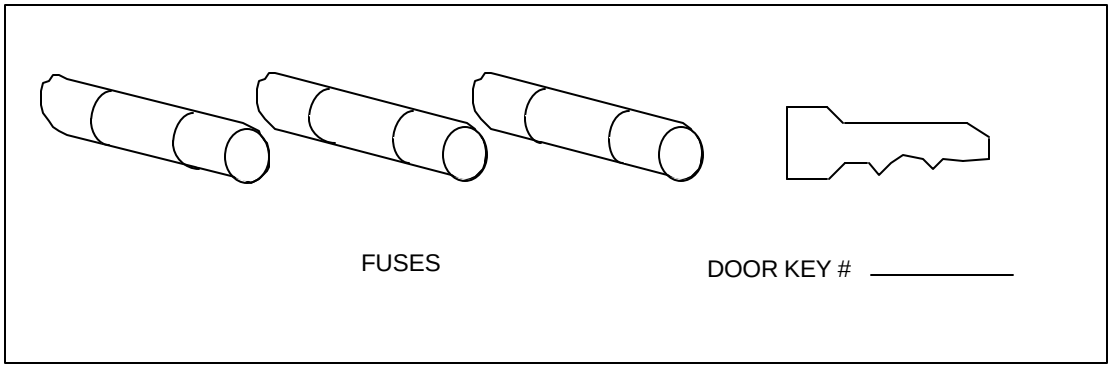
CRITERION CHAMBER
ECT-3
WITH WATLOW F4 CONTROLLER
INSTRUCTION MANUAL

TABLE OF CONTENTS

1. Supplied Accessories



Description	*Quantity*
Fuse KTK 7	*1*
Fuse ABC 5	*1*
2" Port Plug	*2*
Fuse ABC ½	*1*

(NOTE: Please write the key # in the above location as a precaution. This # will be needed if the key is lost.)*

2. Precautions

2.1. List of Harmful Substances

Explosive Materials

1. Nitro-glycol, nitro-glycerin, nitro-cellulose, and other explosive ester nitrates.

2. Tri-nitro-benzene, tri-nitro-toluene, picric acid and other explosive nitro-compounds.

3. Per-acetic acid, methyl-ethyl-ketone peroxides, benzoyl peroxide, and other organic peroxides.

Combustible Materials

a) Inflammable Materials

Metallithium, metal potassium, yellow phosphor, phosphor sulfide, red phosphor, celluloids, calcium carbonate (also called carbide), calcium phosphate, magnesium powder, aluminum powder, metal powders other than magnesium powder and aluminum powder, and hydro-sulfite.

b) Oxides

1. Potassium chlorate, soldium chlorate, ammonium chlorate, and other chlorates.

2. Potassium perchlorate, sodium perchlorate, ammonium perchlorate, and other perchlorates.

3. Potassium peroxide, sodium peroxide, ammonium peroxide, and other peroxides.

4. Potassium nitrate, sodium nitrate, ammonium nitrate, and other nitrates.

5. Sodium chlorite and other chlorites.

6. Calcium hypochlorite and other hypochlorites.

c) Ignitable Materials

1. Ethyl-ether, gasoline, acetaldehyde, propylene oxide, carbon disulfide, and other substances of ignition point of -30°C.

2. Normal hexane, ethylene oxide, acetone, benzene, methyl-ethyl-ketone, and other substances with an ignition point between -30°C and 0°C.

3. Methanol, ethanol, xylene, pentyl oxide (also called amyl), and other substances with an ignition point of between 0°C and 30°C.

4. Kerosene, light oil, turpentine oil, iso-pentyl-alcohol (also called iso-amyl-alcohol), acetic acid, and other substances with an ignition point between 30°C and 65°C.

d) Combustible Gases

Hydrogen, acetylene, ethylene, methane, ethane, propane, and other combustible substances of gaseous state at 15°C and 1 ATM.

2.2. Operation Precautions

1. Never operate the chamber without all access panels on.

2. Whenever a heat generating specimen is put into the chamber, always use the controlled specimen power terminal (see section 6.1. on the proper use of this terminal).

3. Avoid ON - OFF operation of the refrigeration for short periods of time (less than 5 minutes).

4. When the refrigeration is set to [AUTO], the refrigeration system will turn itself on and off as required.

5. Refrain from turning the chamber set point to “OFF” either in the manual mode or at the end of the program. Doing so will cause the chamber to cool to the lower limit of the equipment.

3. Specification

PREPARED BY		5/21/02 KCW		Model	Drawing No.	Spc. No.	ECSP02001	1/4
REVISION	A	01/14/04 KCW	**CRITERION**	ECT-3	2AAE0001	ESPEC		
	B	02/10/05 BP	**TEMPERATURE**					
	C		**CHAMBER**					
	D		**SPECIFICATIONS**					
	E							

1. Product Name Criterion Temperature Chamber.

2. Model

Model	Size (Approx.)
ECT-3	1.2 cu. ft.

3. Power Source Voltage 115 VAC ±10% - 1Ø - 50/60 Hz.

4. Temperature Control System Heating PID with Demand Cooling.

5. Ambient Temperature Allowable Range of Operation: 5 to 30°C (41 to 86°F).

6. Performance

(in a clean, dry, empty chamber; and an ambient temp. of 23°C (74°F))

6.1. Temperature Range -73 to 180°C (-100° to 356°F).

6.2. Temperature Constancy ±0.5°C (±0.9°F).

6.3. Temperature Uniformity (60 Hz) ±1.0°C (±1.8°F) at -68 to 100°C (-90 to 212°F).
±1.5°C (±2.7°F) at 101 to 180°C (214 to 356°F).

6.4. Temperature Uniformity (50 Hz) ±1.5°C (±2.7°F) at -68 to 100°C (-90 to 212°F).
±2.0°C (±3.6°F) at 101 to 180°C (214 to 356°F).

6.5. Temperature Heat-Up Time 23 to 170°C (74 to 340°F) within 43 min.
-40 to 85°C (-40 to 185°F) within 35 min.

6.6. Temperature Pull-Down Time (60 Hz) 23 to -65°C (74 to -85°F) within 43 min.
85 to -40°C (185 to -40°F) within 33 min.

