CONAIR
www.conairnet.com

USERGUIDE

Thermolator

Oil Temperature Controller
Start-Up Guide

microTrac 3 Control
microTrac 1 Control

⚠ **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This manual is out-of-date and is provided only for its technical information, data and capacities.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containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

When attempting maintenance of any kind on the Thermolator®, press the STOP (RES) button and disconnect thepower supply and let the unit cool to less than 125°F before any other action is taken.

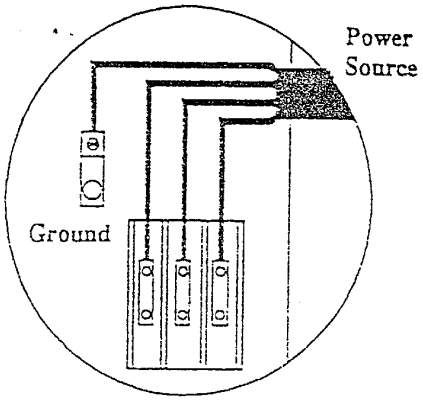
To change rotation direction;

Disconnect and lock out the power at the fused disconnect.

Open the electrical access panel, the door will fold open exposing the electrical compnents and mother board (MT3).

Reverse any two incoming leads at the power terminal block. Donot switch leads at the motor or motor starter.

Check your work, close the electrical access panel, reconnect the power supply, and proceed to start the unit.



Note:

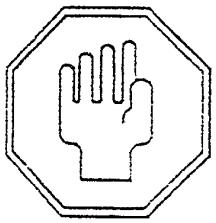
Cooling on a Thermolator® Oil Temperature Control Unit is optional.

TC-400 Oil Temperature controllers are designed to operate from 70°F to 400°F. TC-500 Oil Temperature Control Units are deigned to operate from 70°F to 500°F. TC-500s require 2GPM of 85°F pump seal cooling water.

Conair Tempro tests with, and recommends the use of ***Paratherm NF Heat Transfer Fluid*** in their Thermolator® Oil Temperature Controllers. If an alternate heat transfer fluid is used, all of the manufactures recommendations for flushing the piping system of the Thermolator® must followed to prevent failure of the equipment.

The Thermolators® physical dimensions are 33" deep, 15" wide, and 43" tall. The piping protruding from the back of the unit must be considered when locating the unit. In addition, 6" around the sides, and a minimum of 12" of top clearance should be allowed in order to dissipate heat.

Only the TC-500 Thermolator® Oil Temperature Controllers have an absolute minimum requirement of 2 GPM @ 85°F of cooling water for the pump seal cooling. For those TC-400 or TC-500 Thermolators® that were purchase with a heat exchanger option, a minimum of 25 PSI and a maximum 85 PSI must e supplied to the unit to achieve proper cooling. Cooling water lines must be run full size to the unit in order to reduce line pressure drops.



TC-500s must have seal cooling water flowing whenever the process temperature is above 150°F, including when the unit is shut down. Failure to do so will damage the seal immediately.

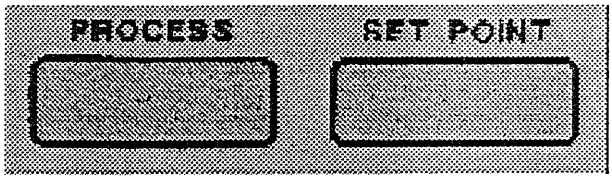
microTrac 1 Control Panel

The microTrac 1 control panel has 3 function areas; Display Screens, Action L.E.D.s, and Control Buttons.

Display Screens

The **Process Display** continuously displays the process oil temperature of the Thermolator®.

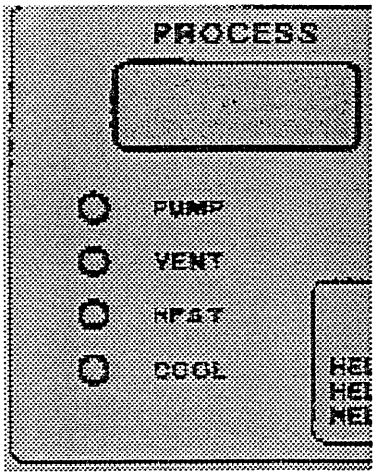
The **Set Point** Display shows the oil temperature SET POINT selected by the operator.



Action L.E.D.s

There are 2 categories of L.E.D.s; Action Monitoring, and Waring.

<u>Action Monitoring</u>



Pump - Indicates the pump is working.

Vent - Indicates that the Thermolator® vent sequence is activated.

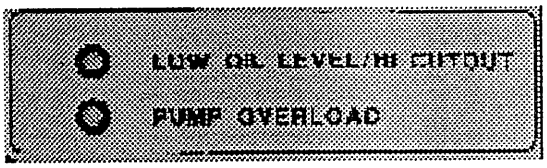
Heat - Indicates the heater has been turned ON by the controller.

Cool - indicates the cooling solenoid, for units equipped with a water cooling heat ex changer, has been opened by the controller.

<u>Warning L.E.D.s</u>

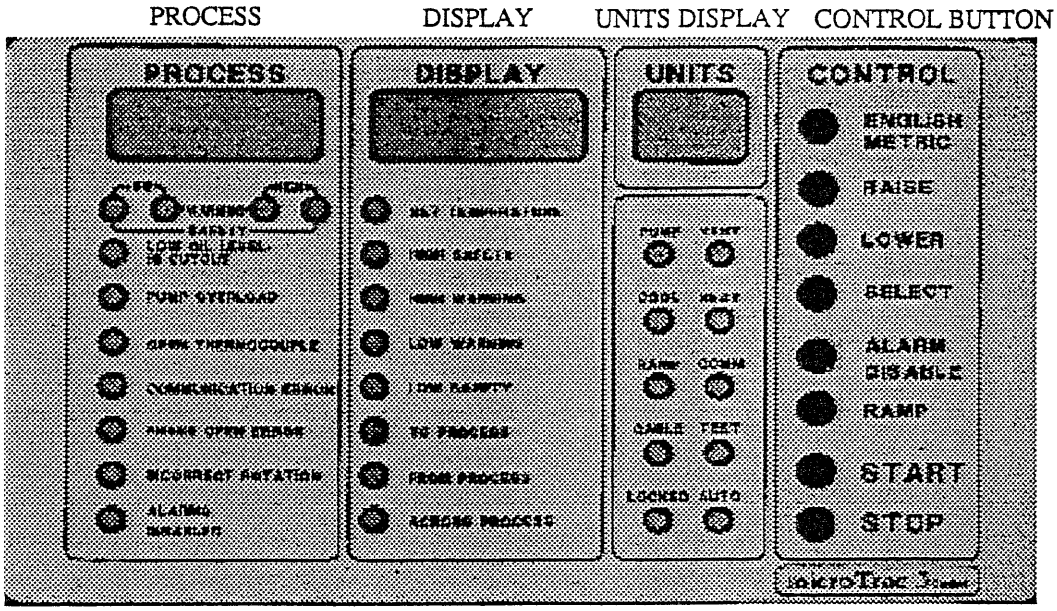
Low Oil Level - Indicates that the process oil level is low.
Check oil level in tank.
Check oil lines and process machinery for oil leaks.

Pump Overload - Indicates that current drawn by any of the three power source lines (phases) exceeds factory specifications.
Inspect pump for jaming of obstruction of impeller.



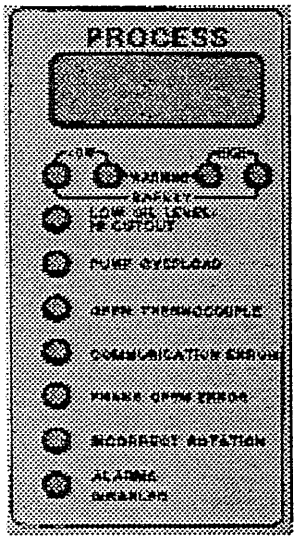
microTrac 3 Control Panel

The microTrac 3 Control Panel consists of five areas that provide process information and control.



Process Area

The Process area contains, a display screen, and eleven L.E.D.s which indicate trouble conditions.



The Process display screen shows the process oil temperature.

The eleven L.E.D. indicators in this area are used to indicate any alarm condition that may occur. More on these indicators are covered in the Trouble Shooting chapter of this manual.

microTrac 3 Control Panel

Heat
The Heat L.E.D. will light indicating the heater has been turned on by the controller.

Ramp
The Ramp L.E.D. will light when the control is raising or lowering the process temperature to the Set Point.

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 control 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 8, System Test. 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 5, Basic Operations & Extra Features.

Auto
The Auto L.E.D. will flash when the autostart 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 5, Basic Operations & Extra Features.

microTrac 3 Control Panel

Ramp (White)

At anytime the Thermolator® Oil Temperature controller is operating in a mode where it is gaining or losing temperature the RAMP function may be activated. This function allows the operator to establish a set rate at which the unit will heat or cool the process. This is done be setting into the MT-3 control a value of time, in seconds, that the controller must allow to time out before it can raise or lower the process temperature 1° F.

The default value for the RAMP function is 300 seconds or five minutes per 1° F. This means that if the unit is in a heating mode, every five minutes, (300 seconds), the MT-3 control will raise the temperature 1°F.

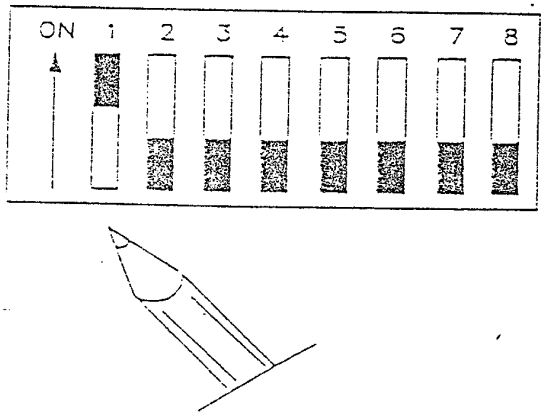
When the RAMP button is pressed the control will ramp the process to the temperature set point.

To change the RAMP time value;

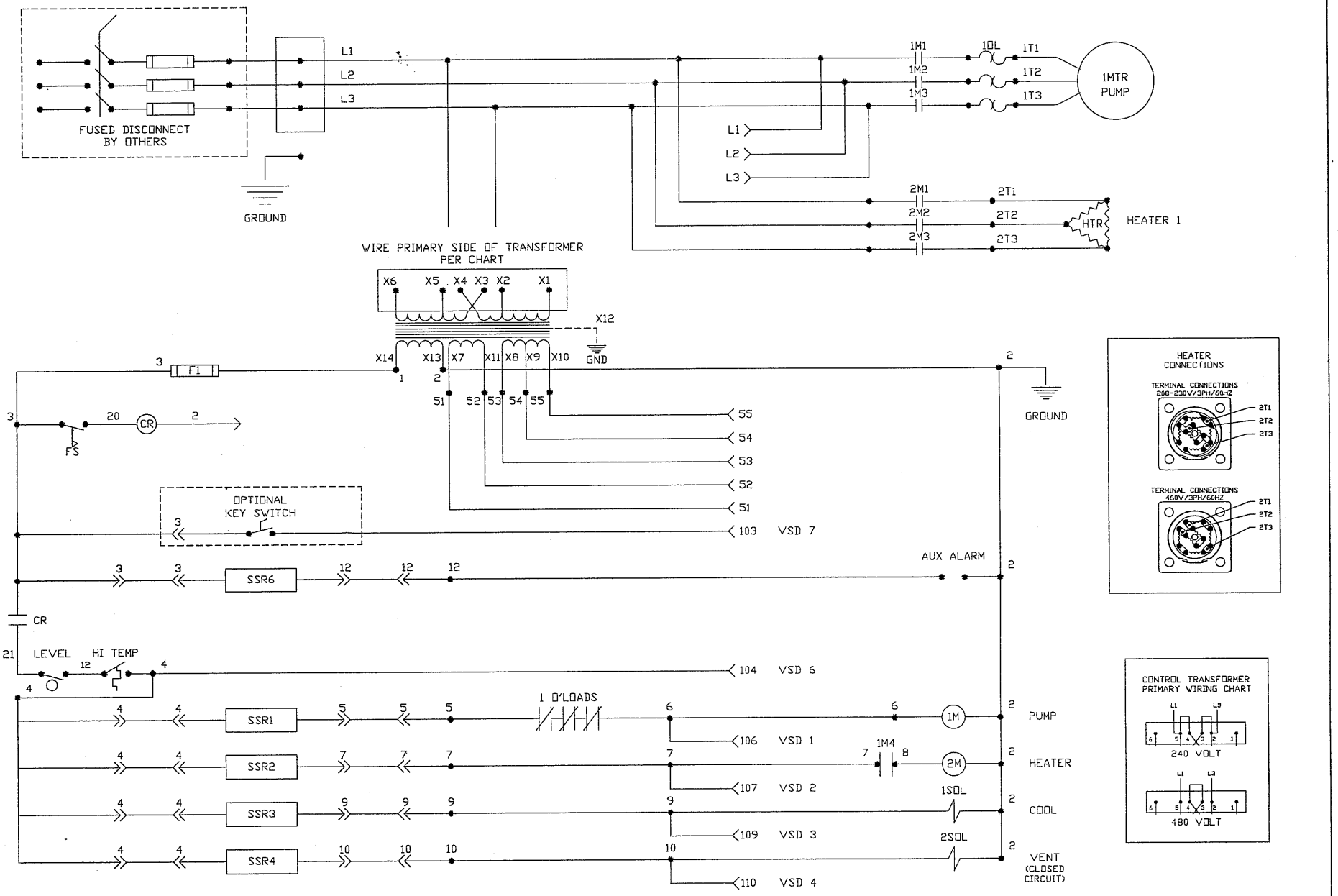
When attempting maintenance of any kind on the Thermolator®, press the Stop (Red) button an then disconnect the power supply and let the unit cool to less than 125° F before any other action is taken.

