



At **Dimplex Thermal Solutions** we are aware that our success depends on your satisfaction. We thank you for the confidence you have displayed in our company through your recent purchase of a **Dimplex Thermal Solutions (DTS), Koolant Koolers Brand chiller.**

The unit is designed with your specific needs in mind to provide years of service and ongoing satisfaction. It has been thoroughly tested in our plant prior to shipping and stands ready to exceed expectations.

Please thoroughly review the enclosed materials before installation or operation. These pages contain detail regarding suggested fluids, start-up/maintenance operation and controls applications. They will guide you through the important steps of making this purchase part of your process.

As always, we stand by our product and should you require clarification or service please call us at:

**1-800-YOU-KOOL (968-5665)**  
**or 269-349-6800**

<p style="text-align: center;"><b>AIR COOLED CHILLER INSTALLATION and OPERATION MANUAL</b></p>
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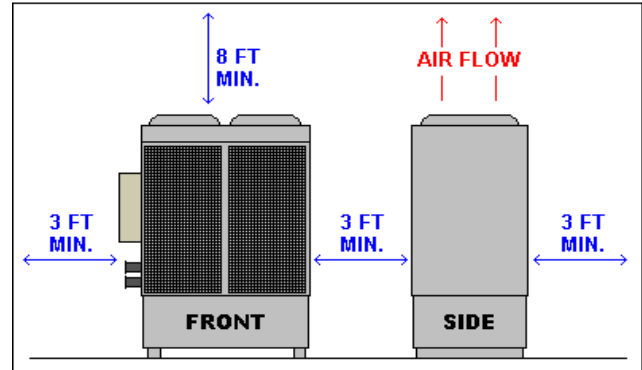
## GENERAL INFORMATION REGARDING DESIGN TEMPERATURE

Our custom chiller systems are designed to maintain the temperature of cooling fluids within a selected temperature range. Each of our units is tested through monitored operation within design parameters. This enables our experienced technicians to calibrate all instrumentation precisely to the customer's needs and verify that each individual unit will function as specified. Supporting test data is enclosed either in digital format or in print.

The units are designed to operate efficiently within given parameters. Due to varying heat exchange rates outside of design temperature, it is highly recommended that the machine operate only at temperatures within 10°F of the specified temperature. **Consult the factory if a process requires changes in excess of 10°F in either direction of design temperature.**

### INSTALLATION:

1. Read and follow all information included with the chiller manual.
2. Read and understand all warning labels and tags on the chiller before installation.
3. Ensure the unit is placed on a flat, level, hard surface. Unless the chiller has been built for outdoor operation, it must be placed indoors. Space above and around the unit must be capable of dissipating the heat rejected by the chiller and allow room for servicing. Keep the unit at least 3ft away from walls or other objects and allow full access to all openings and electrical enclosures. At a minimum, 8ft of clearance is required above the unit for proper air circulation around the chiller as shown in Fig 1.
4. Chillers with solid feet should be secured using the provided mounting holes if possible. Units that have caster wheels should be locked to ensure the chiller does not move around.



**Figure 1. Minimum Installation Clearances**

5. Connect fluid lines to the proper fittings from the process to the chiller marked "FLUID INLET TO CHILLER" and "FLUID OUTLET FROM CHILLER". Make sure that the flow of fluid to and from the unit can not be shut off or blocked while the chiller is in operation. Piping size should be large enough to match the fluid flow conditions, generally the size of the fittings on the chiller.
6. Fill the process plumbing and, if applicable, the chiller reservoir with the proper type and amount of fluid. **Check with the manufacturer of the process equipment for specific fluid requirements. Refer to the "Process Fluid Recommendations" section of the manual for information on using water in the chiller.**
7. Purge any air out of the fluid system to ensure that the pump suction is flooded. If possible, bleed any air trapped in the pump by opening the vent plug at the top of the pump until no more air comes out and fluid is present in the pump cavity.

**DO NOT ALLOW THE FLUID PUMP TO RUN DRY. THIS WILL DAMAGE THE PUMP SEALS AND WILL NOT BE COVERED UNDER WARRANTY.**



8. Connect any communication wiring between the chiller and process equipment including remote controls and interlocks. All communication and remote wiring is to be provided by the customer. Refer to the chiller's electrical prints for information on wiring locations.

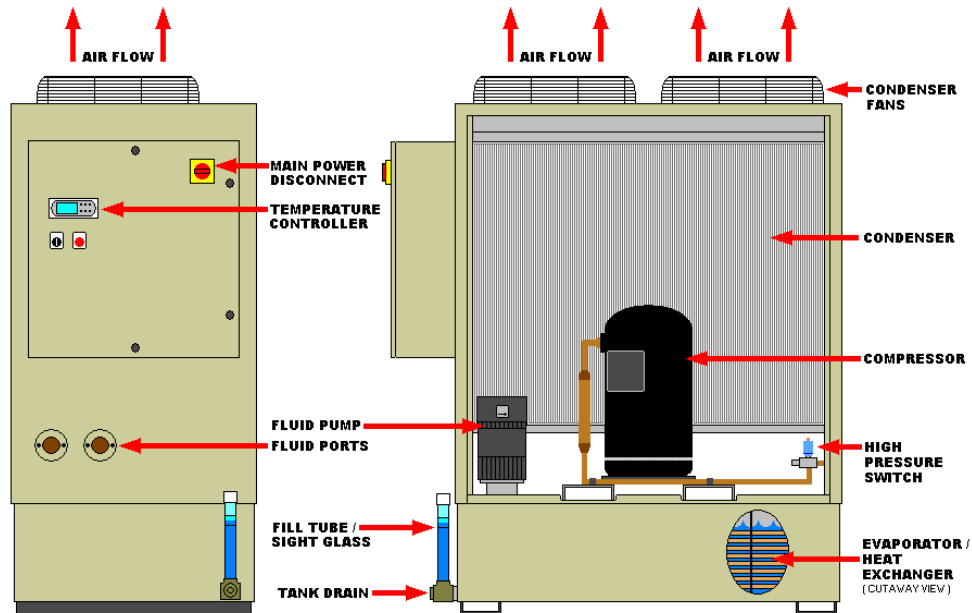
9. Run power wiring to the chiller's main disconnect. Conductor size should match the chiller's disconnect size and power requirements in accordance with local codes. Ensure the power supplied matches the chiller data plate requirement for voltage, frequency, and amperage.
10. All inclusive units are shipped with the proper refrigerant charge in place. No adjustments

should be necessary to the refrigeration system before startup. Refrigeration service valves are shipped in the open (back-seated) position.

11. Chillers with a remote condenser are shipped with a nitrogen charge from the factory. Refer to the included refrigeration drawing or contact Dimplex Thermal Solutions (DTS) for instructions on installing remote condenser units.

### BASIC COMPONENTS:

Refer to Figure 2 for identification of the main parts on a standard DTS chiller. Please note that this is only a general representation of components and the model of your chiller may differ from the design shown. Contact Dimplex Thermal Solutions for specific component information regarding your chiller.



**Figure 2. Basic Air-Cooled Chiller Components**

## PRE-STARTUP PROCEDURE:

1. Complete all steps of the *installation* process before applying power to the chiller.
2. If the unit is equipped, ensure the system switch is in the OFF position, then turn on the main power disconnect. The temperature controller will turn on and automatically go into a self-test. When the self-test is complete, the controller will begin to monitor the process fluid.
3. For units that run on three-phase power, **motor rotation must be checked and corrected to avoid damaging the chiller and voiding the warranty.** If the chiller is equipped with a phase protector, the unit will not start up and may display a fault if phase rotation is not correct. Correcting phase rotation should make this fault go away.


Single phase units will not be affected by any certain phase rotation and should continue on with step 4 of the *pre-startup procedure*.

If the unit is equipped with a process fluid pump, phase rotation can be checked by briefly turning on the system and allowing the pump to energize. Watch the rotation of the cooling fan on the pump to see that it is turning in the direction indicated by the rotation arrow on the pump motor. Do not use condenser fans to judge phase rotation as many three phase units have single phase fans and will run correctly from DTS even with incorrect power phasing.

If the unit does not have a pump or any other visual method of checking rotation, a phase checking device can be used to check power at the disconnect. All components of the chiller are wired to operate with a "right-hand" phase rotation. If you do not have a phase checking device, a certified refrigeration technician should be utilized to monitor refrigerant pressures as the chiller compressor comes online.

**All motors within the chiller are synchronized at the factory for proper rotation.** If one motor is turning in the wrong

direction, all other motors will as well. **DO NOT** change the orientation of any motor leads within the chiller. If phase rotation is incorrect, shut off the power feed and change any two incoming power leads **BEFORE** the main disconnect.

4. Chillers two tons or larger are equipped with a compressor crankcase heater. These units must have power supplied to the unit with only the disconnect switch on for 8 hours prior to starting the chiller. This will raise the temperature of the compressor oil enough to vaporize any refrigerant that may be in the crankcase oil.  **Failure to allow this warm-up can result in compressor damage.**
5. Ensure all process fluid lines and shutoff valves are open and the system is able to flow freely. Re-check the fluid level in the system before continuing with the startup.

## INITIAL STARTUP & OPERATING PROCEDURE:

1. Complete all steps of the *pre-startup procedure* before starting the chiller process.
2. Before turning on the chiller system, become familiar with the operation of the temperature controller on the chiller. Refer to the *temperature controller guide* in this manual for instructions.
3. Turn on the chiller process by moving the selector switch to either ON or LOCAL. If the unit is wired to start remotely, turn the selector switch to REMOTE and start the chiller from the other location.

Chillers that do not have a process selector switch or remote control should begin the chilling process as soon as the disconnect switch is turned on.

4. If the unit is equipped with a process pump, it will energize and produce flow as soon as the

chiller is turned on. Monitor any system pressure gauges and make note of initial pressures. The pump may need to run for several minutes to allow any air to be worked out of the system before regular flow is established. Any fluid bypass valves in the system should be factory set according to customer specifications but may need slight adjustment in the field. **Consult the factory before making any adjustments to the system.**

5. Check the entire fluid system for leaks and ensure there is flow throughout the system.
6. After the pump turns on, the temperature controller will then analyze the process fluid temperature and determine whether or not cooling is needed. If the fluid temperature is above setpoint, the refrigerant compressor will commence and begin cooling the fluid.
7. Monitor the chiller to ensure it is performing as designed. The chiller should be able to maintain the desired fluid setpoint under a full load from the process. Slight adjustments may be necessary according to your specific process. Please consult a technician at Dimplex Thermal Solutions before making any changes to the unit.
8. To turn off the chiller process, move the selector switch to the OFF position. With the selector OFF, the temperature controller display will be on to monitor the process, but indicate the system is off. **Keep the chiller's main power-disconnect ON even when the chiller is not in use**, unless it is used to turn the chiller process off and on. This keeps the power to the crankcase heater and prevents compressor damage when starting again.



If the unit is equipped with a fluid maintenance heater, the heater will operate if the fluid falls below the factory setpoint and will operate with the selector switch off.

