CONAIR
www.conairnet.com

USERGUIDE

Portable Water Chiller

microTrac 3 Control
Single Pump Tank

⚠ **WARNING - Reliance on this Manual Could Result in Severe Bodily Injury or Death!**

This manual is out-of-date and is provided only for its technical information, data and capacities. Portions of this manual detailing procedures or precautions in the operation, inspection, maintenance and repair of the product forming the subject matter of this manual may be inadequate, inaccurate, and/or incomplete and cannot be used, followed, or relied upon. Contact Conair at info@conairgroup.com or 1-800-654-6661 for more current information, warnings, and materials about more recent product manuals containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

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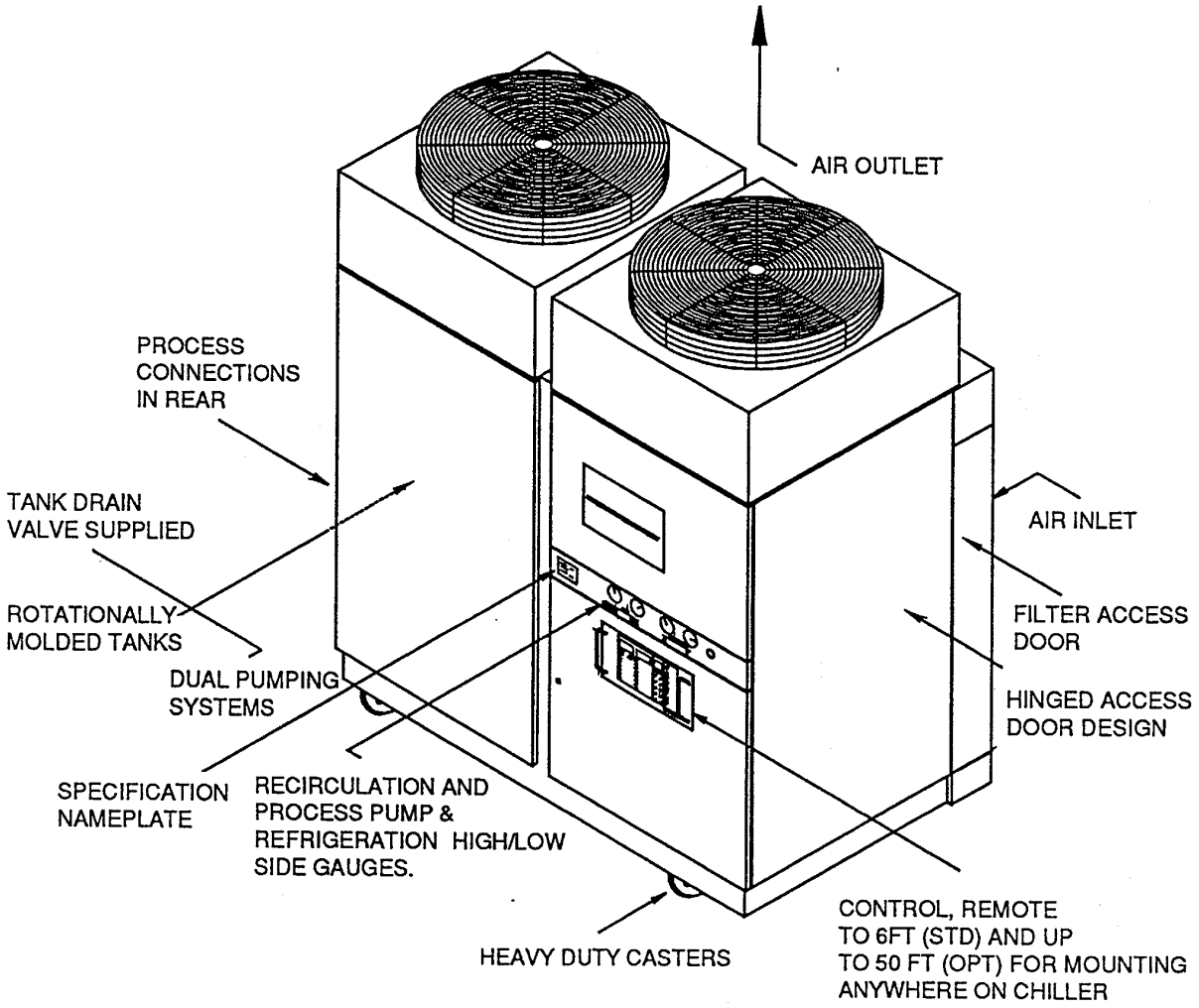
INTRODUCTION

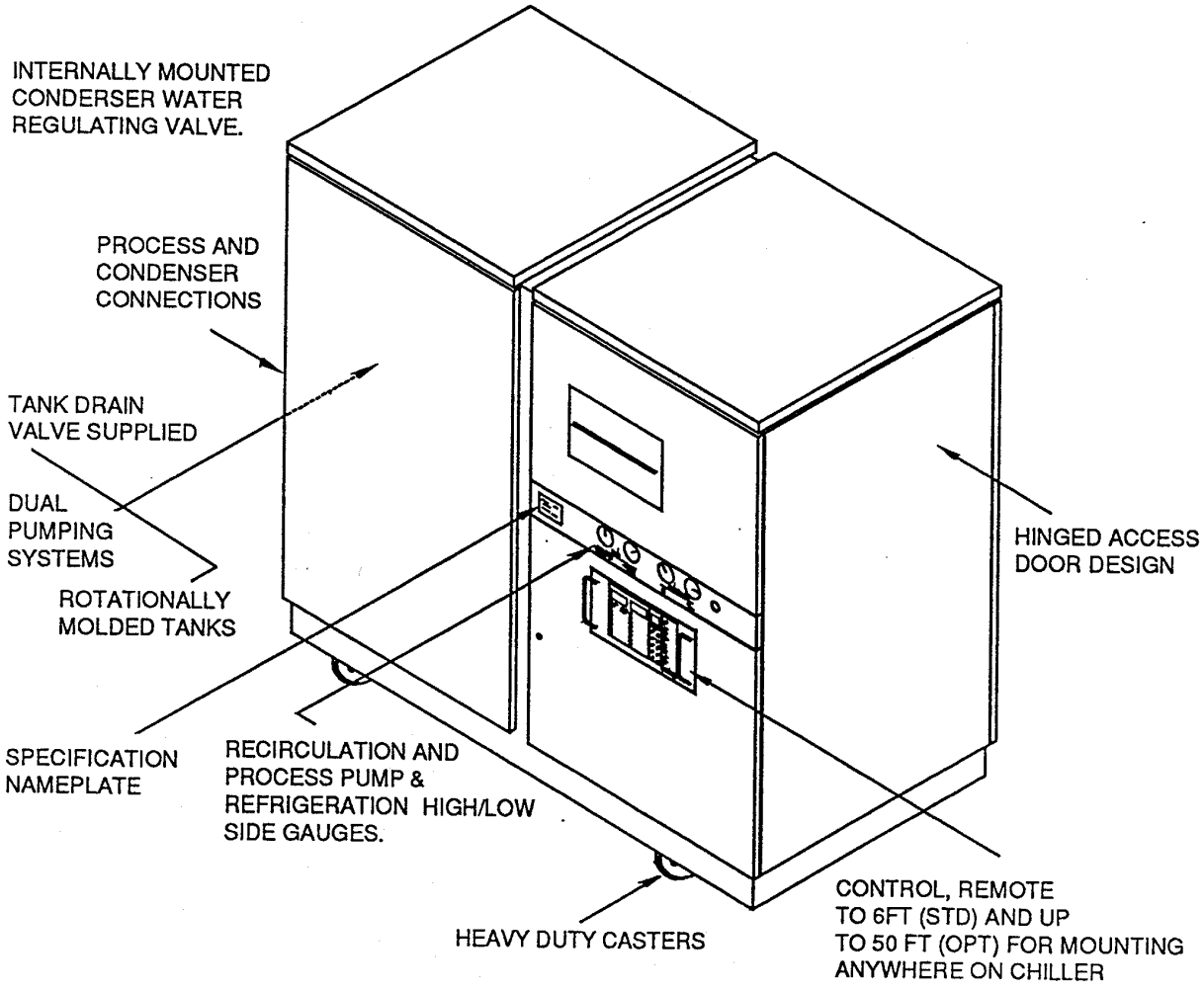
Conair Tempro Portable Chillers

Air Cooled



Conair Tempro Portable Chillers

Water Cooled

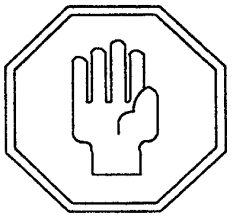


Conventions

The following conventions are used throughout this manual:

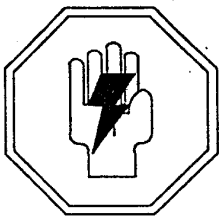
- **BOLD** type is used to highlight important information in the text.
- *ITALIC* type is used for titles that refer to other documentation.
- SHADING is used to set off all tasks and lessons.
- Control panel buttons, such as SELECT or RAISE are placed in all tasks and lessons. Everywhere else, the buttons are noted with uppercase letters, (SELECT, RAISE).

CAUTION!



Caution messages appear before procedures which, if not followed, could result in damage to the equipment.

WARNING!



Warning messages indicate when a procedure, if not followed correctly, could result in personal injury.

We're Here to Help

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

How to Contact Customer Service

To contact Customer Service personnel, call:

From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

Before You Call ...

If you do have a problem, please complete the following checklist before calling Conair:

- ❒ Make sure you have all model, serial and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- ❒ Make sure power is supplied to the equipment.
- ❒ Make sure that all connectors and wires within and between loading control and related components have been installed correctly.
- ❒ Check the troubleshooting guide of this manual for a solution.
- ❒ Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- ❒ Check that the equipment has been operated as described in this manual.
- ❒ Check accompanying schematic drawings for information on special considerations.

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Departments for a nominal fee.

EQUIPMENT GUARANTEE

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

PERFORMANCE WARRANTY

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

WARRANTY LIMITATIONS

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

Receiving Inspection

Receiving Inspection (Air Cooled & Water Cooled)

It is important that the following inspection be completed in the presence of the carrier's representative when the equipment is delivered.

1. Check all crates and cartons received against the bill of lading/ shipping papers to be sure they agree.

2. Check the model number and the electrical characteristics on the nameplate to determine if they are correct.

3. Check for freight damage, shortages or other discrepancies and note them on the delivery receipt before signing.

4. In the event that any damage is found a damage claim should immediately be filed by the purchaser against the delivering carrier.

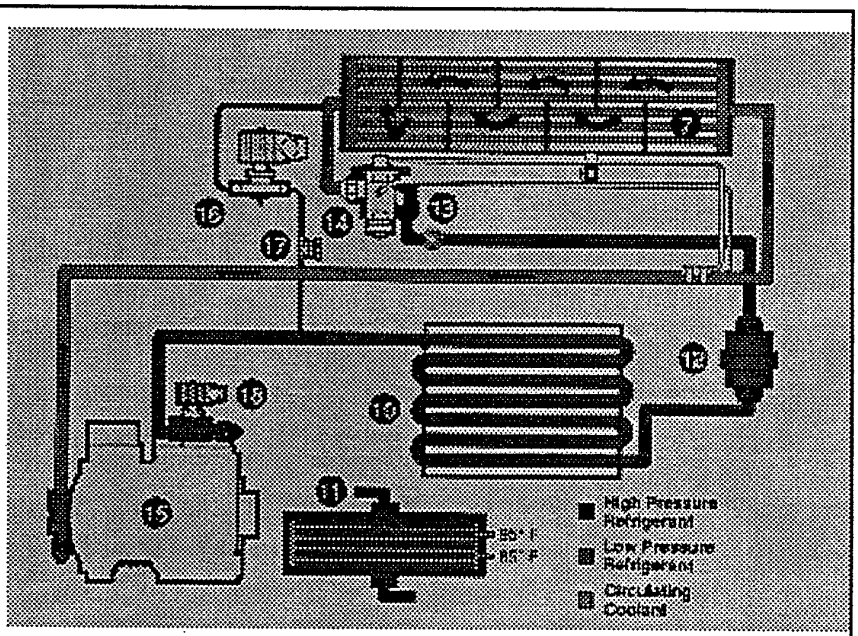
Intended Use & Limitations

Conair Tempro portable chillers are available in either water or air cooled models. The operating sequence differs only in the media that is used to remove heat from the refrigerant. Eighter 85°F cooling tower water or 95°F ambient air can typically be used.

Water cooled models utilize cleanable shell-and-tube heat exchangers (condensers) to condense th hot, compressed, refrigerant gas from the compressors to a cool liquid (11).

Refrigeration Circuit Sequence of Operation

1. Process Supply
2. Process Return
3. Molded Tank
4. Level Sensor
5. Tank Fill/Vent
6. Process Pump
7. Refigerant-to-Water Heat Exchanger
8. Evaporator Pump (microTrac 3 only)
9. Chiller Water Bypass (microTrac 1 only)
10. Air Cooled Condenser
11. Water Cooled Condenser
12. Filter/Dryer
13. Sight Glass
14. Thermal Expansion Valve
15. Compressor
16. Hot Gas Bypass Valve (7.5hp & Under)
17. Hot Gas Cutoff Valve (7.5hp & Under)
18. Cylinder Unlader (10hp and higher)



Aluminum finned, copper tube condensers sith cleanable filters are used on air cooled models for the same purpose (10).

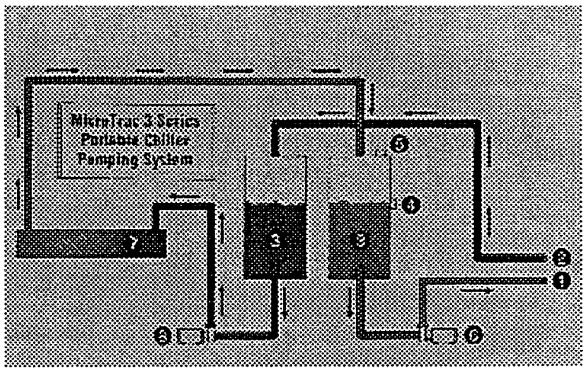
The cool liquid refrigerant then passes through a filter/dryer (12), which protects the systems from moisture or other contaminants. An in-line sight glass (13) then gives a visual indication of proper refrigerant charge and any dangerous moisture present in the system.

The refigerant next passes through a thermal expansion valve (14), where it expands, cools and is precisely metered into the refrigerant heat exchanger (evaporator)-where the heat is removed from the process water (7).

As the refrigeration passes through the evaporator, it extracts the heat from the process coolant and expands to a heat-laden gaseous state. The refrigerant gas is then compressed by the compressor (15) before again giving up its heat by condensing in either the water or air cooled condenser.

Intended Use & Limitations

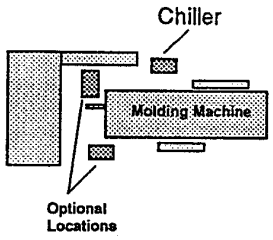
Standard operating set points between 20°F and 65°F LWT. (Adequate Freeze Protection Required)



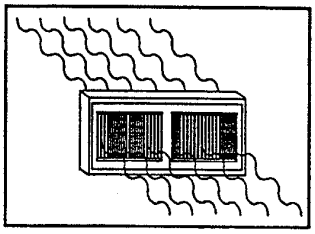
GETTING STARTED

Requirements for Installation

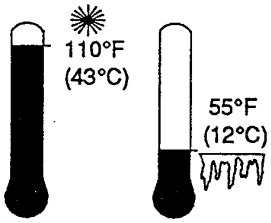
Environmental



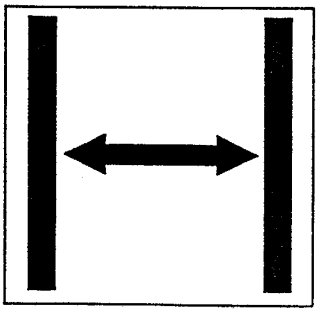
The Portable Chillers are designed for machine side use and should be placed as close to the host machine as practical.



The unit will require an operating environment which is clean and well ventilated. **Nothing should be placed on top of the unit while operating.**



The ambient operating temperature of the chiller must not exceed 110°F (43°C) with 95% relative humidity, noncondensing, or fall below 55°F (12°C). In storage or shipment the unit can withstand a minimum of -40°F (-40°C).



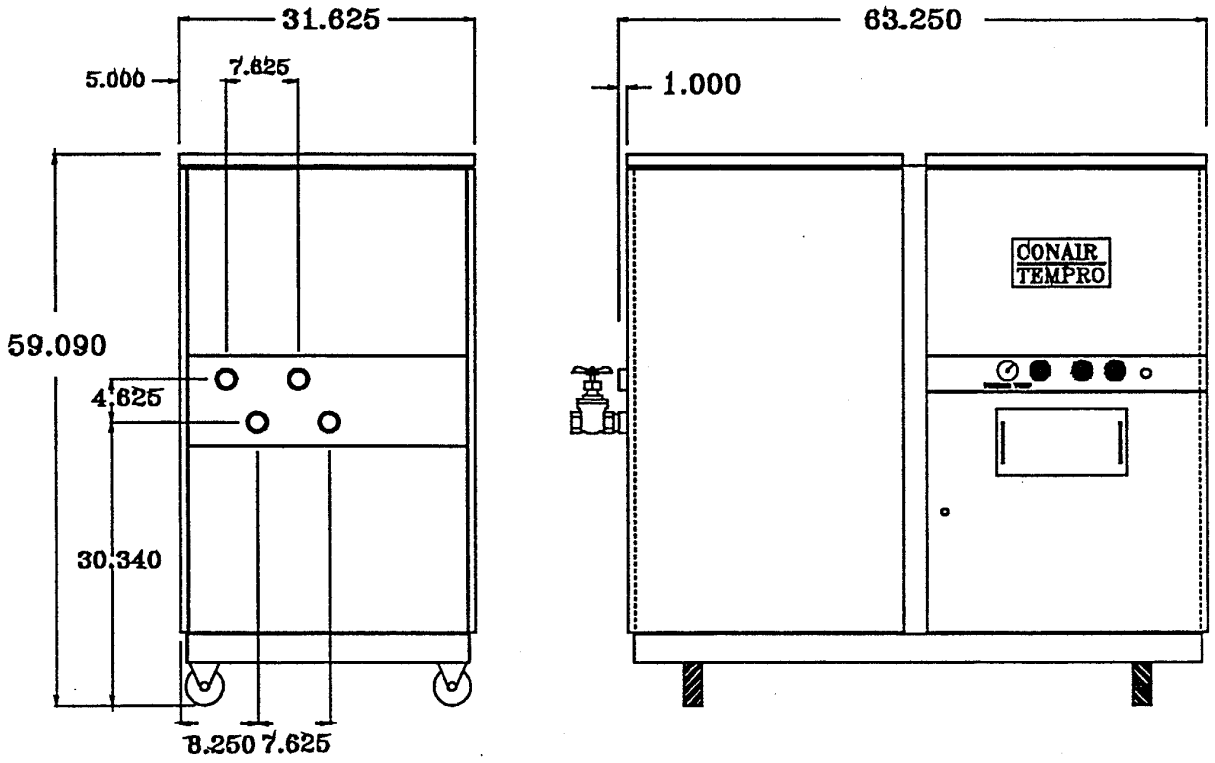
Water cooled units require a minimum clearance of 5ft around the perimiter for serviceability.

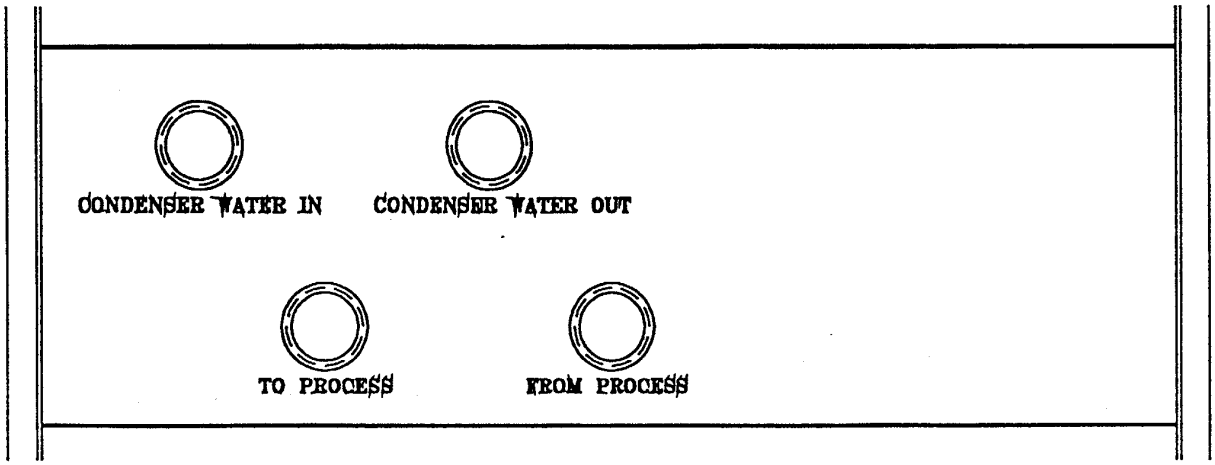
Air cooled units require a minimum clearance of 5ft around perimiter for serviceability. Units with fans require unrestricted outlet air flow. Units with blowers may be ducted at outlet, see page 23.

Units MUST be protected against freeze-up to a minimum of 20°F below the desired set point. Use only industrial grade Ethlene Glycol, corrosion inhibitors are allowed. Do NOT use automotive antifreeze. Consult Conair Tempro Parts Department for available fluids for use.