Open the electrical access panel by turning the locking screws counter clockwise. The electrical access panel will fold down exposing the electrical components and mother board.

Using a 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 pannel.

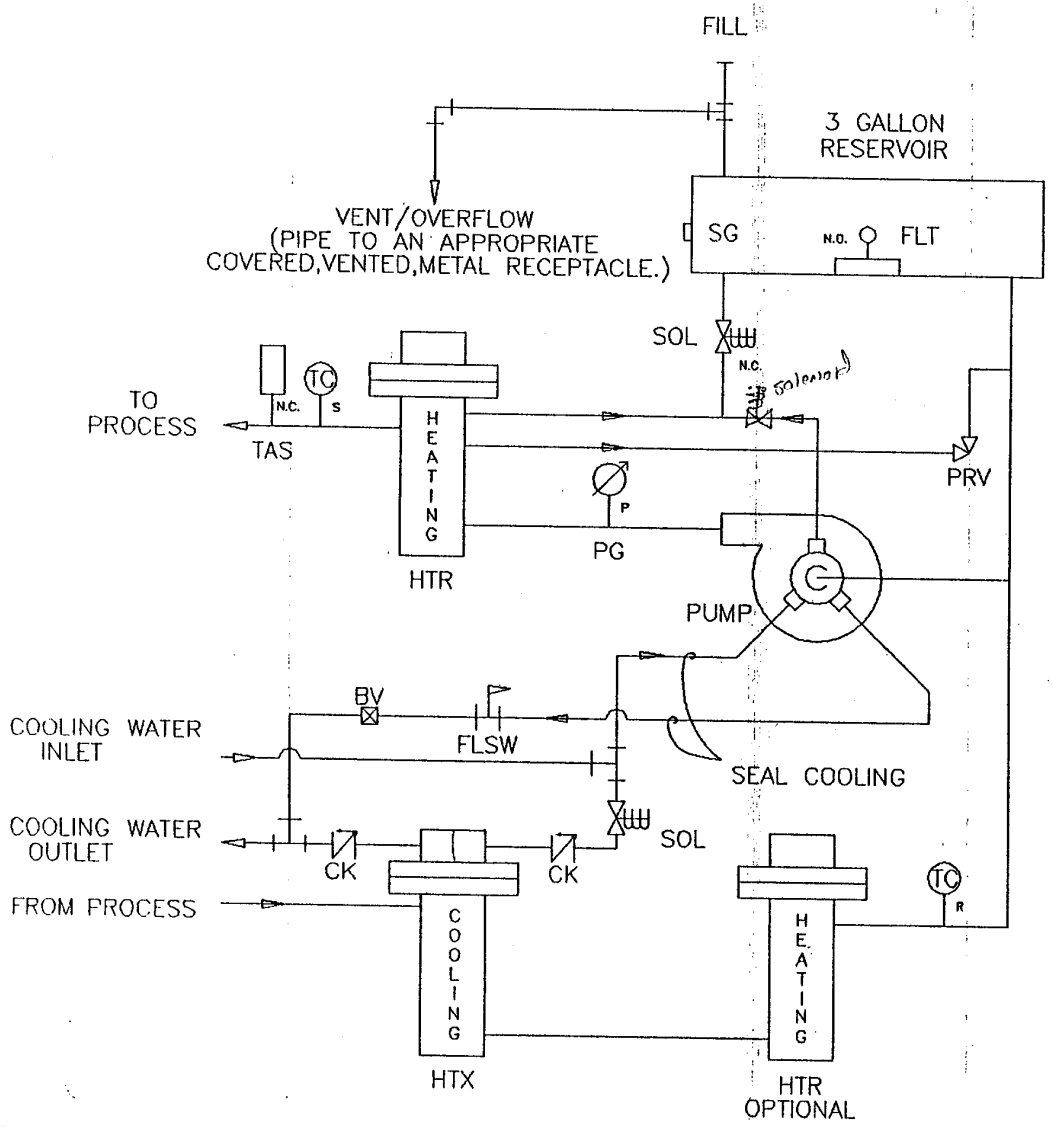


SYM	REV	DESCRIPTION OF REVISION	BY	DATE
	C	ADD FLOW SWITCH	JP	5/95
	B	CONVERT TO OIL SCHEMATIC	AJS	6/92
	A	GENERAL FOR COMMERCIALIZATION	MAW	5/89

CONAIR TEMPRO
1175 DAVIS ROAD
ELGIN, ILLINOIS U.S.A.
60123
(312) 888-8600

230/460 VOLT WIRING SCHEMATIC
OIL TEMPERATURE CONTROL UNITS

DRAWN BY:	APPROVED BY:	DATE:	SCALE:
A.J.S.		6/4/92	NONE
JOB#: STANDARD	CHECKED BY:	DRAWING NUMBER: 09003068	REV: B



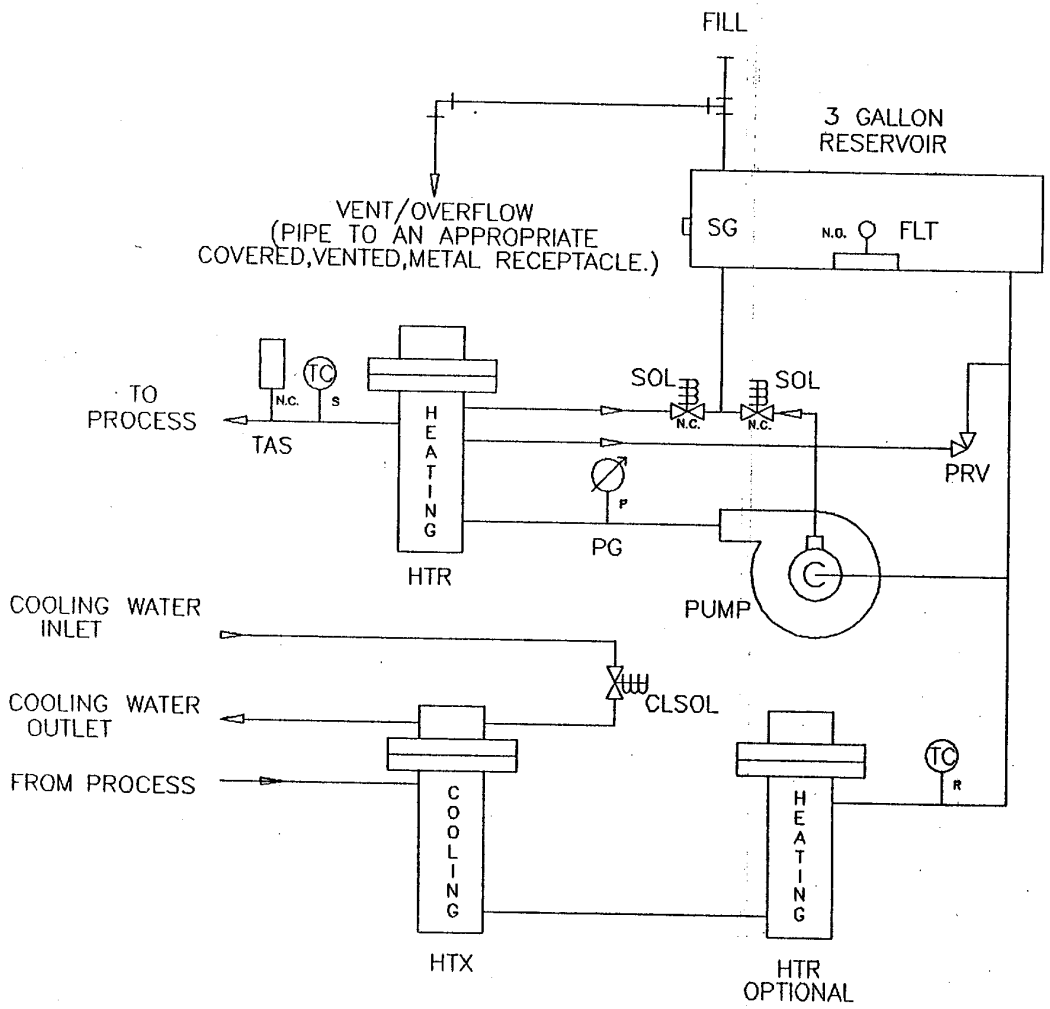
SYMBOL	DESCRIPTION	
PUMP	OIL PUMP– Scot with seal cavity vent	
HTR	OIL IMMERSION HEATER	
SOL	SOLENOID VALVE, VENT	
PRV	PRESSURE RELIEF VALVE	
BV	SQUARE HEAD COCK VALVE	
FLSW	SELA COOLING WATER FLOW SWITCH	
FLT	OIL FLOAT SWITCH	
TAS	OVERTEMPERATURE SAFTEY	
TC S	T'CPL,(K)UNG,6",304SS P,W/6'LEAD	
TC R	T'CPL,(K)UNG,6",304SS P,W/18'LEAD	
SG	SIGHT GLASS,3/4,500 DEG	
PG	PRESSURE GAUGE, 60 P.S.I.	
* HTX	HEAT EXCHANGER	(OPTIONAL)
* CLSOL	SOLENOID VLV, COOLING	(OPTIONAL)
* CK	CHECK VLV	(OPTIONAL)

* OPTIONAL ON ALL UNITS.

CONAIR TEMPRO
1175 DAVIS ROAD
ELGIN, ILLINOIS U.S.A.
60123
(708) 888-8800

PIPING SCHEMATIC
OIL THERMOLATORS

DRAWN BY:	APPROVED BY:	DATE:	SCALE:
WJS	TW	12/8/95	NONE
JOB#:	CHECKED BY:	DRAWING NUMBER: 09003066A	REV '96



SYMBOL	DESCRIPTION
PUMP	OIL PUMP– HTO–80 with seal cavity vent
HTR	OIL IMMERSION HEATER
SOL	SOLENOID VALVE, VENT
PRV	PRESSURE RELIEF VALVE
BV	SQUARE HEAD COCK VALVE
FLT	OIL FLOAT SWITCH
TAS	OVERTEMPERATURE SAFTEY
TC S	T'CPL,(K)UNG,6",304SS P,W/6'LEAD
TC R	T'CPL,(K)UNG,6",304SS P,W/18'LEAD
SG	SIGHT GLASS,3/4,500 DEG
PG	PRESSURE GAUGE, 60 P.S.I.
* HTX	HEAT EXCHANGER, 4.3 SQ FT (OPTIONAL)
* CLSOL	SOLENOID VLV, COOLING (OPTIONAL)
	(OPTIONAL)

* OPTIONAL ON ALL UNITS.