6.7. Temperature Pull-Down Time (50 Hz) 23 to -65°C (74 to -85°F) within 55 min.

6.8. Capacity for Live Load (Approx.)

	Temp.	-65°C (-85°F)	–40°C (-40°F)	–18°C (0°F)
60 Hz	Watts	50 W	100 W	200 W
50 Hz	Watts	40 W	80 W	160 W

7. Construction

7.1. General Material

7.1.1. Exterior Stainless Steel (S.S. 430).

7.1.2. Interior Stainless Steel (S.S. 304), 20 GA.

7.1.3. Color Instrumentation Panel: Dark Silver.

7.1.4. Insulation Fiberglass.

7.1.5. Gasket Silicone, Double Gasket.

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7.2. Door	
7.2.1. Door Handle	Handle on the Right Side and Hinges on the Left Side.
7.3. Test Space Area	Dry Bulb Temp. Detector, Cable Port (Inside dia.: 100 mm).
7.4. Air Conditioning Area	Air Grill, Cooler, Heater (with thermal fuse), Factory Set Overheat and Air Circulator (propeller type).
7.5. Machinery Compartment	
7.5.1. Front: Instrumentation Panel	Watlow F4 Controller, Power Switch, Refrigeration Mode Switch.
7.5.2. Inside	Electrical Chassis, Refrigeration Unit for Cooling, Motor for Air Circulator, Power Fuses.
7.5.3. Rear	Electrical Power Supply Port, Ventilation Grille.
8. Heater	Nichrome Wire Heater: 500 W.
9. Cooler	Aluminum Evaporator Coil.
10. Refrigeration System	Mechanical Cascade Refrigeration System.
10.1. Refrigeration Compressor	Hermetically Sealed Compressor: 1/3 HP x 2 pcs.
10.2. Condenser	Air-Cooled Condenser.
10.3. Expansion System	Capillary Tube.
10.4. Refrigerants	Non-CFC.
11. Instrumentation	Temperature Digital Programmable Controller.
11.1. Model	Watlow F4 with RS-232 Computer Interface.
11.2. Performance	
11.2.1. Temperature Setting	Setting Range…… -75 to 180°C. Setting/Indication Resolution …… 0.1°C.
11.2.2. Time Setting	Ramp Range …… 0 to 99 hrs. 59 mins. 59 sec. Ramp Resolution……1 sec. or 1 to 3,000°/min. Rate. Soak Range …….. 0 to 99 hrs. 59 mins. 59 sec. Soak Resolution ……..…… 1.0 sec. Guaranteed Soak…… Any Ramp or Soak Step.
11.2.3. Sensor	Thermocouple ……..…….. Type T.
11.2.4. Control Function	5 PID Function groups ……..Step Selectable.

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11.2.5. Indication Display	Upper-Temperature - °C
	Lower ……....Main Page: Other Variable and Operating Prompt Information.
	LED ……..…..Outputs, Alarms, Communications.
11.2.6. Program	Setting System ……..……..….. Interactive Setting.
	Program Capacity ... 256 Steps, assignable in 40 Profiles.
	Functions ……..…Autostart, Ramp/Soak, Wait For, Jump (up to 256 times), Link Profile, End, Idle.
11.2.7. Keyboard	Function Keys ..... PROFILE, INFO, LOWER DISPLAY, LEFT, RIGHT, UP, DOWN.
	Numerical Entry ……..…. Raise/Lower keys.
11.2.8. Display	Upper ……..……..…Five 7 Segment LED (RED).
	Lower ……..……..Four Line LCD with Back Light.
11.2.9. Memory Backup	Nonvolatile Memory (backup battery not necessary).
11.2.10. Operational Conditions	0 to 55°C (32 to 131°F), 0 to 90%RH, No Condensation.
11.3. Main Function	
11.3.1. Monitoring Function	Monitoring/Controlling the Actual Temperature Conditions Inside the Chamber (at the supply air).
11.3.2. Constant Setting	Simple Setting of the Temperature in Local Set Mode.
11.3.3. Program Setting	Setting up to 256 steps in 40 Profiles using Profile Left/Right, Raise/Lower keys.
11.3.4. Program Start/Stop	Selection and running of Set Programs using Profile key.
11.3.5. Limit Setting	High/Low Temperature Setting in Control Set-up Group.
11.3.6. Lockout Function	4 Levels of Security.
11.3.7. Other Functions	Alarm Indication, Input Burn-out Detection, Automated Refrigeration/Bypass Switching, Constant Manual Output, Auto Tune.

12. Safety Devices

12.1. Electrical	Fuse……..…….. For Heater.
	Fuse ……..……..…….. For Control Circuit.
	Fuse ……..……..…….. For Controller.
12.2. Refrigeration	Relief Valve ……..……..…….. For Refrig. Circuit.
	Inner Thermal Relay ……..…….. For Refrig. Compressor.
12.3. Cabinet	Thermal Fuse: 216°C (421°F)….. For Overheat Protection.
	Overheat Protector ……..……..…… For Chamber.

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13. Dimensions

13.1. Exterior

Width		Depth		Height		Weight	
37.00	in.	21.00	in.	25.00	in.	309	lbs.
940	mm	533	mm	635	mm	140	kg

13.2. Interior

Width		Depth		Height		Capacity	
16.00	in.	11.00	in.	12.00	in.	1.2	cu.ft.
406	mm	279	mm	305	mm	0.03	cu.M.

14. Load Current (at 115 VAC - 1Ø - 60 Hz.)

14.1. Total Load Current 16 A MAX.

14.2. Service Circuit Protector Required 20 A.

15. Accessories ECT-3 Manual.
Spare Fuses.

16. Optional Equipment 100 mm Video Recorder, Auxiliary Gas Injection Port, Cart with Casters, Viewing Window, LN2 boost cooling, Overheat/Overcool Protector.