Dimensional Data

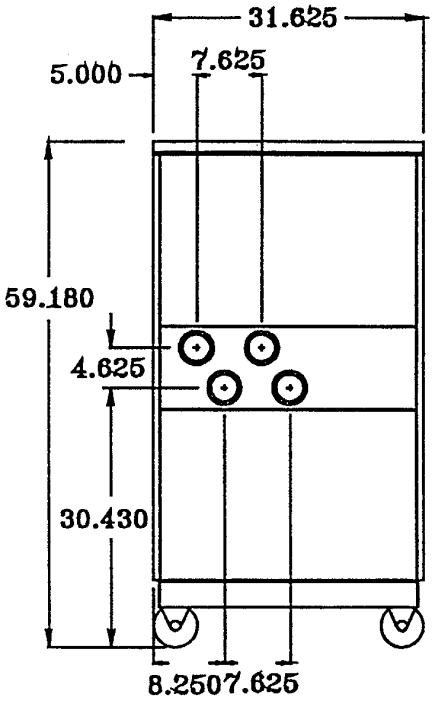
WC(X) - 3 through WC(X) - 10

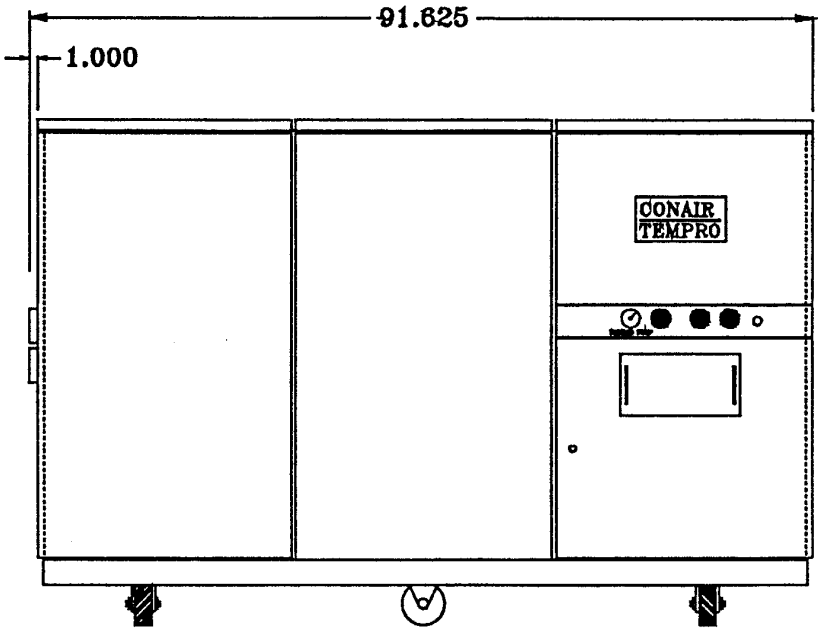


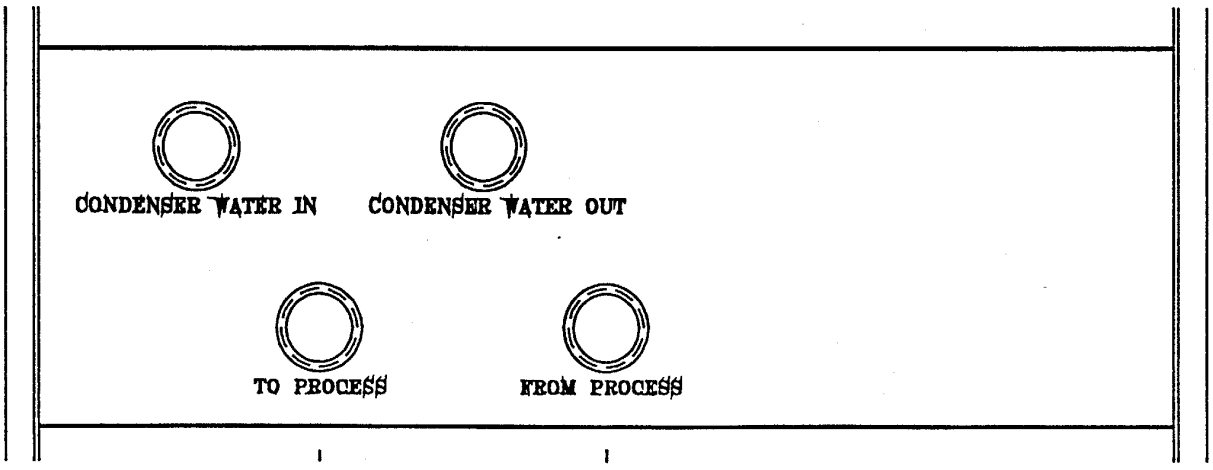


Dimensional Data

WC(X)-15 through WC(X)-40

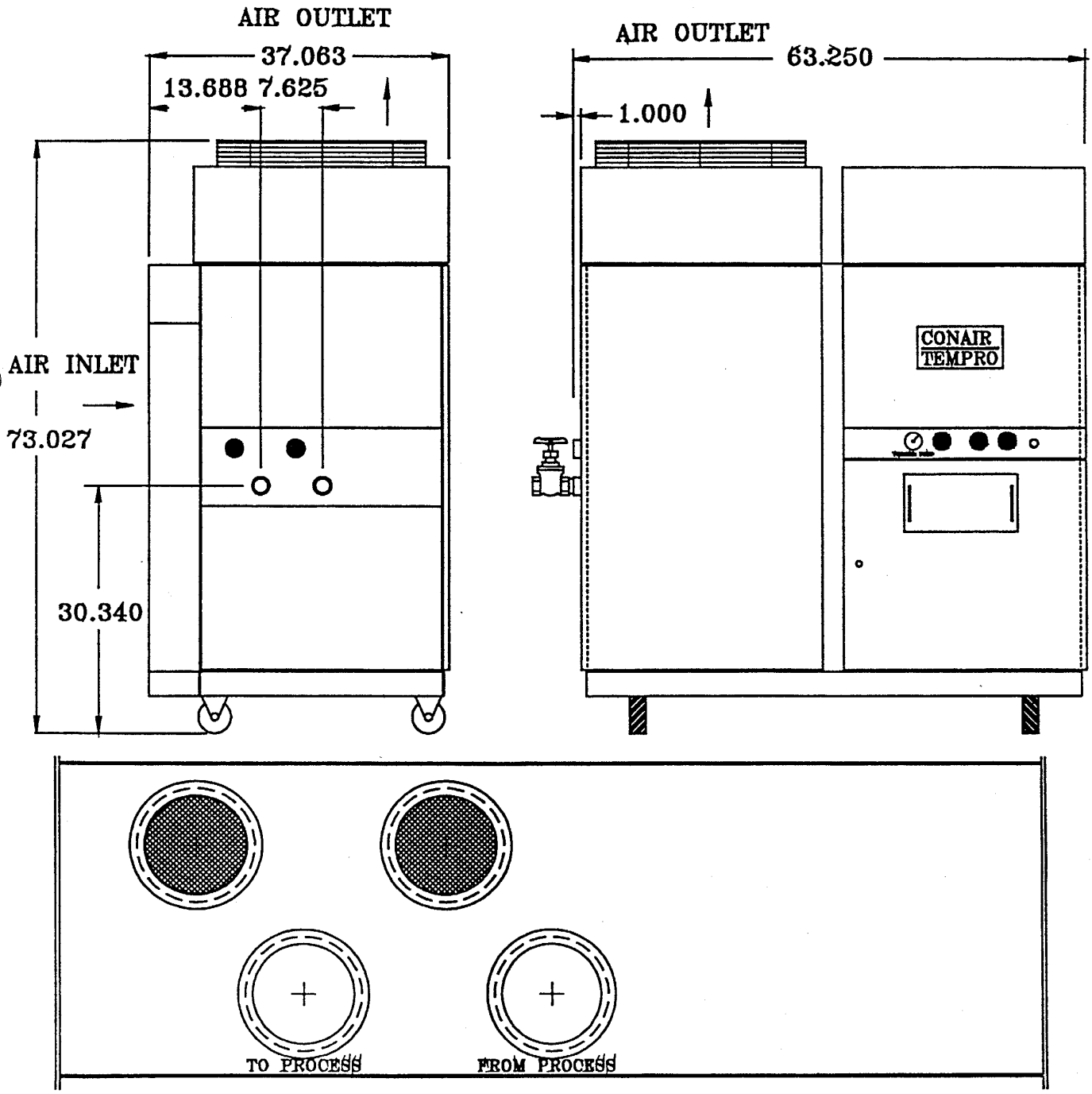






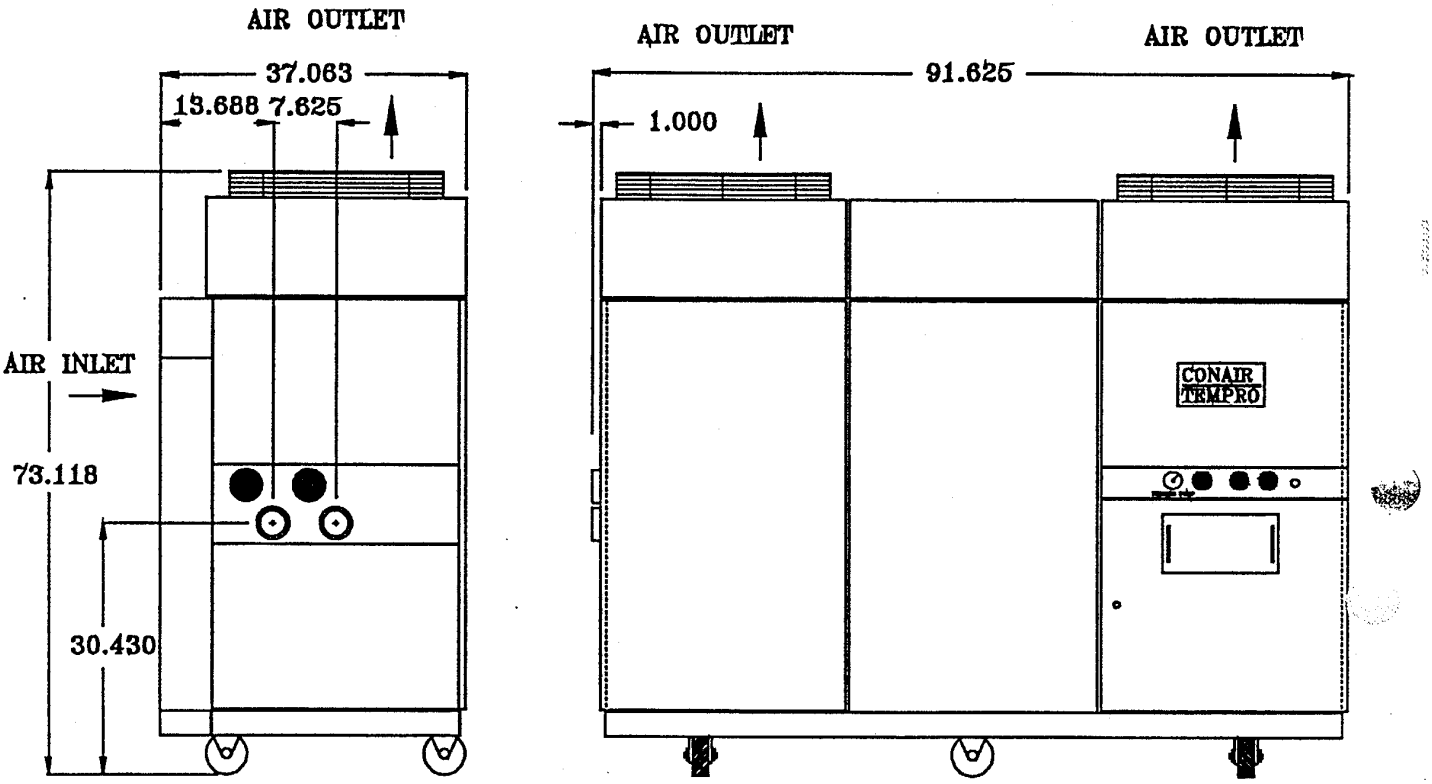
Dimensional Data

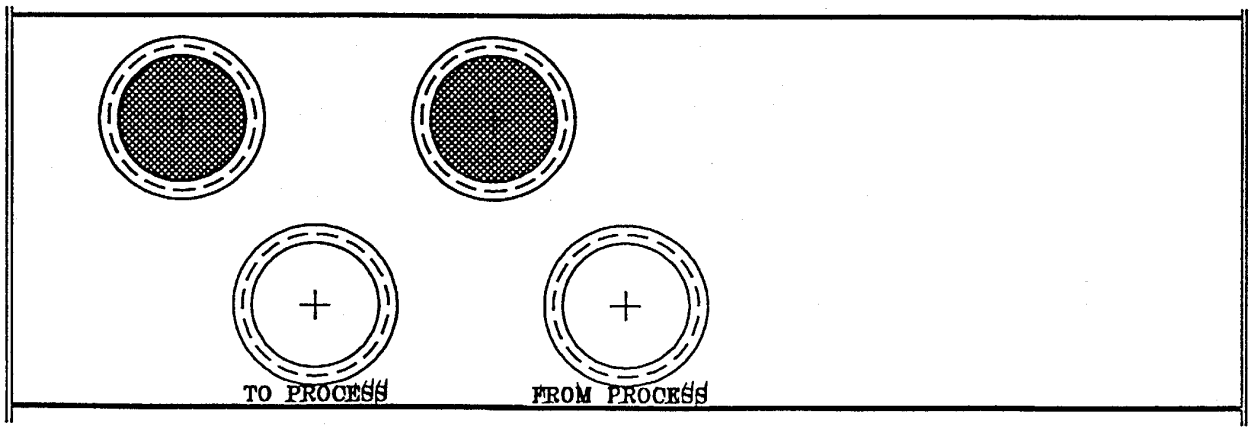
AC(X)-3 through AC(X)-71/2



Dimensional Data

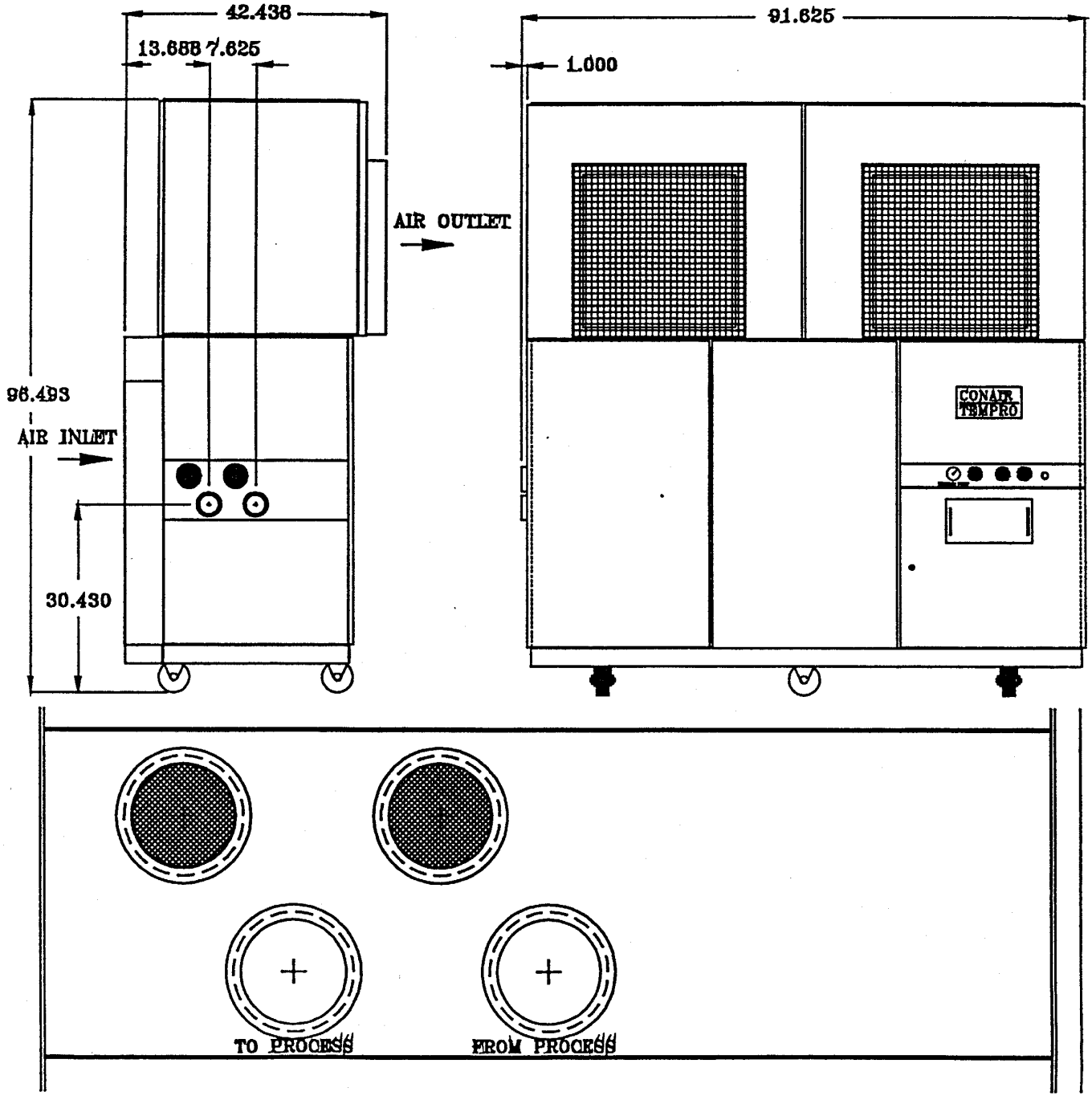
AC(X)-10, 15, 20-1





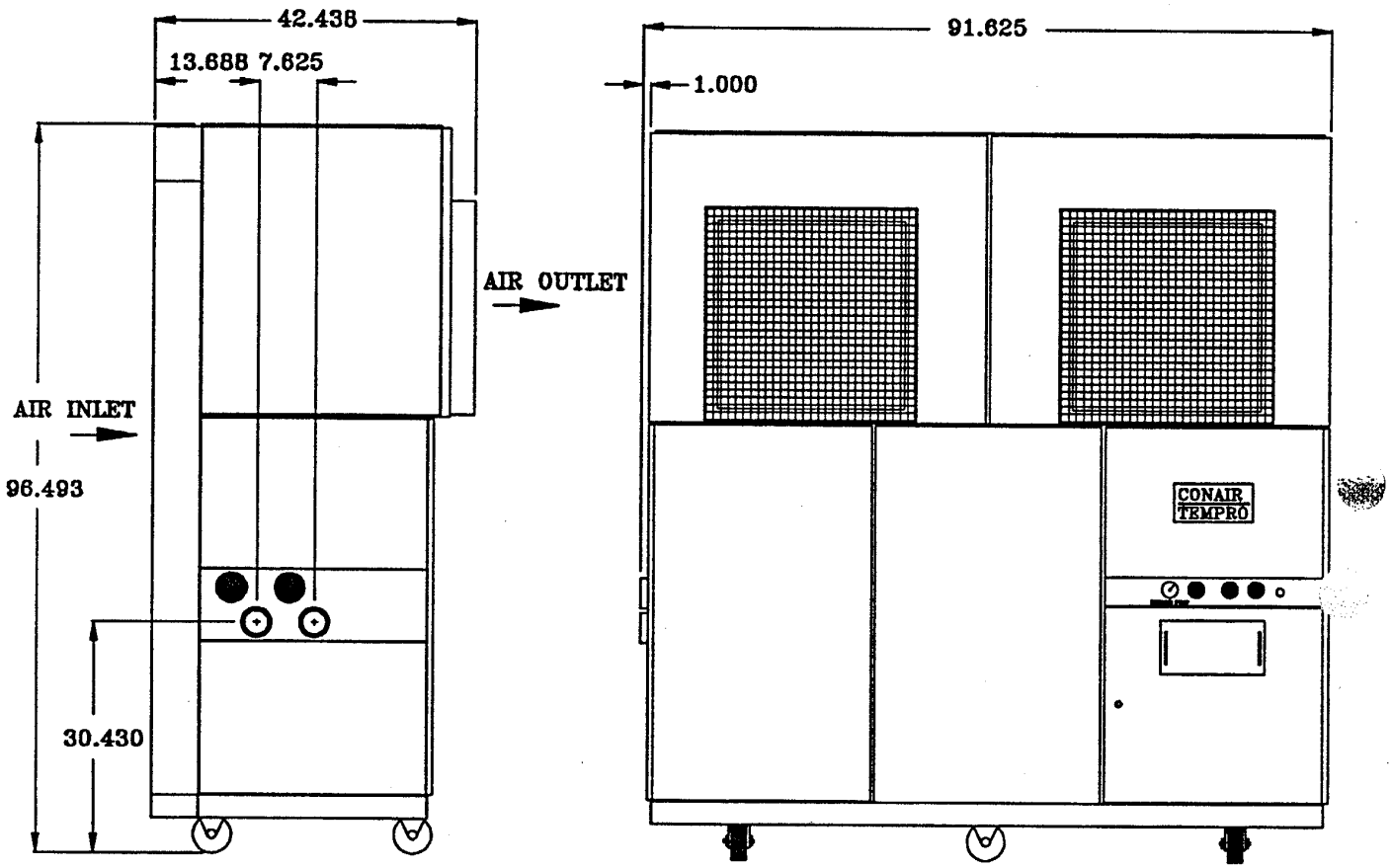
Dimensional Data

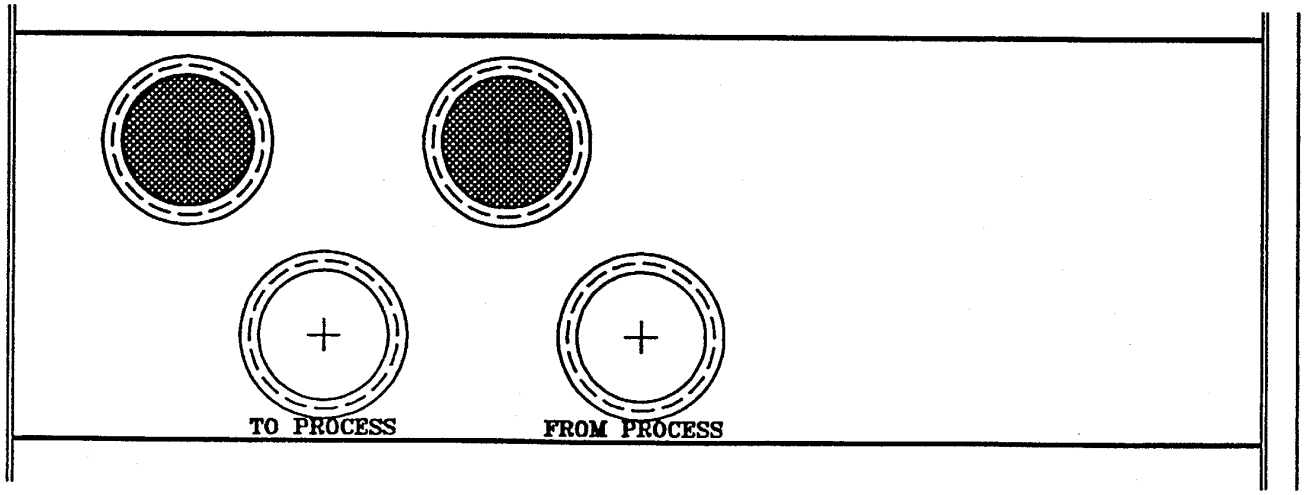
AC(X)-20-2



Dimensional Data

AC(X)-25 throught AC(X)-40





Specifications-Air & Water Cooled

microTrac 3 Series

MODEL	Refrigeration Capacity (tons)	Compressor (hp)	Normal flow to process (GPM/PSI)	Process Pump (hp)	Recirc. Pump (hp)	Condenser Water flow (GPM)	Shipping Weight (lbs.)	AMPS @ 460/3/60 Full load	Running	FPT Process / Condenser Connections (inches)
WC3-3	3.9	3.25	16/23	.50	.33	12	500	11	9	1.5
WC3-5	5.8	5	25/26	.75	.33	17	550	14	12	1.5
WC3-7.5	9.0	7.5	38/24	1	.33	27	825	20	16	2
WC3-10	12.1	10	51/34	1.5	.50	36	900	25	21	2
WC3-15	17.2	15	73/35	2	.75	52	1300	35	28	2.5
WC3-20	19.0	20	81/32	2	.75	57	1500	41	29	2.5
WC3-25	24.8	25	106/36	3	1	74	1700	51	38	3
WC3-30	28.1	30	118/47	5	1	84	2000	68	48	3
WC3-35	36.3	35	151/60	7.5	1.5	109	2150	76	61	3
WC3-40	42.6	40	176/65	10	2	128	2300	88	74	3

Condenser water flow based on 85°F water at 25psi minimum supply pressure at condenser inlet.