## **MAINTENANCE AND SPARE PARTS:**

**Proper maintenance is the key to extending the life of your chiller.** Routine checks and a watchful eye will minimize costly repairs and down time. Establish a regular schedule of maintenance depending on the amount the chiller is used and the environment in which it is used. Environments that are very dirty or dusty will require more attention than ones that maintain a cleaner atmosphere.

This list of maintenance items will help to ensure an operational chiller:

### **1. Inspect and clean condenser / air filters**

Excessive buildup of dirt, oil, and other debris on the condenser coil will cause refrigerant pressures to increase and not allow the unit to perform to its full capacity. Ensure the fins of the condenser are clean and not damaged to keep airflow at a maximum. Use compressed air at no more than 30PSI to blow out the condenser in the opposite direction of air flow. If the unit is equipped with air filters, clean them with compressed air or wash them out with water and allow drying before reinstallation.

### **2. Check water quality/glycol mixture**

The process fluid should be clean and free of contaminants. If the chiller has a reservoir, check for debris or contaminants which could reduce the efficiency of your chiller. Check for normal inlet and outlet fluid pressures through the chiller. A large pressure differential could indicate a plugged heat exchanger or dirty tank. Test the process fluid to ensure proper freeze and corrosion protection in accordance with original design specifications. Do not test the process fluid from the sight glass due to the lower turnover at that location.

### **3. Inspect fluid filters**

Fluid filters should be clean enough to allow for proper flow and pressure in the system. An increased fluid pressure on the system may indicate a dirty filter. Replacement of fluid filters should be done at regular intervals to keep the fluid system clean and free flowing. Inspect fluid filters shortly after initial start-up of the chiller and establish a basis for how frequently they may need to be changed in the future.

#### 4. Inspect fluid system

Visually check for fluid leaks throughout system. Physically check for loose pipe fittings or hoses. Ensure that no plumbing parts are wearing, cracking, or chafing.

#### 5. Check voltage & amp draws

Check for proper incoming voltage and current draws on all motors and heaters. Refer to the chiller's electrical schematics or the motor nameplate for proper voltage and amperage ratings. Readings should be within +/- 10% of the nameplate and have a maximum difference of +/- 2% between each phase.

#### 6. Inspect mechanical components

Check mechanical components of the chiller for signs of wear or over-heating. Metallic sounds or other excessive noise could indicate a problem with the chiller. Discolored paint or metal could be a sign of a motor under excessive load and over-drawing current. Keep all components with lubrication fittings properly filled according to the nameplate data or information tag.

#### 7. Check all wiring

Ensure the chiller's main power disconnect is OFF. Check the electrical box and all junction boxes for any loose or damaged wiring. Replace any wiring that could cause problems with shorting or unintentional grounds.

#### 8. Inspect/test refrigeration system

Check the inside of the chiller for evidence of refrigerant leaks. Spots of oil inside of the chiller or refrigeration lines covered in oil could indicate a possible leak. Have a certified refrigeration technician check the refrigeration system for proper operation. The technician should check the unit, monitor operating pressures, and adjust as needed.

➤ **For more information, contact the DTS Service Department 24 hours a day at 1-800-YOU-KOOL. Be sure to have model and serial number ready when calling.**

➤ **To purchase spare parts and regular maintenance items for your chiller, contact our Parts department at 1-800-YOU-KOOL.**

### PROCESS FLUID RECOMMENDATIONS:

**For recommendations on the correct process fluid to use in your chilling system, refer to the manufacturer of the equipment served by the chiller. Most manufacturers have a specified type of fluid for correct system operation.** This document should serve as a guide only when using a glycol and water mixture for the heat transfer fluid.

#### **USING WATER FOR CHILLER PROCESS:**

Dimplex Thermal Solutions recommends the use of an industrial inhibited glycol and water mixture in its water chiller systems. The main job of glycol is to prevent freezing of the process fluid and ensure consistent flow at the operating temperature. Inhibited glycols will also prevent formation of scale and corrosion while protecting metals such as brass, copper, steel, cast iron, and aluminum. Water systems treated with inhibited glycol will also be protected from algae and bacteria that can grow and degrade the fluid system performance. **Ethylene** and **Propylene** are the two standard types of inhibited glycols that can be used in DTS chillers.

- Do not mix different types or brand names of glycol as this can result in some inhibitors precipitating out of the solution.
- Do not use automotive grade anti-freeze in the chiller process. These types of glycols are not designed for industrial applications and may cause problems with heat transfer or fluid flow. Many automotive glycols contain silicate-based inhibitors that can coat heat-exchangers, attack pump seals, or form a flow restricting gel.

Check state and local codes when selecting the process fluid. Certain areas may have environmental regulations concerning the use and disposal of glycol or other additives.

#### **ETHYLENE GLYCOL:**

Ethylene glycol is the standard heat-transfer fluid for most industrial applications. This type of glycol can be used in any application where a low-toxicity content is not required. Ethylene glycol has moderately acute oral toxicity and should not be used in processes where the fluid could come in

contact with potable water, food, or beverage products.

**PROPYLENE GLYCOL:**

Propylene glycol maintains generally the same freeze protection, corrosion and algae prevention as ethylene glycol, but has a lower level of toxicity. This type of glycol is more readily disposable than ethylene and safer to handle. Propylene glycol is commonly used in the food industry and in applications where the user may come in frequent contact with the fluid.

[Dimplex Thermal Solutions recommends the use of K-Kool Glycols in its units.](#)

**WATER:**

When selecting the water to mix with the glycol, use a good quality, filtered source that meets the requirements of the process machine manufacturer. Dimplex Thermal Solutions recommends the use of **distilled** or **reverse-osmosis** water for the water / glycol mixture.

**De-ionized** water can be used to fill the chiller process initially, but should not be maintained to a de-ionized state thereafter. Unless the chiller has been ordered and designed for the use of water that is continually de-ionized, the fluid will actually attack certain metals within the chiller and cause damage to some components. Damage caused by

the use of maintained de-ionized water in a chiller not designed for it will not be covered under warranty. Consult DTS before continuously using de-ionized water to check for compatibility.

The use of regular tap water is not recommended. Water from the "city" or "ground" contains deposits and additives which can decrease component life and increase maintenance time.

**GLYCOL / WATER MIXTURES:**

The location of the chiller and environmental concerns must be taken into account when selecting the proper mixture of glycol and water for the chiller process. A process which is located completely indoors and has no chance of freezing will require less glycol than a system located outdoors where low temperatures can cause the fluid to freeze and piping to burst. Applications that have a low operating temperature (below 30°F) should use a glycol mixture equivalent to an outdoor system.

After selecting the proper glycol and water types, use the following chart to determine the recommended mixture depending on application and location of the process. The glycol percentage figures in the chart below will apply to any brand of ethylene or propylene glycol.

APPLICATION	GLYCOL %	WATER %	FREEZE PROTECTION*	BURST PROTECTION*
Indoor chiller and process	30	70	5°F / -15°C	-20°F / -29°C
Outdoor chiller / Low fluid temperature system (<30°F)	50	50	-35°F / -37°C	-60°F / -60°C

\* Figures based on performance of DTS "K-Kool-E" brand of Ethylene Glycol.

**FLUID MAINTENANCE / FILTRATION:**

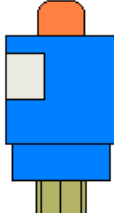
Maintaining clean process water and the proper glycol content will extend the life of the system and reduce costly down-time. If the chiller was not equipped with a fluid filter from the factory, it is highly recommended to install some sort of filtering system to remove unwanted dirt and debris. Refer to the *Chiller Maintenance* section of the manual for water and filter maintenance information.



## TROUBLESHOOTING GUIDE:

- This guide should serve as a general outline for troubleshooting issues with all Dimplex Thermal Solutions chillers. Due to the various models of DTS chillers, the items listed in *possible causes* may not apply to every DTS chiller. Contact the DTS customer service department for assistance at 1-800-YOU-KOOL
- Refer to the *Warranty Procedures* section of this manual before having any work performed on units that are under warranty.

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Chiller will not turn on. (No display on temperature controller)	<ul style="list-style-type: none"> <li>• No power to chiller.</li> <li>• Main disconnect turned off.</li> <li>• Blown fuses.</li> <li>• Tripped starter overloads.</li> </ul>	<ul style="list-style-type: none"> <li>• Check power feed to chiller.</li> <li>• Turn on main disconnect.</li> <li>• Check for and replace blown fuses.</li> <li>• Reset any tripped overloads.</li> </ul>
Chiller turns on but nothing happens. (Display is on but no pump or cooling cycle)	<ul style="list-style-type: none"> <li>• Selector switch not turned on.</li> <li>• Remote signal not active.</li> <li>• Fault present within chiller.</li> <li>• Fluid pump not operating.</li> <li>• Blown fuses.</li> <li>• Phase rotation incorrect.</li> </ul>	<ul style="list-style-type: none"> <li>• Turn selector switch to ON or LOCAL.</li> <li>• Check remote connection for signal.</li> <li>• Determine fault and clear if possible.</li> <li>• Check pump overload and power to contactor.</li> <li>• Check and replace fuses.</li> <li>• Correct phase rotation at main disconnect.</li> </ul>
Fluid pump is on but does not create required pressure or flow. (Flow fault)	<ul style="list-style-type: none"> <li>• No fluid present at pump suction.</li> <li>• Pump discharge closed or blocked.</li> <li>• Fluid is dirty / dirty filters.</li> <li>• Fluid line size too small.</li> <li>• Pump / fluid system is air-bound.</li> <li>• Phase rotation incorrect.</li> </ul>	<ul style="list-style-type: none"> <li>• Check fluid level and ensure there is fluid at the pump's suction.</li> <li>• Ensure all fluid lines are open to flow.</li> <li>• Clean fluid and change filters.</li> <li>• Up-size fluid lines outside of chiller.</li> <li>• Vent pump cavity to flood the suction.</li> <li>• Correct phase rotation at main disconnect.</li> </ul>
Fluid pump is operational but the refrigerant compressor will not run.	<ul style="list-style-type: none"> <li>• Fluid temp is below setpoint.</li> <li>• Inadequate fluid flow.</li> <li>• Low refrigerant pressure.</li> <li>• High refrigerant pressure.</li> <li>• Compressor overload tripped.</li> <li>• Compressor lube protector tripped (If equipped).</li> <li>• Blown fuses to compressor.</li> <li>• Faulty temp controller output.</li> <li>• Bad compressor.</li> </ul>	<ul style="list-style-type: none"> <li>• Allow fluid system to increase in temperature.</li> <li>• Correct fluid system to establish flow.</li> <li>• SEE "Low refrigerant fault" section.</li> <li>• SEE "High refrigerant fault" section.</li> <li>• SEE "Compressor overload" section.</li> <li>• Reset lube protector.</li> <li>• Check and replace blown fuses.</li> <li>• Consult DTS customer service department.</li> <li>• Consult DTS customer service department.</li> </ul>
Chiller is running but does not maintain the desired fluid temp.	<ul style="list-style-type: none"> <li>• Fault present within chiller.</li> <li>• Phase rotation incorrect.</li> <li>• Fluid or heat exchanger is dirty.</li> <li>• Loss of flow or fluid level.</li> <li>• Low refrigerant pressure.</li> <li>• Ambient temperature too high.</li> <li>• Heat load exceeds chiller's capacity.</li> </ul>	<ul style="list-style-type: none"> <li>• Determine fault and clear if possible.</li> <li>• Correct phase rotation at incoming power.</li> <li>• Replace fluid and clean fluid system.</li> <li>• Check fluid system for free flow and ensure chiller has adequate fluid level.</li> <li>• Restart chiller or clear fault on controller. SEE "low refrigerant fault" section.</li> <li>• Ensure chiller is operating within its designed ambient temperature specification.</li> <li>• Reduce heat load to chiller if possible. Check the factory specifications to ensure the chiller is not being operated more than +/- 10°F of the original temperature setpoint or fluid flow.</li> </ul>