HEATRAC

REV	DESCRIPTION	DATE	BY
A	ADAPTED FOR HTO–80	10/97	WJS

CUSTOMER NAME
CUSTOMER LOCATION
PURCHASE ORDER: 000000–000

CONAIR™
ONE CONAIR DRIVE, PITTSBURGH, PA 15202, (412)312–6000
FLUID HEAT TRANSFER GROUP

MODEL NUMBER	HEATRAC
VOLTAGE	480/3/60
F.L. AMPS	
HEATER KW	6,12,18
PUMP HP	1,2,3

DRWN BY: WJS
DATE: 10/10/97
SCALE: none
REVISION: A
DWG. NO. 09003066

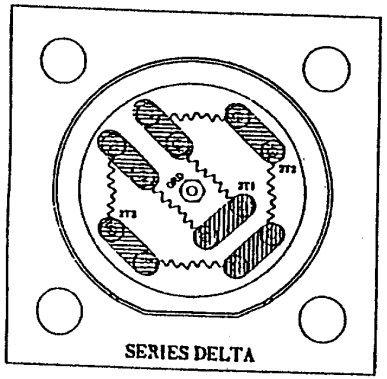
AMP AND KILOWATT CAPACITY CHART FOR [redacted] HD WATER HEATERS WITH 6 ELEMENTS

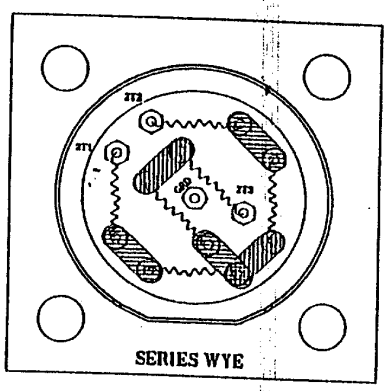
[redacted] = THE HEATER'S RATED AMPS AND KILOWATTS

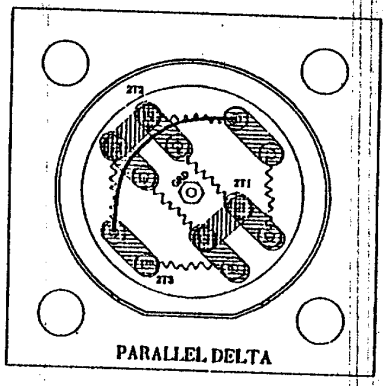
[redacted] = DO NOT WIRE HEATERS FOR THESE VALUES

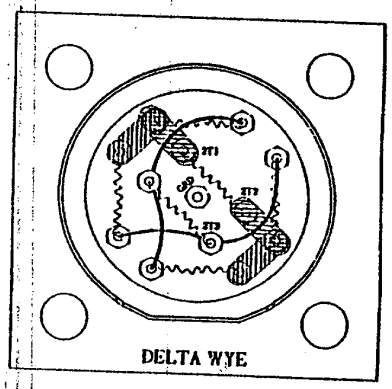
PART NUMBER: 9001548 DESC: 6KW, 380V TYPE: OIL SINGLE ELEMENT RESISTANCE: 158

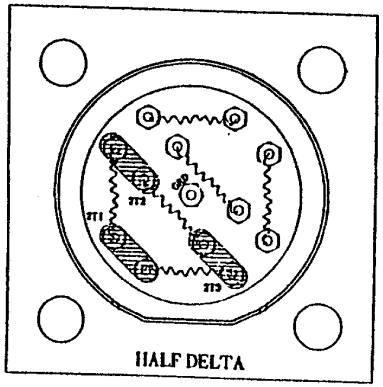
VOLTS	SERIES DELTA REQ = 179.0219		HALF DELTA REQ = 89.5781		SERIES WYE REQ = 537.2		HALF WYE REQ = 268.6		PARALLEL DELTA REQ = 44.319		PARALLEL WYE REQ = 134.3		WYE DELTA REQ = 61.778	
	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A
208	0.36	1.00	0.84	2.32	0.14	0.39	0.28	0.77	1.69	4.69	0.56	1.55	1.21	3.37
230	0.44	1.10	1.02	2.67	0.17	0.43	0.34	0.86	2.07	5.19	0.68	1.71	1.48	3.72
380	1.20	1.82	2.79	4.24	0.47	0.71	0.93	1.41	5.64	8.57	1.86	2.83	4.05	6.16
415	1.43	1.99	3.33	4.63	0.56	0.77	1.11	1.55	6.73	9.36	2.22	3.09	4.83	6.72
460	1.76	2.21	4.09	5.14	0.68	0.86	1.36	1.71	8.27	10.38	2.73	3.43	5.93	7.46
575	2.75	2.76	6.39	6.42	1.07	1.07	2.13	2.14	12.92	12.97	4.26	4.28	9.27	9.31

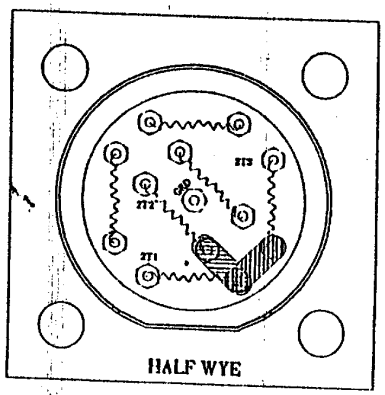


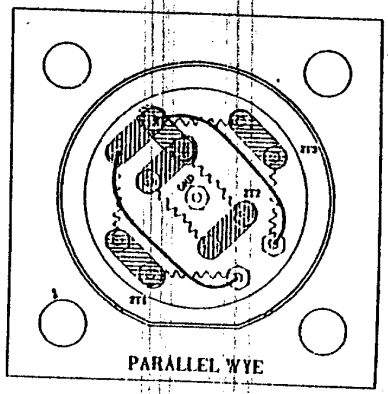










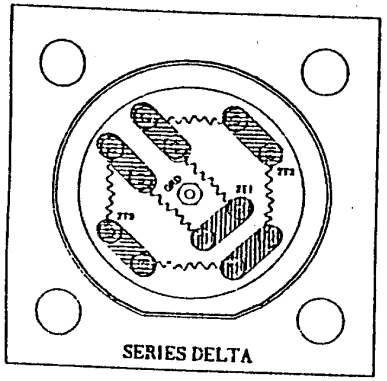


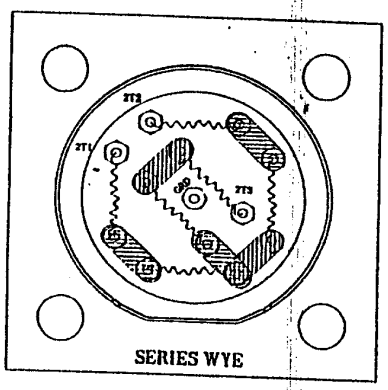
= THE HEATER'S RATED AMPS AND KILOWATTS

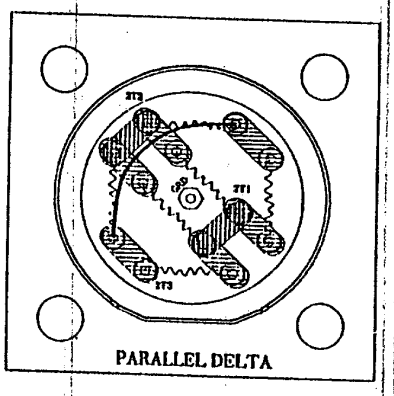
= DO NOT WIRE HEATERS FOR THESE VALUES

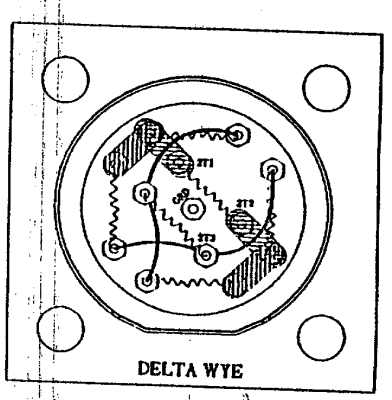
PART NUMBER: 9002018 **DESC:** 6KW, 208V **TYPE:** OIL **SINGLE ELEMENT RESISTANCE:** 42.6

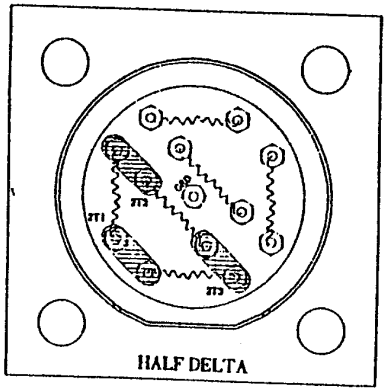
VOLTS	SERIES DELTA REQ= 48.26793		HALF DELTA REQ= 24.15207		SERIES WYE REQ= 144.84		HALF WYE REQ= 72.42		PARALLEL DELTA REQ= 11.9493		PARALLEL WYE REQ= 36.21		WYE DELTA REQ= 16.6566	
	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A
208	1.55	4.31	3.10	8.61	0.52	1.44	1.03	2.87	6.27	17.41	2.07	5.74	4.50	12.49
230	1.90	4.77	3.79	9.52	0.63	1.59	1.27	3.18	7.67	19.26	2.53	6.35	5.50	13.81
380	5.18	7.87	10.36	15.73	1.73	2.62	3.45	5.25	20.98	31.60	6.91	10.49	15.02	22.81
415	6.18	8.60	12.35	17.18	2.06	2.87	4.12	5.73	24.66	34.76	8.24	11.46	17.61	24.92
460	7.59	9.53	15.17	19.05	2.53	3.18	5.06	6.35	30.67	38.60	10.12	12.70	22.00	27.62
575	11.86	11.91	23.71	23.81	3.95	3.97	7.91	7.94	47.92	48.12	15.81	15.86	34.38	34.52

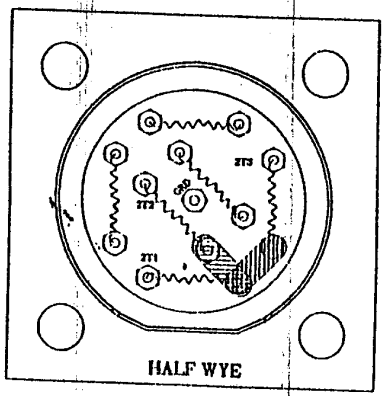

SERIES DELTA

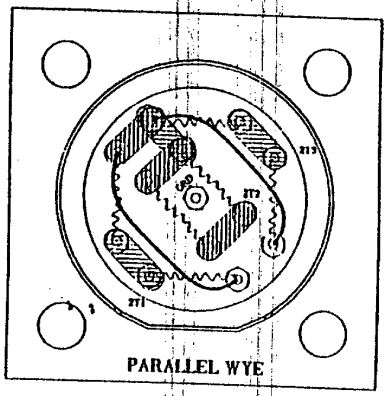

SERIES WYE


PARALLEL DELTA


DELTA WYE


HALF DELTA


HALF WYE


PARALLEL WYE

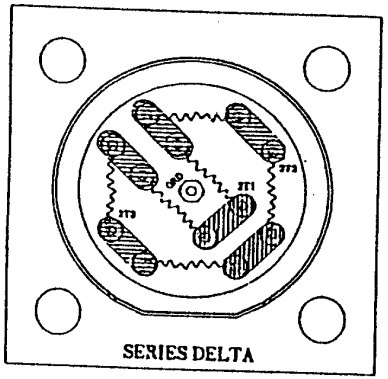
AMP AND KILOWATT CAPACITY CHART FOR OIL AND WATER HEATERS WITH 6 ELEMENTS

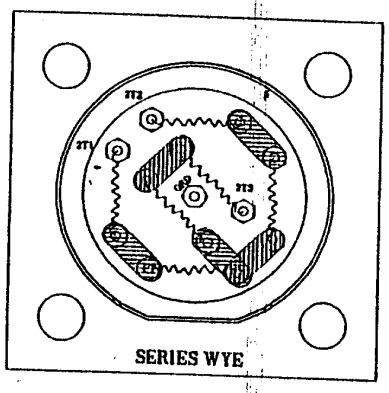
[ ] = THE HEATER'S RATED AMPS AND KILOWATTS

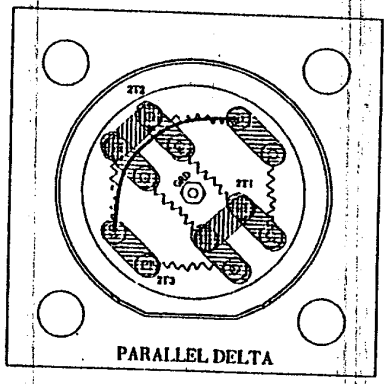
[ ] = DO NOT WIRE HEATERS FOR THESE VALUES