microTrac 3 Series

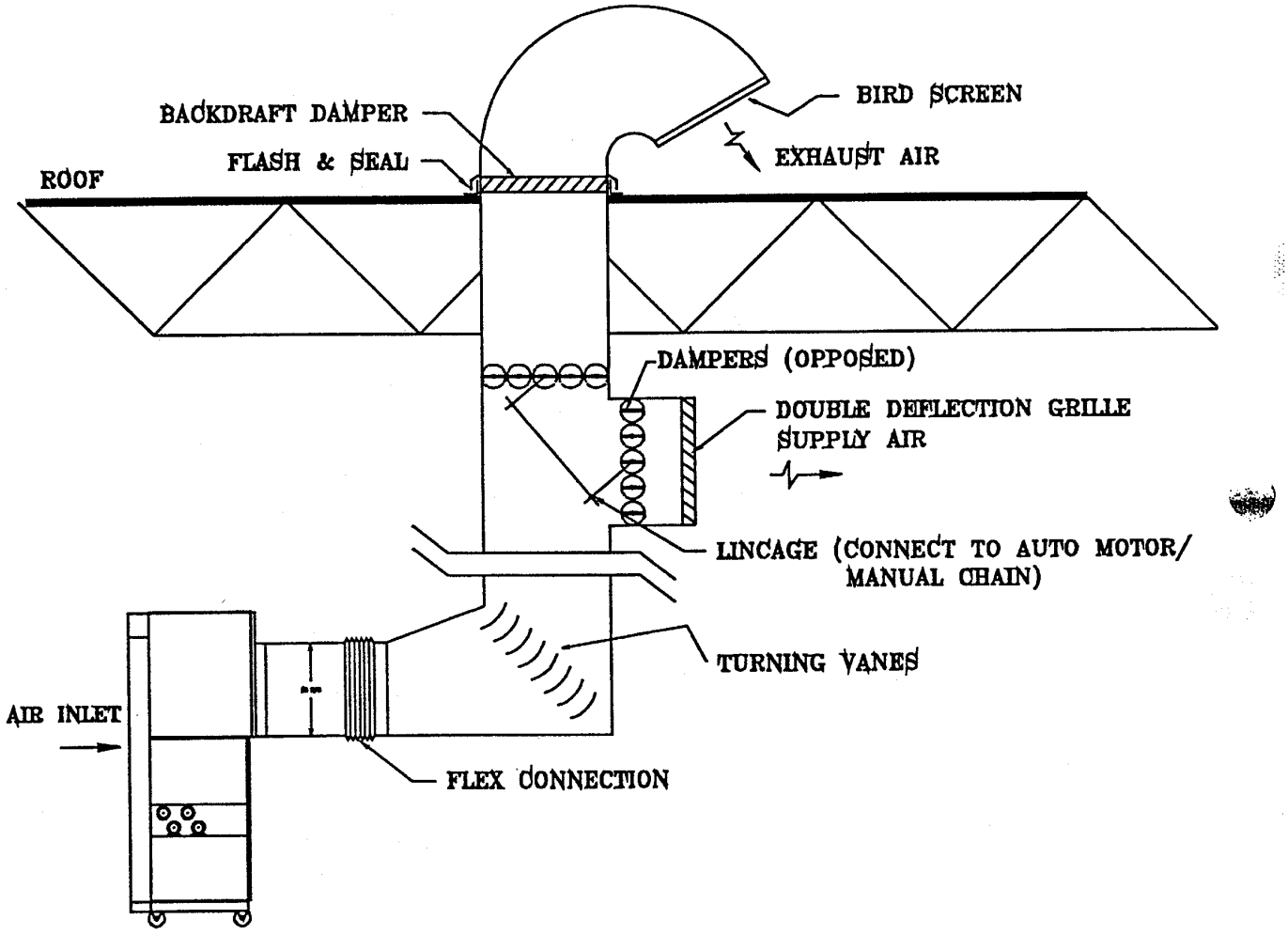
MODEL	Refrigeration Capacity (tons)	Compressor (hp)	Norminal flow to process (GPM/PSI)	Process Pump (hp)	Recirc. Pump (hp)	Condenser Fan (qty/hp)	Space Heating Capacity (btu/hr x 1000)	Condenser Air flow (cfm)	Shipping Weight (lbs)	AMPS @ 460/3/60 Full load	Running	FPT Process Connections (inches)
AC3-3	3.4	3.25	14/24	.50	.33	1/1	59	6,200	500	13	11	1.5
AC3-5	5.1	5	22/27	.75	.33	1/1	88	6,200	575	16	14	1.5
AC3-7.5	7.8	7.5	33/26	1	.33	1/1.5	139	8,300	825	23	19	2
AC3-10	11.0	10	47/36	1.5	.50	2/1	171	10,000	950	29	24	2
AC3-15	15.7	15	66/37	2	.75	2/1.5	260	14,000	1300	40	33	2.5
AC3-201	17.3	20	73/35	2	.75	3/1.5	356	16,000	1550	49	37	2.5
AC3-202	17.3	20	73/35	2	.75	2/3	360	16,000	1750	51	38	2.5
AC3-25	22.5	25	95/37	3	1	2/5	445	21,000	2100	66	52	3
AC3-30	25.6	30	107/52	5	1	2/7.5	537	22,800	2600	90	68	3
AC3-35	33.1	35	137/62	7.5	1.5	2/10	637	27,900	2800	105	88	3
AC3-40	38.7	40	159/67	10	2	2/10	737	27,900	3000	117	101	3

Condenser Air Flows also represent Air Make-up requirements if ducting outside.

All customer supplied water piping must be sized for minimal pressure loss at rated flows.

Ductwork System

Typical Ductwork Detail for Air Exhaust and Space Heating
AC20-2 through AC-40



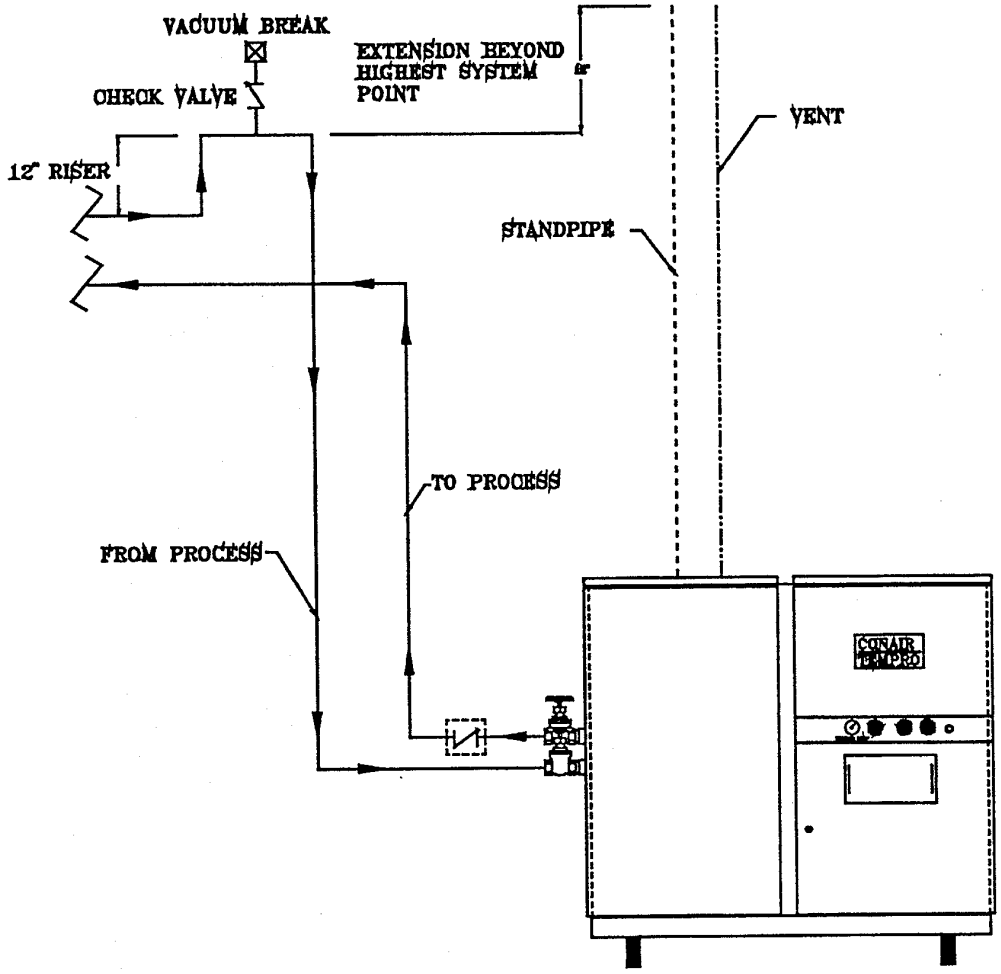
Ductwork must be securely attached to the building construction in an approved manner.

Duct area to be sized for a minimum velocity of 1800ft/min and static pressure not to exceed 2" wc.

AC20-2 = 9 ft^2 = 1296 in^2 minimum
AC25 = 12 ft^2 =1728 in^2
AC30 = 13 ft^2 = 1872 in^2
AC35, AC40 = 16 ft^2 = 2304 in^2

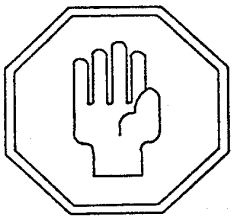
External Vents must be closed when chiller is not in operation.

Overhead Piping Detail

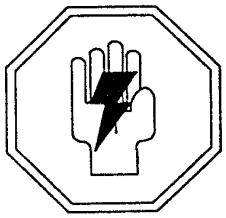


Overhead piping installations above process connections require the installation of a check valve in the To Process line, and riser with check valve and vacuum break in the From Process line to prevent syphoning at shut down. A standpipe and vent tube must be installed to 12 inches above the highest system point. This prevents over pressurization. The maximum height of piping above process connections = 10 ft.

Electrical



It is strongly recommended that when installing the electrical portion of the Portable Chiller, all wiring, disconnects, and fusing follow the National Electrical Code and any local electrical codes for your area.



ALWAYS maintain a safe GOUND and ALWAYS disconnect the incoming power BEFORE an attempt is made to open the unit or other nonstandard operating procedures, such as routine maintenance.

The electrical specifications are located on the nameplate mounted on the side of the unit, (see figure below). This will indicate the required voltage, number of phases, frequency, full load amps, disconnect fuse size, and minimum wire connection size for this unit. The electrical hookup should be identical, with a maximum of +/- 10% variance in voltage.

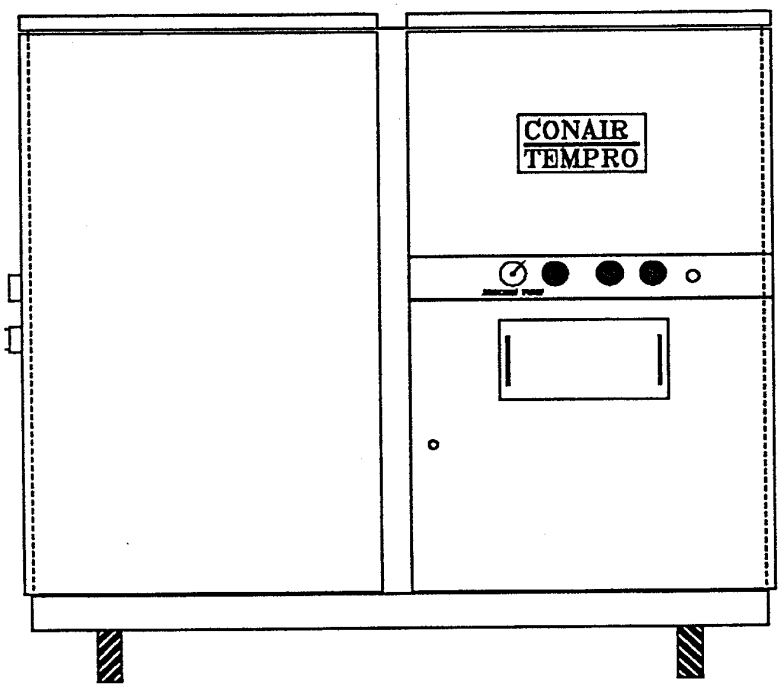
The electrical hookup should be also run through a fused disconnect, sized in accordance with the nameplate amoerage and conforming to *Article 250 of the National Electrical Code.*

CONAIR TEMPRO Part of The Conair Group		1176 DAVIS ROAD ELGIN, ILLINOIS U.S.A. 60123 (847) 888-8800
MODEL	SERIAL #	
VOLTS	PHASE	HZ
FLA	DISCONNECT FUSE SIZE	
MIN. WIRE CONNECTION SIZE		
WIRING SCHEMATIC #		
RECIRC PUMP	HP	FLA
PROC PUMP	HP	FLA
COMP	HP	FLA
FANS (x 2)	HP	FLA
OPERATING TEMP. RANGE		
TESTED BY		

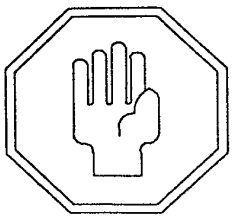
Electrical

Before power is initiated to the unit, make sure the proper voltage, phase, frequency, full load amps, disconnect fuse size, and minimum wire size meet the specifications stated on the nameplate mounted on the outside of the unit. Improper power supply could result in damage to the unit as well as serious injury to the operator.

Connect the power feed to the unit



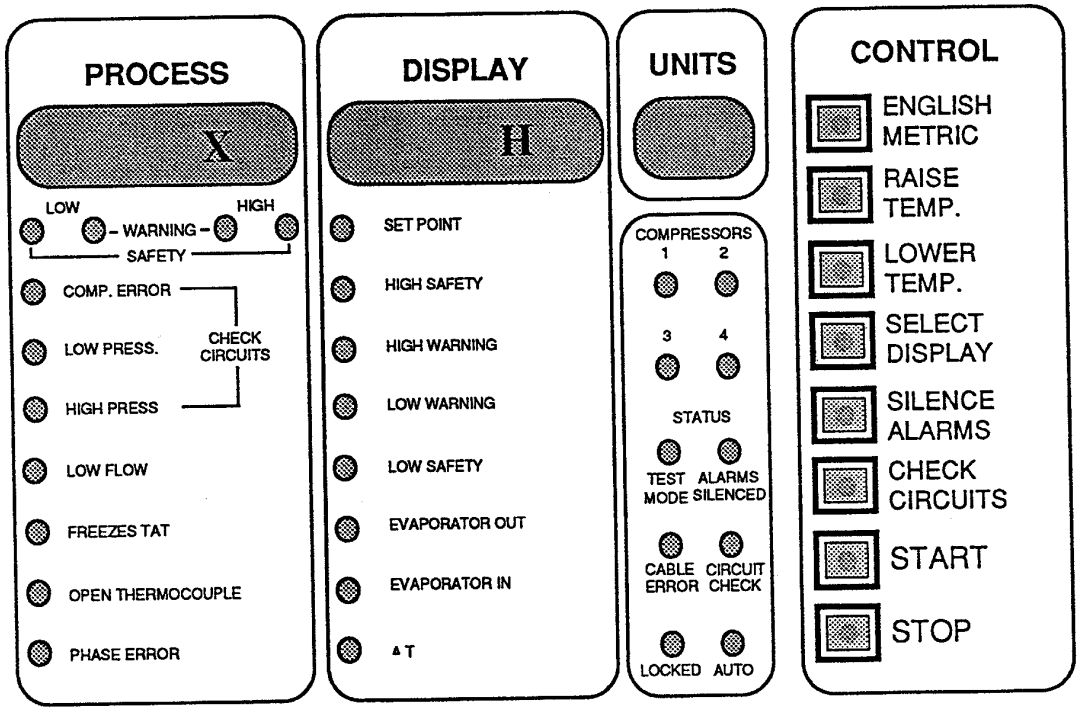
A flexible pig-tail is recommended at the unit for servicability.



Power must be applied to the chiller for at least 24hrs. prior to start-up to allow the crankcase heater to sufficiently vaporize dissolved refrigerant.

Electrical

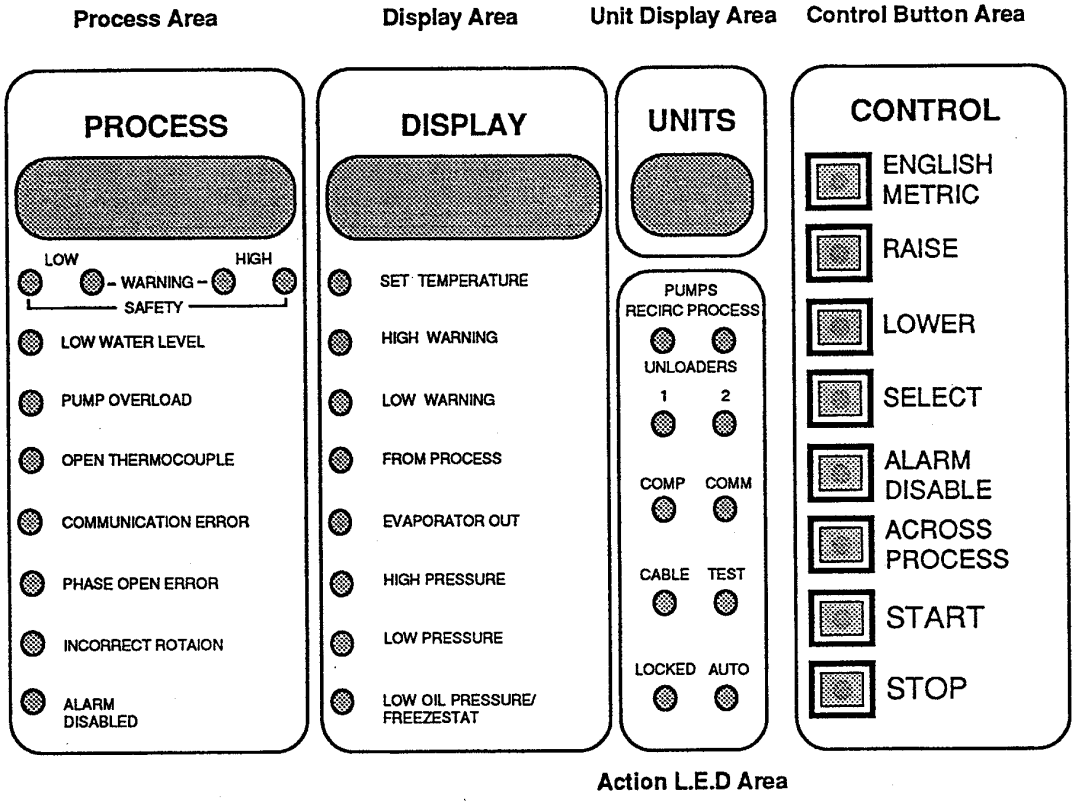
Upon power hookup, the control display will indicate the hours the unit has been in operation by displaying "X" in the Process Screen, "X" being the number of hours, and "H" in the Display Screen indicating hours. All L.E.D.s except "CABLE" will be lit for 5 seconds.



LAYOUT & FUNCTION of the CONTROL PANEL

Control Panel

The Control Panel consists of 5 areas that provide process information and control. These 5 areas are:



Process Area

This area consists of a display screen and 11 L.E.D., (Light Emitting Diode), indicators. The Process Area will constantly monitor the operations of the Chiller and display the current TO PROCESS temperature in the screen. The L.E.D. indicators in this area are used to indicate any alarm condition that may occur. More on these indicators is covered in the Trouble Shooting Chapter of this manual.

Display Area

The Display Area consists of a display screen an 8 L.E.D. indicators. The display screen shows the value of the item indicated by the selected L.E.D. indicator, ex., If the Set Temperature indicator is on, the display screen will show the temperature set point. This area is used in conjunction with the SELECT (Gray), RAISE (Orange), and LOWER (Blue) buttons.

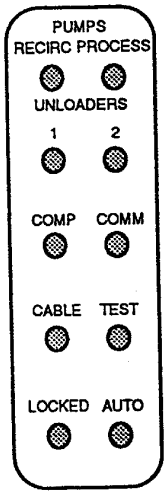
Control Panel

Unit Display

This Area consists only of the smaller display screen. This will differentiate between degrees fahrenheit and degrees celsius by displaying either "°F" or "°C". This area is used in conjunction with the English/Meteic button to toggle between the two units of measurement.

Action L.E.D. Area

This Area consists of 10 L.E.D. indicators that will indicate what action the unit is taking as the present time.



Recirc. Pump

The Recirc. Pump L.E.D. indicator will light when the pump is turned on by the contoller.

Process Pump

The Process Pump L.E.D. indicator will light when the pump is turned on by the controller. This will occur after the Recirc. Pump has started. In some cases, there may be a sufficient delay, to allow the Recirc. pump to circulate water internally for cooling prior to accepting heat from the process. This provides faster pull-down times at the start. The process pump will not start until the internal water temperature has been pulled down beyond the high safety value. If the system cannot be pulled down within 1/2 hour on initial start, the high safety alarm will activate to shut down.

Unloaders (1 & 2)

The unloaders L.E.D.s will light indicating the unloader or hot gas bypass valve, if equiped, has energized due to load falling below chiller capacity. The unloader provides capacity control as well as reduced energy consumption.

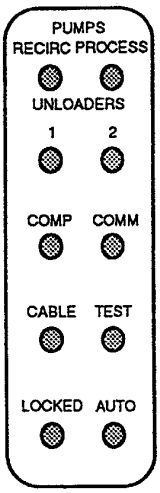
Compressor (COMP)

The compressor L.E.D. will light when the compressor has been energized by the controller. Compressor operation will only be initiated if the recirc. pump is in operation, or the flow switch as been activated on units less pump and tank.

Control Panel

Communication (COMM)

The COMM L.E.D. will flash on indicating that communication with a host machine has been enabled. When the host machine makes a change to the microTrac 3 contol parameters the COMM L.E.D. will flash off. The display L.E.D. for any parameter that has been changed through communication will also flash when selected.



Cable

The CABLE L.E.D. will light indicating the control panel cable that links the control panel to the mother board is improperly connected, or is not a proper cable type.

Test

The TEST L.E.D. will light indicating the unit is in the diagnostic test mode. The process display screen will also show "SEL" and the display screen will indicate the number of the specific test about to be preformed. For more on diagnostic testing, see Chapter 7, System Tests. The test L.E.D. must be **off** for proper operation to occur.

Locked

The LOCKED L.E.D. will light when the locking key has been enabled. The Control Panel Locking Key is a user option as well as a factory installed option. For more on the Locking Key Option, see Chapter 4, Basic Operation & Extra Features. All units are shipped with a locking jumper wire installed, ensuring factory preset defaults values are loaded.

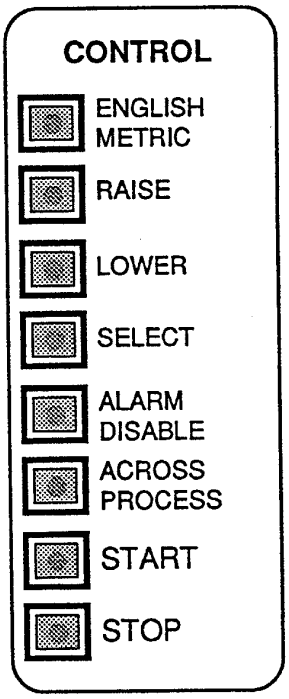
Auto

The AUTO L.E.D. will flash when the auto start capability is enabled. The L.E.D. will remain flashing when the unit is started or stopped by the autostart option. For more on the autostart option, see Chapter 4, Basic Operation & Extra Features.

Control Panel

Control Buttons

The Control Button Area contains 8 different control buttons. When a button is depressed you will feel a click as well as hear a high pitch beep to confirm your action. When a button is held down the button will repeat its function until released. This will be accompanied by consecutive audible beeps. **No two buttons should be pressed at the same time.**



English/Metric (Brown)

The English/Metric button will toggle the process and display screens to degrees celsius or degrees fahrenheit. The unit display screen will change to "°C" or "°F" respectively.