<p>Low refrigerant pressure fault - (<u>Automatically reset when satisfied with pressure</u>)</p>	<ul style="list-style-type: none"> <li>• Low ambient air temperature.</li> <li>• Loss of fluid flow through evaporator.</li> <li>• Loss of refrigerant.</li> <li>• Refrigerant solenoid not functional.</li> <li>• Faulty pressure switch.</li> <li>• Compressor crankcase not warm or faulty crankcase heater.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure chiller is operating within its designed ambient temperature specification.</li> <li>• Check fluid flow and ensure evaporator is clean.</li> <li>• Have a refrigerant technician leak check unit and charge with the appropriate refrigerant.</li> <li>• Check wiring to solenoid or replace valve.</li> <li>• Replace pressure switch.</li> <li>• Ensure main power disconnect has been on for at least 8 hours prior to use. Replace crankcase heater if faulty.</li> </ul>
<p>High refrigerant pressure fault - (<u>Manually reset inside of chiller</u>)</p>  <p>(Example of a high pressure switch shown)</p>	<p><u>AIR COOLED CHILLERS:</u></p> <ul style="list-style-type: none"> <li>• Air filters dirty.</li> <li>• Condenser dirty.</li> <li>• Incoming air too hot.</li> <li>• Inoperative fans.</li> <li>• Back panel out of chiller.</li> <li>• Phase rotation incorrect.</li> <li>• Refrigerant system overcharged.</li> </ul> <p><u>WATER COOLED CHILLERS:</u></p> <ul style="list-style-type: none"> <li>• Low water flow to condenser.</li> <li>• Condenser dirty.</li> <li>• Regulating valve operating incorrectly.</li> <li>• Refrigerant system overcharged.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean filters (See maintenance section).</li> <li>• Clean condenser (See maintenance section).</li> <li>• Ensure the chiller is properly ventilated with fresh air not exceeding 90°F, unless designed for high-ambient temperature operation.</li> <li>• Check for blown fan fuses.</li> <li>• Ensure all covers and panels are in chiller.</li> <li>• Correct phase rotation at incoming power.</li> <li>• Have a refrigeration technician ensure the system is properly charged.</li> <li>• Check condenser water supply and pressure.</li> <li>• Clean condenser.</li> <li>• Have a refrigeration technician adjust the valve to the proper pressure setting and check operation.</li> <li>• Have a refrigeration technician ensure the system is properly charged.</li> </ul>
<p>Compressor overload - (<u>May be manually or automatically reset, depending on compressor</u>)</p>	<ul style="list-style-type: none"> <li>• Compressor running too hot.</li> <li>• Temperature setpoint too high.</li> <li>• Refrigerant pressures too high or low.</li> <li>• Faulty overload module.</li> <li>• Low voltage to chiller.</li> <li>• Defective compressor.</li> </ul>	<ul style="list-style-type: none"> <li>• Allow compressor to cool, then restart unit.</li> <li>• Move temperature setpoint to +/- 10°F of factory setting.</li> <li>• Have a refrigeration technician monitor pressures and determine cause.</li> <li>• If compressor will run, check amp draw on compressor leads to verify compressor is ok.</li> <li>• Correct incoming voltage.</li> <li>• Replace compressor.</li> </ul>

## GENERAL WARRANTY PROCEDURES:

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### **WARRANTY WORK:**

Before doing any work on a chiller covered under warranty, call Dimplex Thermal Solutions (DTS) and explain the problem to one of our service technicians who can then determine the best course of action. DTS will not be obligated to pay for warranty service performed without our prior approval.

Refer to the *Warranty* section of this manual on the specific terms of warranty for your chiller.

**Please Note:** It is the service contractor's responsibility to enclose a service report/work order with each invoice. Unless pre-authorized for special circumstances, DTS will not honor invoices for work done by two or more people at a time, or for overtime labor charges. If the customer requests work that falls into either of these categories, the customer is responsible for the extra charges incurred.

### **WARRANTY PARTS:**

All replacement parts under warranty must come from Dimplex Thermal Solutions. When it is necessary for DTS to replace parts which are under warranty, we will issue a Returned Goods Authorization (RGA) for all parts we wish to have shipped back to our factory, freight prepaid. RGA's are valid for a period of thirty (30) days. If DTS has not received the requested parts by the expiration date, the customer will be invoiced for the replacement cost at that time.

**Please Note:** While DTS is willing to pay freight charges one way for replacement parts, special freight charges such as next day service, Saturday delivery, etc, are not included. If the customer requests one of these special services, they are responsible for the charges incurred.

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## **DIMPLEX THERMAL SOLUTIONS**

**2625 Emerald Drive  
Kalamazoo, MI 49001**

**1-800-YOU-KOOL  
(1-800-968-5665)**

**Dimplex Thermal Solutions, Inc.**  
**Terms and Conditions of Sale**

**1. OFFER AND ACCEPTANCE**

Dimplex Thermal Solutions, Inc. (Seller) offers to sell the equipment, materials or services indicated in strict accordance with the terms and conditions stated herein. Submittal of a Purchase Order or execution of this offer by Buyer, or allowing Seller to commence work, shall be deemed an acceptance of this offer, through which offer and acceptance shall constitute a legally enforceable contract between Buyer and Seller. Any additional or differing terms and conditions contained on Buyer's Purchase Order (whether or not such terms materially alter this offer) are hereby rejected by Seller and shall not become part of the contract between Buyer and Seller unless expressly consented to in writing by Seller.

**2. PRICE**

The prices contained in this offer to sell are firm upon acceptance by Buyer, provided: (1) that such acceptance occurs within thirty (30) days of the submission of this offer and (2) that within ninety (90) days of Buyer's acceptance, Buyer authorizes Seller to release for fabrication (in accordance with approved submittal data) and shipment immediately upon completion of fabrication. In the event that Buyer's release for fabrication is not received by Seller at Kalamazoo, Michigan, within such ninety (90) day period, prices are subject to increases equal to the percentage increase in Seller's prices during such period of delay.

**3. TERMS OF PAYMENT**

Upon normal credit approval by Seller's Credit Department, terms of payment for goods shipped hereunder shall be net thirty (30) days immediately following shipment of any portion of the goods. Seller reserves the right to add to any account outstanding more than thirty (30) days a charge of one and one-half percent (1-1/2%) of the principal amount due at the end of each thirty (30) day period. Unless other terms are specifically negotiated between Buyer and Seller, orders over \$50,000.00 shall require a thirty percent (30%) deposit by Buyer at the time the purchase order is issued by Buyer to Seller. Irrevocable sight letters of credit or wire transferred prepayment in full for the purchase amount shall be required for a Buyer outside the United States. In the event of disapproval by the Seller's Credit Department or if Buyer does not agree to Seller terms, terms of payment will be established through mutual agreement of Buyer and Seller. If Buyer submits or requests design or specification changes after the date on which Seller acknowledges the order, Seller is entitled to charge Buyer, and Buyer is obligated to pay, a change order fee as determined and set by Seller for all costs and expenses incurred by Seller as a result of the requested changes. Such additional costs and expenses include but are not limited to engineering time, parts to be ordered, manufacturing time and materials used as a result of the requested changes.

**4. PERFORMANCE**

Seller shall not be held liable for failure or delays in delivery hereunder where such failure or delay is due to the disapproval of the Seller's Credit department, or due to force majeure, fires, accidents, national emergency, failure to secure materials from the usual sources of supply, or any other circumstance beyond the control of the Seller. Upon occurrence of any of the before-mentioned events, Seller may cancel this order without any liability on the part of the Seller. Receipt of the equipment by Buyer upon its delivery shall constitute a waiver of all claims for delay.

**5. PRODUCT DESIGN**

Seller does not assume responsibility for nor warrants the performance or accuracy of Buyer's furnished design, design criteria, or specifications.

**6. TAXES**

All prices in Seller's offer to sell are exclusive of taxes. The amount of any present or any future occupation, sales, use, service, excise or other tax which Seller shall be liable for, either on its own behalf or on behalf of the Buyer, with respect to any orders for machinery or services, shall be in addition to the billing prices paid by the Buyer.

**7. WARRANTY OF WORKMANSHIP AND MATERIALS**

**THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE AND, EXCEPT AS SPECIFICALLY SET FORTH IN THIS SECTION 7, ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESSED OR IMPLIED, ARE HEREBY DISCLAIMED AND EXCLUDED BY THIS AGREEMENT. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION HEREOF. SELLER'S WARRANTIES HEREIN APPLY ONLY TO THE ORIGINAL PURCHASER AND DO NOT EXTEND, EXPRESSLY OR BY IMPLICATION, TO ANY OTHER PERSON OR PERSONS.**

Seller guarantees all North American installed equipment and materials of its manufacture or start-up services performed by Seller against defects in workmanship and material—under normal and intended use, service, maintenance and proper installation—for a period of twelve (12) months as to Schreiber Brand Chillers and eighteen (18) months for Koolant Kooler Brand Chillers from date of shipment. Equipment installed outside of North America will be warranted for parts only, standard delivery shipment. The Seller obligation under this agreement is limited solely to repair or replacement at Seller's option, in Seller's factory or in the field, with Seller approval, within said warranty period. If the equipment is returned to Seller's factory, the unit must be returned freight prepaid, with prior approval from Seller, with Buyer having obtained a returned goods authorization (RGA) number from Seller. Seller will make any needed repairs at no charge to Buyer if the damage is determined not to be the fault of the Buyer. Seller will then return the equipment to Buyer freight prepaid; in other words, Seller will be responsible for one leg of the transportation costs. The above warranty shall not apply to any equipment, or components thereof, which have been subject to abnormal or improper use, negligence (including failure to maintain the equipment as recommended in writing by Seller) or accident or which have been altered or repaired by other than Seller or Seller's authorized representative. Nothing shall be construed as an additional warranty unless specifically designated as such in writing and signed by Seller ("Additional Warranty"). The Additional Warranty shall be subject to the provision of Section 7 as to duration and limitation of remedy, unless the Additional Warranty expressly amends such provisions. The above warranty shall not apply to any parts sold independently of the unit sold. All parts sales are subject to ninety (90) day warranty.