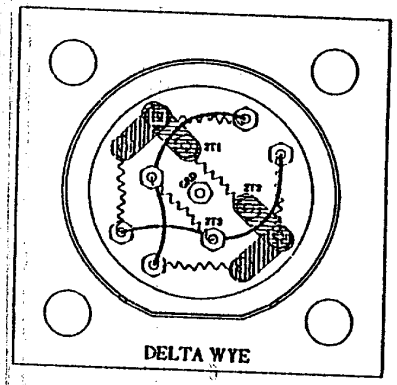
PART NUMBER: 9001579 **DESC:** 6KW, 230/460V **TYPE:** OIL **SINGLE ELEMENT RESISTANCE:** 53.7

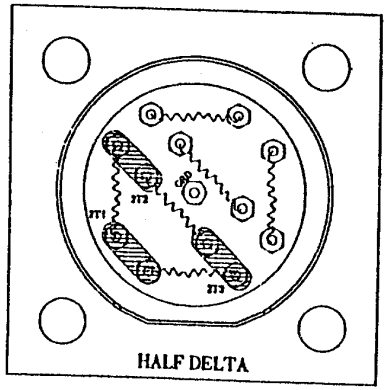
VOLTS	SERIES DELTA REQ= 60.844785		HALF DELTA REQ= 30.44522		SERIES WYE REQ= 182.58		HALF WYE REQ= 91.29		PARALLEL DELTA REQ= 15.06285		PARALLEL WYE REQ= 45.645		WYE DELTA REQ= 20.9967	
	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A
208	1.23	3.42	2.46	6.83	0.41	1.14	0.82	2.28	4.97	13.81	1.64	4.56	3.57	9.91
230	1.51	3.78	3.01	7.55	0.50	1.26	1.00	2.52	6.08	15.27	2.01	5.04	4.36	10.95
380	4.11	6.25	8.21	12.48	1.37	2.08	2.74	4.16	16.60	25.23	5.48	8.33	11.91	18.10
415	4.90	6.82	9.80	13.63	1.63	2.27	3.27	4.55	19.80	27.55	6.54	9.09	14.21	19.77
460	6.02	7.56	12.04	15.11	2.01	2.52	4.01	5.04	24.33	30.64	8.03	10.08	17.45	21.91
575	9.41	9.45	18.81	18.89	3.14	3.15	6.27	6.30	38.02	38.17	12.55	12.60	27.27	27.39

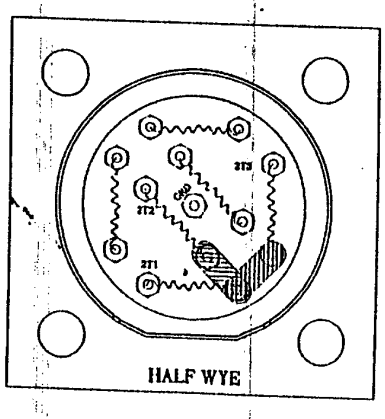


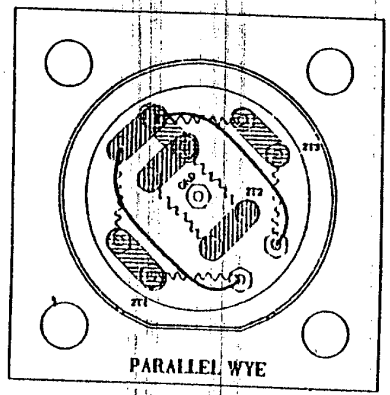










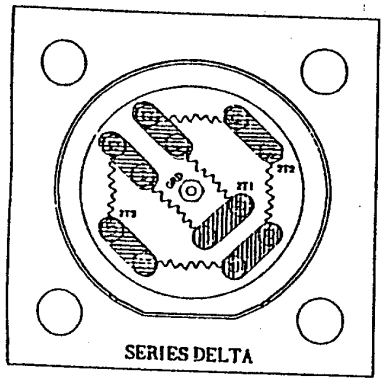


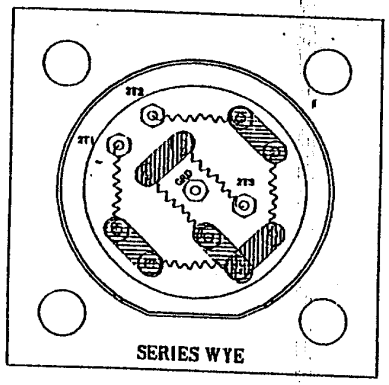
= THE HEATER'S RATED AMPS AND KILOWATTS

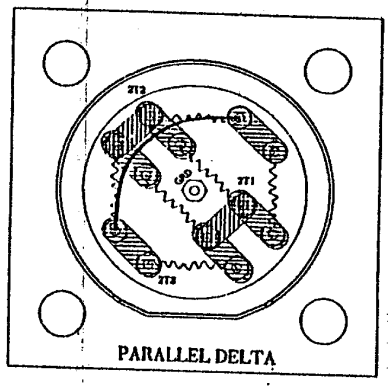
= DO NOT WIRE HEATERS FOR THESE VALUES

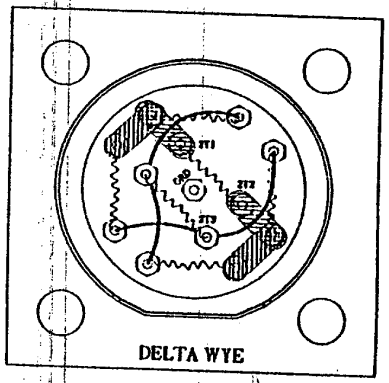
PART NUMBER: 9002017 **DESC:** 12KW, 230/460V **TYPE:** OIL **SINGLE ELEMENT RESISTANCE:** 27.3

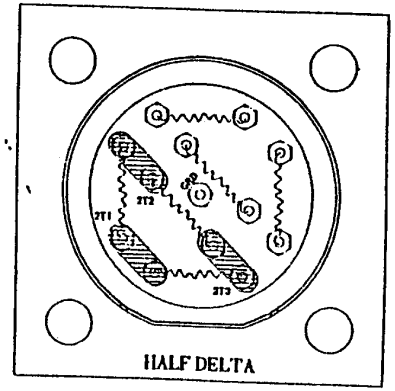
VOLTS	SERIES DELTA REQ= 30.932265		HALF DELTA REQ= 15.47774		SERIES WYE REQ= 92.82		HALF WYE REQ= 46.41		PARALLEL DELTA REQ= 7.65765		PARALLEL WYE REQ= 23.205		WYE DELTA REQ= 10.6743	
	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A
208	2.42	6.72	4.84	13.44	0.81	2.24	1.61	4.48	9.79	27.16	3.23	8.96	7.02	19.49
230	2.96	7.44	5.92	14.86	0.99	2.48	1.97	4.96	11.96	30.04	3.95	9.91	8.58	21.55
380	8.09	12.28	16.16	24.55	2.69	4.09	5.39	8.19	32.66	49.62	10.78	16.38	23.43	35.607
415	9.64	13.42	19.27	26.81	3.21	4.47	6.43	8.94	38.95	54.19	12.85	17.88	27.95	38.88
460	11.85	14.87	23.68	29.72	3.95	4.96	7.90	9.91	47.86	60.07	15.79	19.82	34.35	43.001
575	18.51	18.59	37.00	37.16	6.17	6.19	12.34	12.39	74.78	75.09	24.68	24.78	53.65	53.87

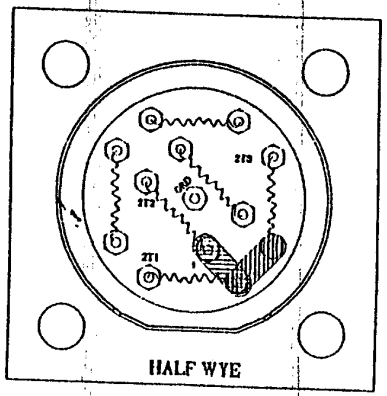


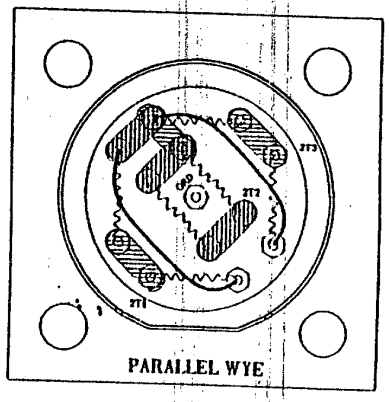








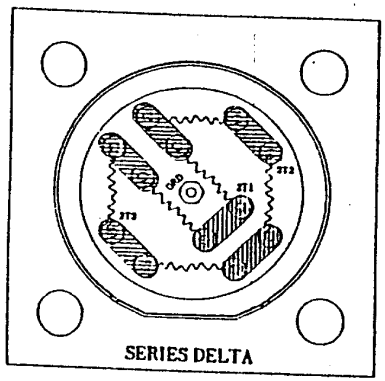


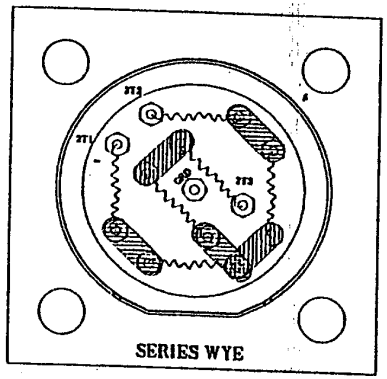


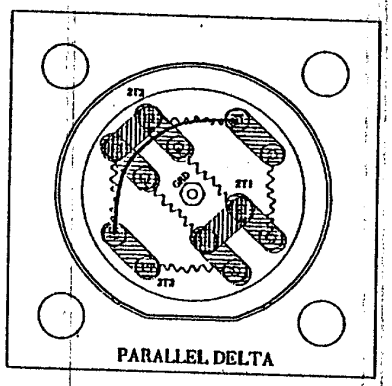
= THE HEATER'S RATED AMP'S AND KILOWATTS

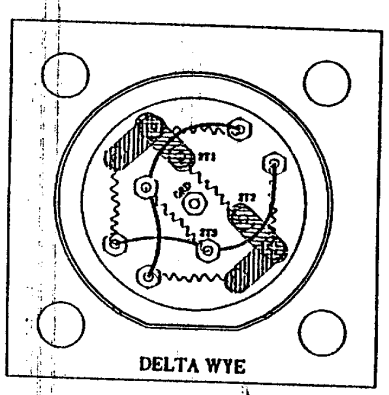
= DO NOT WIRE HEATERS FOR THESE VALUES

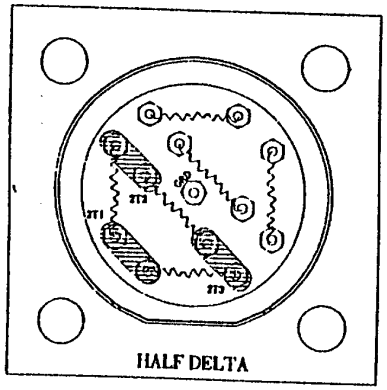
PART NUMBER: 9002019 DESC: 12KW, 208V TYPE: OIL													SINGLE ELEMENT RESISTANCE: 21.3			
VOLTS	SERIES DELTA REQ= 24.133965		HALF DELTA REQ= 12.07604		SERIES WYE REQ= 72.42		HALF WYE REQ= 36.21		PARALLEL DELTA REQ= 5.97465		PARALLEL WYE REQ= 18.105		WYE DELTA REQ= 8.3283	
	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A
208	3.10	8.62	6.21	17.22	1.03	2.87	2.07	5.74	12.54	34.81	4.14	11.49	9.00	24.98
230	3.80	9.53	7.59	19.05	1.27	3.18	2.53	6.35	15.34	38.50	5.06	12.70	11.00	27.62
380	10.36	15.75	20.71	31.47	3.45	5.25	6.91	10.49	41.86	63.66	13.81	20.99	30.03	46.63
415	12.36	17.20	24.70	34.37	4.12	5.73	8.24	11.46	49.93	69.46	16.48	22.92	35.82	49.83
460	15.19	19.06	30.35	38.09	5.06	6.35	10.12	12.70	61.34	76.99	20.24	25.41	44.01	55.23
575	23.73	23.83	47.42	47.61	7.91	7.94	15.81	15.88	95.85	96.24	31.63	31.76	68.76	69.04