Raise (Orange)

The Raise button is used to raise the settable parameters. The selected parameter will be raised 1 degree each time the button is depressed.

Lower (Blue)

The Lower button is used to lower the settable parameters. The selected parameter will be lowered 1 degree each time this button is depressed.

Select (Gray)

The Select button will toggle through the settable parameters in the display area, in a top to bottom sequence. The indicator L.E.D.s will indicate which parameter has been selected while the display screen will show the value of that particular parameter.

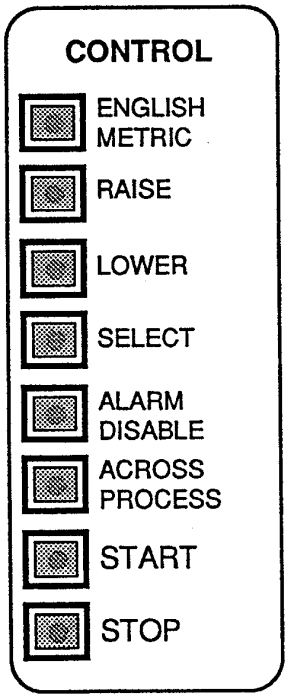
Alam Disable/Enable (Yellow)

The Alarm button will toggle the audible alarm and external alarms, (optional), on and off during an alarm condition. However, when the alarm is sounded and the Alarm Disable button is depressed the Alarms Disabled L.E.D., in the process area, will light indicating that an alarm condition has occured an that the audible alarm(s) have been disabled. Once the condition has been corrected, press the Alarm button again to enable the audible alarms. If the Alarms Disable/Enable L.E.D. is illuminated, alarms will be indicated on the L.E.D. panel, but will not activate audible or external alarms.

Control Panel

Across Process (White) (Optional)

Depressing the Across Process button will cause the display screen to read the temperature difference between To and From Process Lines.



Start (Green)

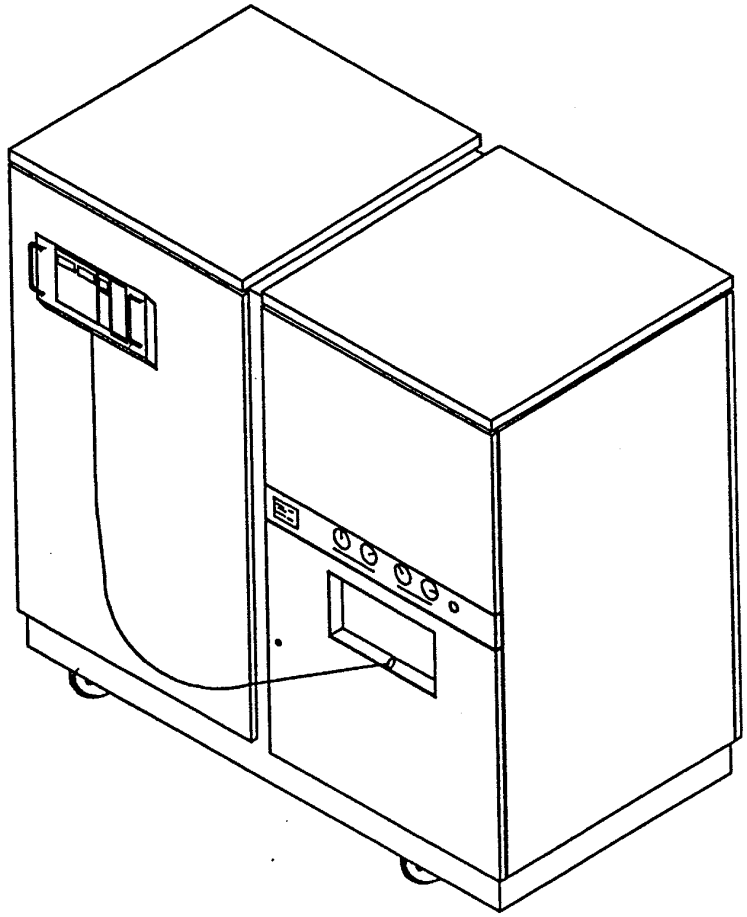
The Start button is used to activate the Chiller into normal operation conditions as specified by the settable parameters.

Stop (Red)

The Stop button is used to stop the operation of the Chiller, however the Process, Display, and Units Screens wil still show their respective values.

Control Panel

The control panel can be remotely mounted. The control panel is mounted to the Chiller by two magnets located on the back of the panel. These magnets can be used to mount the control panel to any ferous metal. The control panel is removed by grasping the black handles and prying the panel from the enclosure. The control panel can be located as far away as 50 feet with the use of the optional 50 foot coil cord. The Chiller comes with a standard 9 foot coil cord.



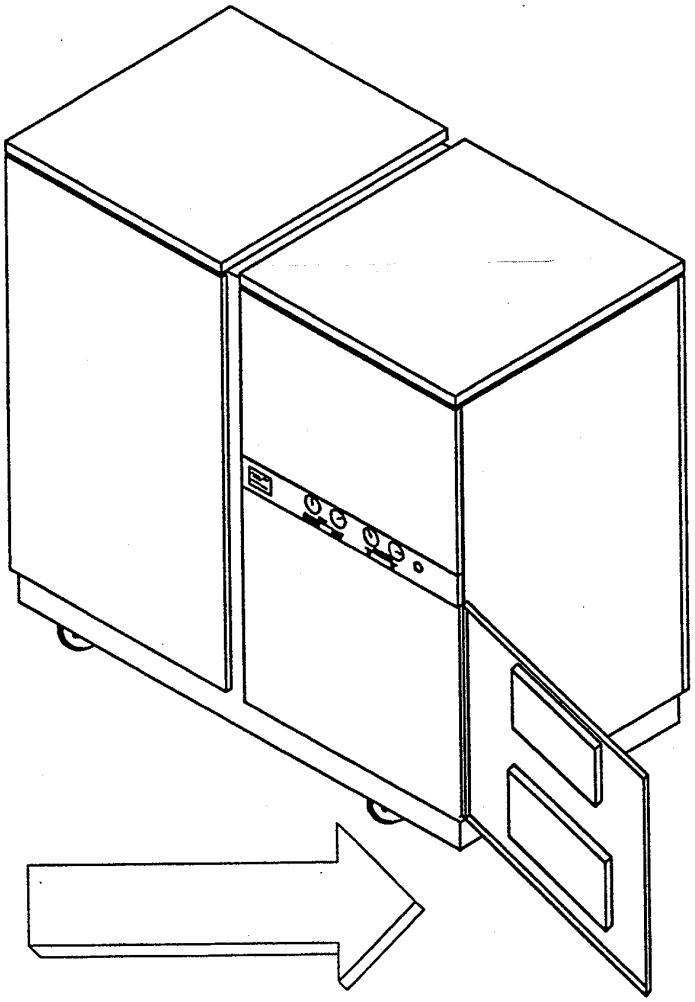
Basic Operations & Extra Features

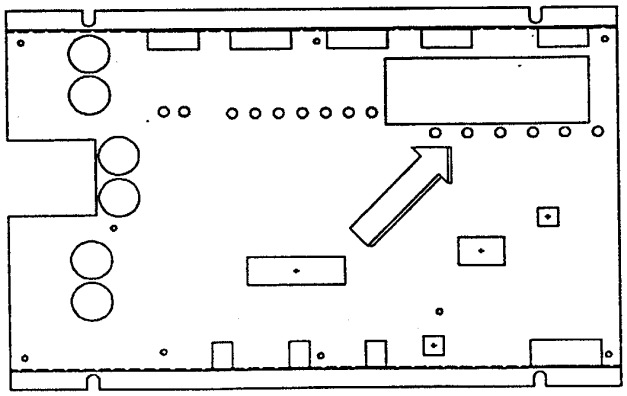
Alarm Conditions

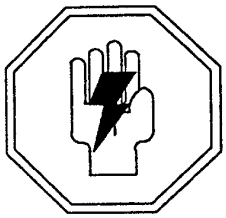
When an alarm condition occurs, the first step is to press the Alarm Disable (Yellow) button. This will disable the audible alarm along with the optional external alarm(s), however the Alarm Disable L.E.D. will illuminate indicating an alarm has gone off. The trouble condition will be indicated by the lit L.E.D. in the Process Area of the control panel. Use Chapter 6, Trouble Shooting, of this manual to determine the problem and find the suggested course of action.

Some failure conditions will not be displayed, such as a mother board output fuse clearing. This will result in the inability of another device,such as the process pump, to function and will be displayed by its appropriate L.E.D.

The fuses are located on the mother board in the upper right of the board. Replace the blown fuse with 1 amp 5 x 20 mm. replacement fuse, see replacement parts section of this manual, Chapter 10.



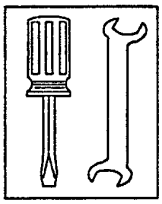




When attempting any maintenance of any kind, disconnect the power supply first!

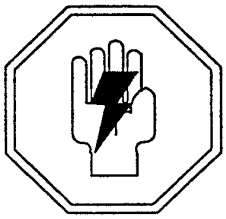
Adding a Key Lock

The Key Lock can be installed as either a factory installed option or by the customer. The Key Lock Kit can be ordered from Conair Tempro, part number: 05000129.



The tools that are required to install the Key Lock are;

Meduim blade type screw driver
7/8" open end wrench
Panel Knockout equipment

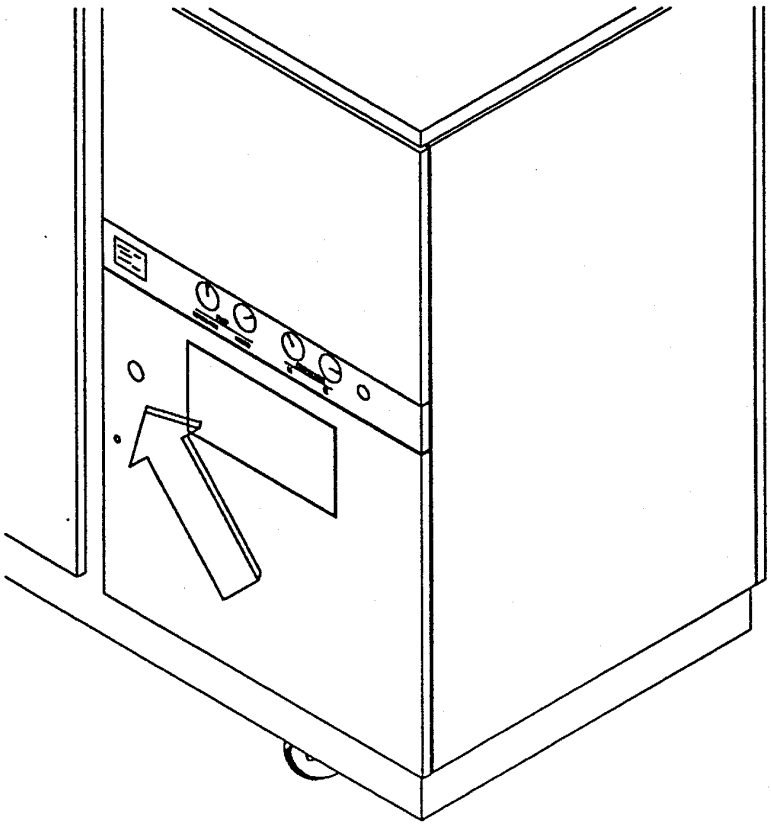


Make sure the Chiller has stopped operation and the power supply has been disconnected!

Open the electrical access panel, the door will fold open exposing the electrical components.

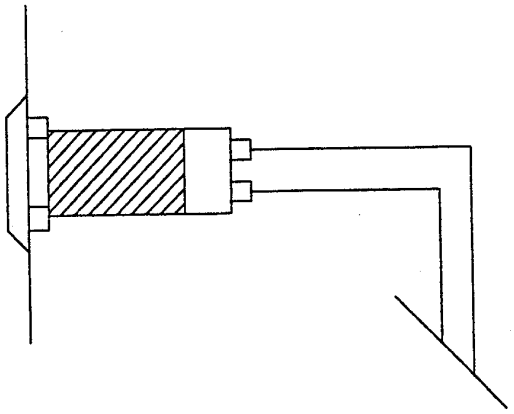
Switch configuration switch 3 to either the "ON" or "OFF" position depending on your application.

Knock out a 7/8" diameter hole at a clear spot on the electrical enclosure door.



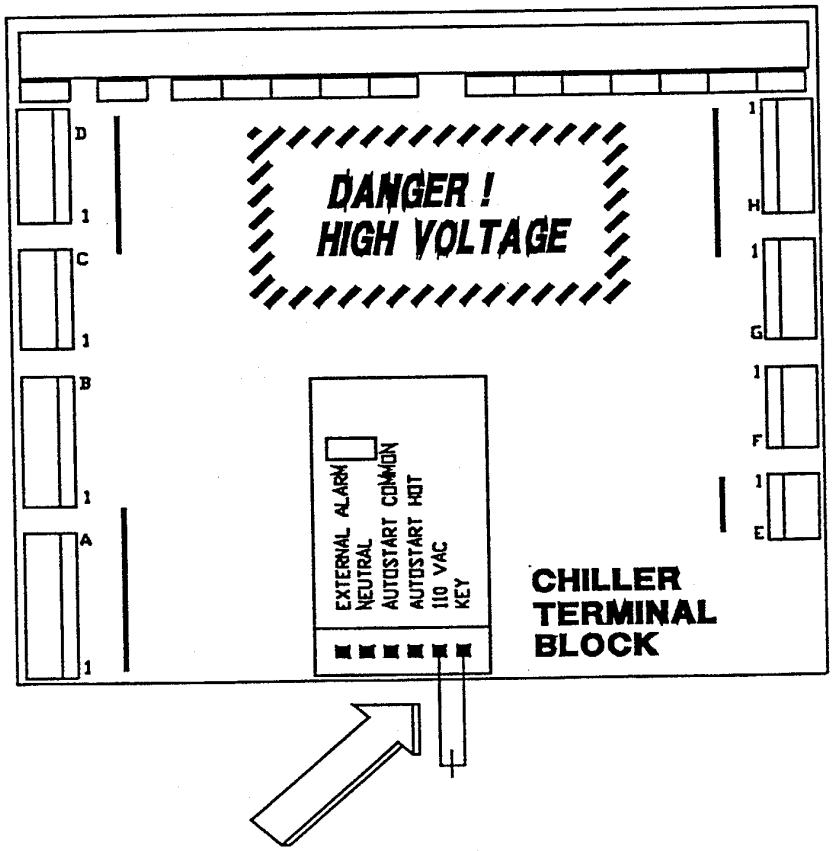
Adding a Key Lock

Feed the wires from the locking device through the locking key hole, and pull the locking key through so that it is mounted flush with the side panel.



Feed the two wires through the locking bolt and bolt the locking device to the panel.

Run the wires down the inside of the electrical box to the chiller terminal block, located on the upper right side of the electrical box. Make sure the wire insulation has been pulled back at least 1/8". Insert one wire into the 110 VAC port and screw down tight. Insert the other wire into the Key port and screw down tight.



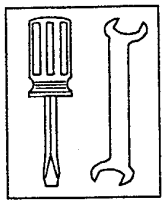
Check your connections, and close the electrical access panel.

Reconnect the power supply. The key lock will now function as previously stated.

Actual in-chiller orientation is 180°.

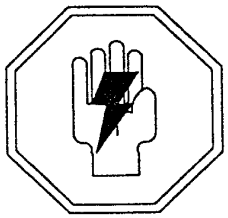
Adding a Key Lock

The Key Lock can be installed as either a factory installed option or by the customer. The Key Lock Kit can be ordered from Conair Tempro, part number: 05000129.



The tools that are required to install the Key Lock are;

Meduim blade type screw driver
7/8" open end wrench
Panel Knockout equipment

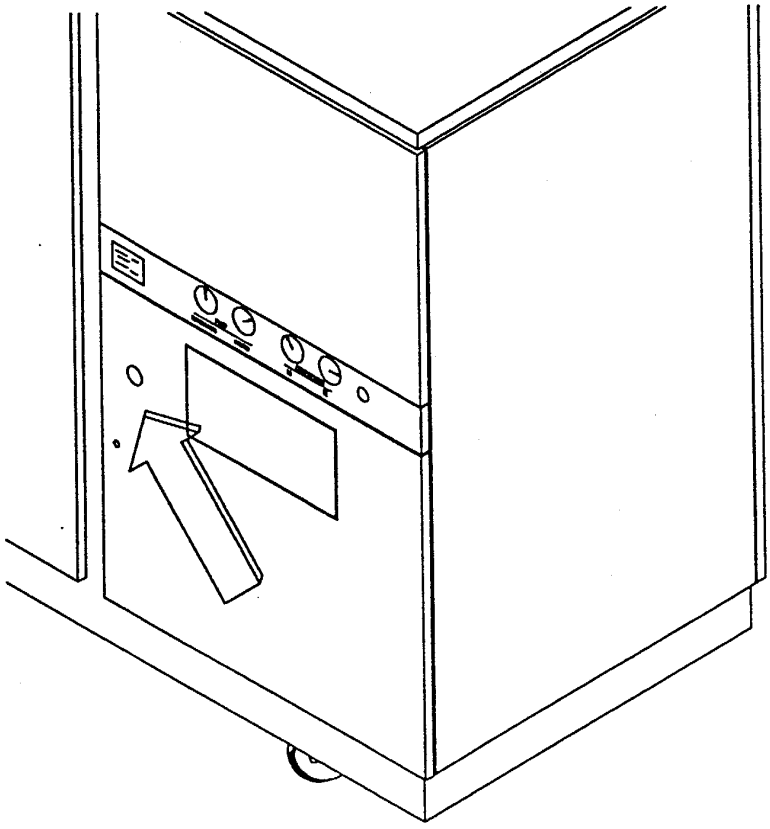


Make sure the Chiller has stopped operation and the power supply has been disconnected!

Open the electrical access panel, the door will fold open exposing the electrical components.

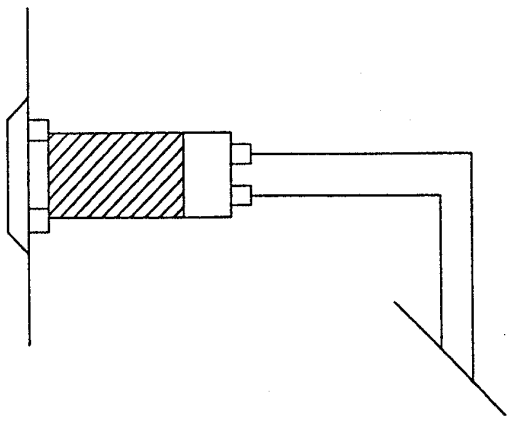
Switch configuration switch 3 to either the "ON" or "OFF" position depending on your application.

Knock out a 7/8" diameter hole at a clear spot on the electrical enclosure door.



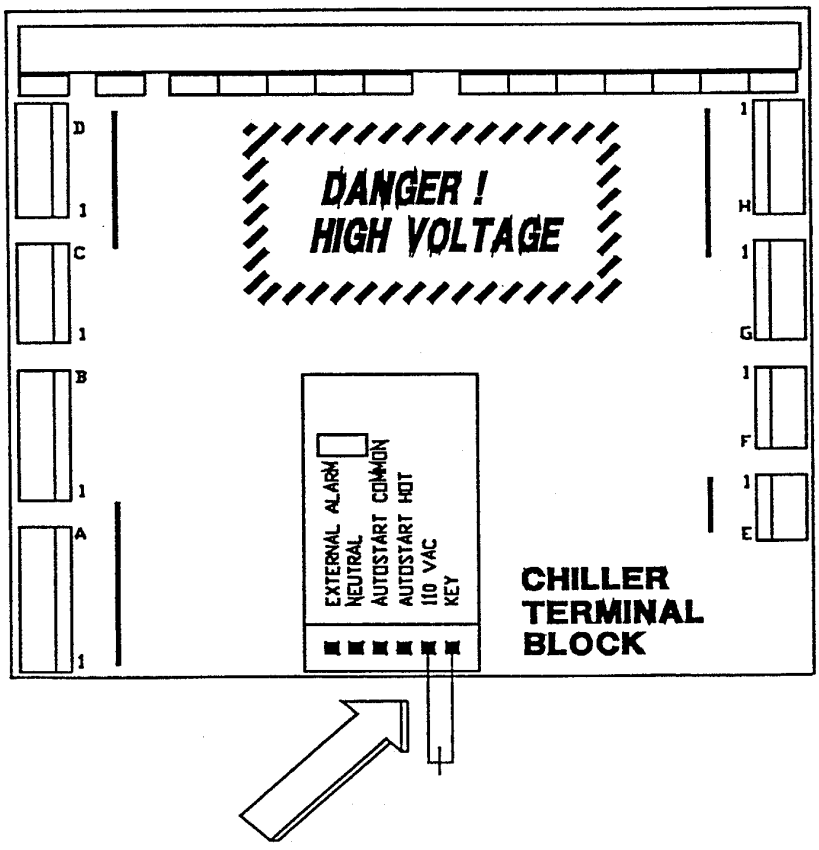
Adding a Key Lock

Feed the wires from the locking device through the locking key hole, and pull the locking key through so that it is mounted flush with the side panel.



Feed the two wires through the locking bolt and bolt the locking device to the panel.

Run the wires down the inside of the electrical box to the chiller terminal block, located on the upper right side of the electrical box. Make sure the wire insulation has been pulled back at least 1/8". Insert one wire into the 110 VAC port and screw down tight. Insert the other wire into the Key port and screw down tight.



Check your connections, and close the electrical access panel.

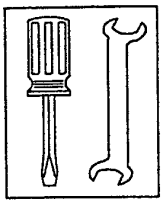
Reconnect the power supply. The key lock will now function as previously stated.

Actual in-chiller orientation is 180°.

Auto Start

The auto start mode enables the chiller to start automatically with eigther a timing device or when the process molding machine starts.

There are two configurations for the auto start operation, **Contact Closure** and **Voltage Source.**



The tools that are required for this operation are;

Meduim blade type screw driver
Panel Knockout equipment

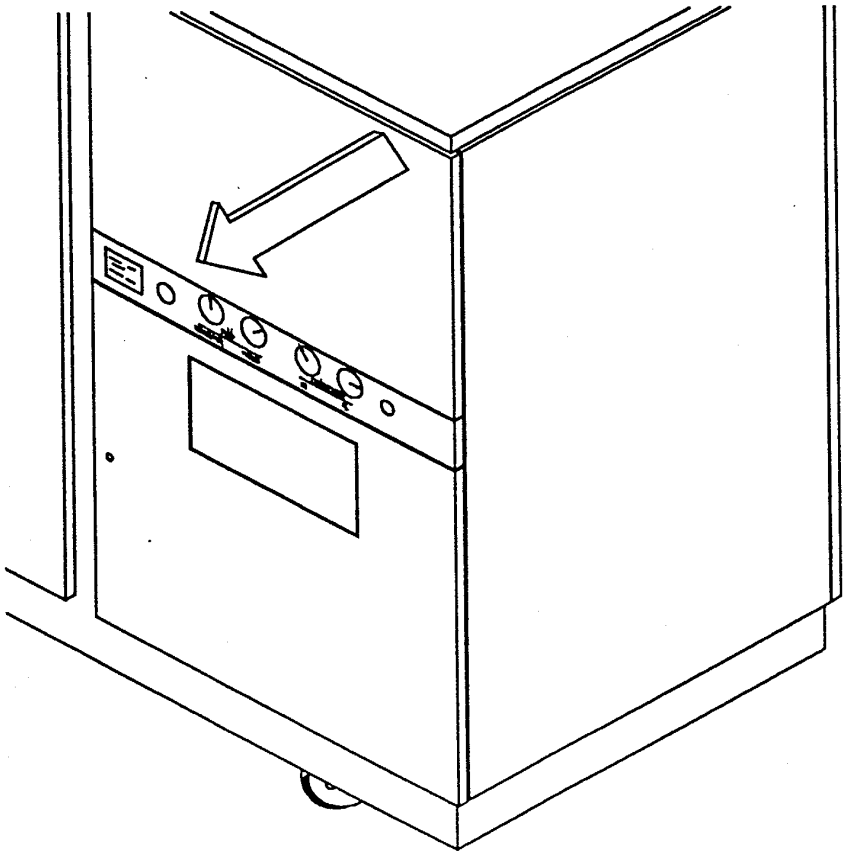
Make sure the Chiller has stopped operation and the power supply has been disconnected!