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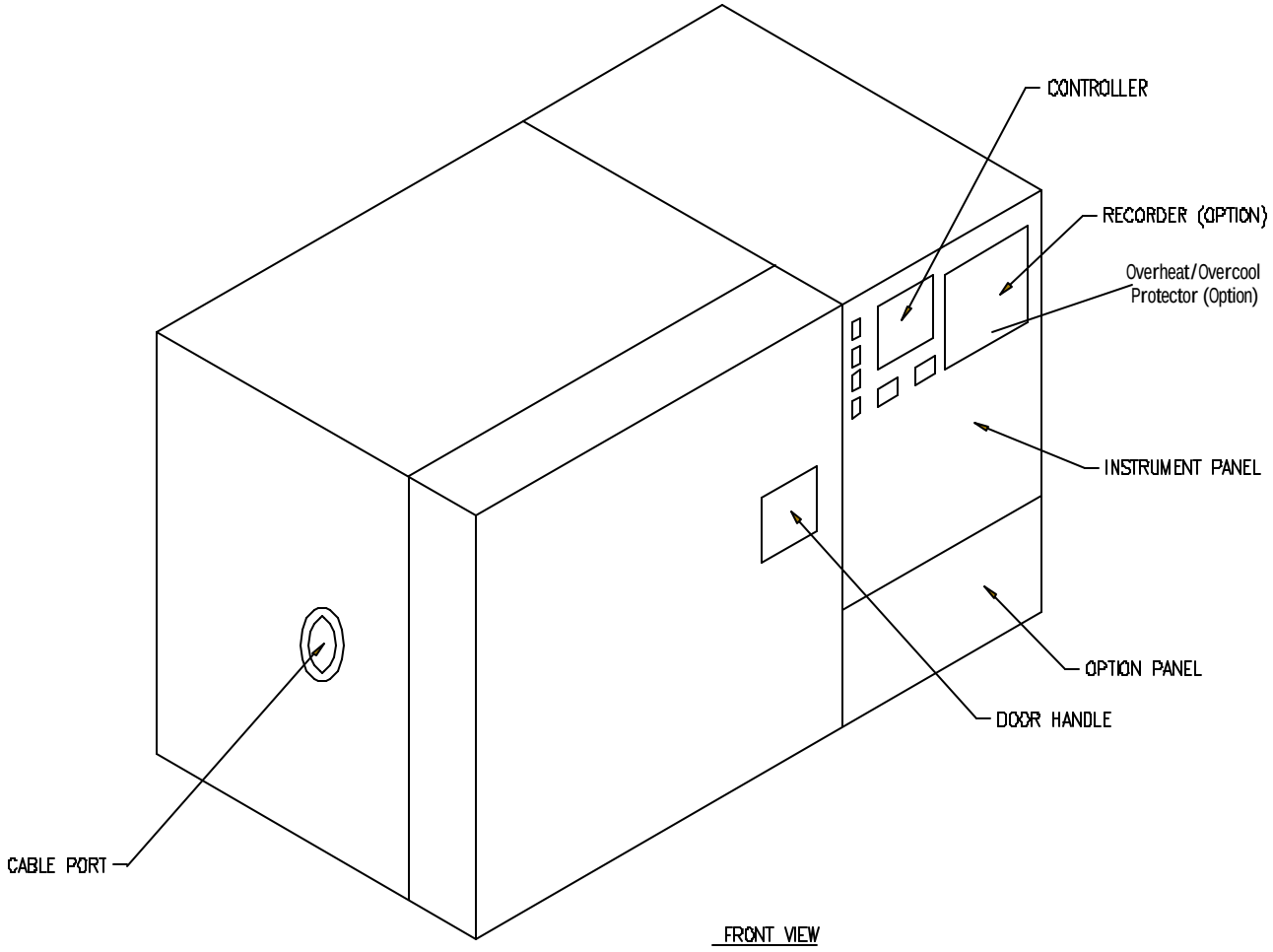
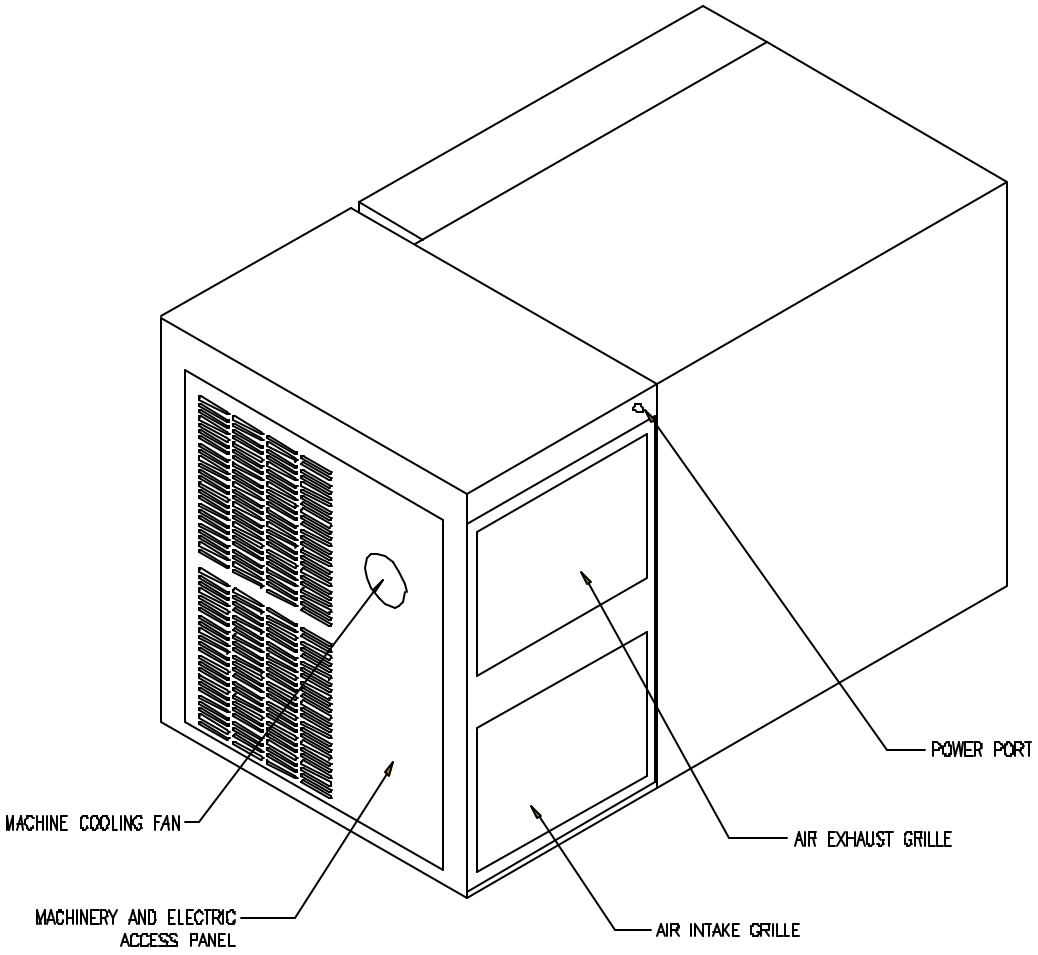
4. Description of Respective Components