**8. LIMITATION OF LIABILITY**

Seller does not assume or authorize any person to assume for Seller any liability or obligations in connection with sale of equipment, except said repair or replacement of the defective part as set forth in Section 7. Seller's liability does not include any labor charges for replacement of parts, adjustments, repairs, or any other work done outside Seller's factory without Seller's approval. Seller's liability does not include any consequential or resulting damage to persons, property, equipment, goods, merchandise, profits, good will or reputation arising out of any defect in or failure of Seller's equipment. Seller's obligation to repair or replace does not apply to any equipment or component of such equipment which has been repaired or altered outside of Seller's factory in any way, or which has been subject to negligence, misuse, or to pressure and temperature outside of stated limits. Nothing in these warranty provisions will impose any liability or obligation of any type, nature or description upon Seller if Seller has not received payment in full for the equipment in question. All stated warranty policies are limited to sales and ultimate shipment of equipment within the continental U.S. only. Shipments to other states or countries must be handled on an individual basis.

**IN NO EVENT SHALL SELLER'S LIABILITY EXCEED THE PAYMENTS RECEIVED BY SELLER FROM BUYER UNDER THE PARTICULAR PURCHASE ORDER, NOR SHALL SELLER BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES. THE LIMITATIONS ON DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING BUT NOT LIMITED TO CONTRACT WARRANTY, TORT OR STRICT LIABILITY.**

#### **9. DELIVERY**

Shipping dates are approximate only. No shipping date requested or specified by Buyer will be binding on Seller unless an authorized officer of Seller agrees to the request or specification in writing. Failure by the Seller to meet the quoted delivery date will not give Buyer the right to cancel the order or to hold Seller responsible for any damages resulting from the inability to deliver within the stated time. Shipment shall be F.O.B. factory with title transferring to Buyer upon delivery to the carrier by Seller.

#### **10. CANCELLATION**

Buyer and Seller agree that Seller would incur damages from a change order or termination by Buyer and Buyer agrees to liquidate Seller's damages as follows: (1) if, after Seller's acceptance, Buyer makes, requests or demands changes to the design of the Work, Buyer must pay all increased costs and expenses incurred by Seller as a result of such changes, in an amount set in Seller's good faith discretion; (2) if Buyer terminates this agreement, Buyer must pay Seller an amount calculated in the discretion of Seller, which is to approximate the costs incurred and committed to by Seller relative to the work; and (3) if the termination by Buyer occurs after Seller has substantially completed the Work, the Buyer must pay Seller a restocking fee of eighty percent (80%) of the purchase price for all non-stock equipment or a restocking fee of twenty-five percent (25%) of the purchase price for stock equipment.

Buyer acknowledges that any charges assessed above are reasonable in light of the difficulties in proof of actual losses caused by Buyer's changes or termination and are not to be construed as a penalty. Any payments pursuant to this Paragraph 10 are due and payable in full within ten (10) days of Seller sending Buyer a notice of said charges by registered mail, certified mail, or electronic mail.

#### **11. FREIGHT CHARGES**

Shipment shall be F.O.B. point of manufacture. Unless buyer designates in writing a specific mode of shipment of the equipment ordered herein ("Order"), shipment shall be made by any reasonable means of transportation at the direction of the Seller for the account of Buyer; and at Seller's discretion, shipment made freight collect. Delivery of the order to a carrier for transportation to Buyer ("Shipper") shall constitute delivery to Buyer and Shipper shall be deemed Buyer's agent for such purpose. Any claims Buyer may have for damages to or loss of Order shall be made directly to Shipper.

#### **12. DISPUTES AND CHOICE OF LAWS**

This contract shall be deemed to have entered into and shall be governed by the laws of the State of Michigan. All claims, disputes and controversies arising out of or relating to this contract, or the breach thereof, shall, in lieu of court action, be submitted to arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association, and any judgment upon the award rendered by the arbitrator(s) may be entered in a court having jurisdiction thereof. The site of the arbitration shall be Kalamazoo, Michigan, unless another site is mutually agreed between the parties. The parties agree that any party to the arbitration shall be entitled to discovery of the other party as provided by the Federal Rules of Civil Procedure; provided, however, that any such discovery shall be completed within four (4) months from the date of Demand by Arbitration is filed by the American Arbitration Association.

#### **13. COSTS TO SELLER**

In the event it becomes necessary for Seller to incur any costs or expenses in the collection of monies due Seller from Buyer, or to enforce any of its rights or privileges hereunder, Buyer, upon demand, shall reimburse Seller for all such costs and expenses (including, but not limited to, reasonable attorney's fees).

#### **14. ENTIRE AGREEMENT**

These terms and conditions, and the matter set forth on the face of Seller's offer to sell, constitute the entire agreement between Seller and Buyer. No prior understandings, agreements, or representations, written or verbal, express or implied, are a part of this contract, nor shall any subsequent modification, agreement or representation become part of this contract unless expressly agreed to in writing by an authorized representative of Seller.



DuPont Chemicals



DuPont Chemicals

2187FR

Revised 12-APR-1996

Printed 19-AUG-1997

# "SUVA" 134A

## CHEMICAL PRODUCT/COMPANY IDENTIFICATION

### Material Identification

Corporate MSDS Number	DU000693
CAS Number	811-97-2
Formula	CH2FCF3
CAS Name	" SUVA " 134A

### Tradenames and Synonyms

HCF 134A  
VT1505

### Company Identification

MANUFACTURER / DISTRIBUTOR  
DuPont  
1007 Market Street  
Wilmington, DE 19898

### PHONE NUMBERS

Product Information	1-800-441-7515
Transport Emergency	CHEMTREC: 1-800-424-9300
Medical Emergency	1-800-441-3637

## COMPOSITION/INFORMATION ON INGREDIENTS

### Components

Material	CAS Number	%
*ETHANE, 1, 1, 1, 2-TETRAFLUORO- (HFC-134a).		811-97-2 100

---

## HAZARDS IDENTIFICATION

### Potential Health Effects

#### INHALATION

##### ETHANE, 1,1,1,2-TETRAFLUORO-

Gross overexposure may cause: Central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness. Inhalation of high concentrations of vapor is harmful and may cause heart irregularity unconsciousness or death. Intentional misuse or deliberate inhalation may cause death without warning. Vapor reduces oxygen available for breathing and is heavier than air. Liquid contact can cause frostbite.

#### HUMAN HEALTH EFFECTS:

#### SKIN CONTACT

##### ETHANE, 1,1,1,2-TETRAFLUORO-

Immediate effects of overexposure may include frostbite. If liquid or escaping vapor contacts the skin. Frostbite-like effects may occur if the liquid or escaping vapors contact the eyes.

Inhalation may include temporary nervous system depression with anesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness.

Higher exposures may lead to temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation. Fatality may occur from gross overexposure.

Individuals with preexisting diseases of the central nervous or cardiovascular system may have increased susceptibility to the toxicity of excessive exposures.

#### CARCINOGENICITY INFORMATION

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

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## FIRST AID MEASURES

### First Aid

#### INHALATION

If inhaled, immediately remove to fresh air. Keep person calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

#### SKIN CONTACT

In case of contact, immediately flush area with plenty of lukewarm water for at least 15 minutes, while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse. Treat for frostbite if necessary by gently warming affected area.

#### EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

---

## FIRST AID MEASURES CONTINUED,

### INGESTION

Ingestion is not considered a potential route of exposure.

#### *Notes to Physicians*

Because of possible disturbances of cardiac rhythm catecholamine drugs, such as epinephrine should only be used with special caution in situations of emergency life support.

---

## FIRE FIGHTING MEASURES

### Flammable Properties

Flash Point	Will not burn
LEL	Not Applicable
UEL	Not Applicable
Autoignition	>743 C (>1369 F)

HFC-134A is not flammable at ambient temperatures and atmospheric pressure. However, HFC-134A has been shown in tests to be combustible at pressures as low as 5.5 psig at 177 C (351 F) when mixed with air at concentrations of 60 volume % air. At lower temperatures, higher pressures are required for combustibility. Experimental data have also been reported which indicate combustibility of HFC 134A in the presence of certain concentrations of chlorine.

### FIRE AND EXPLOSION HAZARDS:

Cylinders may rupture under fire conditions. Decomposition may occur. Contact of welding or soldering torch flame with high concentrations of refrigerent can result in visible changes in the size and color of the torch flame. This flame effect will only occur in concentrations of product well above the recommended exposure limit, therefore stop all work and ventilate the area before proceeding. Use forced ventilation to disperse refrigerant vapors from the work area before using any open flames.

#### *Extinguishing Media*

As appropriate for combustibles in area. Extinguishant for other burning material in area is sufficient to stop burning.

#### *Fire Fighting Instructions*

Cool tank/container with water spray. Self-contained breathing apparatus (SCBA) is required if cylinders rupture or contents are released under fire conditions.



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## ACCIDENTAL RELEASE MEASURES

### *Safeguards (Personnel)*

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

### *Accidental Release Measures*

Ventilate area, especially low or enclosed places where heavy vapors might collect. Remove open flames. Use self-contained breathing apparatus (SCBA) for large spills or releases.

---

## HANDLING AND STORAGE

### **Handling (Personnel/Physical Aspects)**

Use with sufficient ventilation to keep employee below recommended limits. HFC-134A should not mixed with air for leak testing. In general it should be used or allowed to be present with high concentration air above atmospheric pressure. See Flamable Propertiesaction. Contact with chlorine or other strong oxidizing agents should also be avoided.

### **Storage**

Store in a Clean, dry area. Do not heat above 52 C (126 F)

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## EXPOSURE CONTROLS/PERSONAL PROTECTION

### **Engineering Controls**

Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places. Refrigerant concentration monitors may be necessary to determine vapor concentrations in work areas prior to use of torches or other open flames, or if employees are entering enclosed areas.

### **PERSONAL PROTECTIVE EQUIPMENT**

Impervious gloves and chemical splash goggles should be used when handling liquid. Under normal manufacturing conditions, no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a large release occurs.

### **EXPOSURE GUIDELINES**

#### **EXPOSURE LIMITS**

“SUVA” 134A

PEL (OSHA)

None Established

TLV (ACGIH)

None Established

AEL \* (DuPont)

1,000 ppm, 8 & 12 Hr. TWA

WEEL (AIHA)

1000 ppm, 8 Hr. TWA

\* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

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## PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL DATA

Boiling Point	-26.5 C (15.7 F) @ 736 mm Hg
Vapor Pressure	96 psig @ 25 C (77 F)
Fl Vapor Density	3.6 (Air=1.0) @ 25 C (77 F)
Fl % Volatilize	100 WT%
Solubility in Water	0.15 WT%, @ 25 C (77 F) @ 14.7 psia
Odor	Slight ethereal
Form	Liquefied Gas.
Color	Clear, Colorless.
Liquid Density	1.21 g/cm <sup>3</sup> @ 25 C (77 F)

---

## STABILITY AND REACTIVITY

### CHEMICAL STABILITY

Material is stable. However, avoid open flames and high temperatures.

### CONDITIONS TO AVOID

Avoid open flames and high temperatures.