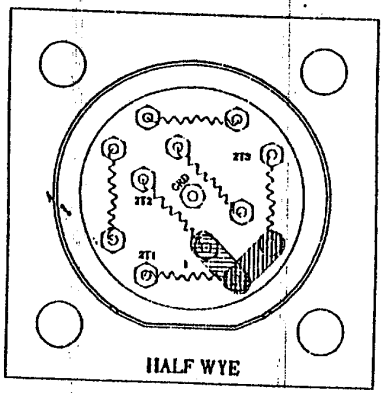


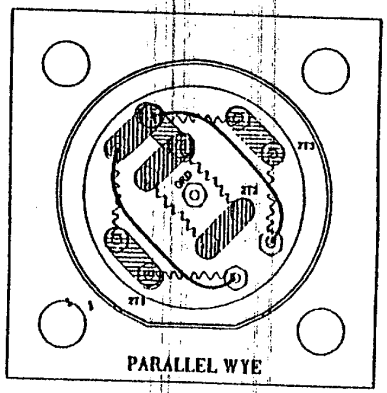










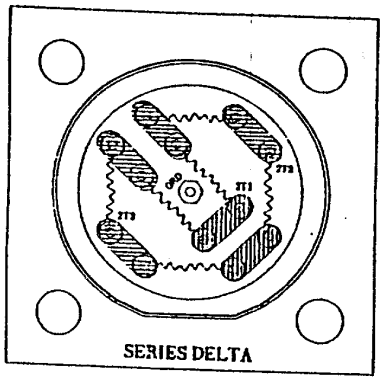


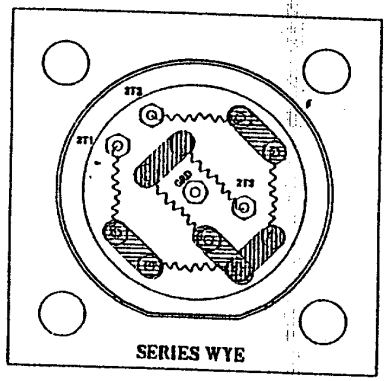
= THE HEATER'S RATED AMPS AND KILOWATTS

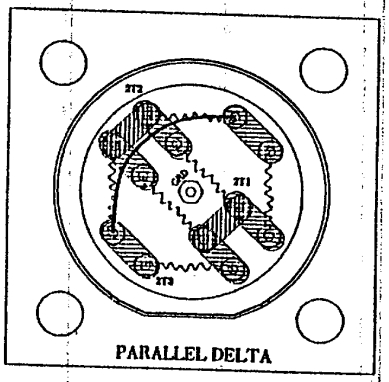
= DO NOT WIRE HEATERS FOR THESE VALUES

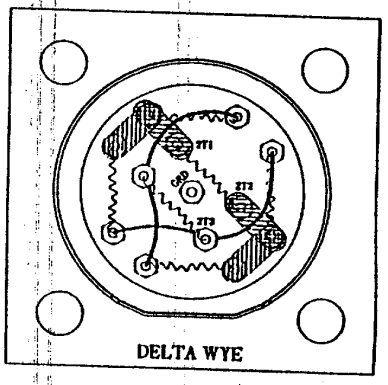
PART NUMBER: 9002021 **DESC:** 12KW, 575V **TYPE:** OIL **SINGLE ELEMENT RESISTANCE:** 177

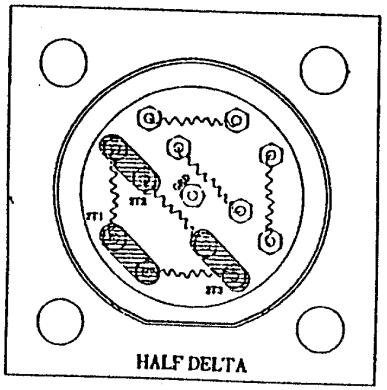
VOLTS	SERIES DELTA REQ= 200.54985		HALF DELTA REQ= 100.3502		SERIES WYE REQ= 601.8		HALF WYE REQ= 300.9		PARALLEL DELTA REQ= 49.6485		PARALLEL WYE REQ= 150.45		WYE DELTA REQ= 69.207	
	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A
208	0.37	1.04	0.75	2.07	0.12	0.35	0.25	0.69	1.51	4.19	0.50	1.38	1.08	3.01
230	0.46	1.15	0.91	2.29	0.15	0.38	0.30	0.76	1.85	4.63	0.61	1.53	1.32	3.32
380	1.25	1.89	2.49	3.79	0.42	0.63	0.83	1.26	5.04	7.65	1.66	2.53	3.61	5.49
415	1.49	2.07	2.97	4.14	0.50	0.69	0.99	1.38	6.01	8.36	1.98	2.76	4.31	6.00
460	1.83	2.29	3.65	4.58	0.61	0.76	1.22	1.53	7.38	9.27	2.44	3.06	5.30	6.65
575	2.86	2.87	5.71	5.73	0.95	0.96	1.90	1.91	11.53	11.58	3.81	3.82	8.27	8.31

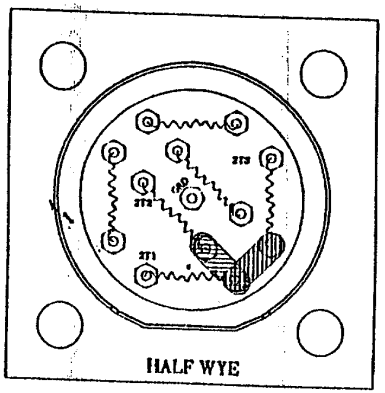


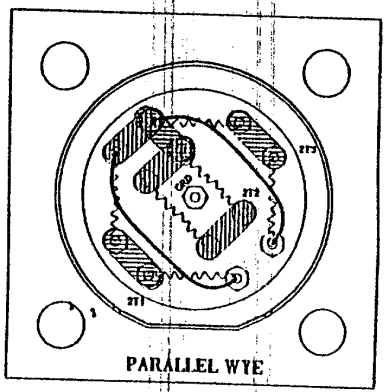












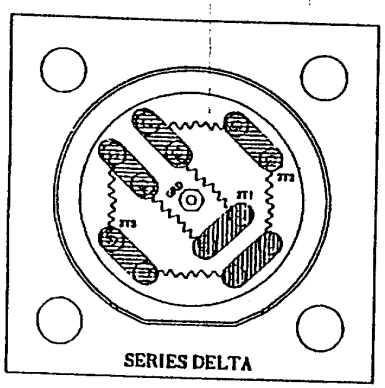
AMP AND KILOWATT CAPACITY CHART FOR [illegible] WATER HEATERS WITH 6 ELEMENTS

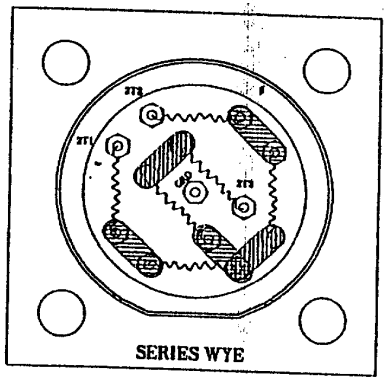
= THE HEATER'S RATED AMPS AND KILOWATTS

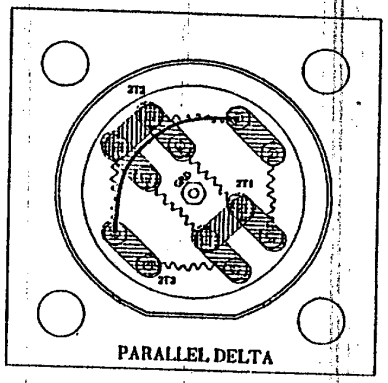
= DO NOT WIRE HEATERS FOR THESE VALUES

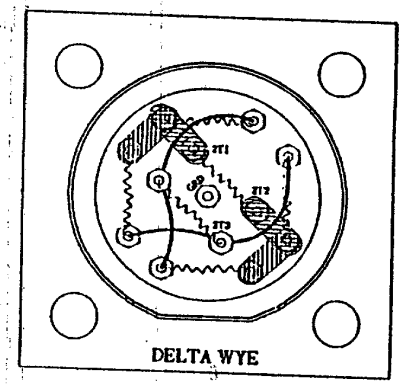
PART NUMBER: 9001549 DESC: 12KW, 380V TYPE: OIL SINGLE ELEMENT RESISTANCE: 76.6

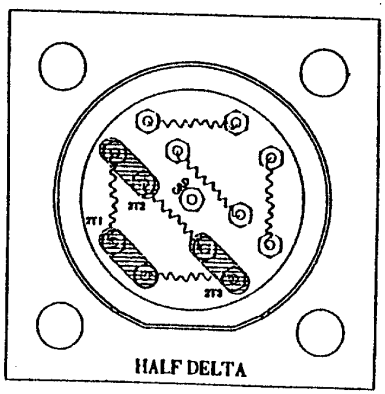
VOLTS	SERIES DELTA REQ = 85.65858		HALF DELTA REQ = 42.8614		SERIES WYE REQ = 257.04		HALF WYE REQ = 128.52		PARALLEL DELTA REQ = 21.2058		PARALLEL WYE REQ = 64.26		WYE DELTA REQ = 29.5596	
	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A	KW	A
208	0.87	2.43	1.75	4.85	0.29	0.81	0.58	1.62	3.53	9.81	1.17	3.24	2.53	7.04
230	1.07	2.69	2.14	5.37	0.36	0.89	0.71	1.79	4.32	10.85	1.43	3.58	3.10	7.78
380	2.92	4.44	5.84	8.87	0.97	1.48	1.96	2.96	11.79	17.92	3.89	5.91	8.46	12.86
415	3.48	4.84	6.96	9.68	1.16	1.61	2.32	3.23	14.07	19.67	4.64	6.46	10.09	14.04
460	4.28	5.37	8.56	10.73	1.43	1.79	2.86	3.58	17.28	21.69	5.70	7.16	12.40	15.56
575	6.69	6.71	13.36	13.42	2.23	2.24	4.46	4.47	27.00	27.12	8.91	8.95	19.37	19.45