4.1. Overall Description

(See sketch below)



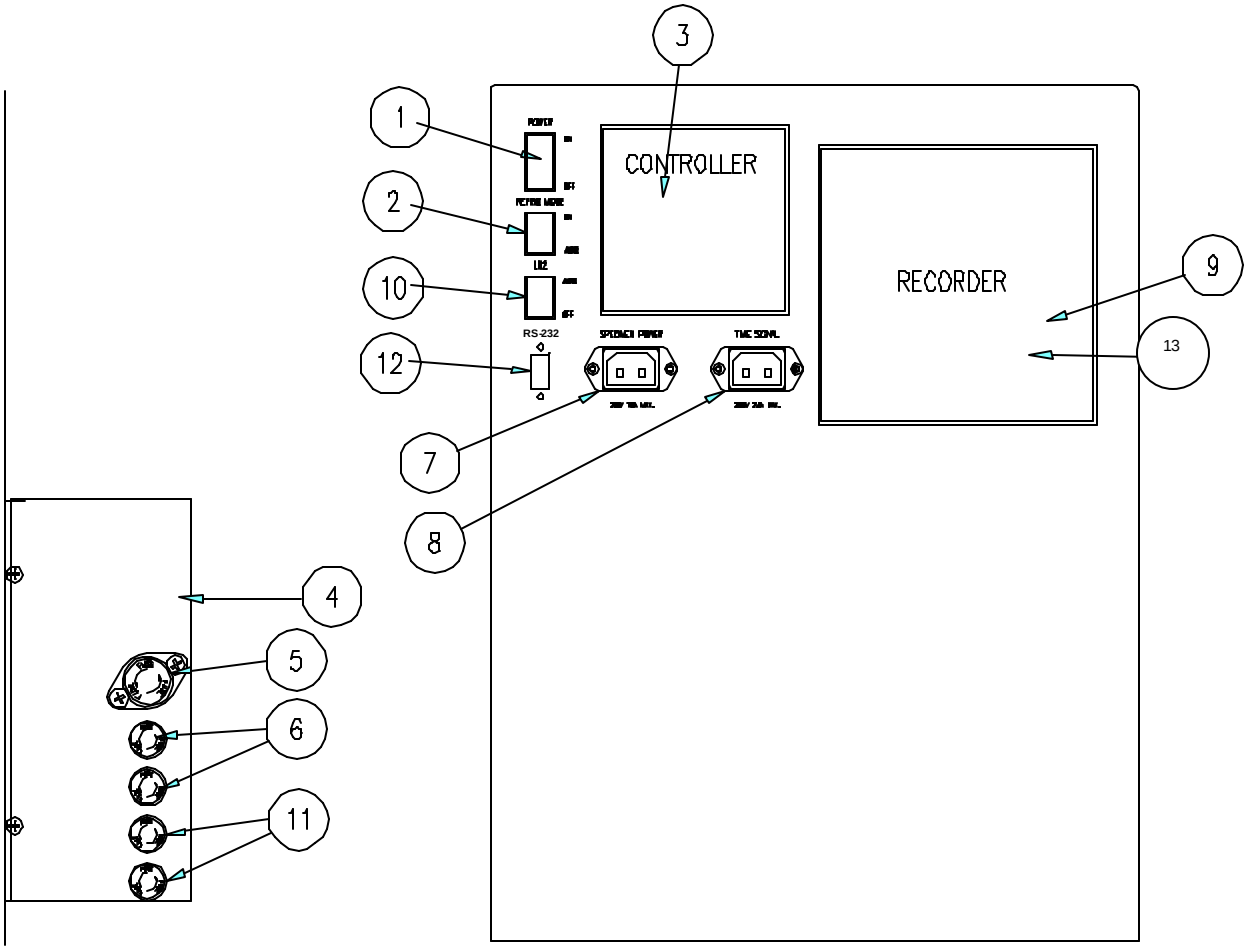
4.1. (cont.)



BACK VIEW

NOTE: *Do not block Air Circulation.*
Keep Chamber 12" from walls.

4.2. Controller Panel Description



1. "POWER ON/OFF" Switch

   This switch controls power to the controller. All chamber systems are controlled by the controller and therefore powered ON/OFF by this switch. The switch will illuminate when ON.

2. "REFRIG MODE ON/AUTO" Switch

   This switch controls the refrigeration system when power is ON. In Auto Mode, the controller will determine the need for cooling and turning on and off the refrigeration system as needed. With the Refrig. Mode switch ON, the refrigeration system will run constantly, with the Power switch ON, regardless of the chamber temperature. In most cases the switch should be left in the AUTO position; but in the case where a live (powered) specimen is being tested at temperature above 62.5°C, the switch should be ON.

3. CONTROLLER

   The ECT Chamber uses a Watlow Controller. A product manual set for the controller is included with the Chamber.

4. FUSE PANEL

   The fuse panel is located on the left side of the chamber behind the access door.

5. HEATER Fuse

   The heater circuit is protected by a 7A fuse. The circulator motor is also on this circuit. A replacement fuse is included in the accessory kit or available from ESPEC's Parts Service.

6. CONTROL Fuses

   The control circuit is protected by 2 fuses - 5A for general control and ½A for the controller. Replacement fuses are included in the accessory kit or available from ESPEC's Parts Service.

7. SPECIMEN POWER Inlet

   The specimen power terminals provide a means to interconnect specimen power to chamber power and operation for the protection of the specimen. The specimen power output terminals are normally open; during chamber operation the terminals are closed. The terminals are rated at 10A 250V max. Proper circuit protection must be supplied by the customer. A mating connector is provided in the accessory kit.

8. TIME SIGNAL Inlet

   The Time Signal terminal provides a means to power specimens or external equipment during a specific program step. The terminal may be opened and closed in a ramp/soak program using Event Output 1. Refer to the Controller Product Manual to set the output. The terminals are rated 2.5A 250V, 5A 125V and are to be protected from over current by the customer. A mating connector is provided in the accessory kit.