### INCOMPATIBILITY WITH OTHER MATERIALS

Incompatible with alkali or alkaline earth metals- powdered Al, Zn, Be, etc.

### DECOMPOSITION

Decomposition Products are hazardous. HCFC-134A can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides.

### POLYMERIZATION

Polymerization will not occur.

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## TOXICOLOGICAL INFORMATION

### ANIMAL DATA

#### ETHANE, 1,1,1,2-TETRAFLUORO

INHALATION: 4 hour, ALC, rat: 567,000 ppm.

SKIN: The compound is a skin irritant and a slight eye irritant but is not a skin sensitizer in animals.

EYE: A short duration spray of vapor produced very slight eye irritation.

Effects from single high exposures include central nervous system depression, anesthesia, rapid breathing, lung congestion and microscopic liver changes. Cardiac sensitization occurred in dogs at 50,000 ppm or greater from the action of exogenous epinephrine.

No toxic effects or abnormal histopathological observations occurred in rats repeatedly exposed to concentrations ranging from 10,000 to 50,000 ppm (v/v). Long-term exposures to 50,000 ppm (v/v) of vapors produced organ weight increases and a decrease in body weight gain, but no increased mortality or adverse hematological effects. In chronic inhalation studies, HCFC-22, at a concentration of 50,000 ppm (v/v), produced a small, but statistically significant increase of late-occurring tumors involving salivary glands in male rats, but not female rats or male or female mice. In the same studies, no increased incidence of tumors was seen in either species at concentrations of 10,000 ppm or 1,000 ppm (v/v).

Long-term administration in corn oil produced no effects on body weight or mortality.

HCFC-22 was mutagenic in some strains of bacteria in bacterial cell cultures, but not mammalian cell cultures or animals. It did not cause heritable genetic damage in

(Continued)

2008FR

(Continued)

## **TOXICOLOGICAL INFORMATION** (Continued)

mammals.

Single exposure caused: Cardiac sensitization, a potentially fatal disturbance of heart rhythm associated with a heightened sensitivity to the action of epinephrine. Lowest-Observed-Adverse-Effect-Level for cardiac sensitization: 75,000 ppm. Single exposure caused: Lethargy. Narcosis. Increased respiratory rates. These effects were temporary. Single exposure to near lethal doses caused: Pulmonary edema. Repeated exposure to caused: Increased adrenals, liver, spleen weight. Decreased uterine, prostate weight. Repeated dosing of higher concentrations caused: the following temporary effects- Tremors. Incoordination.

**CARCINOGENIC, DEVELOPMENTAL, REPRODUCTIVE, MUTAGENIC EFFECTS:**

In a two-year inhalation study, HFC-134A, at a concentration of 50,000 ppm, produced an increase in late-occurring benign testicular tumors, testicular hyperplasia and testicular weight. The no-effect-level for this study was 10,000 ppm. Animal data show slight fetotoxicity but only

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## **ECOLOGICAL INFORMATION**

ECOTOXICOLOGICAL INFORMATION

Aquatic Toxicity:

HCFC-22 48 hour EC50 - Daphnia magna: 433 mg/L

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## **DISPOSAL CONSIDERATIONS**

WASTE DISPOSAL

Comply with Federal, State, and local regulations. Reclaim

Comply with Federal, State, and local regulations. Red by distillation or remove to a permitted waste disposal facility.

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## TRANSPORTATION INFORMATION

### SHIPPING INFORMATION

DOT/IMO Proper Shipping Name	CHLORDDIFLUOROMETHANE
Hazard Class	2.2
UN No.	1018
DOT/IMO Label	NONFLAMMABLE GAS

Shipping Containers

Tank Cars.  
Tank Trucks.  
Cylinders.

(Continued)

2008FR

(Continued)

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## REGULATORY INFORMATION

### U.S. FEDERAL REGULATIONS

TSGA Inventory Status    Reported/Included.

### TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute     : Yes  
Chronic  : No  
Fire      : No  
Reactivity : No  
Pressure  : Yes

### HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance	:	No
CERCLA Hazardous Substance	:	No
SARA Toxic Chemical	- See Components Section	

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## OTHER INFORMATION

NFPA NPCA-HMIS

NPCA HMIS

Health	1
Flammability	0
Reactivity	1

Personal Protection rating to be supplied by user depending on use conditions.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS	: DuPont Chemicals
Address	: Engineering a Product Safety
➤	: P.O. Box 80709, Chestnut Run
➤	: Wilmington, DE 19880-0709
Telephone	: (302) 999-4946

# Indicates updated section.

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End of MSDS

2008FR



## **CAREL TEMPERATURE CONTROLLER**

### **USER GUIDE**

This guide is designed as a basic reference on the features of the Carel PLC temperature controller on your Dimplex Thermal Solutions chiller. The information in this manual will explain how the controller works, how to use it, and how to understand what it tells you. Be advised that this is a GENERAL guide and your chiller may have different features from what this manual shows.

Use CAUTION while operating the controller to avoid making changes that may affect the performance and life span of the chiller. Consult a DTS service representative before making any changes to programming.

### **GETTING STARTED:**

When power is first turned on to the chiller, the temperature controller will immediately go into a self-test mode. This self-test is an automatic diagnostic for problems with the controller or any faults present within the chiller.

After the self-test is completed (about 10 seconds), and there are no chiller faults, the process pump will come online and produce system flow. At this point, the controller will read the fluid temperature and begin cooling if needed.

As the self-test completes and the pump comes online, the controller will display the program number and prompt the user to press enter. Pressing the enter button (↵) will bring up the main menu for the controller.

## USING THE MAIN MENU:

The first page of the main menu should resemble the display in figure 1.

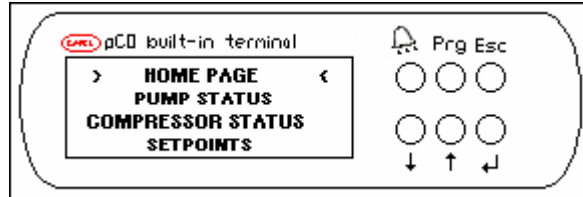


FIGURE 1.

Use the UP ( ↑ ) and DOWN ( ↓ ) buttons to navigate through the menu choices. When the arrows ( > < ) surround the desired menu listing, press the ENTER ( ↵ ) button to display that submenu. Press the ESCAPE button ( **Esc** ) to back out of any menu. The following is a break-down of the most common main menu options:

**HOME PAGE** – Displays system status (On or Off), Fluid temperature (actual), and Setpoint (required fluid temperature). This is the default controller display while the chiller is operational.

**PUMP STATUS** – Displays the status of pump (On or Off), the status of the pump overload (OK or fault), pump run time, and the status of any other fluid related components (Tank level, fluid flow, etc).

**COMPRESSOR STATUS** – Displays status of the chiller compressor (On or Off), and any refrigeration related components (solenoids, pressure switches, etc).

**SETPOINTS** – This is a sub-menu which contains temperature, timer, alarm, and other settings for the chiller. These are the common setpoint menu options:

**TEMP SETPOINTS** – Lists the desired fluid setpoint and the range at which the refrigerant compressor turns off and on.

**TIMER SETTINGS** – Lists certain timers in the chiller for its protection. Do NOT change these settings without consulting a DTS engineer.

**ALARM SETPOINTS** – Shows any changeable alarm settings for the chiller, including under-temperature and over-temperature faults.

Main Menu Options (Continued)

**CHILLER STATUS** – Displays an overview of the chillers component status including system, pump, compressor, and fluid temperature.

**SERVICE INFO** – Displays a phone number to contact DTS and the program number that is installed on the controller.

## CHANGING SETPOINTS:

Here is an example on how to change the fluid setpoint. This process is the same for changing other settings within the controller.

1. In the setpoints menu, select **TEMP SETPOINTS** and press **ENTER** (↵). This will take you into that menu and the cursor should be blinking over the letter “T” on the words **TEMPERATURE SETTINGS**. See figure 2.

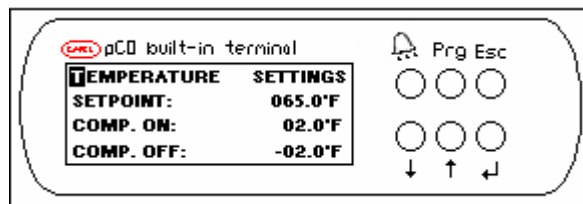


FIGURE 2

2. Now press the **ENTER** button again so that the cursor is blinking next to the setpoint temperature. Use the **UP** and **DOWN** arrows to change the setpoint to the new value. See figure 3.

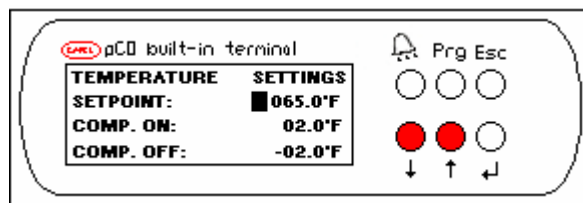


FIGURE 3

3. Pressing **ENTER** will save the change and move the cursor to the next setting (**COMP ON**). Pressing **ESCAPE** (Esc) will exit back to the Temp Settings menu without saving.