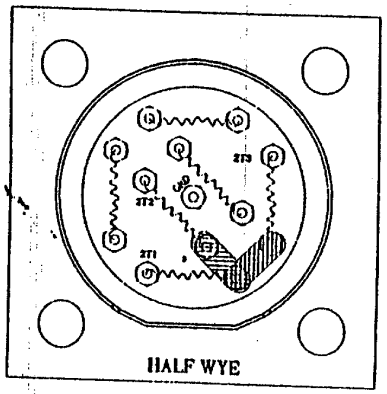


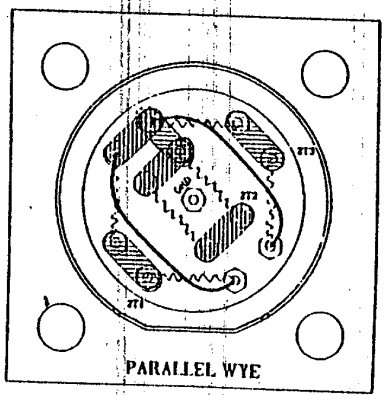




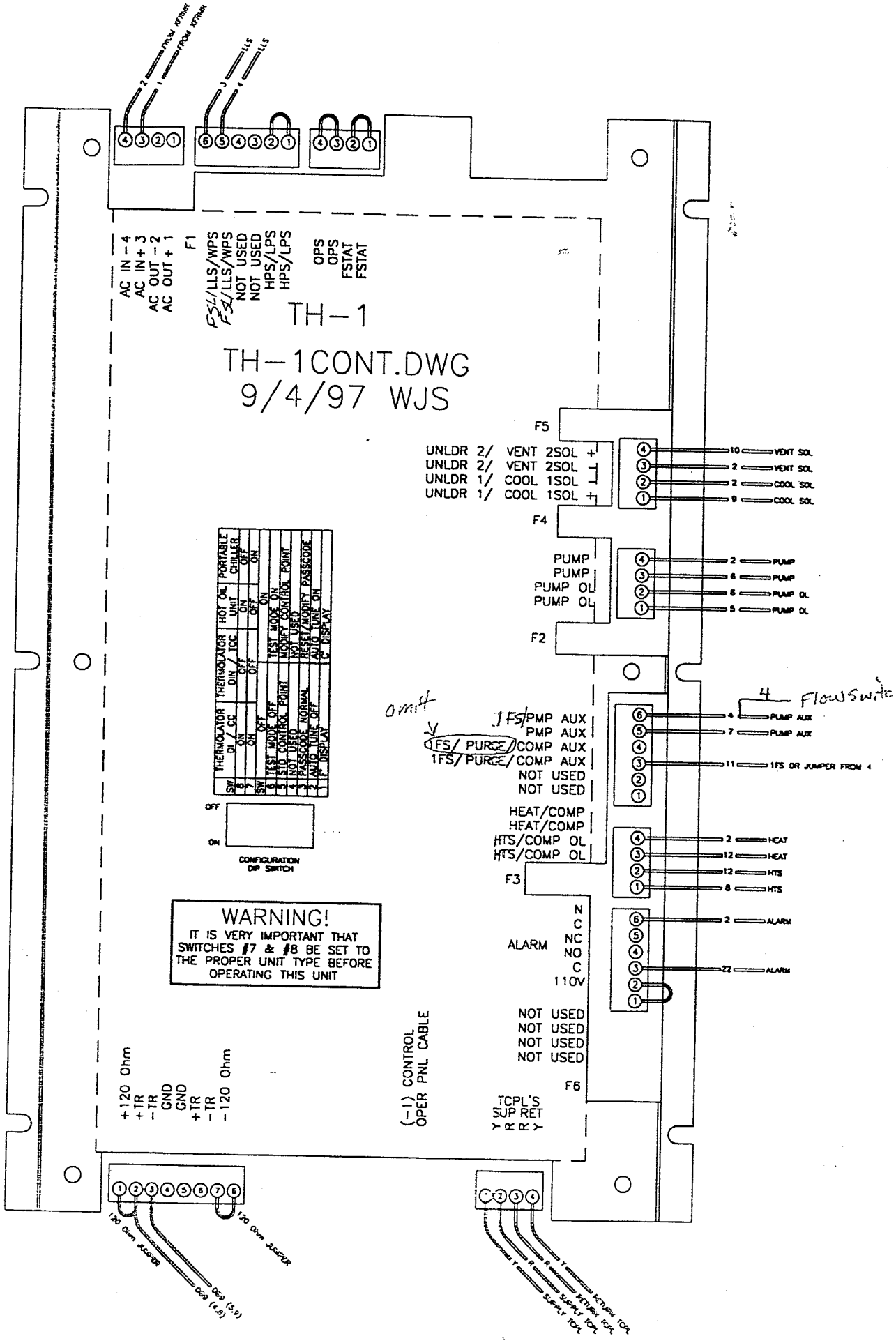


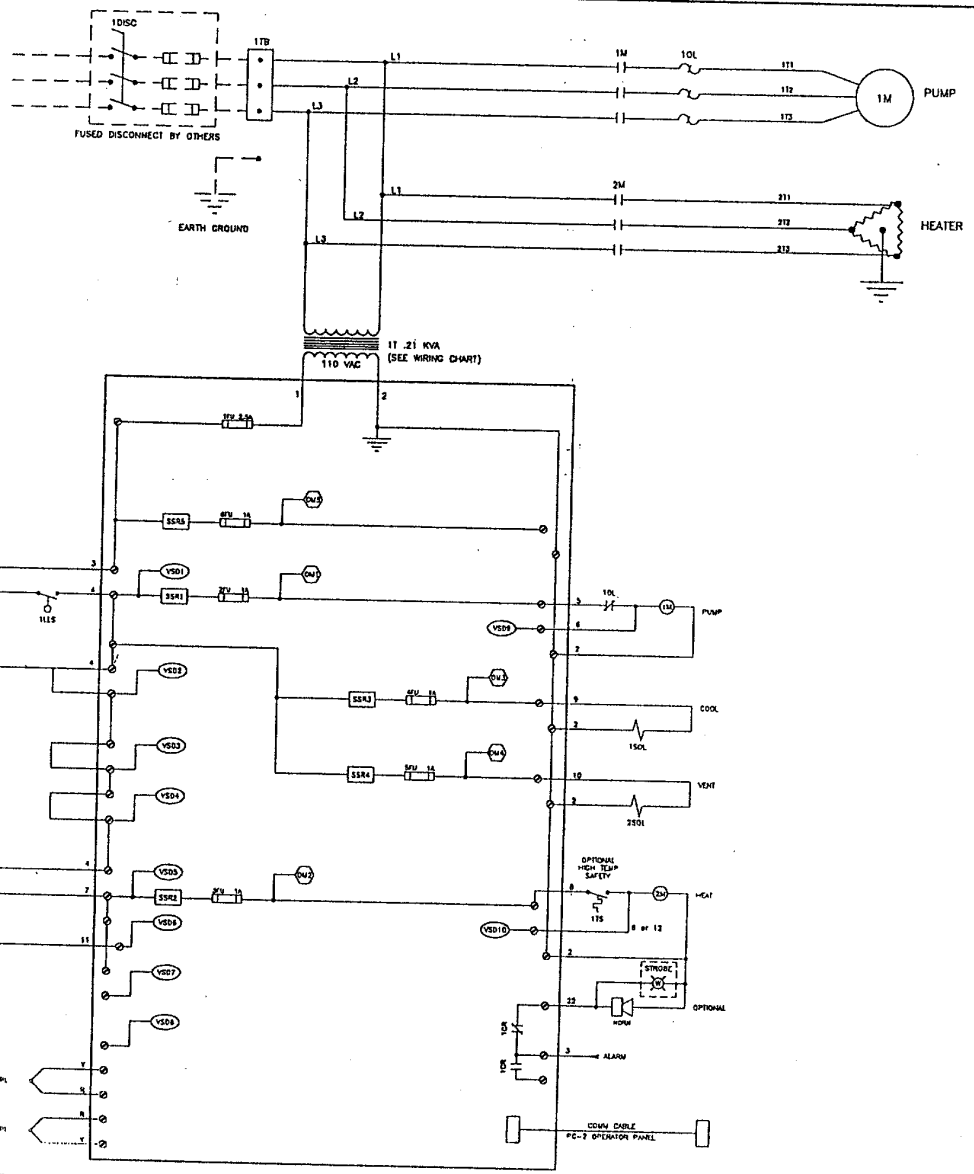






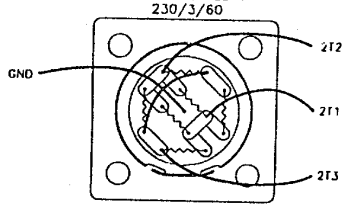
9/11/97


TH-1
TH-1CONT.DWG
9/4/97 WJS
F1
AC IN -4
AC IN +3
AC OUT -2
AC OUT +1
FSL/LLS/WPS
FSL/LLS/WPS
NOT USED
NOT USED
HPS/LPS
HPS/LPS
OPS
OPS
FSTAT
FSTAT
F5
UNLDR 2/ VENT 2SOL +
UNLDR 2/ VENT 2SOL -
UNLDR 1/ COOL 1SOL -
UNLDR 1/ COOL 1SOL +
F4
PUMP
PUMP
PUMP OL
PUMP OL
F2
omit
4 FLOWSWITCH
1FS/PMP AUX
PMP AUX
1FS/ PURGE/COMP AUX
1FS/ PURGE/COMP AUX
NOT USED
NOT USED
HEAT/COMP
HEAT/COMP
HTS/COMP OL
HTS/COMP OL
F3
ALARM
N
C
NC
NO
C
110V
NOT USED
NOT USED
NOT USED
NOT USED
F6
TCPL'S
SUP RET
Y R R Y
(-1) CONTROL
OPER PNL CABLE
+120 Ohm
+TR
-TR
GND
GND
+TR
-TR
-120 Ohm
THERMOLATOR DI / CC
THERMOLATOR DIN / TCC
HOT OIL UNIT
PORTABLE CHILLER
SW
TEST MODE OFF
STD CONTROL POINT
PASSCODE NORMAL
AUTO TUNE OFF
°F DISPLAY
TEST MODE ON
MODIFY CONTROL POINT
NOT USED
RESET/MODIFY PASSCODE
AUTO TUNE ON
°C DISPLAY
OFF
ON
CONFIGURATION DIP SWITCH
WARNING!
IT IS VERY IMPORTANT THAT SWITCHES #7 & #8 BE SET TO THE PROPER UNIT TYPE BEFORE OPERATING THIS UNIT