Contact Closure Start

Open the electrical panel. The panel will swing open exposing the electrical components.

Using the panel knockout equipment, punch a small hole in the left side of the gauge panel. The hole should be large enough to connect conduit for the wires from your switching or timing device.

Connect standard conduit to the hole and insert the two leads from your switching device through the conduit and into the electrical cabinet.

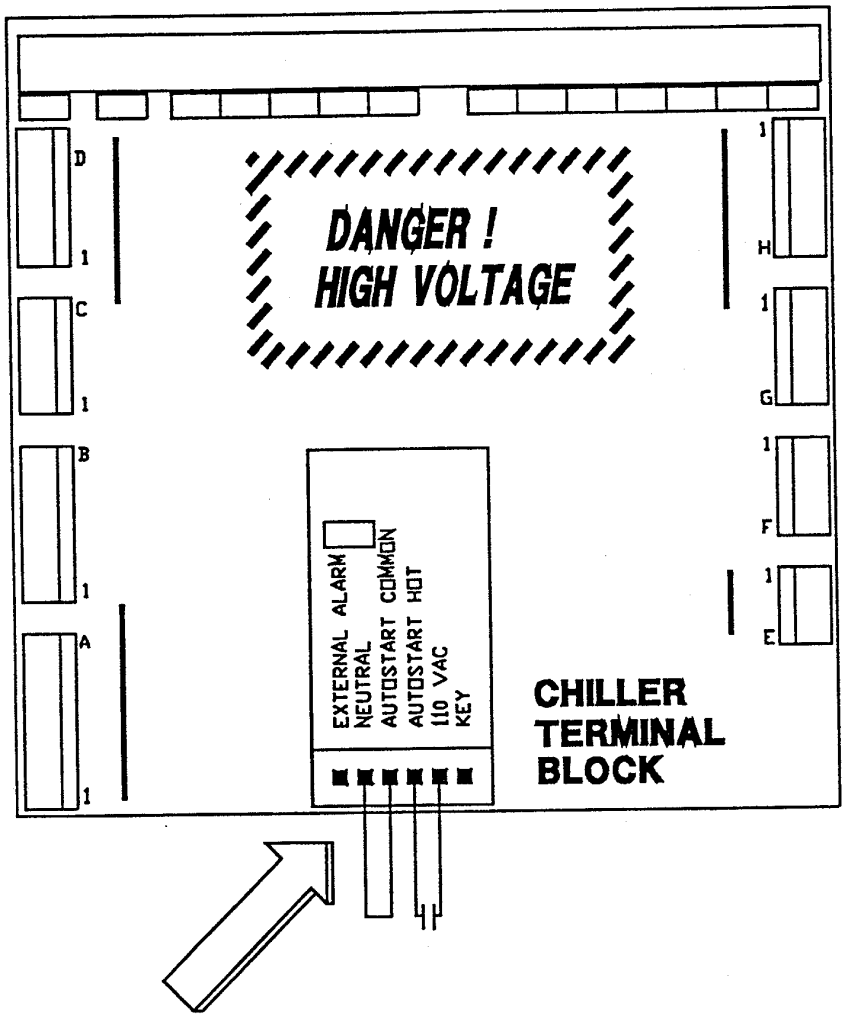


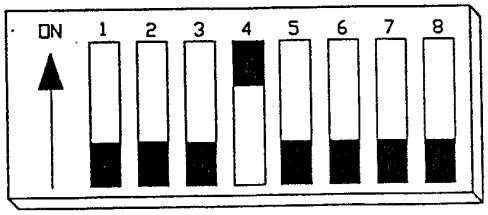
Auto Start

Locate the Chiller Terminal Block, mounted to the back of the electrical cabinet in the upper right corner. Connect one wire from the switching device to the 110 VAC terminal and the other to the Auto Start Hot terminal. Connect a wire from the Auto Start Common terminal to the Neutral terminal. Make sure all contacts are screwed down tight.

Switch Configuration switch 4, labeled "Auto Start / Stop" on the mother board, to "ON", on will be designated by the arrow on the switch block.

Close the electrical cabinet access panel. Reconnect the power supply. The Auto Start L.E.D. in the Action L.E.D. area will flash indicating the auto start mode is enabled. When the Chiller has been started or stopped through the auto start mode the Auto Start L.E.D. will remain flashing.





Auto Start

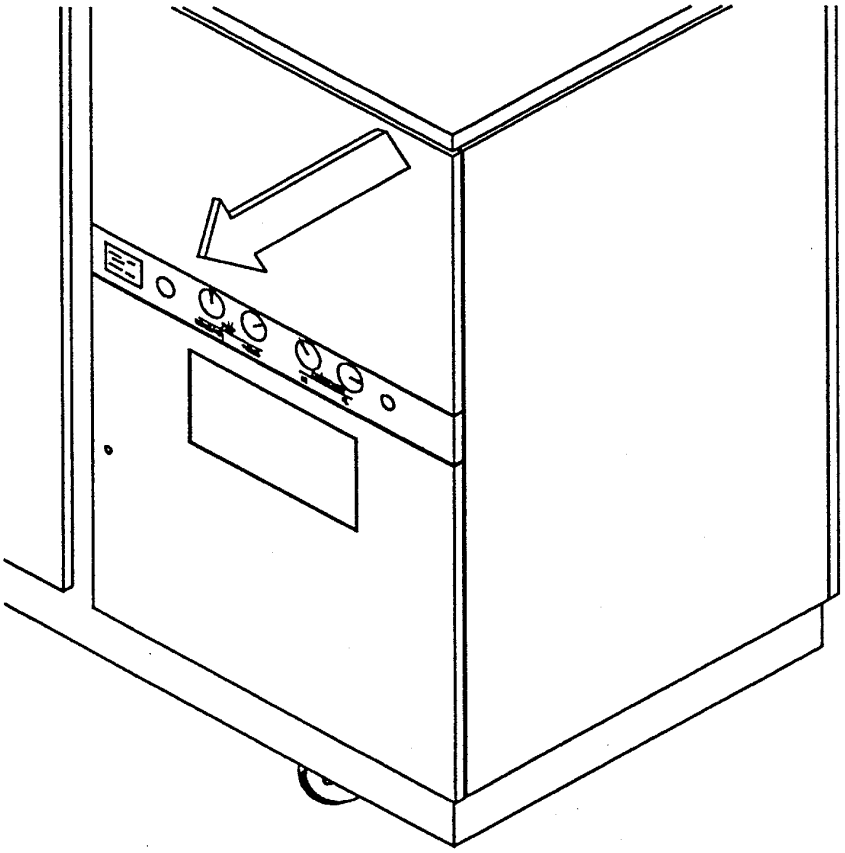
Voltage Source Auto Start

The Voltage Source configuration is used when it is desired to have the chiller start along with a process machine that has 110 VAC power outputs, such as a molding machine.

Open the electrical panel. The panel will swing open exposing the electrical components.

Using the panel knock-out equipment, punch a small hole in the left side of the gauge panel. The hole should be large enough to connect conduit for the wires from your switching or timing device.

Connect standard conduit to the hole and insert the two leads from the process machine through the conduit and into the electrical cabinet.



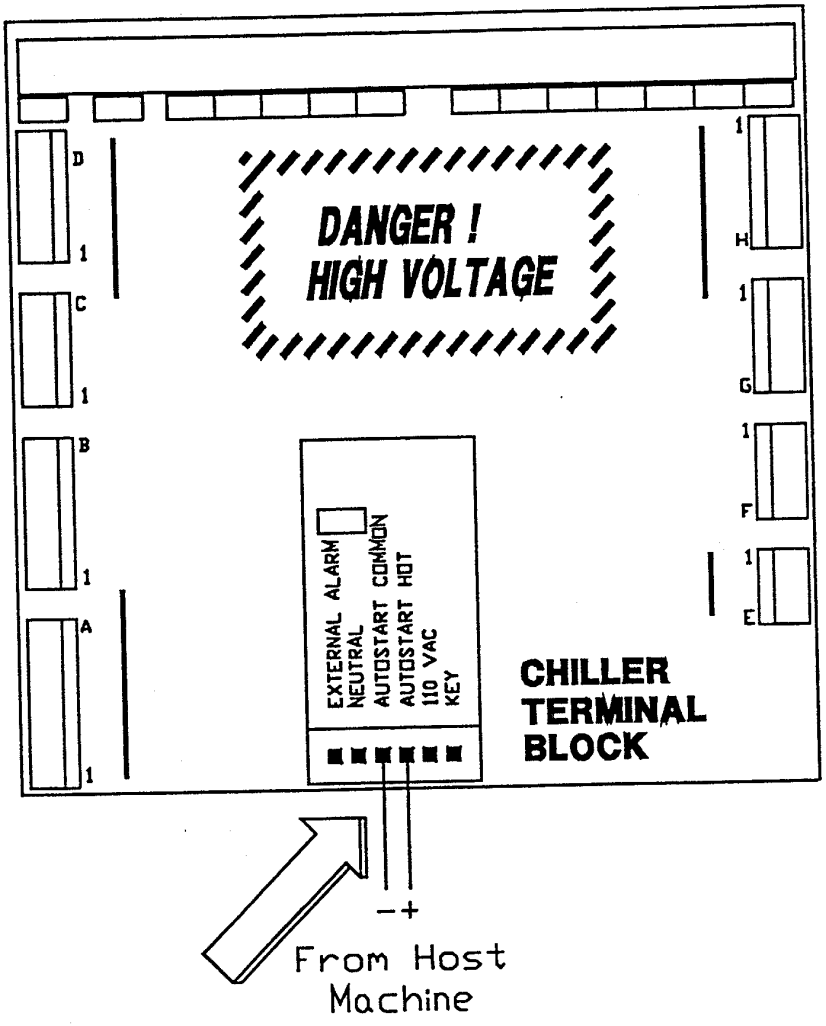
Auto Start

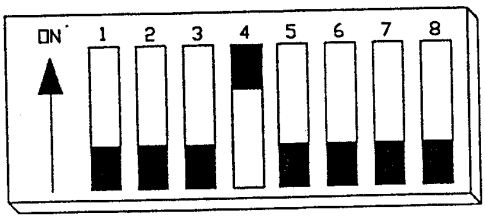
Locate the Chiller Terminal Block, Mounted to the back of the electrical cabinet in the upper right corner. Connect the 110 VAC hot lead from the process machine to the Auto Start Hot Terminal and the Neutral lead the Auto Start Common Terminal. Make Sure all contacts are screwed down tight.

Switch configuration switch 4, labled "Auto Start / Stop" on the mother board, to the "ON" position. "ON" will be designated by the arrow on the switch block.

Close the electrical cabinet access panel and reconnect the power supply.

The Auto Start L.E.D. in the Action L.E.D. area will flash indicating the auto start mode is enabled. When the Chiller has been started or stopped by the process machine the Auto Start L.E.D. will remain flashing.

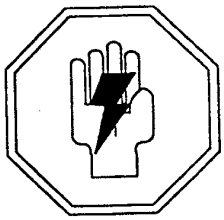




Preventative & Routine Maintenance

Maintenance

A program of REGULAR inspection, cleaning and PREVENTIVE MAINTENANCE by trained personnel will contribute greatly to the long satifactory service life of this product.



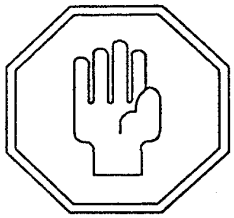
WHERE MAINTENANCE PROCEDURES CALL FOR SHUT DOWN -- DISCONNECT THE POWER SUPPLY BEFORE PROCEEDING!

HIGH VOLTAGE OR UNEXPECTED (AUTO START) OPERATION CAN BE HAZARDOUS!

Periodic Inspection	Read essential temperatures and pressures periodically to see that they indicate normal operation. Record these readings on a log sheet on the maintance log, supplied on page 52. If any abnormal operation is observed, see the Troubleshooting Section of the manual.
Monthly Inpection	Check cooling tower water treatment system, (for water cooled units). Wipe down external surfaces of the unit. **SHUT UNIT DOWN, OPEN MAIN DISCONNECT.** Inspect control panel, checking for loose wires, burned contacts, signs of overheated wires, etc. Apply power to the unit and restart, check performance of controls. Check the sight glass for proper refrigerant charge while the unit is operating **at full load.**

Maintenance

Vessel Maintenance

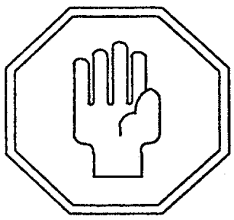


The efficient performance of the evaporator and condenser heat transfer surfaces is essential for proper performance of your portable chiller.

If these surfaces accumulate a film of dirt, scale or slime, their performance efficiency will degrade substantially.

The refrigerant side of the heat transfer surface does not foul, since refrigerant is a good solvent and is in a closed, filtered cycle.

Evaporator Cleaning



The surfaces of the heat transfer system exposed to water can foul from minerals and other contaminants in the water system. A program of water treatment can slow the rate of fouling on heat transfer surfaces, but will not eliminate it.

The effects of fouling can be detected by recording full load performance data on the log sheet. Degrading performance over time may signify fouling.

Check the supply water for the cause of fouling, i.e., minerals, dirt, slime, and algae.

The evaporator should be cleaned with chemicals and procedures that are suitable for the kind of fouling.

Clean the evaporator water side surfaces at least annnually, and more often if serverely foul water is used.

To remove **minerals** and **slime**, cleaning must be done chemically. The proper chemicals can be recommended by a water treatment specialists.

It is important to **rinse** the system thoroughly after cleaning to remove the chemicals before they attack the metal surfaces.

Maintenance

Water Cooled Condenser Cleaning

To remove **dirt, slime,** and **algae** fouling from condenser tubes;

Drain the condenser water.

Remove the condenser heads.

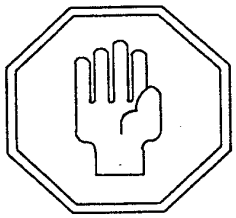
Brush each tube with a tube cleaning brush until clean. An acid solution may be required.

Always remove both heads before cleaning the tubes.

Replace the heads making sure to position the gaskets properly.

Refill the system with water.

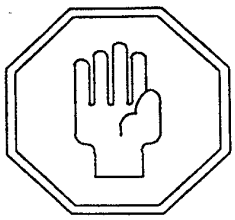
Head Gaskets



Head gaskets do not need to be replaced after each head disassembly operation. However, **Inspect the head gaskets carefully!**

Gaskets must be renewed if they are physically disfigured or otherwise deteriorated. New gaskets are available from the Conair Tempro Parts Department.

Tube Replacement, Water Cooled Units



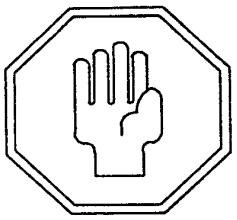
In case of condenser tube failure; call Conair Tempro Service. Special procedures and tools are required and this should only be preformed by Conair Tempro designated service personnel.

The tubes in the evaporators are not replaceable.

If the evaporator tubes should fail, replacement vessels are available from the Conair Tempro Parts Department.

Maintenance

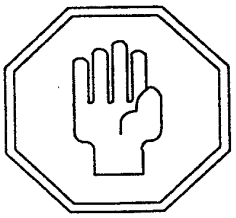
Air Cooled Condenser Cleaning



The face of the condenser should be inspected regularly for dirt and clogging. It should be cleaned at least once a month. More frequent cleaning will be required if conditions are bad and the condenser picks up dirt very quickly. If the condenser is allowed to get too dirty the unit will run a high head pressure, performance will be poor and the fan motors may overload.

Clean dirty coils with a soft brush, flush with cool water, or commercially available coil cleaners.

Discus Compressor Maintenance



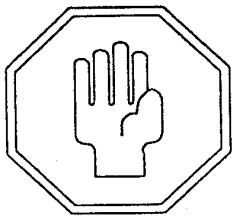
The discus compressor has four components that may be replaced; the suction strainer, oil pump, cylinder heads, and valve plates. If a component other than listed fails, the compressor will require replacement. This service may only be preformed by an autorized Conair Tempro Service Representative.

Refrigerant Charge

All chillers are given a complete charge of refrigerant at the factory. See Pyhsical Specifications for the type and amount of refrigerant charge for your model. The total refrigerant shown is for the entire system.

In order to check for proper refrigerant charge, look in the liquid line sight glass with the aid of a flashlight during system operation. At full load conditions, the sight glass should be clear. Bubbles may be visible while cylinder unloaders or hot gas valves are energized. This is normal and does not signify that refrigeration charge is low.

Recharging



If recharging is necessary, additional or replacement of refrigerant must be performed by qualified Conair Tempro Service Personnel.

CONAIR TEMPRO

PORTABLE CHILLER MAINTENANCE LOG

DATE	circuit														
Comp Amps 100% / Unloaded															
Discharge															
Suction															
Evap.Press.															
Oil Press. hi / lo															
Oil Level															
Lo. Press. Setting															
Hi Press. Setting															
Freestat. Setting															
Evap. Water out Temp.															
Process Water, P															
Recirc. Water, P															
Cond. Water Temp: in / out															
Cond. Water Press: in / out															
Cond. Fan Amps	1														
	2														
	3														

TROUBLESHOOTING

WARNING! The procedures in this section should be preformed ONLY by qualified service personnel. Failure to take appropriate precautions could result in serious injury or death!

Symptom	Possible Cause	Solution
Unit will not start.	1.) Power turned off.	1.) Check main disconnect and fuses.
	2.) Control Circuit Fuse Blown.	2.) Check fuse at chiller terminal block. (Note: Control board does remain illuminated).
	3.) Loose wiring connection.	3.) Turn power off! Check all wires/cables for tightness. Stranded wire tends to "flow" over time.
	4.) Alarm condition exists.	4.) Check control board for possible phase open, rotation, or other errors.
	5.) Compressor time delay in effect.	5.) Wait for the 5 minute anti-cycle timer to elapse. Do not apply heat load until compressor starts.
Compressor Hums but does not run.	1.) Low Input Voltage.	1.) Check main supply voltage, must be within 10% of nameplate rating.
	2.) Phase Loss	2.) Check operator panel for phase open error. Check main supply fusing and phase-to-phase voltages. If ok, check phase continuity through compressor contactor. Check wiring at compressor.

Symptom	Possible Cause	Solution
Compressor Cycles on Low Pressure cut-out.	1.) Refrigerant Charge Low.	1.) Check for leaks, repair and recharge required.
	2.) Low pressure switch setting incorrect.	2.) Factory standard setting 70# cut-in, 40# differential = 30# cut-out. Reset to factory parameters.
	3.) Low load and low flow rate through chiller.	3.) Check line size to/from process, possible excessive resistance. Check chiller internal evaporator water flow balance valve, factory preset for 10° difference across evaporator at full load.
	4.) Restriction in liquid line.	4.) Check for temperature differential across filter drier - replace or change core if possible. Open liquid line shut-off valve fully. Check for closed suction valve at compressor - open fully. Expansion valve clogged, inoperative or misadjusted. Check superheat.
	AIR COOLED	
Compressor Cycles on High Pressure Cut - Out.	1.) Condenser dirty.	1.) Clean Air Filters and Coil.
	2.) Fan(s) inoperative.	2.) Check for overload. Confirm rotation. Check for proper voltage at output of starter(s). Check blower belts.
	3.) Excessive ambient temperature.	3.)Ambient temperature above 110°F (43°C) will create problems.
	4.) Insufficient air flow.	4.) Obstructions at condenser inlets and/or outlets must be removed. Check for properly sized ductwork if applicable.

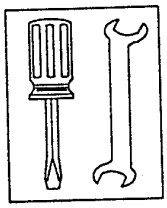
Symptom	Possible Cause	Solution
Compressor Cycles on High Pressure Cut - Out. (contd.)	5.) Improperly set high pressure switch.	5.) Factory standard setting = 360# cut - out.
	<u>WATER COOLED</u>	
	1.) Condenser dirty	1.) Remove heads to examine, clean tubes and shell.
	2.) Insufficient condenser water flow.	2.) Check flow source, closed valves, etc. Check for minimum 25psi at condenser water inlet. Check for proper water regulating valve operation, factory preset for 85°F condenser supply water = 210 psi head pressure.
	3.) Condenser supply water temperature excessive.	3.) Temperatures above 95°F may present problems. Check cooling tower fan / nossles / fill, etc., if applicable.
	4.) Improperly set high pressure switch.	4.) Standard factory setting = 290# cut - out.
	<u>ALL UNITS</u>	
	1.) Refrigerant overcharge.	1.) Pump system down, if not possible due to high pressure trip - overcharged. Bleed system while fully loaded and in operation until bubbles appear in sight glass. Then as small amount of refigerant until sight glass clears.

Symptom	Possible Cause	Solution
Compressor Cycles On, Oil - Pressure Cut - Out	1.) Oil level insufficient	1.) Check oil level sight glass at compressor crankase, should be 1/2 to 3/4 full during operation - add if required.
	2.) Oil pump at compressor inoperative.	2.) Check pressure at oil pump repair / replace as required.
	3.) Oil pressure switch / sensor defective.	3.) Replace
	4.) Crankase heater defective.	4.) Replace
Unit Cycles Off / On, Freezestat Cut - Out	1.) Setting too high for the desired set-point.	1.) Adjust to protect chiller based on the concentration of ethylene glycol used. Set to cut - out 5°F above the freeze point of the solution. Solution should protect chiller to 20°F below set-point.
	2.) Freezestat installed improperly.	2.) Check that bulb is inserted completely into evaporator well, and insulated.
	3.) Freezestat defective.	3.) Replace
High Safety Cut - Out	1.) Water temperature leaving evaporator has been above 75°F for over 1/2 hr. (standard units). Water temperature above 100°F will cause immediate shut down.	1.) Low evaporator flow. Defective control board.
Open Thermocouple	1.) Thermocouple defective, control displays temperature as 185°F	1.) Replace thermocouple. Check for possible cause of a broken thermocouple wire. Check junction block at mother board, repair if possible. Check unit and mother board for proper earth grounding

SYSTEM TESTS

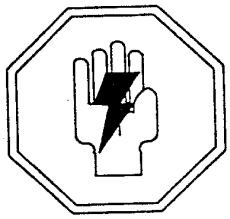
SYSTEM TESTS

This chapter is provided for the operator to perform simple diagnostic tests on the microTrac 3 controller.