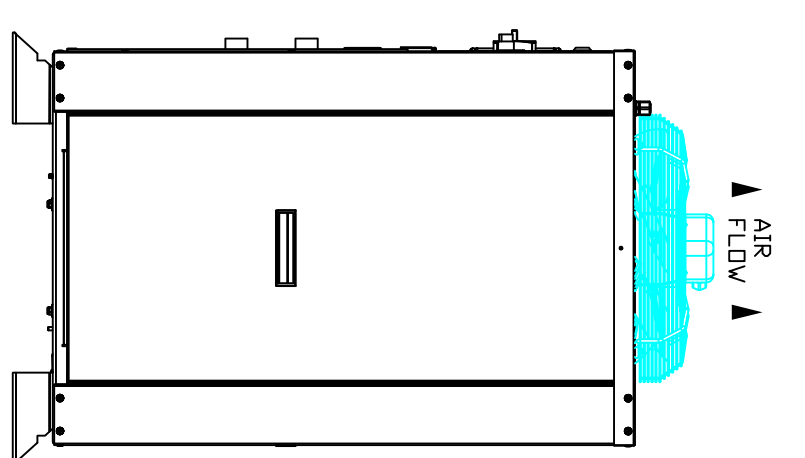
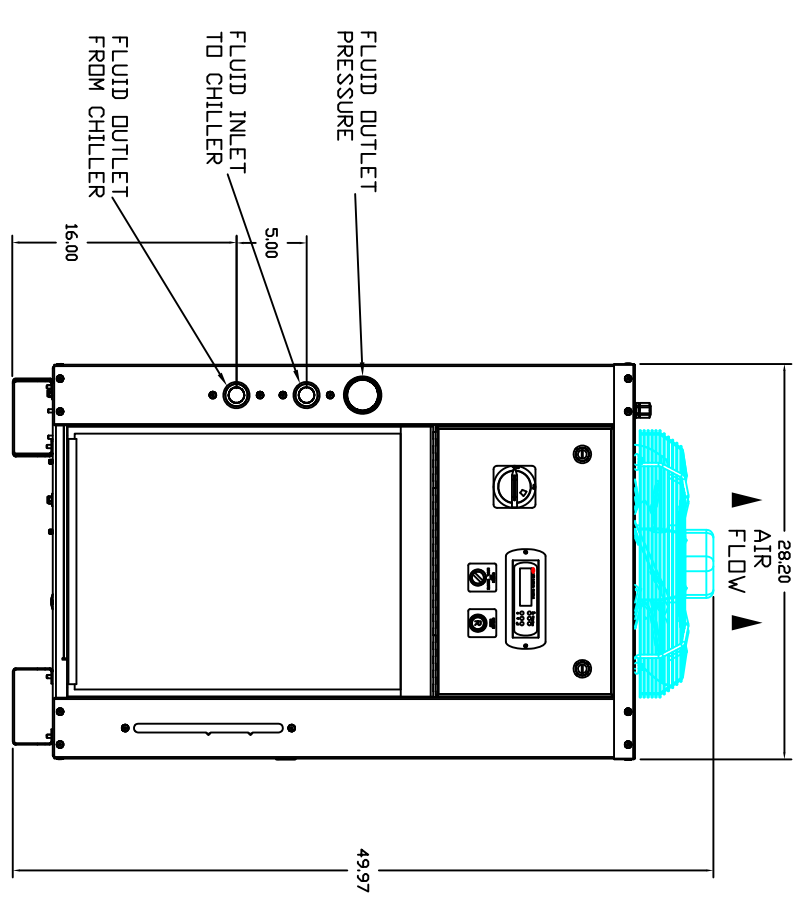
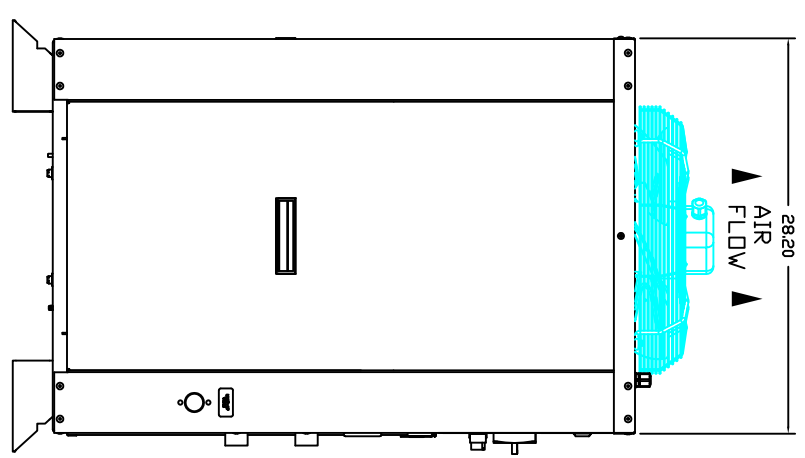
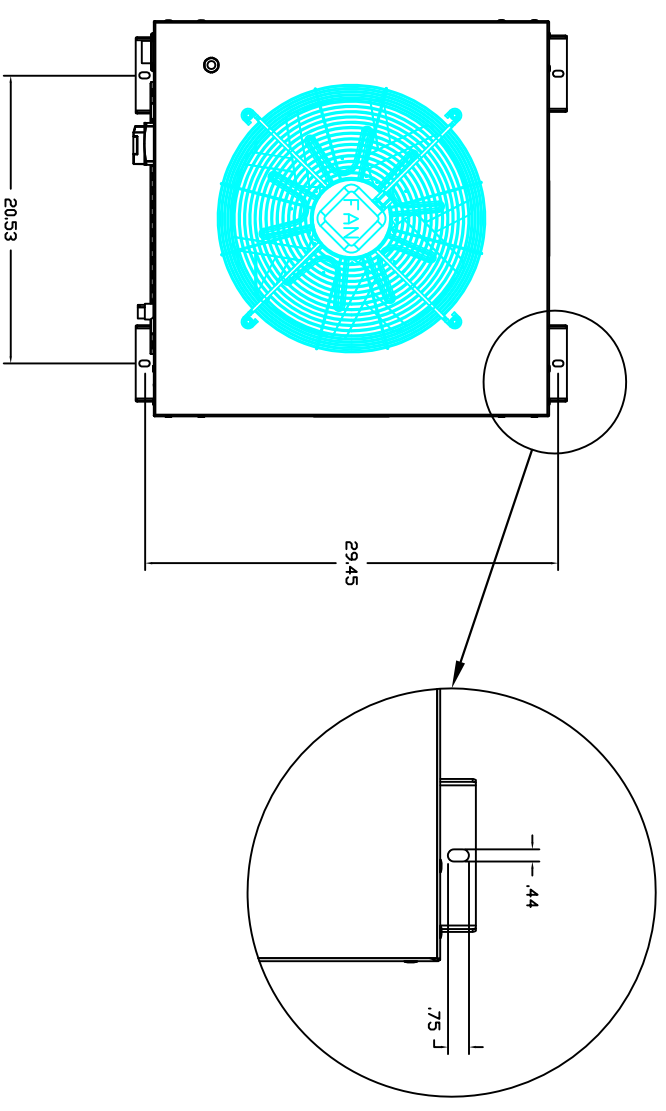
## **CHILLER FAULTS:**

In the event of a fault, the chiller may shutdown or continue to run, depending upon the issue. The temperature controller will indicate that a fault has occurred and display the words “SYSTEM FAULT”. Press the down arrow ( ↓ ) to view the fault, making note of the exact wording of the fault. Continue to press the down arrow, noting any other faults, until the screen shows **\*\*END OF ALARMS\*\***. Press ENTER ( ↵ ) to clear any inactive faults. Pressing the ALARM button ( **Bell** ) will return you to the fault listings and display any active alarms.

Depending on the type of fault, the operator may or may not be able to take any action to correct the problem. Refer to the manual included with the chiller for troubleshooting assistance, or contact DTS at the number listed below.

## **NEED HELP ?**

For assistance on using this temperature controller or to address any questions, please contact the Dimplex Thermal Solutions Technical Service Department at **1-800-968-5665**.




ALL DIMENSIONS ARE IN INCHES


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DATE	DESCRIPTION OF REVISION	APPROVED BY
07/20/10	ADDED DIM FOR ANCHOR HOLE	JH



**Koolant**  
Koolant  
Koolants



**Dimplex**  
Thermal Solutions



**SCHNEIDER**  
Schneider  
Schneider

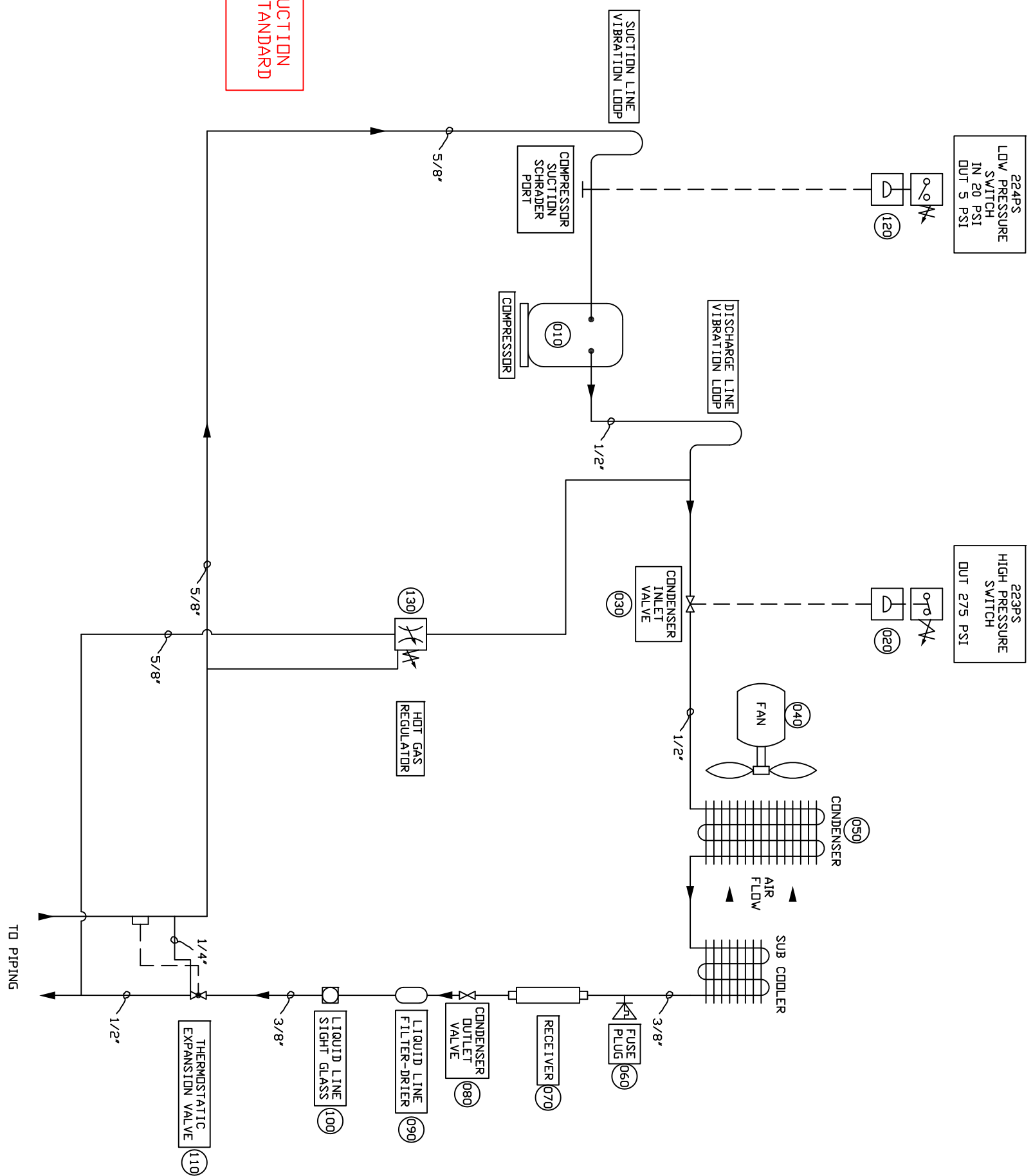
DESIGN BY: JH      DRAWN BY: JH  
 DATE: 06/25/10      PAGE 1 OF 1  
 KALAMAZOO, MI      PH (800) 968-5665  
 WWW.DIMPLEXTHERMAL.COM

**JH1500-BP-S0**

**LAYOUT**

DRAWING NO:  
445507





INSULATE SUCTION LINE PER STANDARD ES-001.