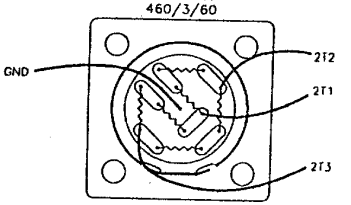


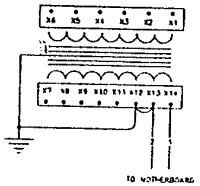
HEATER TERMINAL WIRING PATTERNS

PARALLEL DELTA
230/3/60

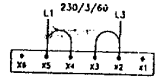


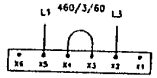
SERIES DELTA
460/3/60





CONTROL TRANSFORMER PRIMARY WIRING CHART

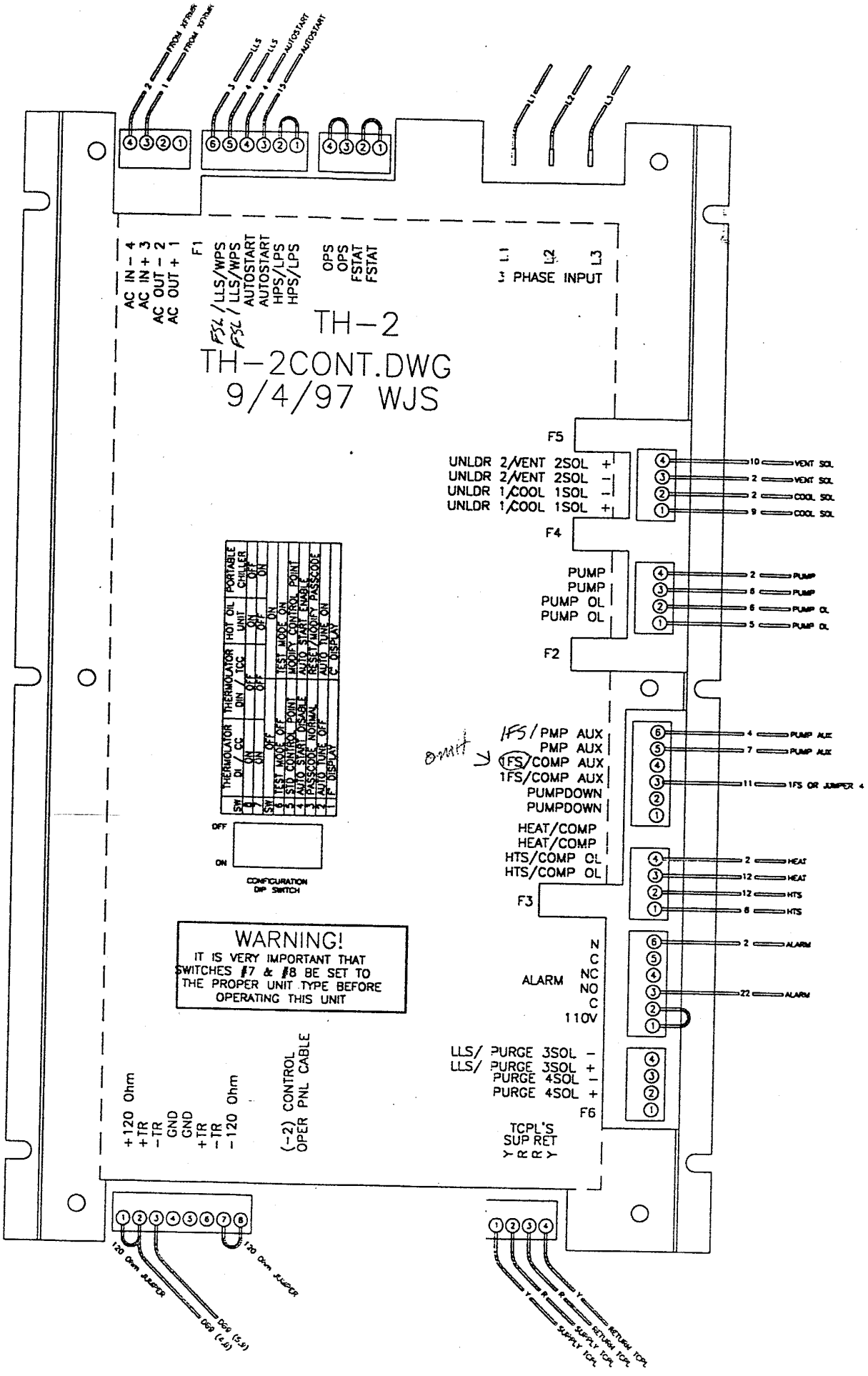




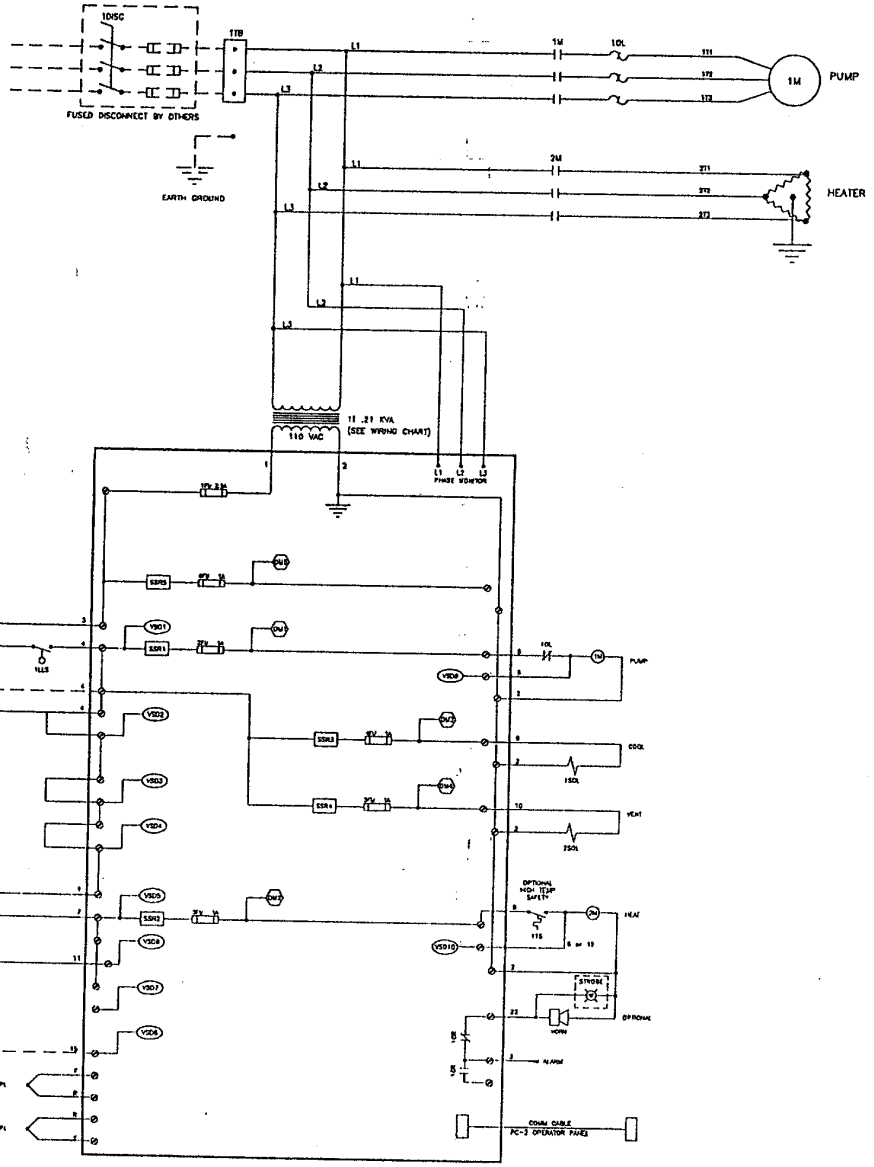
THERMOLATOR HOT OIL WIRING SCHEMATIC
TC (400, 500) -1 CONTROL

	TH-1 PWG	NONE
		7/16/97

CONAIR TEMPRO
1175 DAVIS ROAD
ELGIN ILLINOIS USA
60123 (847)888 8800

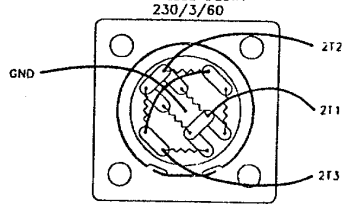

AC IN - 4
AC IN + 3
AC OUT - 2
AC OUT + 1
F1
FSL / LLS/WPS
FSL / LLS/WPS
AUTOSTART
AUTOSTART
HPS/LPS
HPS/LPS
OPS
OPS
FSTAT
FSTAT
L1
L2
L3
3 PHASE INPUT
TH-2
TH-2CONT.DWG
9/4/97 WJS
F5
UNLDR 2/VENT 2SOL +
UNLDR 2/VENT 2SOL -
UNLDR 1/COOL 1SOL -
UNLDR 1/COOL 1SOL +
VENT SOL
VENT SOL
COOL SOL
COOL SOL
F4
PUMP
PUMP
PUMP OL
PUMP OL
PUMP
PUMP
PUMP OL
PUMP OL
F2
OMIT
IFS / PMP AUX
PMP AUX
IFS/COMP AUX
1FS/COMP AUX
PUMPDOWN
PUMPDOWN
PUMP AUX
PUMP AUX
1FS OR JUMPER 4
HEAT/COMP
HEAT/COMP
HTS/COMP OL
HTS/COMP OL
HEAT
HEAT
HTS
HTS
F3
ALARM
N
C
NC
NO
C
110V
ALARM
ALARM
LLS/ PURGE 3SOL -
LLS/ PURGE 3SOL +
PURGE 4SOL -
PURGE 4SOL +
F6
TCPL'S
SUP RET
Y R R Y
THERMOLATOR DI / CC
THERMOLATOR DIN / TCC
HOT OIL UNIT
PORTABLE CHILLER
SW
TEST MODE
STD CONTROL POINT
AUTO START ENABLE
1FS/COMP DISABLE
AUTO TUNE
°F DISPLAY
MODIFY CONTROL POINT
RESET/MODIFY PASSCODE
°C DISPLAY
OFF
ON
CONFIGURATION DIP SWITCH
WARNING!
IT IS VERY IMPORTANT THAT SWITCHES #7 & #8 BE SET TO THE PROPER UNIT TYPE BEFORE OPERATING THIS UNIT
+120 Ohm
+TR
-TR
GND
GND
+TR
-TR
-120 Ohm
(-2) CONTROL
OPER PNL CABLE
120 Ohm JUMPER
120 Ohm JUMPER
RETURN TCPL
RETURN TCPL
SUPPLY TCPL
SUPPLY TCPL

9/11/97

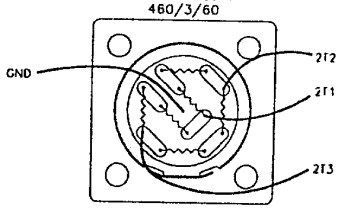


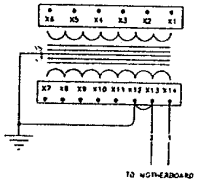
HEATER TERMINAL WIRING PATTERNS

PARALLEL DELTA
230/3/60

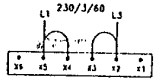


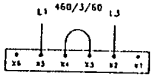
SERIES DELTA
460/3/60





CONTROL TRANSFORMER PRIMARY WIRING CHART



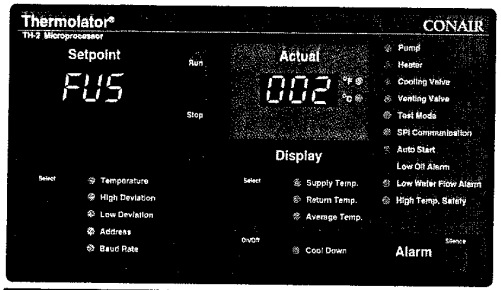


THERMOLATOR HOT OIL WIRING SCHEMATIC
1C (100, 500) -2 CONTROL

7/18/97

CONAIR TEMPRO
175 DAVIS ROAD
ELGIN ILLINOIS USA
60123 (847)888-8800

TROUBLESHOOTING



If there is a problem, the Thermolator® activates the red Alarm light and changes the RUN/STOP light from green to flashing red.

1 **Press** ⊘ **to silence the optional audible alarm.**

2 **Check the indicator lights and messages** to help determine the cause of the problem. Pump

⚠ **WARNING: Before servicing the Thermolator®** Allow the unit to cool to below 100° F. Disconnect and lockout the main power source. Disconnect water and air supply lines.

Shut down alarms

The Thermolator has shut down automatically to prevent damage to equipment or personnel. To resume normal operation, press Stop, fix the problem, then press Run.

Pump

The pump overload has tripped. Contact is open.
1. Verify that the correct voltage is supplied to the motor.
2. Fluid flow may be more than the pump can handle. Check current draw against motor rating. Decrease flow.

Low Oil Alarm

The oil level in the unit reservoir is too low.
1. Check reservoir and add oil as needed.

Low Water Flow Alarm

There is not enough cooling water at the pump seal.
1. Check the water-jacketed seal chamber at the pump.

High Temp. Safety

The actual temperature of oil supplied to the mold exceeds the temperature safety switch limit.
1. The unit is not running. Start the Thermolator.
2. Oil has stopped flowing between supply the outlet and return inlet. Check for closed valve or plugged line.
3. The heater contactor failed. Replace contactor.

Hi SAF **Actual temperature of oil supplied to the mold higher than the programmed 510° F safety limit.**
1. Oil has stopped flowing between supply outlet and return inlet. Check for closed valve or plugged line.
2. The heater contactor failed. Replace contactor.

Lo SAF **Actual temperature of oil supplied to the mold is below the programmed 60° F safety limit.**
1. The cooling valve is stuck open. Clean valve.
2. The heater has failed. Check for a bad heating element, or a heater contact that failed in the open position.

PHS Err **The incoming power is out of phase. A leg may have failed or is disconnected.**
1. The pump is rotating in the wrong direction. Reverse any two leads on the power connection.
2. Check fuses or circuits at the main power supply.

Pbr Err **The return line temperature probe failed.** Check for loose connections, or replace.

PbS Err **The supply line temperature probe failed.** Check for loose connections, or replace.

FUS 002 **The pump fuse failed.** Replace the fuse on the motherboard.

NOTE: See the Thermolator User Guide for additional alarm messages regarding fuses and controller errors.

Warning alarms

The Thermolator continues operating, but this problem could lead to a shutdown condition if not corrected.

Low Deviation

Actual temperature of oil supplied to the mold is lower than the setpoint deviation limit allows.
1. Low deviation temperature is set too low. Increase.
2. The heater failed. Check for a bad heating element or a heater contact that failed in the open position.
3. The cooling valve is stuck open. Clean valve as needed.

High Deviation

Actual temperature of oil supplied to the mold is higher than the setpoint deviation limit allows.
1. High deviation temperature is set too low. Increase.
2. Oil has stopped flowing between supply outlet and return inlet. Check for plugged pipe or failed cooling valve.
3. The heater contact failed. Replace the contactor.
4. The heater and lines may be too large for this application.

SPI Communication

The SPI communication link has failed.
1. Check SPI device, cables and cable connections.

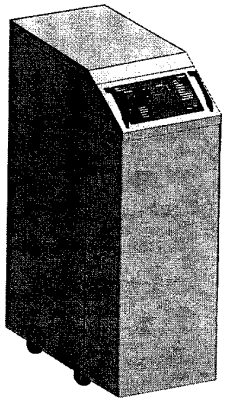
Quick Card

Thermolator® heaTrac

Oil Temperature Controller with TH-2 Microprocessor

Basic Operation

Troubleshooting



Instant Access Parts & Service:
(800) 458-1960
(814) 437-6861

www.conairnet.com

CONAIR™
The Conair Group, Inc.
One Conair Drive
Pittsburgh, PA 15202
Phone: (412) 312-6000
Fax: (412) 312-6001

QCH004/1197

Setpoint display

The window displays the setpoints entered for the fluid temperature, the high and low temperature deviation alarms, the SPI baud rate and the SPI address.