9. RECORDER (Optional)

   The recorder is a 100mm wide videographic (ie. paperless) recorder used to log chamber temperature.

10. LN_2 AUTO/OFF (Optional)

    This switch controls the cooling function of the liquid nitrogen (LN_2) system. In AUTO mode, the LN_2 will be controlled by the control system and used as needed. With the switch OFF, LN_2 will not be used for cooling.

11. WINDOW Fuses (Optional)

    These fuses are used to protect the window lighting and non-condensing heater. The fuse on the left is rated at 2A and the right is 3A. Replacement fuses are included in the accessory kit or available from ESPEC's Parts Service.

12. RS-232 Connector

    The connector is included with the Chamber.

    This connector is used to provide RS-232 communications between the Chamber Controller and a Host Computer. The connector is a 9 pin 'D' male with the following signals used:

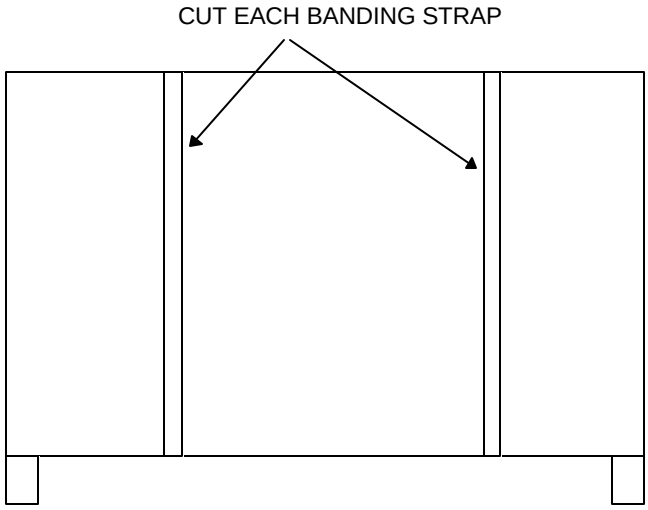
PIN	DESCRIPTION (CHAMBER CONTROLLER END)
2	TRANSMIT
3	RECEIVE
5	SIGNAL COMMON

13. Overheat / Overcool Protectors (Optional).

    The set point selectors for the overheat and overcool protectors are mounted here.
    (Note: This option can only be installed in this location if the recorder option is not being used).

5. Installation

5.1. Removing Packing Material



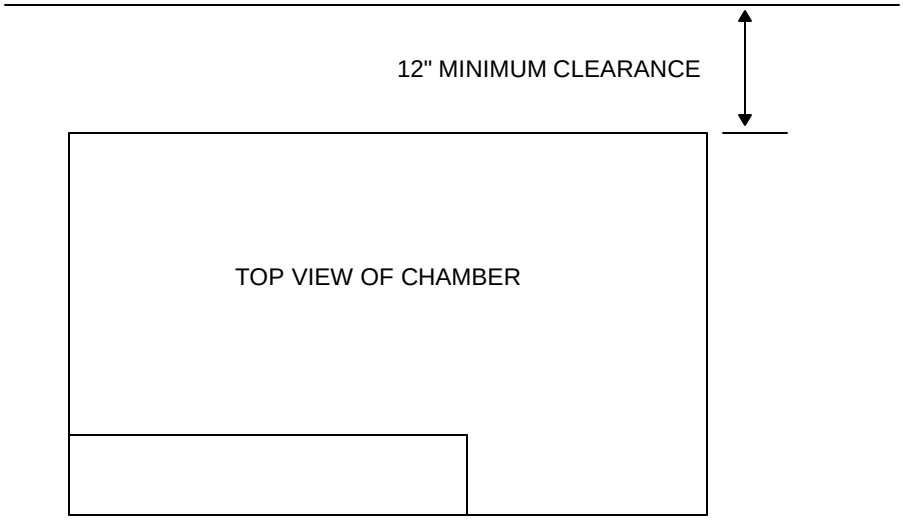
a. Cut strap and pull off box cover.

b. The chamber is not bolted to the pallet, so it can be removed easily.

CAUTION: The chamber weighs move than 300 lbs. DO NOT attempt to lift this unit without some form of mechanical advantage.

c. Keep the box and pallet until the chamber is running properly, then discard (this is in case of any hidden shipping damage).

5.2. Installation Site Conditions



a. An open space between the chamber and the wall must be as shown in the sketch, otherwise, the chamber will not operate properly.

b. A location where the ambient temperature is between 10°C and 25°C throughout the entire year will ensure stable function and performance of the chamber.

c. A location where sudden temperature changes are at a minimum should be selected. Temperature controlling will be disturbed where sudden temperature changes occur (changes in the excess of 5°C within a few minutes).

d. The site should be free from direct sun light, dust, and have good ventilation.

5.2.1. Heat Load to Ambient (in BTU/Hr.)

MODEL	HEAT LOAD
ECT	5,000

5.3. Electrical Installation

The chamber comes equipped with a power cord and plug. This plug is designed for a 20A - 120V receptacle. This chamber will require a dedicated circuit protected with a 20A fuse or circuit breaker for proper operation. If an extension cord is needed, use only a cord rated for 120V - 20A service.

6. Preparation of Operation

6.1. How to Use the Controlled Specimen Power Terminal and the Time Signal Output Terminals

All the external terminals are equipped on the front panel of the chamber.

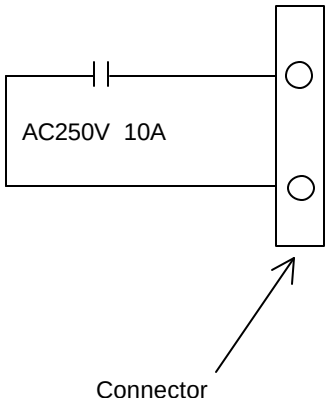
The controlled specimen power terminal should be used when testing heat generating specimens. This is suggested because if one of the safety devices is activated, the chamber and specimen power will be disrupted, and no damage will occur to either the chamber or the specimen.

The time signal output terminals relay the time signal of the temperature digital programmable controller to an outside source.

The following applies to the controlled specimen power terminal.