223PS  
LOW PRESSURE SWITCH  
IN 20 PSI  
OUT 5 PSI

223PS  
HIGH PRESSURE SWITCH  
OUT 275 PSI

\* PARTS NOT SHOWN ON DRAWING DETAIL

REFRIGERATION PARTS

IND.	ID/DESCRIPTION	K. K. PART#	QTY.	TYPE
001	VV 1500 REFRIG 460/3/60	0445554	1.0	ASSEM
010	COMPRESSOR 3 TON 460/3/60 R-407C	0612001	1.0	ASSEM
* 010	C-SBNA6384 GDMF 3 460/3/60 407C 440/460. INCLUDES MOUNTING KIT.	1450037	1.0	PC
* 020	COMPRESSOR CDD# #809 930 988 USED WITH R407C HAS PVE OIL SANYO	1298032	1.0	PC
020	018-0095-08 CRANKCASE HEATER			
	F113 2R18-81 480 VAC 20 WATTS 48 LEADS CRIFLAND C11/06/09 OLD PAR			
	P100CC-9C SWITCH HIGH PRESSURE 275 PSI CUT OUT 275 PSI CUT IN 175 PSI ENC APSULATED WITH A 4 FOOT LEADS JOHNS ON CONTROLS	3640012	1.0	PC
030	VALVE ANGLE REFRIG 1/2"	3980001	1.0	PC
040	FAN ASSEMBLY - 18" ZA 3PH INDOOR WIRE 14/4 SDV-A 600V BLACK	0611590	1.0	ASSEM
010	WIRE 14/4 SDV-A 600V BLACK	3807037	8.0	PC
020	REEL	3802413	4.0	PC
* 030	PANDUIT (KC AS DE 5/3/77)	4800112	1.0	PC
* 040	18" FBD45-4DK 4E VAL FAN 138449 230/400/3/50 45KV 1 6/ 92A 1380 GERMNET FOR Z A FAN INSTALLATION 100' RPK	7739582	1.0	PC
050	COT LMC 2 TON 3 RRV COIL 'S' PRINT UPDATED DN 3/2/09*****9/15/0 9' SHEET METAL UPDATED*****	1413132	1.0	PC
060	PLUG-175 FUSE PLUG 3/8 MPT. 283F 6/10/05: CHANGED MELT TEMP	1438020	1.0	PC
070	RECEIVER **V1500-2000 .8 # R22 1/2" INLET 3/8" OUTLET	0101284	1.0	ASSEM
* 010	W-1317 REDUCER 5/8 FTG X 3/8 C	7305140	1.0	PC
* 020	W-1315 REDUCER 5/8 FTG X 1/2 C	7305160	1.0	PC
* 030	TUBING 1-5/8 HARD COPPER ACR	7313010	0.8	PC
* 040	W-1069 COUPLING 1-5/8 C X 5/8 C VALVE ANGLE REFRIG 3/8" WITH ACCESS PORT	7313220	2.0	PC
080	C-1635 FILTER DRIER 3/8"	3980000	1.0	PC
090	SPORLAN	2730030	1.0	PC
100	SA-135 SIGHT GLASS 3/8 DDE (R146-1) SPORLAN	2720002	1.0	PC
110	EBFVE-B-CP100 VALVE EXPANSION 3/8 IN 1/2 OUT DDE SDR EXTERNAL USE DN 1-1/2 TO 2-1/2 TON UNITS** *CHANGED FROM CP85 TO CP100 DN 1/29/07** SPORLAN	2760058	1.0	PC
120	P100AC-1 LOW PRESSURE SWITCH 5/20** IN 20 OUT 5 PSI AUTO RESET ENCAPSU LATED WITH 4' CORD. ***** USE 364 0006 C10/20 PSI SWITCH) IF POSSIBLE ***** JOHNSON CONTROLS	3640010	1.0	PC
130	APRSE-2 VALVE DISCHARGE BYPASS 1/2 1/2 DDE 0/80 SPORLAN	2740001	1.0	PC
140	026M030 CLAMP 1-5/8	2980027	1.0	PC
150	DMEGA 008M011 CLAMP 1/2"	2980022	1.0	PC
160	DMEGA SERIES INSULATION TAPE GASKET .25 X 2 X 50 NITRILE/PVC BLEND CLOSED CELL SPD NGE RUBBER TEMPERATURE RANGE: -20 TO 160F INTERMITTENT 200F CAN BE USED AT 200F CONTINUOUS PER GR. G R RUBBER PRODUCTS INSULATION TAPE VCI-2 BULK CDRK INSULATION TAPE KMP / P-H 12 ROLLS PER CASE A-4544 SEAL CAP 56-4	4449009	1.0	PC
170	VALVE CORE	4450000	1.0	PC
180	100 CT / PK ***** EQUIV. TO SCH RADER # 805 70	7613100	5.0	PC
190	TUBING 1/4 SOFT COPPER REFRIG.	7502953	1.0	PC
* 200	TUBING 3/8 SOFT COPPER REFRIG	7302000	2.0	PC
* 210	50' ROLL	7303000	2.8	PC
* 220	TUBING 1/2 SOFT COPPER REFRIG.	7304000	4.0	PC
* 230	TUBING 5/8 SOFT COPPER REFRIG.	7305000	3.0	PC
* 240	REFRIGERANT R134A IN A 125 LB CYL	2990135	5.0	PC

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DATE	DESCRIPTION OF REVISION	APPROVED BY

Thermal Solutions

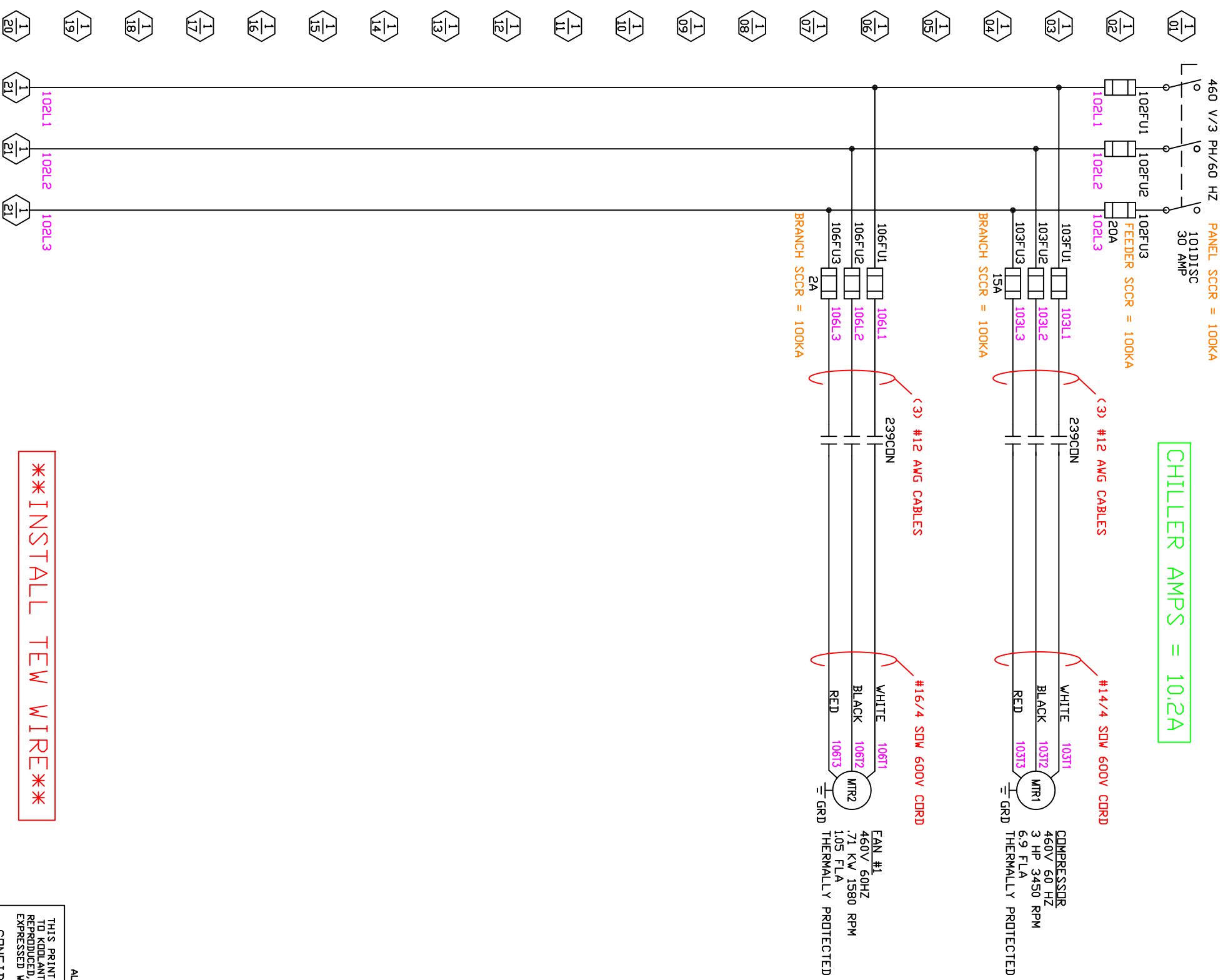
DESIGN BY: AWK  
DRAWN BY: AWK  
DATE: 06/30/10  
PAGE 1 OF 2

**WV 1,500 460/3/60**

REFRIGERATION

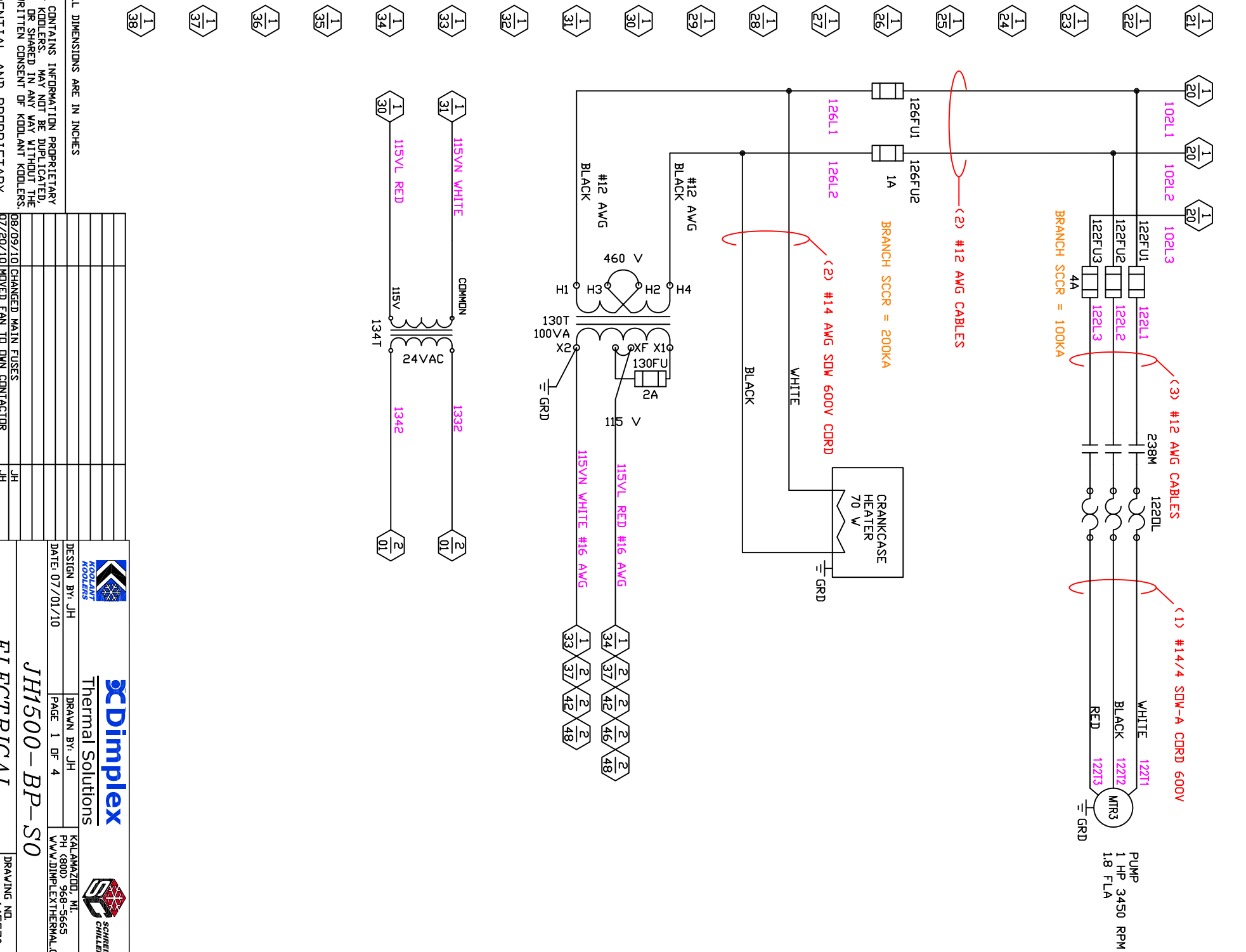
KALAMAZOO, MI.  
PH (800) 968-5665  
WWW.DIMPLEXTHERMAL.COM