The tools that are required for this operation are;

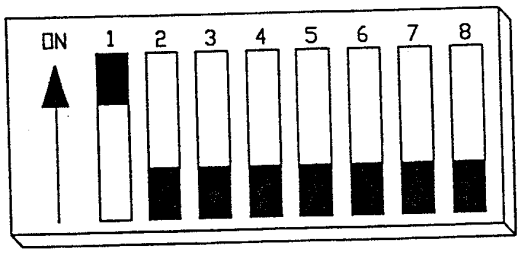
Ball point pen



Make sure the chiller has stopped operation and the power supply has been disconnected.

Open the electrical access panel. The electrical access panel will swing open exposing the electrical components and the mother board.

Using the ball point pen, switch configuration switch 1 labeled, "System Test Mode", on the mother board to the "ON" position. "ON" will be indicated by an arrow on the switch block.



Close the electrical access panel and secure it by turning the locking screw clockwise.

Reconnect the power supply.

The EPROM revision number will appear on the display for 8 seconds or until a button is pressed.

SYSTEM TESTS

The display on the operator panel should now read **"SEL 0"**, meaning that test number 0 has been selected. All available tests may be selected by pressing the **"RAISE"** and **"LOWER"** buttons until the desired test number is displayed. To start a test, press the **"START"** buttons. To stop a test, press the **"STOP"** button. The following is a list of currently available test routines.

Test Number	Description
0	Watchdog Test
1	RAM Test
2	L.E.D. Test
3	Button Test
4	Solid State Relay Test
10	Thermocouple Open Test

Perform the following tests in the order shown:

TEST 0 WATCHDOG TEST:

The display will increment by tens. A failed test is indicated when the microTrac 3 performs a hardware reset before the count of **90** is reached on the display. A failed test is also indicated when the microTrac 3 does **not** perform a hardware reset before the count of **160** is reached on the display.

TEST 1 RAM TEST:

The Random Access Memory is pattern tested. Durring the test, the **"SEL"** portion of the display is blanked. If the RAM was found to be good, **"SEL 1"** will return to the display, otherwise **"HELP XXXX"** will be displayed, with **"XXXX"** representing the address in display hex notation of the bad address. If a bad address is encountered, the controller must be powered down to exit the test.

NOTE: A similar test is executed every time the controller is turned on, displaying **"HELP 102"** if the test failed.

TEST 2 LED TEST:

The L.E.D.s on the Operator Panel are all turned on except for the **"CABLE"** L.E.D. The L.E.D.s (except for the **"TEST"** L.E.D.) are then turned off sequentially. The digits are then incremented form **"0"** thru **"9"** followed by **"-","E","H","L"**, and **"P"**. The digits are all turned to **"8"** and are turned off sequentially.

SYSTEM TESTS

TEST 3 BUTTON TEST:

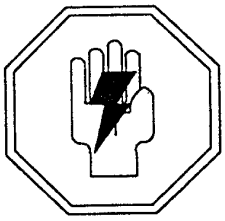
When the controller detects a button is pressed, the corresponding L.E.D. in the display section of the Operator Panel is lit. To exit the test, the **"STOP"** button must be pressed **twice** consecutively. With each button pressed, you will here a short chirp. If the button is held down, the chirp will repeat. It is necessary to test the button repeat on only one of the eight buttons.

TEST 4 SOLID STATE RELAY TEST:

The Operator Panel display reads **"SOL X"** where **"X"** is the number of the solid state relay that is on. The SSR selected may be changed by pressing the **"RAISE"** and **"LOWER"** buttons. The selected SSR will stay on for 30 seconds. The "START" button will turn on the same SSR for 30 seconds more.

TEST 10 THERMOCOUPLE OPEN TEST:

Connect Jumper wire across terminals on thermocouple channel 1 **(J3)**, thermocouple channel 2 **(J4)** and thermocouple channel 3 **(J5)**. One at a time remove the jumpers. The thermocouple open test displays data with L.E.D.s being lit when a thermocouple is OPEN.

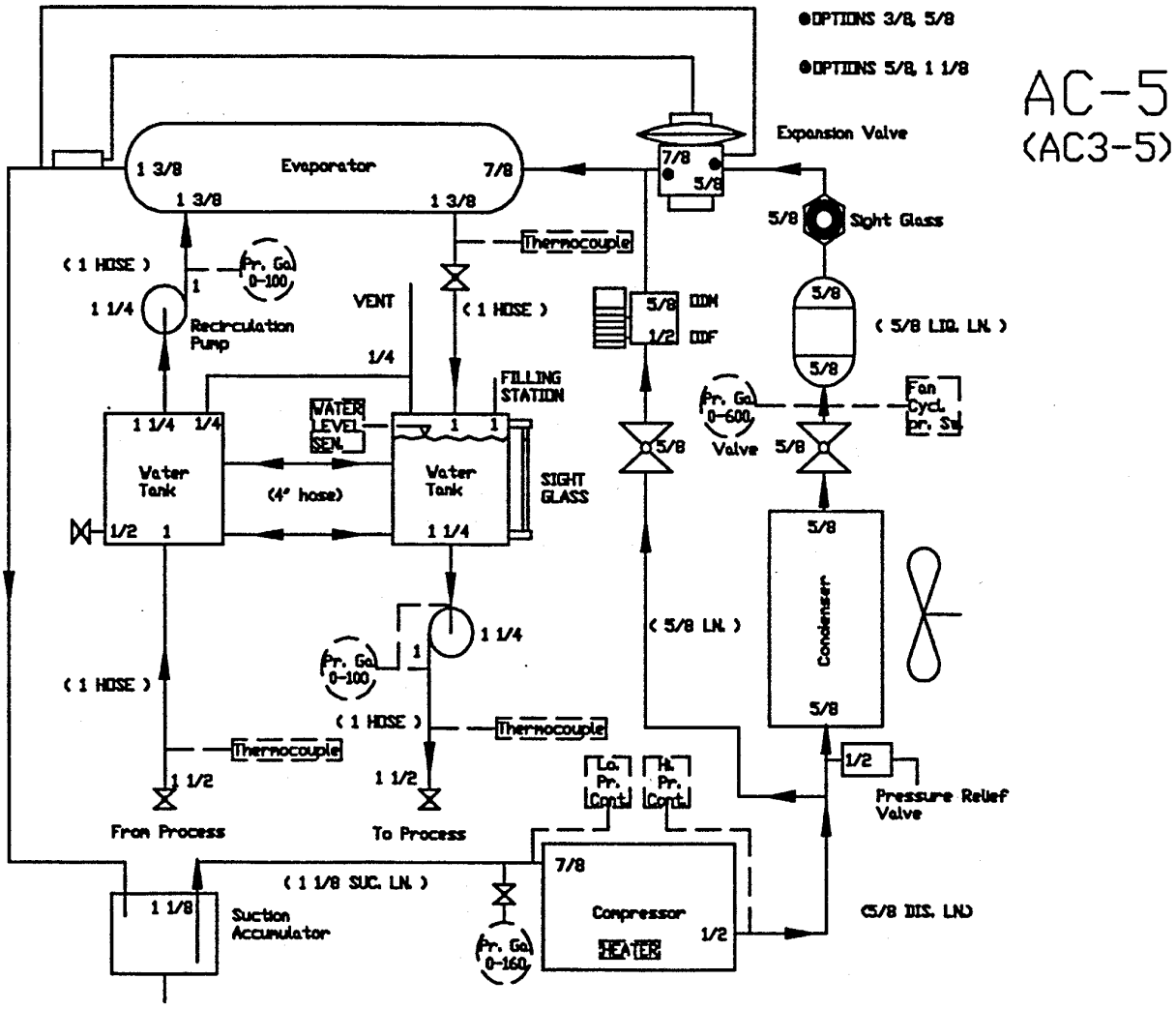


Test number other than those indicated should be performed only by qualified CONAIR TEMPRO Service Personel. Perfomance of these tests by other than CONAIR TEMPRO Service Personnel may cause serious damage to the equipment and void the warranty.

Disconnect the power supply, then using the ball point pen, switch configuration switch 1, labeled **"System Test Mode"**, on the mother board to the **"OFF"** position and then reconnect the power supply.

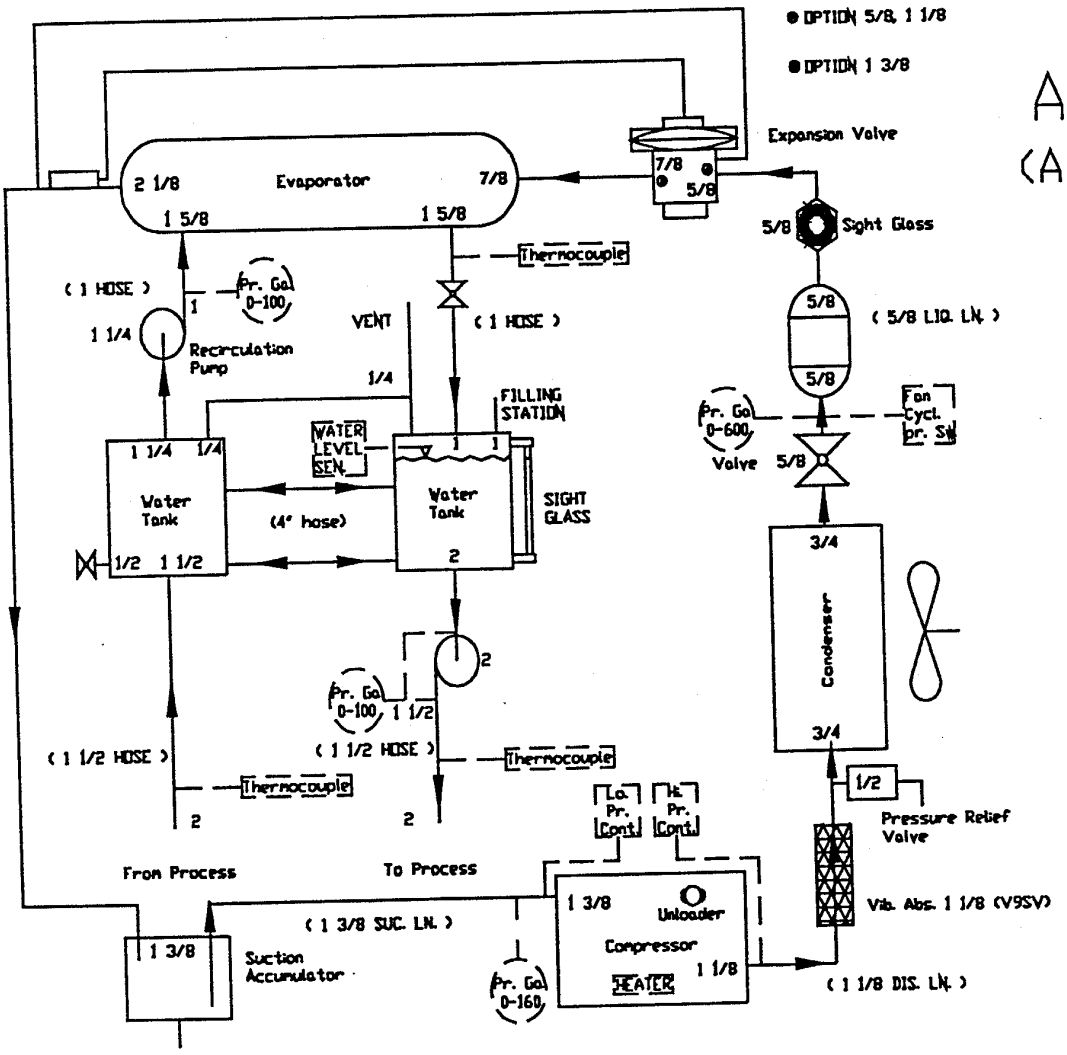
TYPICAL PLUMBING DIAGRAMS

TYPICAL PLUMBING DIAGRAMS

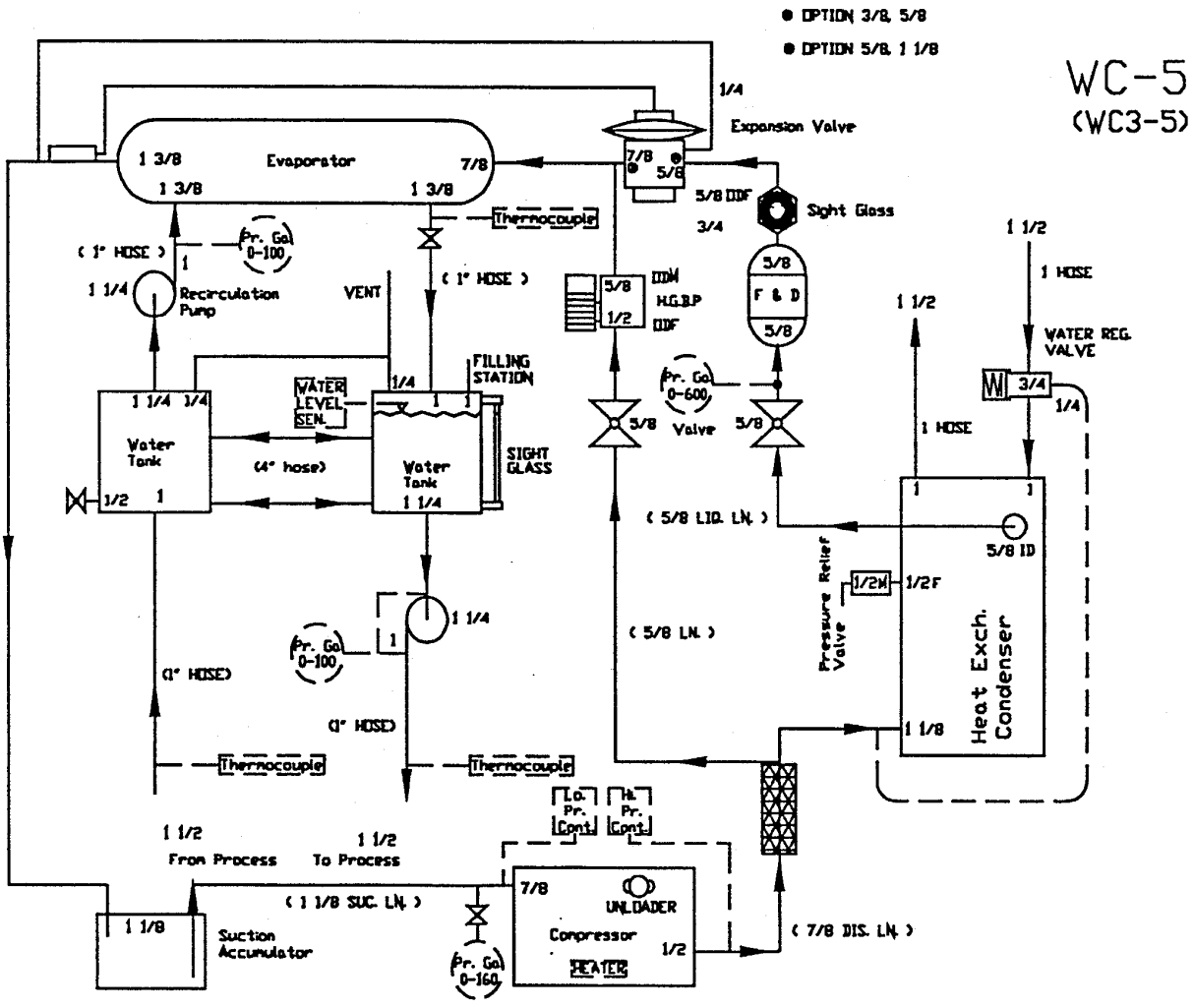


TYPICAL PLUMBING DIAGRAMS

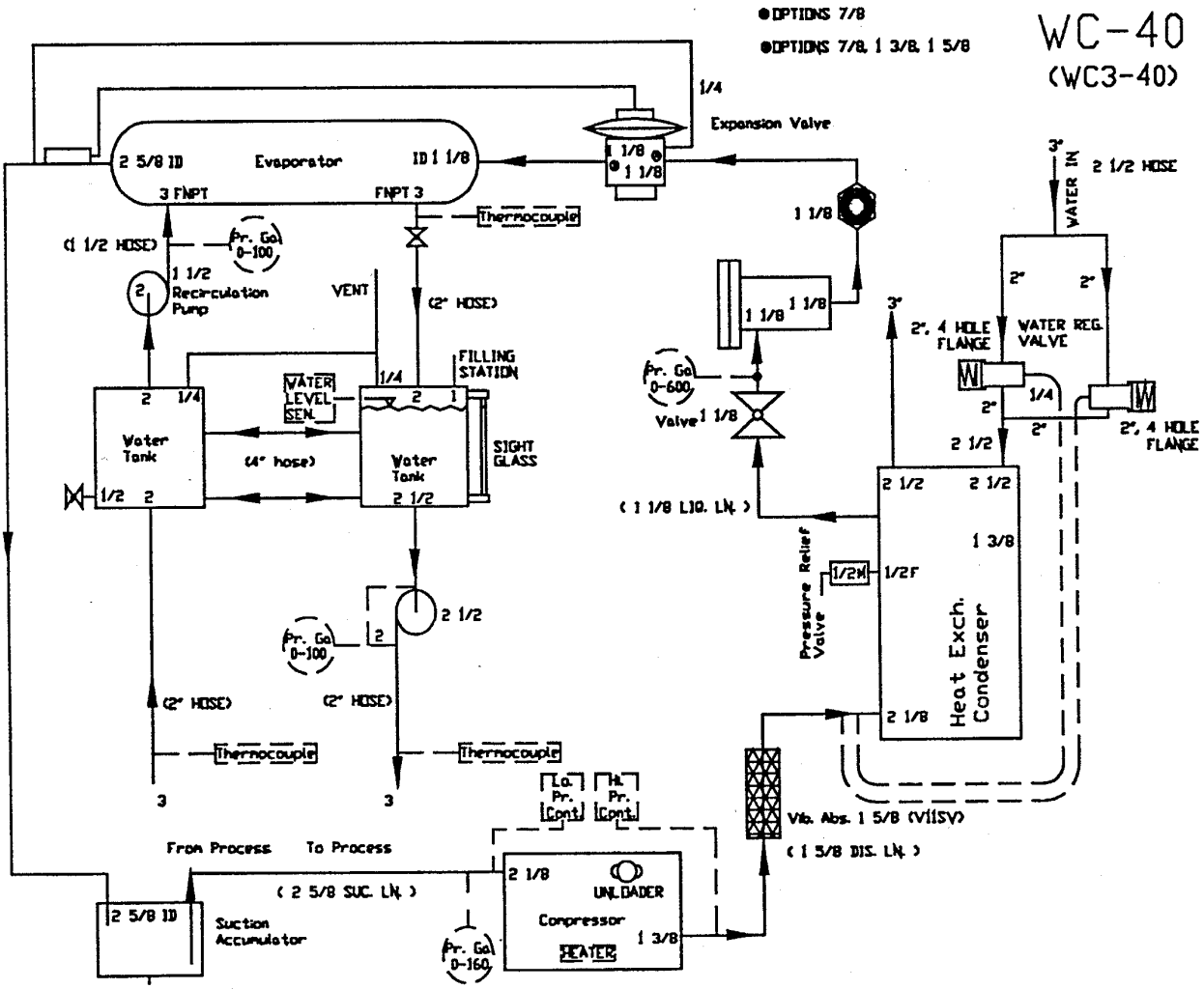
AC-10
(AC3-10)