CAUTION: It is extremely dangerous to stop operation of the chamber while supplying electricity to specimens, therefore a protection circuit must be used to ensure the safety of all personnel.

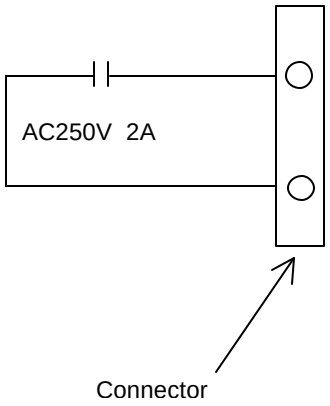
Specimen Power



Controlled Specimen Power Terminal

The circuit is in a connected state during normal operation of the chamber. When a chamber safety device is activated, power is turned "OFF" or in case of power failure, the terminal assumes an open state.

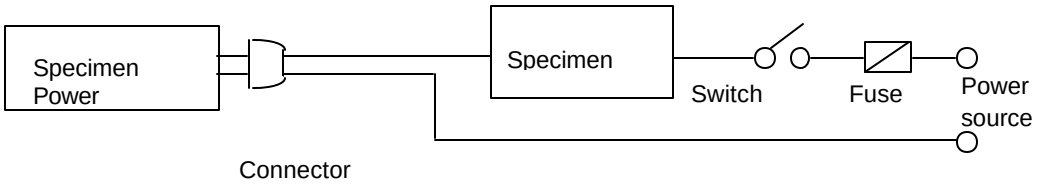
Time Signal



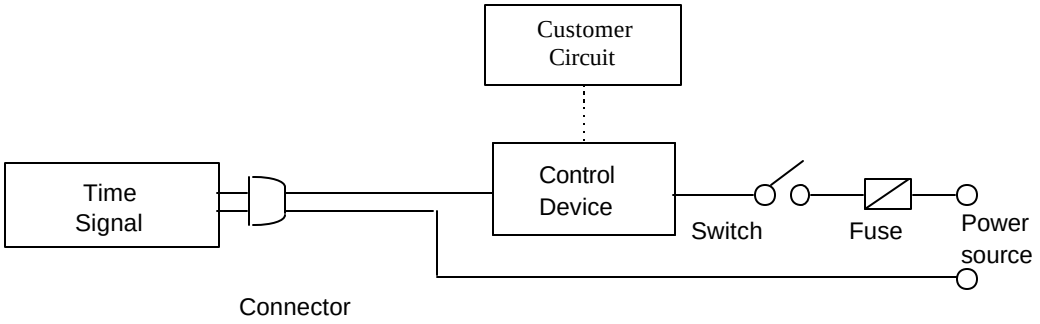
Time Signal

When the chamber is operating normally in the program mode, the terminals are open whenever the programmer sends a time signal. If the temperature digital programmable controller alarm activates, or if the power is switched "OFF" or is otherwise interrupted, the terminals change to a closed state. The time signal corresponds to the alarm relay menu of the temperature digital programmable controller.

CAUTION: The rated electrical capacity of the specimen power is 10A 250VAC. The capacity of the time signal is 2A 250VAC. Verify that the total for the devices connected do not exceed the circuit limits. For loads higher than the limits, a relay or CONTACTOR must be used. Fusing of the circuit is the customers responsibility.



The diagram above is an example of the specimen power circuit. In this case, power to the specimen is shut off when the chamber stops.



The diagram above is an example of the time signal circuit. In this case, power to customer circuit is shut off when the event is completed or when the chamber stops.

6.2. Product Thermocouple option

Purpose The user may monitor the temperature of the Device Under Test at the product T/C terminals.

Operation The product T/C is connected to a T/C jack inside the chamber. A mating plug is supplied in the chamber accessory kit. A Type 'T' T/C can be located on the product and connected to the plug and jack to monitor product temperature.

Specifications Product T/C : Thermocouple Type 'T' (Copper/Copper-Nickel).

The terminals are located on the front of the chamber (instrumentation panel).

Replacement Parts

ESPEC NO.	SYMBOL	DESCRIPTION	MFG. NUMBER
6ACJ0015		Jack Thermocouple	RMJ-TR
6ACJ0050		Jack Thermocouple	1231
6ACJ0016		Plug Thermocouple	SMP-TM
6ACJ0047		Plug Thermocouple	1360-T
6ACJ0059		Thermocouple	20-1001271

7. Operating the Test Chamber

The controller has password security protection, thereby decreasing the likelihood of inadvertently changing the factory set-up configurations of the controller. Consideration in changing this password or changing the factory set-up configurations of the controller will require calling the ESPEC Field Service Department.

7.1. Power ON

Place the Power ON/OFF switch in ON position (the switch will be lit when ON). The controller screen will display several screens of self-test results then go into a manual output with no heating. The circulator motor will start and the compressors will run. The controller display will monitor the process value and output percentage (0.0).

7.2. Refrig. Mode

Place the Refrigeration Mode switch in desired position. Most situations will be best served with the switch in AUTO. If the test specimen will be powered and run at a chamber temperature above 62.5°C then the switch should be ON.

7.3. LN_2 Mode (Optional)

Place the LN_2 switch in the desired position - AUTO is recommended for most applications.

