures. Capacities +/-5% as reserved by the compressor manufacturer.

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END

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