Run/Stop

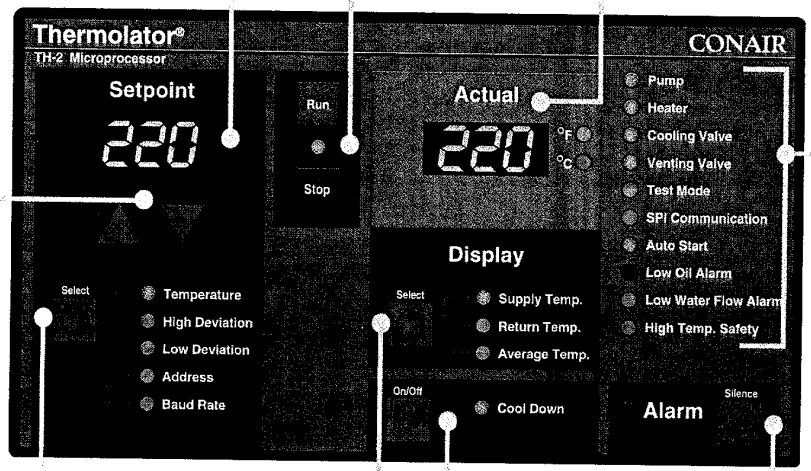
Press the RUN button to start normal operation. Press STOP to stop the temperature control unit.

- = Running
- = Stopped
- = Alarm (flashing)

Actual values display

The green window displays the temperature at the middle of the mold. This temperature is calculated as an average of the temperatures of the supply oil and return oil.

The lights indicate whether the temperature is in degrees Fahrenheit or Celsius.



Status lights

The lights indicate the operating status of the listed components. Except in Test Mode and Auto Start, the lights indicate:

- = Off or inactive
- = On or active
- = Alarm condition

Test Mode is used for initial programming. When test mode is enabled, normal operation is disabled.

- = Test Mode off
- = Test Mode on; unit disabled

Auto Start allows you to start and stop the Thermolator® from a remote switching or timing device, such as the processing machine control. This feature can only be enabled by configuring a dip switch on the control motherboard.

- = Disabled; Auto Start not available
- = (flashing) Enabled; unit can start at any time
- = On and under control of the remote device

Setpoint Select button

Press repeatedly until a green light appears next to the parameter you want to program or view.

NOTE: Default settings for the deviation setpoints are:
High = setpoint + 10° F
Low = setpoint - 10° F
A warning alarm occurs (indicator light turns red) whenever the actual temperature is outside this setpoint range. Recommend setting: ± 2-10°.

Setpoint adjustment buttons

Press ▲ or ▼ to enter temperature and SPI parameters. Press ▲ to increase a value. Press ▼ to decrease a value.

TIP: Press and hold the button for faster scrolling speed.

Alarm

Press to acknowledge the alarm light and silence the optional audible alarm. The alarm light will flash until the cause of the alarm condition is fixed.

Cool Down On/Off

The Cool Down feature resets the setpoint temperature to 100° F to cool the system before stopping. Press to turn the feature on. Press again to turn it off.

Display Select button

Press repeatedly until a green light appears next to the parameter you want to program or view in the Actual values window. See the User Guide for programming information.

Starting the Thermolator®.

1 Turn on main power to the Thermolator®.
- Setpoint and actual windows display 888 for three seconds, then display the most recently entered setpoint temperature and the current actual temperature.
- Indicator lights blink green, then red.

2 Turn on the water supply to the unit.
If the water supply is on, go to Step 3.

3 Enter the temperature setpoint.
Press the Setpoint button until the green light appears next to Temperature. Press ▲ to increase the setpoint or ▼ to decrease.

4 Press Run.
- The RUN/STOP light turns green.
- If fluid temperature is 210° F or lower, the unit initiates a 60-second venting sequence. Cooling and venting valves are active for 60 seconds. The pump runs for the final 30 seconds.
- Normal operation begins. The heater turns on if the actual temperature is below setpoint. The cooling valve remains active if the actual temperature is above setpoint.

If the Alarm light turns on, press the Silence button to silence an audible alarm and go to the Troubleshooting section.

Cooling the Thermolator®.

If your setpoint is over 250° F, you should cool the unit and fluid before stopping. The Thermolator® must be running to use the Cool Down feature.

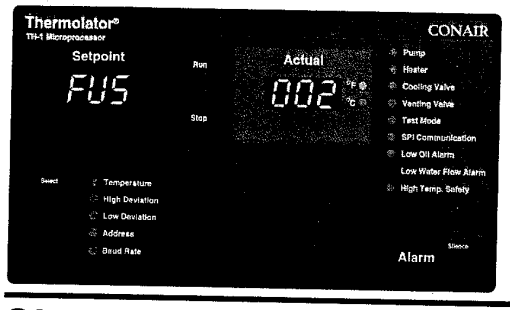
1 Press the Cool Down button to begin cooling.
- The green Cool Down light turns on.
- The temperature setpoint changes to 100° F.
- The heater indicator light turns off.
- The cooling valve indicator light turns green and stays on until the actual temperature reaches 100° F.

2 Press the Cool Down button again to stop cooling.
- The setpoint temperature stays at 100° F until a new setpoint is entered.

Stopping the Thermolator®.

1 Press Stop.
- The RUN/STOP light turns red.

TROUBLESHOOTING



If there is a problem, the Thermolator® activates the red Alarm light and changes the RUN/STOP light from green to flashing red.

1 **Press** **to silence the optional audible alarm.**

2 **Check the indicator lights and messages** to help determine the cause of the problem. Pump

⚠ **WARNING: Before servicing the Thermolator®** Allow the unit to cool to below 100° F. Disconnect and lockout the main power source. Disconnect water and air supply lines.

Shut down alarms

The Thermolator has shut down automatically to prevent damage to equipment or personnel. To resume normal operation, press Stop, fix the problem, then press Run.

Pump

The pump overload has tripped. Contact is open.
1. Verify that the correct voltage is supplied to the motor.
2. Fluid flow may be more than the pump can handle. Check current draw against motor rating. Decrease flow.

Low Oil Alarm

The oil level in the unit reservoir is too low.
1. Check reservoir and add oil as needed.

Low Water Flow Alarm

There is not enough cooling water at the pump seal.
1. Check the water-jacketed seal chamber at the pump.

High Temp. Safety

The actual temperature of oil supplied to the mold exceeds the temperature safety switch limit.
1. The unit is not running. Start the Thermolator.
2. Oil has stopped flowing between supply outlet and return inlet. Check for closed valve or plugged line.
3. The heater contactor failed. Replace contactor.

Hi SAF **Actual temperature of oil supplied to the mold is higher than the programmed 510° F safety limit.**
1. Oil has stopped flowing between supply outlet and return inlet. Check for closed valve or plugged line.
2. The heater contactor failed. Replace contactor.

Lo SAF **Actual temperature of oil supplied to the mold is below the programmed 60° F safety limit.**
1. The cooling valve is stuck open. Clean valve.
2. The heater has failed. Check for a bad heating element, or a heater contact that failed in the open position.

PHS Err **The incoming power is out of phase. A leg may have failed or is disconnected.**
1. The pump is rotating in the wrong direction. Reverse any two leads on the power connection.
2. Check fuses or circuits at the main power supply.

Pbr Err **The return line temperature probe failed.** Check for loose connections, or replace.

PbS Err **The supply line temperature probe failed.** Check for loose connections, or replace.

FUS 002 **The pump fuse failed.** Replace the fuse on the motherboard.

NOTE: See the Thermolator User Guide for additional alarm messages regarding fuses and controller errors.

Warning alarms

The Thermolator continues operating, but this problem could lead to a shutdown condition if not corrected.

Low Deviation

Actual temperature of oil supplied to the mold is lower than the setpoint deviation limit allows.
1. Low deviation temperature is set too low. Increase.
2. The heater failed. Check for a bad heating element or a heater contact that failed in the open position.
3. The cooling valve is stuck open. Clean valve as needed.

High Deviation

Actual temperature of oil supplied to the mold is higher than the setpoint deviation limit allows.
1. High deviation temperature is set too low. Increase.
2. Oil has stopped flowing between supply outlet and return inlet. Check for plugged pipe or failed cooling valve.
3. The heater contact failed. Replace the contactor.
4. The heater and lines may be too large for this application.

SPI Communication

The SPI communication link has failed.
1. Check SPI device, cables and cable connections.

Quick Card

Basic Operation

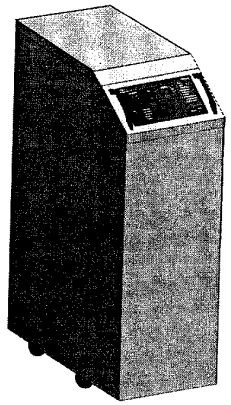
Troubleshooting

Instant Access Parts & Service:
(800) 458-1960
(814) 437-6861

www.conairnet.com

Thermolator® heaTrac

Oil Temperature Controller with TH-1 Microprocessor



CONAIR™
The Conair Group, Inc.
One Conair Drive
Pittsburgh, PA 15202
Phone: (412) 312-6000
Fax: (412) 312-6001

QCH003/1197

Setpoint display

The window displays the setpoints entered for the fluid temperature, the high and low temperature deviation alarms, the SPI baud rate and the SPI address.

Run/Stop

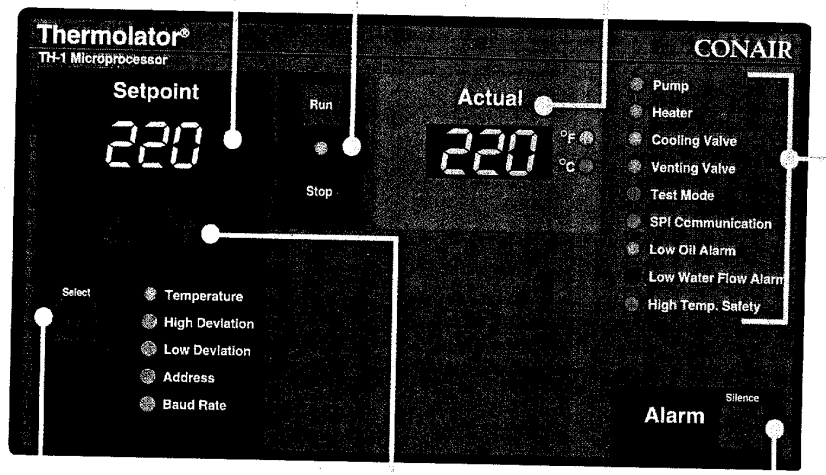
Press the RUN button to start normal operation. Press STOP to stop the temperature control unit.

- = Running
- = Stopped
- = Alarm (flashing)

Actual values display

The green window displays the temperature at the middle of the mold. This temperature is calculated as an average of the temperatures of the supply oil and return oil.

The lights indicate whether the temperature is in degrees Fahrenheit or Celsius.



Status lights

The lights indicate the operating status of the listed components. Except in Test Mode and Auto Start, the lights indicate:

- = Off or inactive
- = On or active
- = Alarm condition

Test Mode is used for initial programming. When test mode is enabled, normal operation is disabled.

- = Test Mode off
- = Test Mode on; unit disabled

Setpoint Select button

Press repeatedly until a green light appears next to the parameter you want to program or view.

NOTE: Default settings for the deviation setpoints are:
High = setpoint + 10° F
Low = setpoint - 10° F
A warning alarm occurs (indicator light turns red) whenever the actual temperature is outside this setpoint range. Recommend setting: ± 2-10°.

Setpoint adjustment buttons

Press ▲ or ▼ to enter temperature and SPI parameters. Press ▲ to increase a value. Press ▼ to decrease a value.

TIP: Press and hold the button for faster scrolling speed.

Alarm

Press to acknowledge the alarm light and silence the optional audible alarm. The alarm light will flash until the cause of the alarm condition is fixed.

Starting the Thermolator®.

1 Turn on main power to the Thermolator®.
- Setpoint and actual windows display 888 for three seconds, then display the most recently entered setpoint temperature and the current actual temperature.
- Indicator lights blink green, then red.

2 Turn on water supply to the unit.
If the water supply is on, go to Step 3.

3 Enter the temperature setpoint.
Press the Setpoint button until the green light appears next to Temperature. Press ▲ to increase the setpoint or ▼ to decrease.

4 Press Run.
- The RUN/STOP light turns green.
- If the fluid temperature is 210° F or lower, the unit initiates a 60-second venting sequence. Cooling and venting valves are active for 60 seconds. The pump is active for the final 30 seconds.
- Normal operation begins. The heater turns on if the actual temperature is below setpoint. The cooling valve remains active if the actual temperature is above setpoint.

If the Alarm light turns on, press to silence an audible alarm and go to the Troubleshooting section.

Stopping the Thermolator®.

1 Press Stop.
- The RUN/STOP light turns red.

NOTE: If your setpoint temperature was 250° F or higher, you should cool the system to 100° F before stopping the unit for a long time. To cool, enter a temperature setpoint of 100° F. Allow the unit to continue running until the actual temperature reaches 100° F.

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.