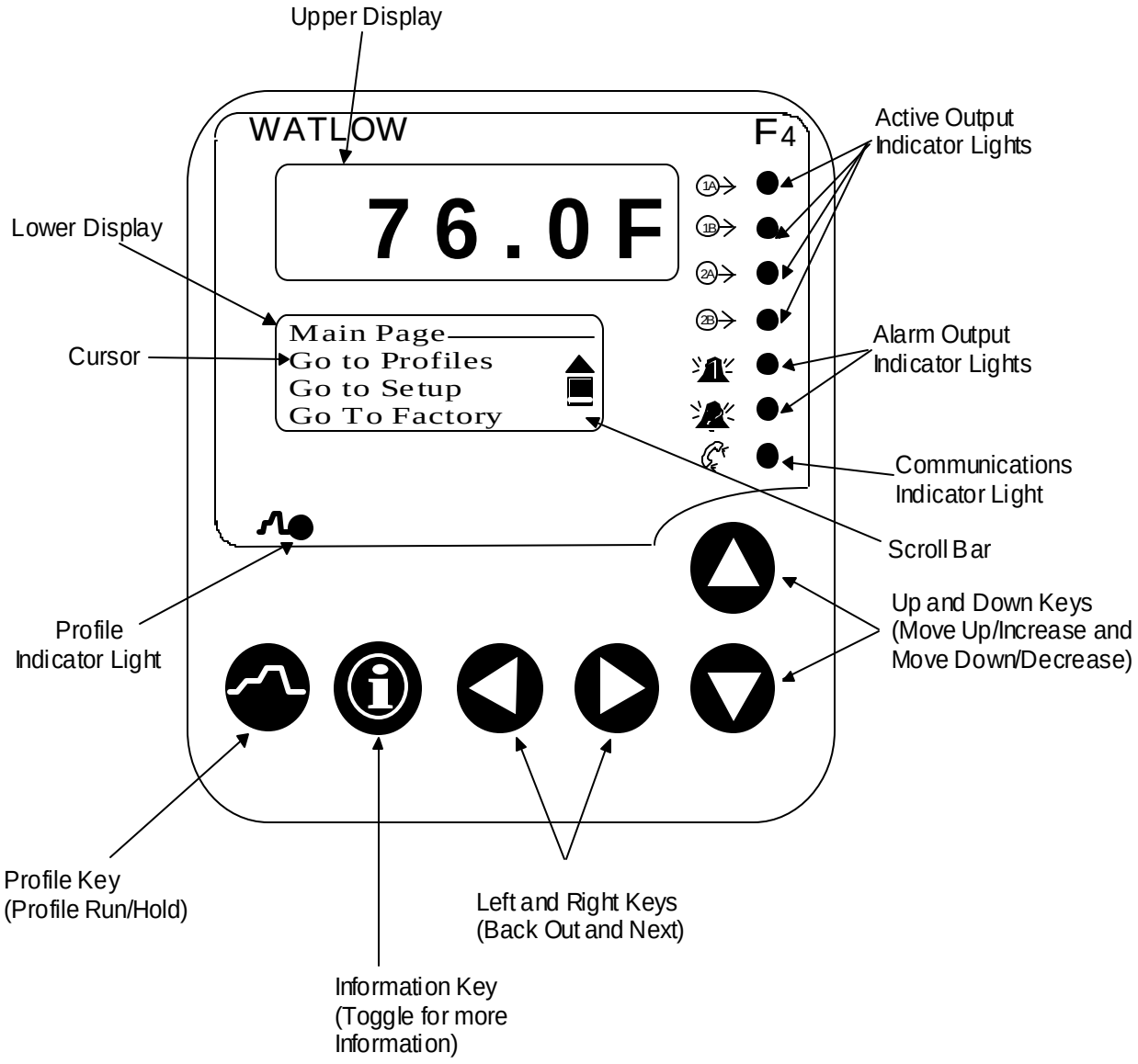
7.4. GN_2 Purge (Optional)

The GN_2 purge is energized when the chamber is running. If adjustments to the flow of nitrogen are required there is a flow meter located on the left side of the chamber, turn the black knob to adjust the flow either up or down.

7.5. Overheat/Overcool Protectors (Optional)

Set the temperature values of the overheat and overcool protector set point thumbwheels to the appropriate temperature (that is required for product protection).

7.6. Operating The Controller



* The controller alarms are factory configured for control of the cooling system. DO NOT change alarm settings or incorrect chamber operation may result.

7.6.1. Operating at a Setpoint (Static Mode)

When not in the profile mode (the Profile Indicator Light is off), the controller may be operated in static mode by using the navigation keys (▲ ▼ ◀ ▶) to select and adjust the setpoint (SP1) displayed in the Lower Display. The Upper Display always shows the actual temperature in the chamber.

7.6.2. Running a Ramp/Soak Profile (Profile Mode)

To initiate the profile mode, press the Profile Key and answer the questions that follow.

While running a profile, the Profile Status message on the lower display will keep you informed about the progress of the profile.

7.6.3 Monitoring the Operation

While the chamber and controller are running either a single setpoint or a program, key parameters may be viewed in the lower display. Use the ▲ ▼ keys to scroll through the information available in the lower display.

8. Maintenance

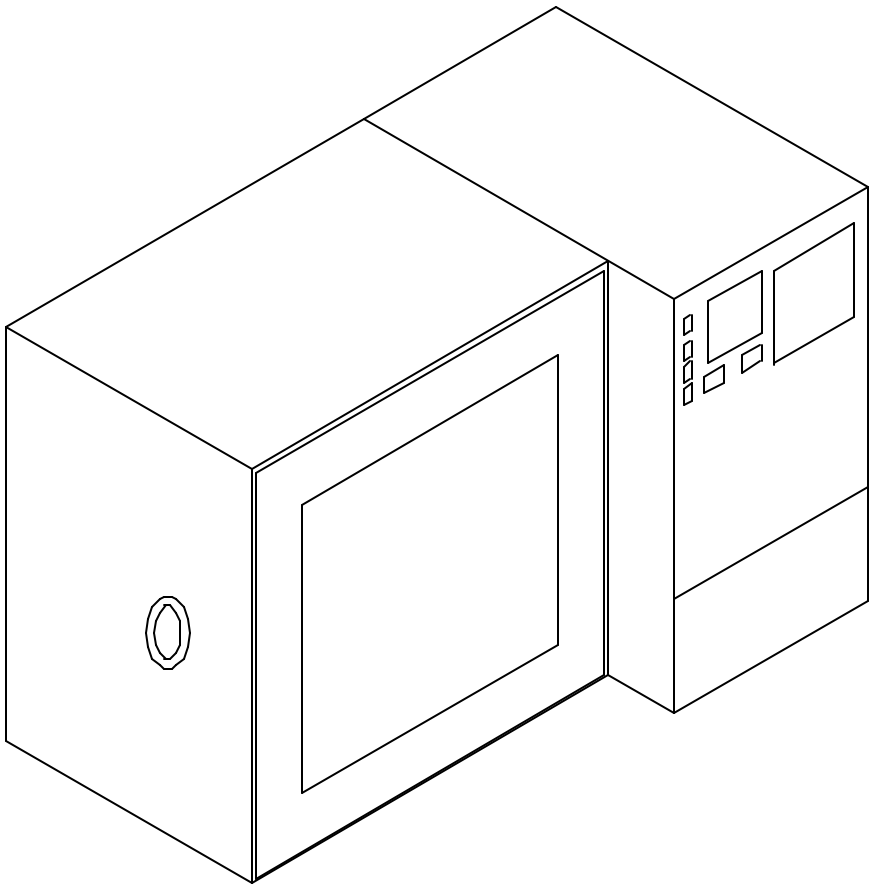
8.1. Cleaning the Chamber Interior (Monthly)

This should be done on a monthly basis because certain debris in the chamber can cause corrosion to the stainless steel. Do not use metal abrasive pads to clean the chamber as this will contaminate the stainless steel. Also, if your products are sensitive to chemical gases, be careful of the ingredients in your cleaning solution. ESPEC recommends using water or an ammonia and water mixture (very little ammonia is needed).