DRAWING NO: 445554



CHILLER AMPS = 10.2A

\*\*INSTALL TEW WIRE\*\*





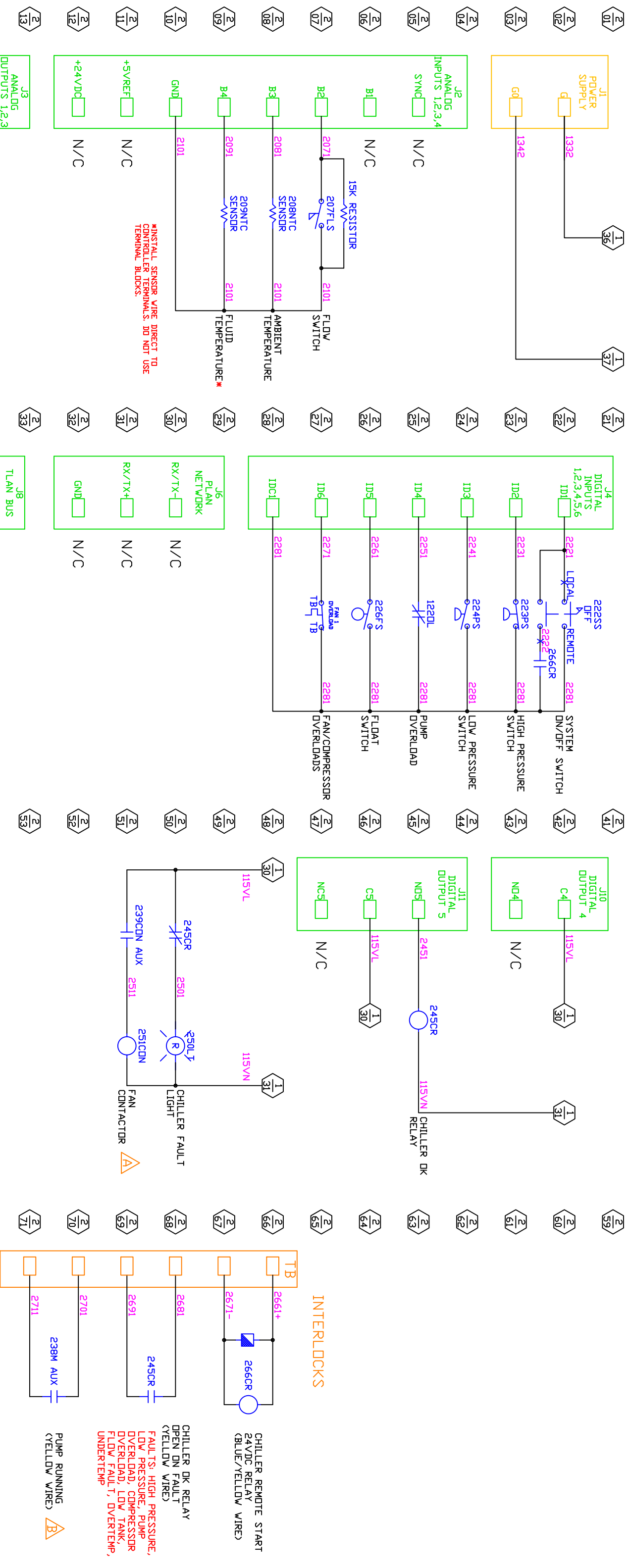
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DATE DESCRIPTION OF REVISION APPROVED BY

08/09/10	CHANGED MAIN FUSES	JH
07/20/10	MOVED FAN TO OWN CONTACTOR	JH



  
**Thermal Solutions**
  
 DESIGN BY: JH      DRAWN BY: JH
   
 DATE: 07/01/10      PAGE 1 OF 4
   
**JH1500-BP-S0**
  
 ELECTRICAL
   
 DRAWING NO: 445570



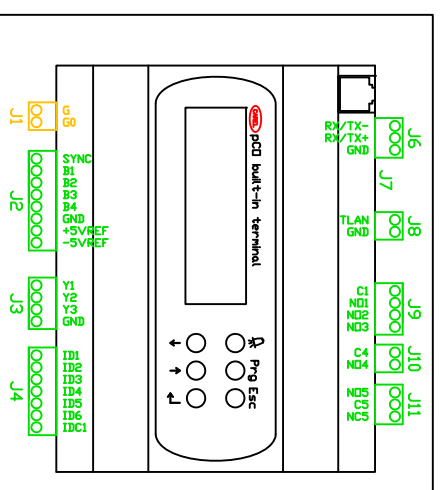
**\*\*INSTALL TEW WIRE\*\***

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09/10/10	ADDED PUMP RUNNING INTERLOCK	JH <B>	
07/20/10	ADDED FAN CONTACTOR	JH <A>	
DATE	DESCRIPTION OF REVISION	APPROVED BY	
<b>Thermal Solutions</b> Thermal Solutions Kalamazoo, MI PH (800) 968-5665 WWW.THERMALC.COM		DRAWN BY: JH DATE: 07/01/10 PAGE 2 OF 4 <b>JH1500-BP-S0</b> <b>ELECTRICAL</b> DRAWING NO: 445571	



SEE OPTION SHEET  
FOR SETTINGS  
IF OPTION IS SELECTED  
CHANGE SETTING TO 'YES'

OPTION:

SEE DATA PACK  
FOR SETTINGS  
SETTING \*

PROGRAM SETTINGS	ALARM TIMERS	AMBIENT SETTINGS	TIMER SETTINGS	CHILLER UNDERTEMP	MHG PID TUNING	CONVERSION	PRESSURE SETTINGS
FLOAT SWITCH: YES #5	LOW PRESS ALARM: 055	LOW PRESSURE: 00.0°F *	PUMP OUT LIMIT: 0s	DEVIATION: -10.0°F	PRDP BAND: 006.0°F	* F	PROBE MIN: -14.7psi
FAN / COMP DL: YES	FLOAT ALARM: 055	COMP DN: 02.0°F	COMP LOCK TIME: 180s	HYSTERESIS: 02.0°F	INTEGRAL TIME: 060s	PSI	PROBE MAX: 135psi
PROCESS PUMP: YES #4	FLOW ALARM: 105	COMP OFF: -02.0°F	LP BYPASS TIME: 3s	CHILLER UNDERTEMP	TIME: 00s		MHG REG SP: 50psi
AMBIENT TRACK: YES #2	EVD OFF TIMER: 205	HIGH LIMIT: 95.0°F	MIN OFF TIME: 90s	DEVIATION: 10.0°F	VALVE STEPS: 6386		* HG REG BAND: 10.0psi
MOTOR HOT GAS: NO #3	PROBE ERRDR: 205	LOW LIMIT: 45.0°F	PUMP DELAY: 20s	HYSTERESIS: 02.0°F	SER-11 = 1596		LP CUT-OUT: 10.0psi
EVD DRIVER (MHG): NO #3		DR			SEI-30, SDR-3 = 3193		LP CUT-IN: 20.0psi
NFPA 79: YES					SDR-4, SHE-100 = 6386		ENABLE ALARM: YES
DIGITAL OUTPUT #4		CHILLER SETTINGS	* PUMP STANDBY TIMER		MHG OVERRIDE		
HEATER: NO		SETPOINT: 50.0°F *	RUN TIMER: 60min		SETPOINT: 095.0%		
HG BYPASS SOL: NO #7		COMP DN: 02.0°F	RUN DURATION: 30s		DELAY TIME: 060min		
		COMP OFF: -02.0°F			OVERRIDE TIME: 030s		
AIN #1 INPUT		* HOTGAS BYPASS: -1.0°F			NO MOTORIZED HOT GAS		
LUBE PROTECT: NO		HYSTERESIS: 1.0°F			SELECTED		
PHASE MONITOR: NO		* PUMP STANDBY HEAT					
		SETPOINT: 20.0°F					
AIN #2 INPUT		HYSTERESIS: 2.0°F					
FLOW SWITCH: YES #1		* HEATER SETTINGS					
PHASE MONITOR: NO		SETPOINT: 20.0°F					
		HYSTERESIS: 2.0°F					
IN-LINE HEATER: NO		* TEMP OUTPUT SCALE					
INLET TEMP DISP: NO		SCALE LOW: 00.0°F					
Y2 TEMP OUTPUT: NO		SCALE HIGH: 100.0°F					
USER IDLE TIME: 60s							
HEAT ONLY W/PUMP: NO							
PUMP HEAT: NO							
PUMP RUN TIMER: NO							
DN FLOAT ALARM:							
SHUT OFF PUMP							
SETUP COMPLETE: YES							
SERIAL COMMUNICATION							
ADDRESS: 01							
PROTD: Slave Loc							
BAUD RATE: 19,200							

\* OPTIONAL  
SCREENS THAT  
DO NOT APPEAR  
DO NOT NEED TO  
BE SET

PROGRAM SETTINGS  
0900000k  
VER: 05-01-10

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09/09/10	CHANGED PUMP OUT LIMIT TIME	JH	APPROVED BY	
DATE	DESCRIPTION OF REVISION			
 				
DESIGN BY: JH	DRAWN BY: JH	KALAMAZOO, MI.		
DATE: 07/01/10	PAGE 3 OF 4	PH (800) 968-5665		
WWW.DIMPLEXTHERMAL.COM				
PROGRAM SETTINGS				DRAWING NO. 445572