TYPICAL PLUMBING DIAGRAMS



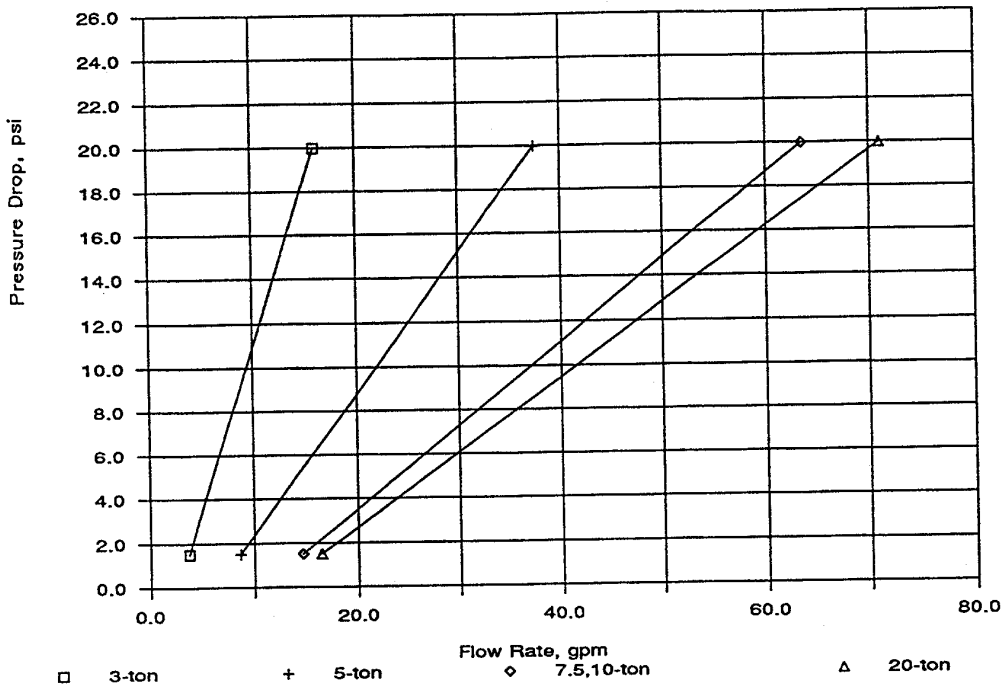
TYPICAL PLUMBING DIAGRAMS



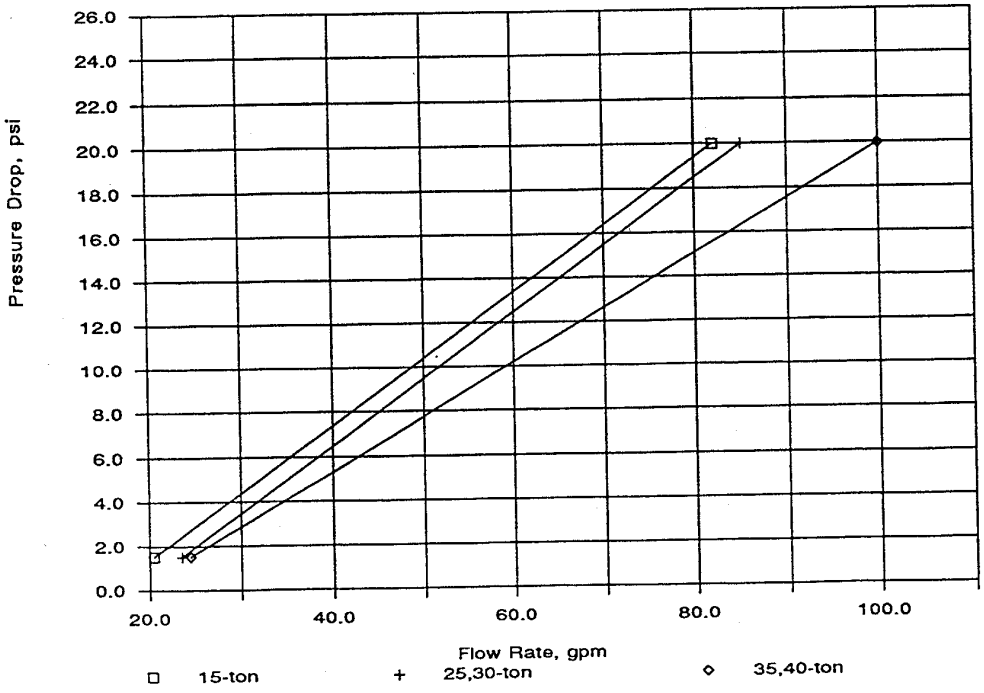
TECHNICAL INFORMATION

Evaporator Curves

Evaporator Pressure Drop Data

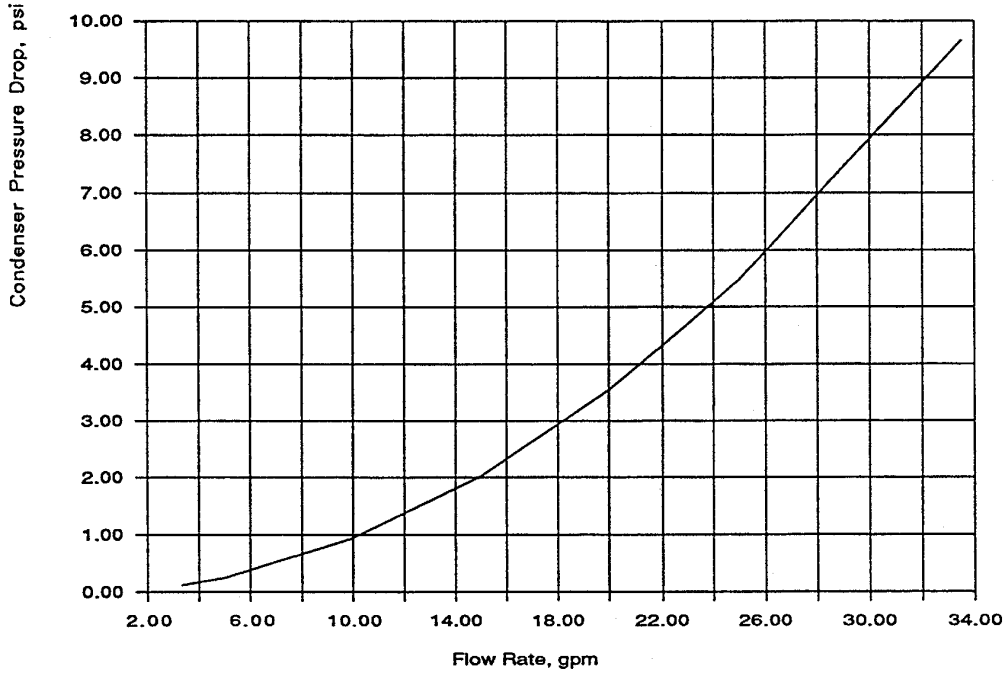


Evaporator Pressure Drop Data

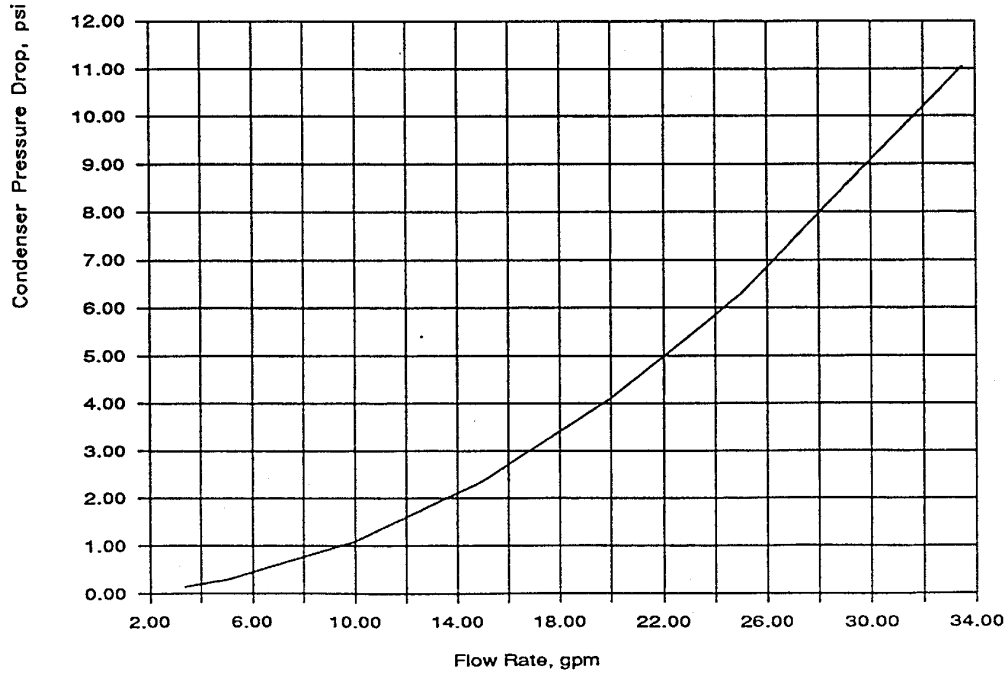


Condenser Curves

5-ton Portable Chiller

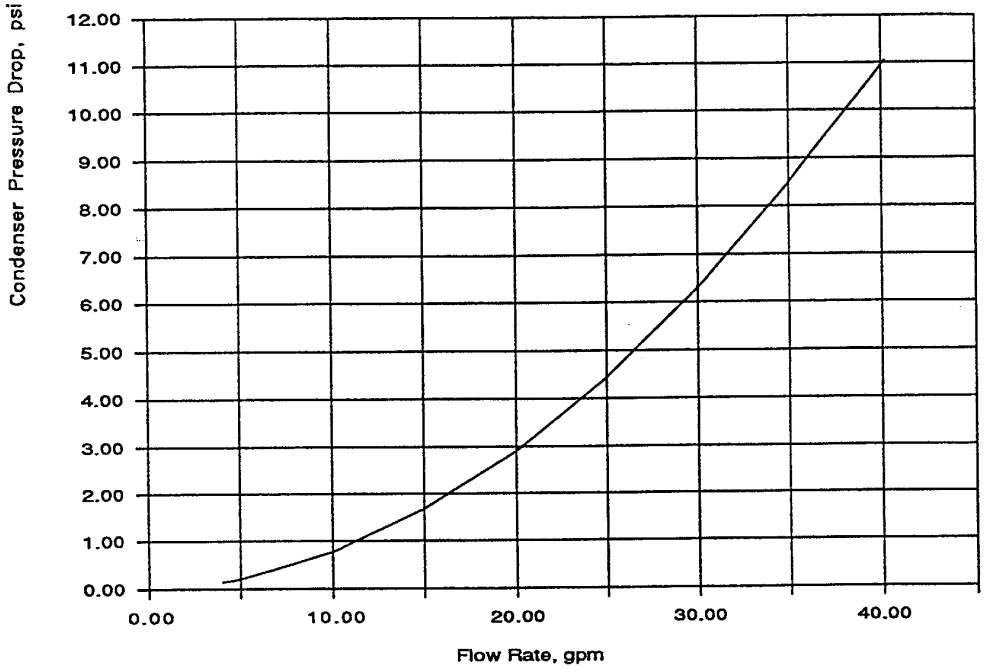


7.5-ton Portable Chiller

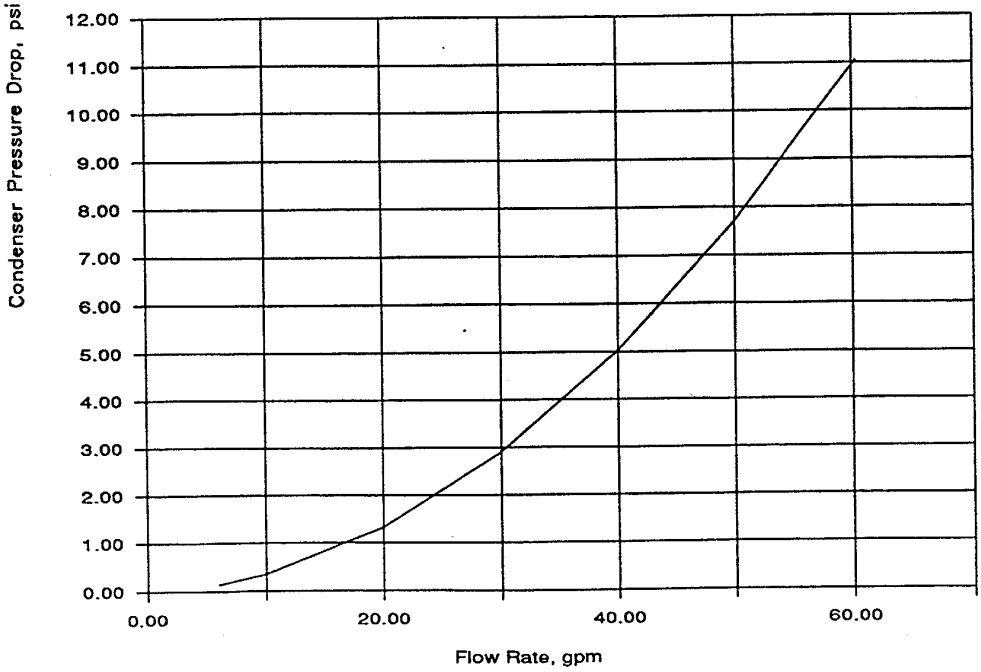


Condenser Curves

10-ton Portable Chiller

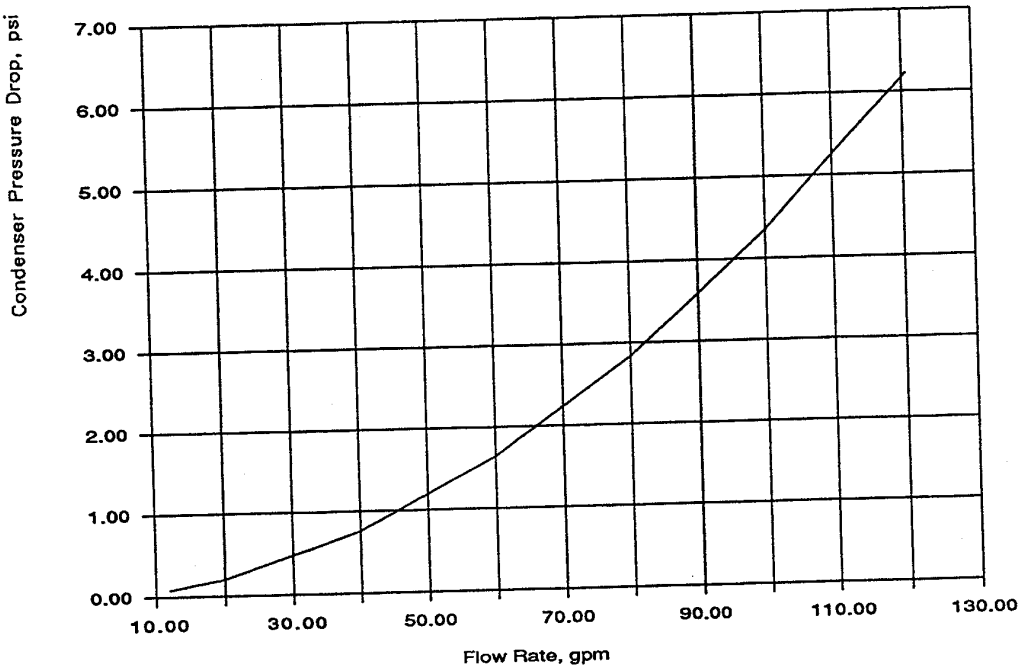


15-ton Portable Chiller

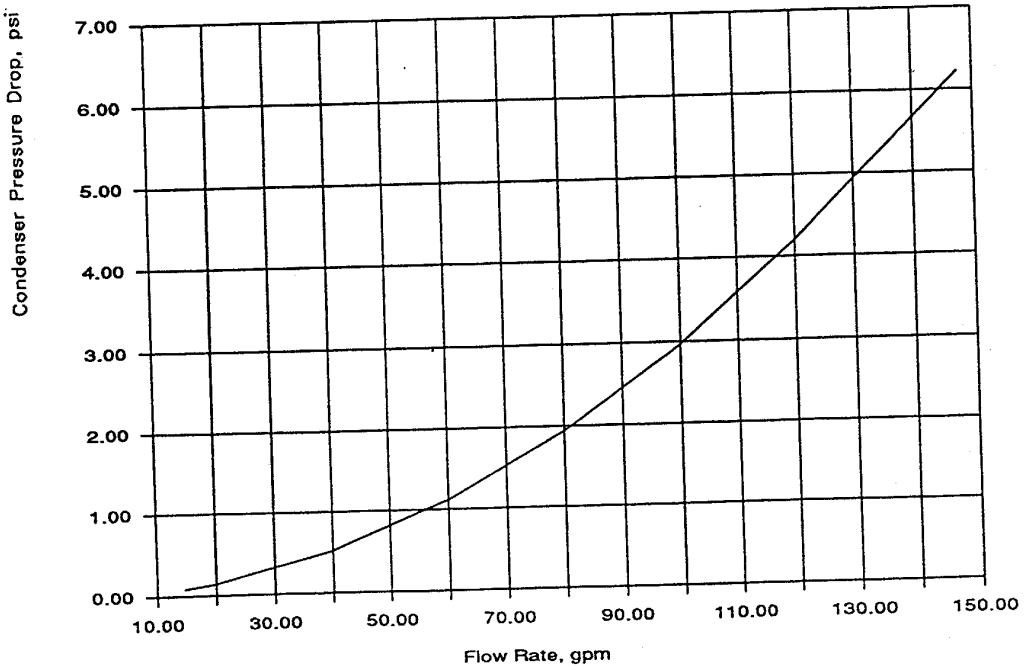


Condenser Curves

20-ton Portable Chiller

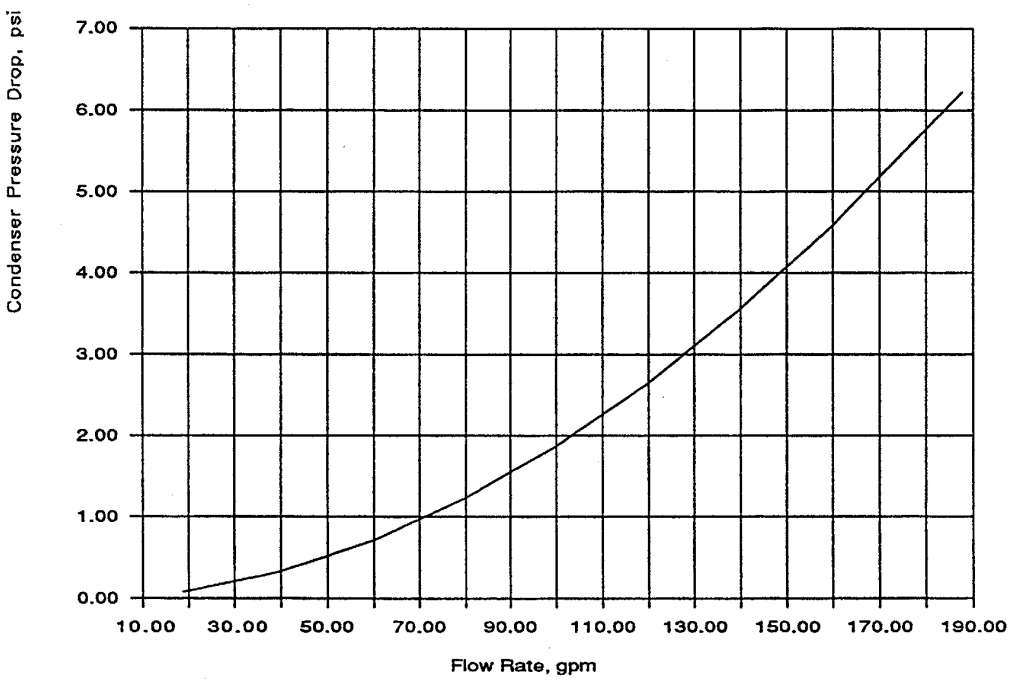


25-ton Portable Chiller

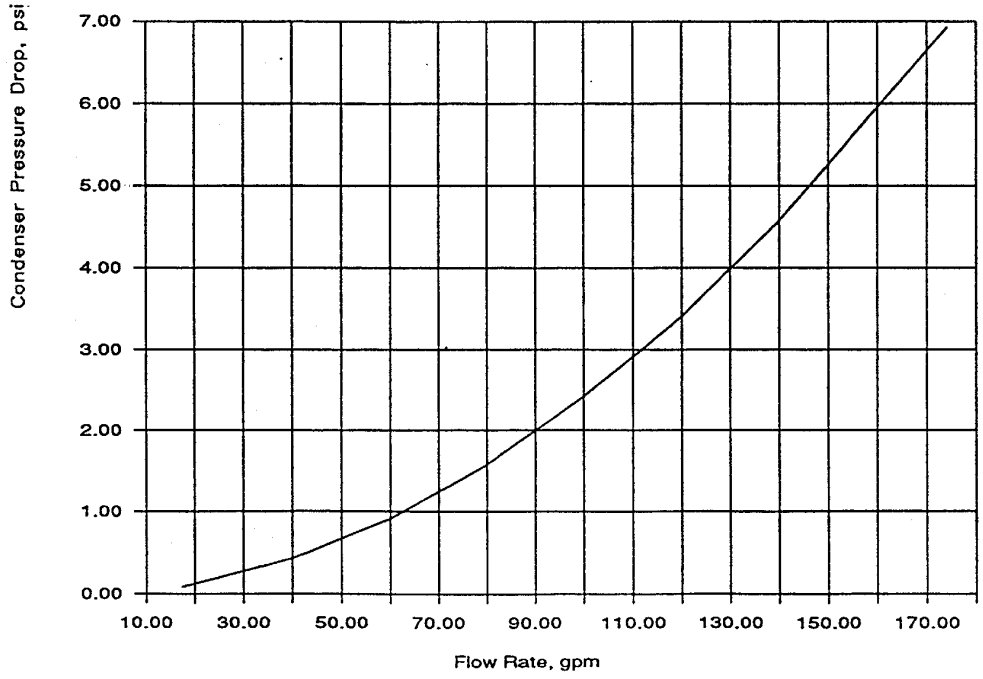


Condenser Curves

30-ton Portable Chiller



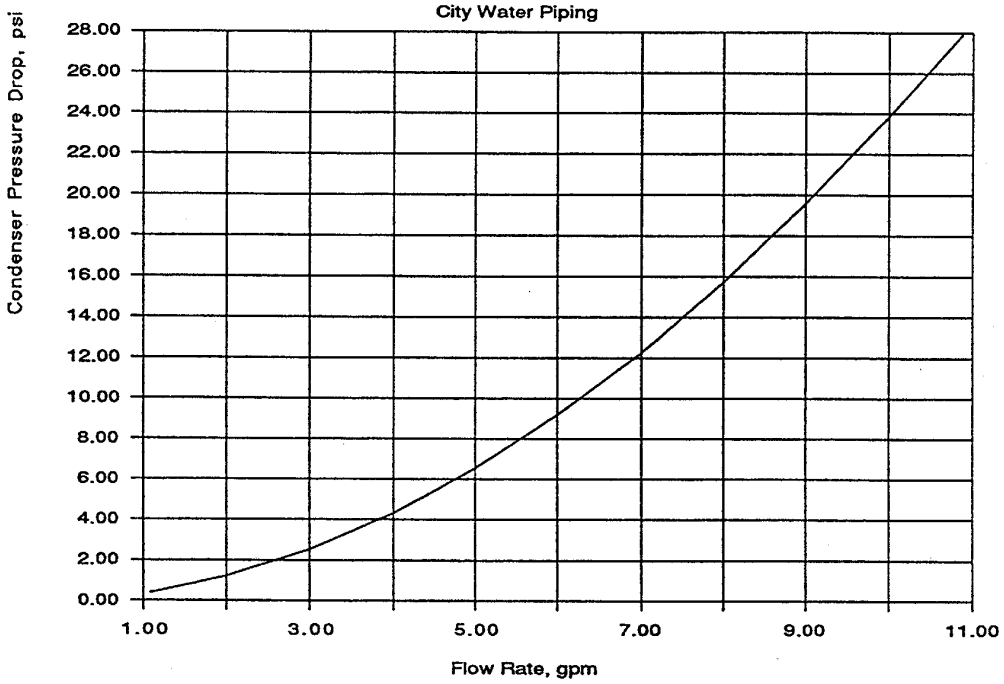
40-ton Portable Chiller



Condenser Curves

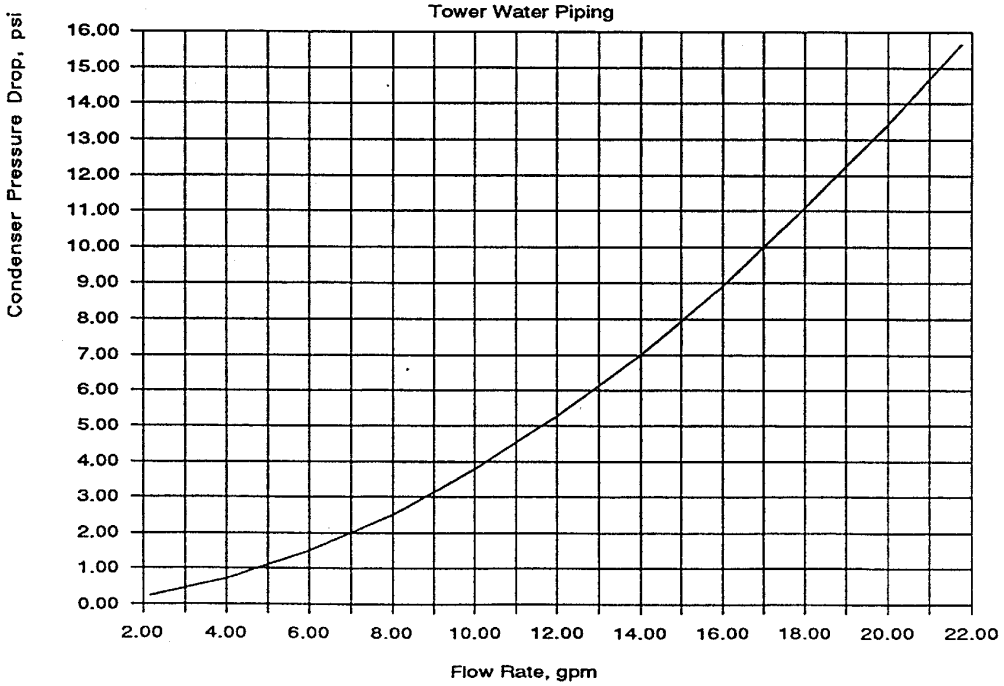
3-ton Portable Chiller

City Water Piping



3-ton Portable Chiller

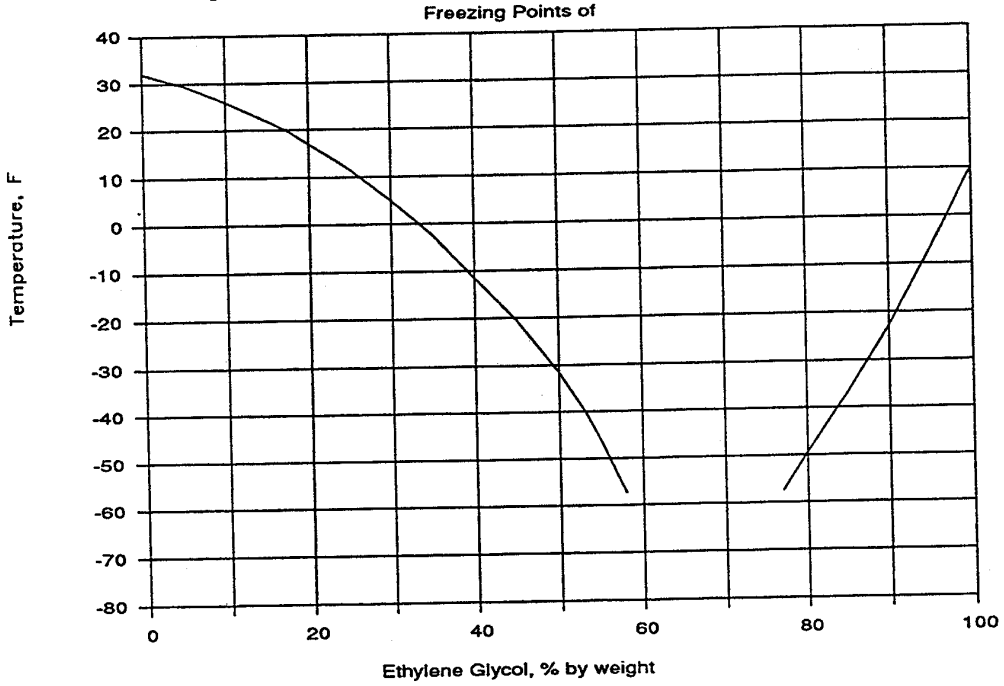
Tower Water Piping



Glycol Curve

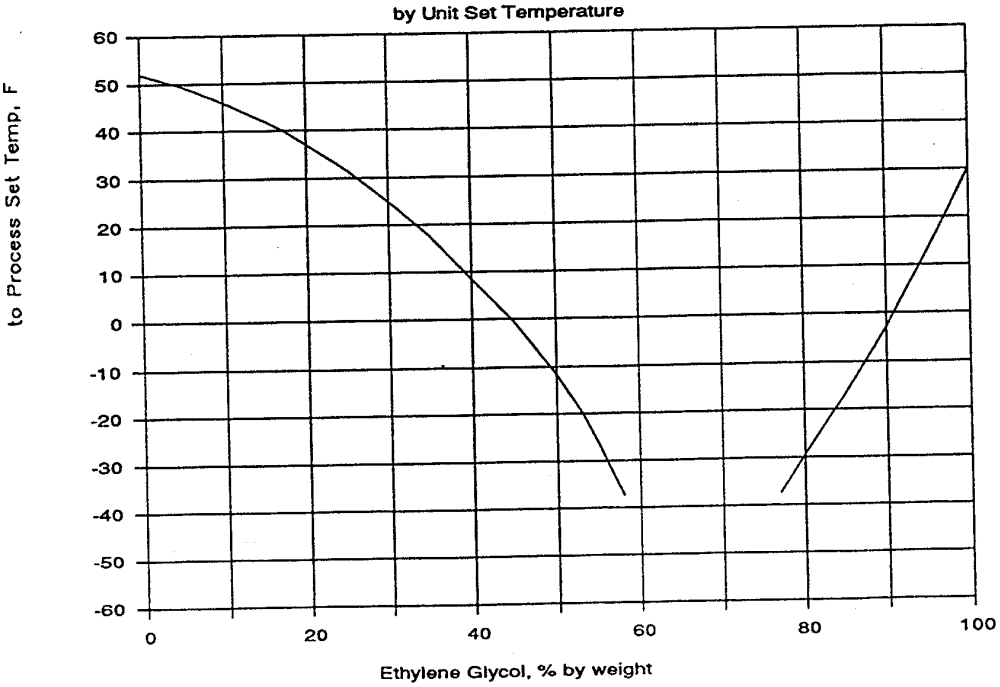
Aqueous Ethylene Glycol Solutions

Freezing Points of

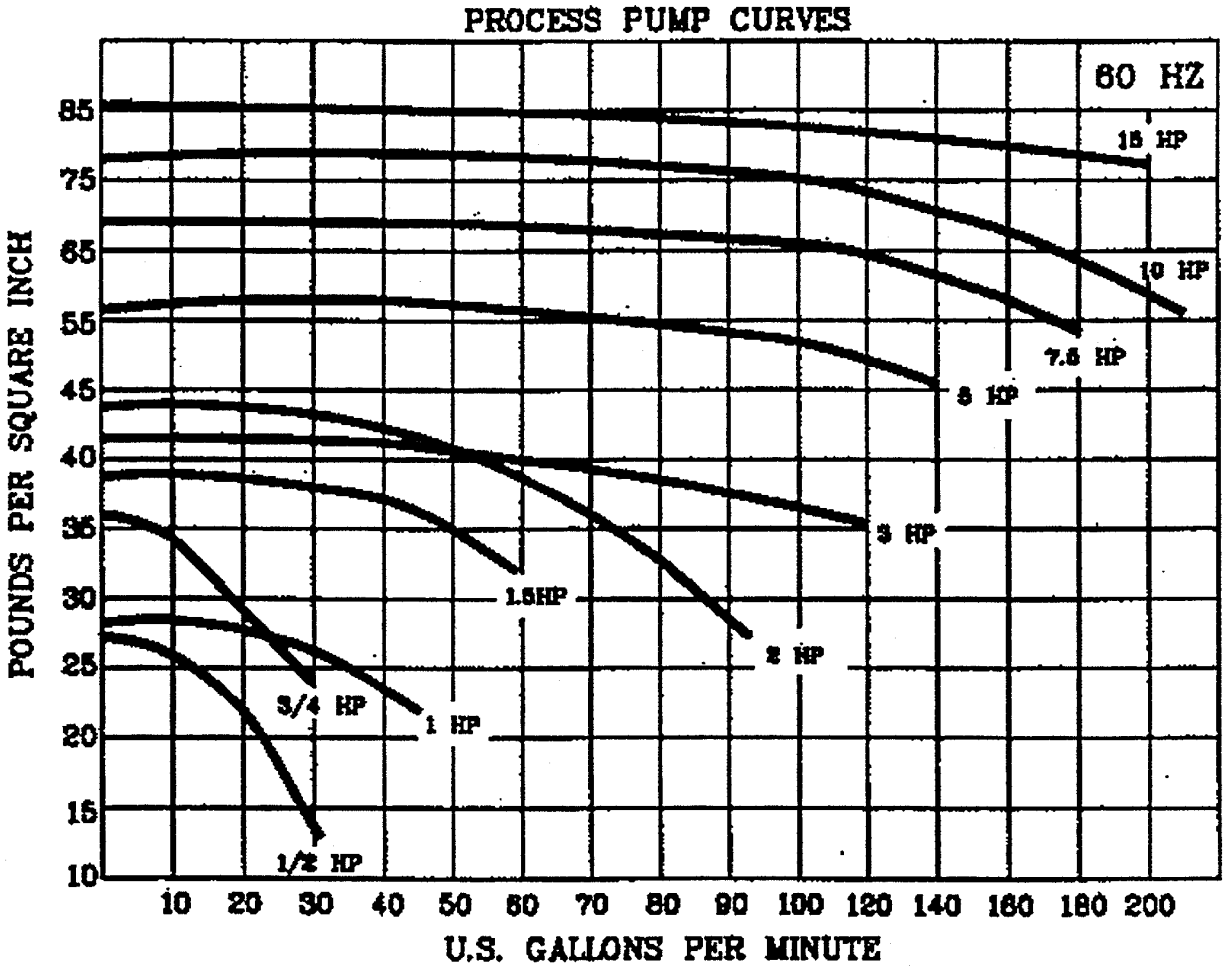


Freeze Protection Requirements

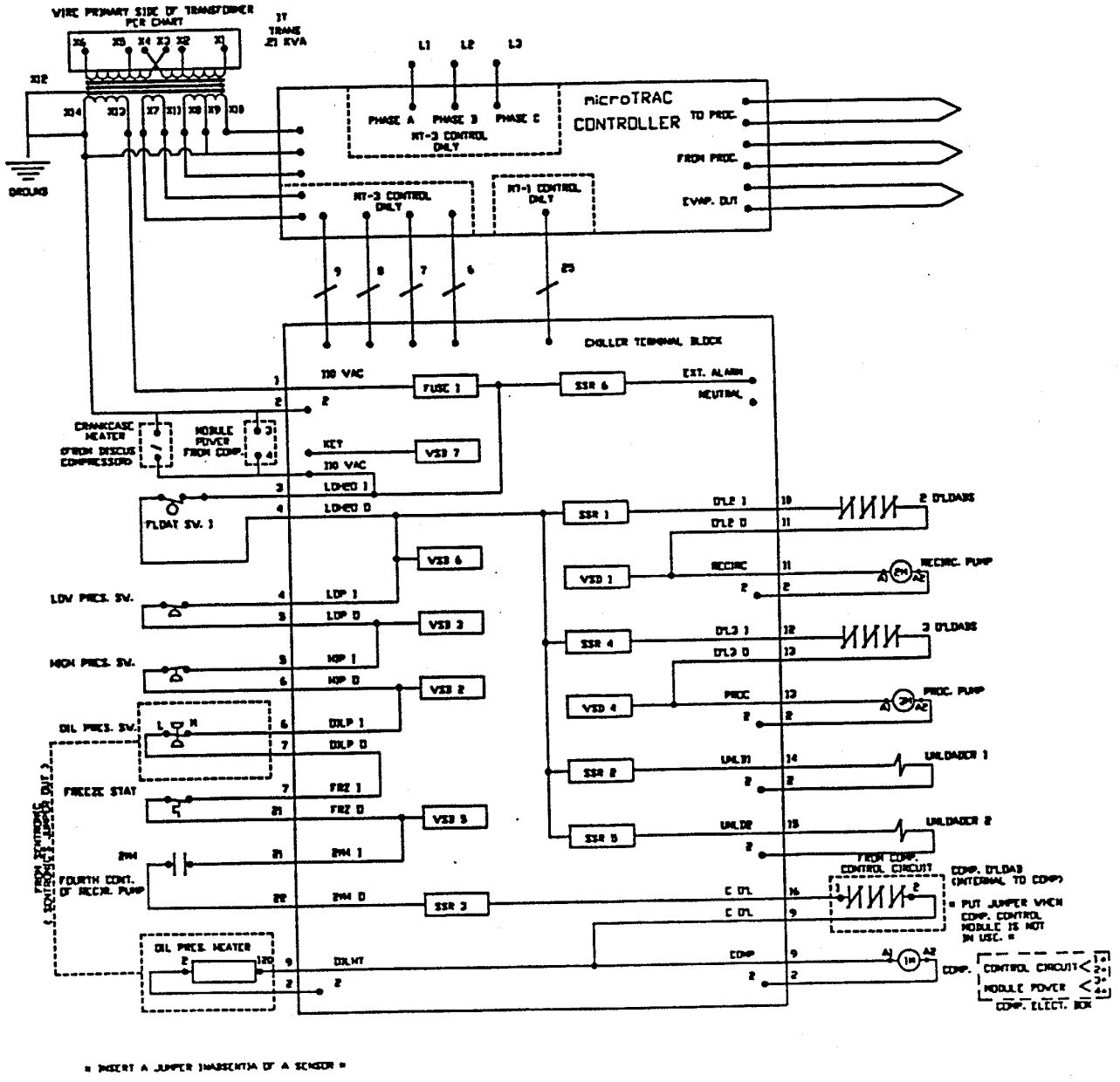
by Unit Set Temperature



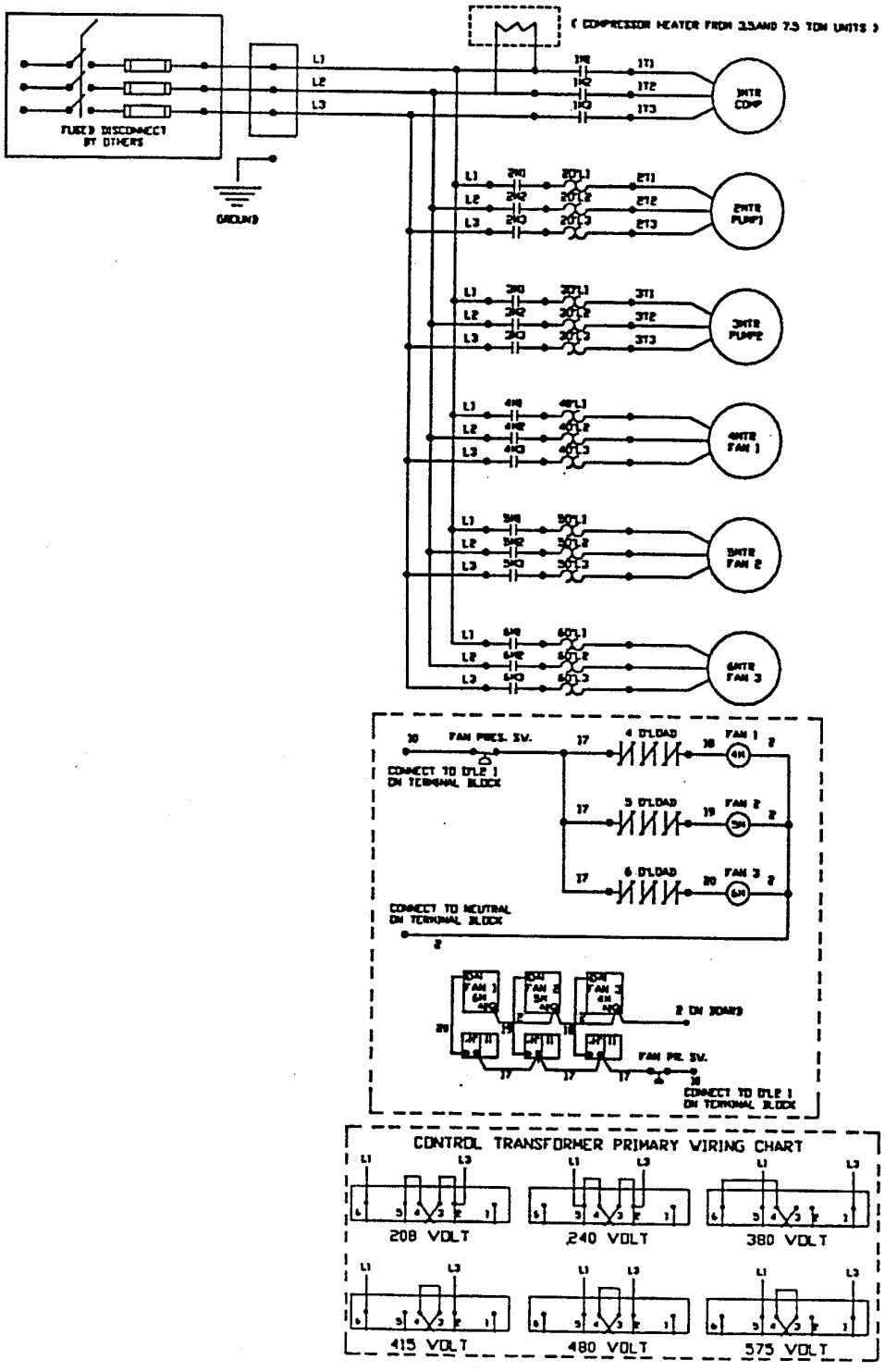
PUMP CURVE


PROCESS PUMP CURVES
60 HZ
POUNDS PER SQUARE INCH
U.S. GALLONS PER MINUTE
85
75
65
55
45
40
35
30
25
20
15
10
10 20 30 40 50 60 70 80 90 100 120 140 160 180 200
15 HP
10 HP
7.5 HP
5 HP
3 HP
2 HP
1.5HP
1 HP
3/4 HP
1/2 HP

Electrical Schematic



Electrical Schematic



Process Control Set

The process control set is factory set to control from the To Process Thermocouple channel. There are two options for the controlling of the process temperature. They are as follow:

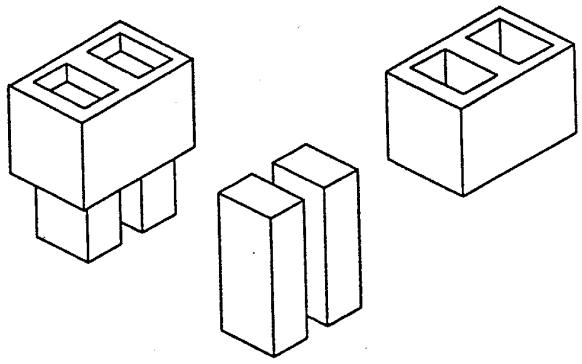
To Process Temperature
Average of To / From Process Temperature

The process control set is selected by the setting of jumpers JP1, JP2, and JP3, located on the right side of the mother board toward the rear, labeled **Process Control Set.** Jumpers are small switches consisting of two terminals and a bridging piece. To turn a jumper on, place the bridging piece over both terminals. Conversely, the bridging piece is removed to turn the jumper off.

Process Control Settings

<u>To Process Temperature Control</u>

JP1 -- ON
JP2 -- OFF
JP3 -- OFF



<u>Average of To / From Process Temperature Control</u>

JP1 -- ON
JP2 -- ON
JP3 -- OFF

Network Communications

Communications is possible with a host machine by ordering the network communications cable. This cable is inserted into the Network EIA 485 port located on the right rear corner of the mother board. A 3/4" hole will also have to be punched in the cabinet to mount the network communications cable.

Switch number 7 of the configuration switches should be turned to the "ON" position. The COMM L.E.D. will flash indicating that communications have been enabled. At that time the unit can be plugged into the network.

120 OHMS Termination

If network communications has been enabled, the unit farthest from the molding machine in the network must have 120 OHMS line termination. On the chiller this is done by turning jumper JP22 ON. This switch is located in the middle of the mother board, toward the rear, and is labeled "Jumper for 120 OHM Line Termination". The OHM termination should only be active for one unit on the network, the farthest one.

PARTS LIST

Replacement Parts

Controls

Operator Panel MT - 3 Conrol	11000550
Mother Board MT - 3 Control (with RFI Shield Installed)	05300183
Graphic Overlay MT - 3 Control	11001300
Power Cable, 5 pin	05300322
I / O Cable, 6 pin	05300185
I / O Cable, 7 pin	05300188
I / O Cable, 8 pin	05300186
I / O Cable, 9 pin	05300187
Phase Detection Harness	05300326
Thermocouple	09001207
Chiller Terminal Block (with fuse)	11000511
Control Transformer	11001213
Low Pressure Switch	09001264
High Pressure Switch	09001850
Fan Cycle Switch	09001864
Freezestat	09000782
Oil Pressure Switch / Sensor	09000595
Crankcase heater (10 ton and up)	09000575
Flow Switch	09000502
Float Switch	09000657
Solenoid Valve (Auto Make - Up)	09004500
Time Delay Relay (Auto Make - Up)	09002422
Control Fuse 1 A	10001118
Output Fuse 2 1/2 A	10001124

Contactors

9 AMP	11002215
12 AMP	11002016
18 AMP	09000348
24 AMP	09000349
30 AMP	11002015
38 AMP	09001856
45 AMP	09000596
60 AMP	09001398
75 AMP	09001399
110 AMP	09001400

Replacement Parts

Overloads

0.6 - 1 AMP	09001843
0.8 - 1.2 AMP	09001289
1.0 - 1.6 AMP	09001857
1.5 - 2.3 AMP	11002550
2 - 3 AMP	11003215
4 - 6 AMP	11002552
5.5 - 8 AMP	09000344
6 - 10 AMP	09000343
10 - 15 AMP	09000345
16 - 24 AMP	09000346
16 - 24 AMP	09000347
22 - 32 AMP	09001859

Pump / Motor Assemblies (208 / 230 / 465) - 575 Consult Factory

1 / 3 HP	09001676
1 / 2 HP	09001005
3 / 4 HP	09000769
1 HP	09001274
1 1 / 2 HP	09002369
2 HP	09001071
3 HP	09001275
5 HP	09001291
7 1 / 2 HP	09002449
10 HP	09002531
15 HP	09001337

Fan Motors

	208 / 230 / 460 Volts	575 Volts
3 , 5 ton (1 required)	09001332	09002427
10 ton (2 required)		
7 1 / 2 ton (1 required)	09001745	09002448
15 ton (2 required)		
20 - 1 (3 required)		
20 - 2 ton	09002463	09002464
25 ton	09002485	09002487
30 ton	09001746	09002491
35 , 40 ton	09001072	09002499

Replacement Parts

Evaporators

3 ton	09001677
5 ton	09000805
7 1 / 2 ton, 10 ton	09001277
15 ton	09001678
20 ton	09001679
25 ton, 30 ton	09001668
35 ton, 40 ton	09001862

Condensers

AC 3 , 5	09001685
AC 7 1 / 2	09001687
AC 10	09001288
AC 15	09001686
AC 20	09001688
AC 25	09001550
AC 30 , 35	09002492
AC 40	09002402
WC 3	09001689
WC 5	09001690
WC 7 1 / 2	09001691
WC 10	09001692
WC 15	09001693
WC 20	09001694
WC 25	09002488
WC 30	09002494
WC 35	09002500
WC 40	09002504

Hot Gas Bypass Valves

3 ton	09001669
5 ton	09001270
7 1 / 2 ton	09004550

Bypass Valve Solenoid 09004551

Replacement Parts

Cylinder Unloader Kit (Valve , Solenoid and Gasket)

10 , 15 ton	09002574
20 thru 40 ton	09002575

Cylinder Unloader (Valve Only)

10 / 15 ton	09002580
20 thru 40 ton , ALCO	09002578
20 thru 40 ton , SPORLAN	09002579

Cylinder Unloader (Solenoid Only)

ALCO	09002576
SPORLAN	09002577

Refrigerant Pressure Relief Valves

Water Cooled 350 #	09001280
Air Cooled 450 #	09001737

Filter Drier

3 ton	09001671
5 , 7 1 / 2	09018005
10 ton	09001269
15 ton	09018015
20 thru 30 ton	09018020
35 , 40 ton Replaceable Cores , 2 Required	09001090

Expansion Vlaves

3 ton	09001672
5 ton	09001266
7 1 / 2 ton	09001673
10 , 15 ton	09007015
20 , 25 ton	09001268
30 , 35 ton	09002493
40 ton	09001091

Replacement Parts

Compressors

HP	Voltage	Part #
3	208 / 230	09000581
	460	09000582
5	208 / 230	09000583
	460	09000305
	575	09002425
7 1 / 2	208 / 230	09000584
	460	09000585
	575	09002450
10	208 / 230	09000586
	460	09000587
	575	09002446
15	208 / 230	09000588
	460	09000589
	575	09002453
20	208 / 230 / 460	09000590
	575	09002465
25	208 / 230 / 460	09000591
	575	09002486
30	208 / 230 / 460	09000592
	575	09002490
35	208 / 230 / 460	09000593
	575	09002490
40	208 / 230 / 460	09002401
	575	09002502

Water Reuglating Valves

3 , 5 ton	09001278
7 1 / 2 ton	09001814
10 ton	09001813
15 ton	09008015
20 , 25 ton	09001812
30 , 35 ton	09001812
40 ton (2 required)	09002495

Replacement Parts

Miscellaneous

Water Pressure Gauge 0 - 100 #	09030001
Compressor Suction Pressure Gauge 30 " - 160 #	09030002
Compressor Discharge Pressure Gauge 0 - 600 #	09030003
Air Filter 28 x 42	09001098
Fan Guard 3 thru 20 - 1 ton	09000261
Blower Belt 20 ton (Qty 2 per motor required)	09002581
Blower Belt 25 thru 40 ton (Qty 2 per motor required)	09001081