8.2. Cleaning the Condenser (Monthly)

To clean the condenser, remove the back service panel. Use a cloth, or vacuum, or user pressurized air, to clean the condenser of dirt and dust. The condenser maintenance interval is every month, but this time may be extended if the condenser is not collecting dust or dirt at its monthly cleanings.

CAUTION: The condenser fins are VERY sharp.



9. Trouble Shooting

This section will overview chamber trouble symptoms and corrective action. If the chart refers you to contact the Service Department, please have the model number and serial number of the chamber ready when you call.

9.1. Alarm List on Display Panel

PROBLEM	POSSIBLE CAUSE	ACTION
Chamber not Reaching Low Temperature.	1. Condenser Dirty	Check or Clean
	2. Circulator Off	Check Rotation Check Fuse
	3. Evaporator Coil Iced Up.	Defrost Chamber
Chamber not Reaching High Temperature.	1. Circulator Off	Check Rotation Check Fuse
	2. Heater Fuse	Check or Replace
No Controller Display	1. Input Power	Check power Outlet
	2. Control Fuses	Check or Replace
	3. Switch - Power	Place On
Controller Always at 0.0% Output	1. Open Thermocouple	Call Service

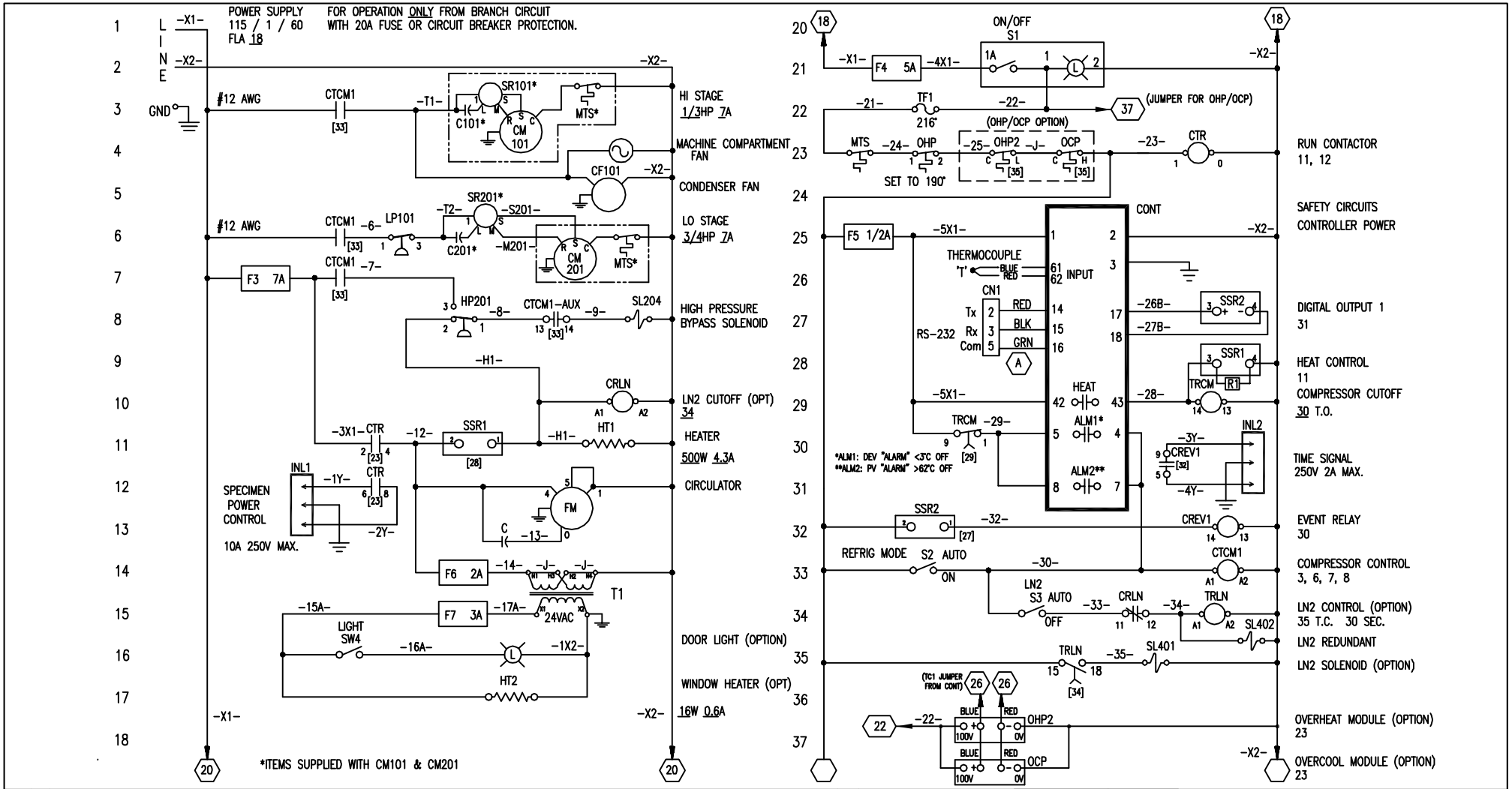
10. Replacement Parts List and Schematics

REPLACEMENT PARTS LIST FOR MODEL NO: ECT-3

ESPEC NO.	REV.	DESCRIPTION	MFG. NO.	SYMBOL
6ACX0059		BULB LIGHT 24V 5W ECT	21020304	BULB
5AAB0013		COIL 1/3 HP COND 2CZ1004M-9x9		AC101
5AAB0003	D	COIL EVAPORATOR 3EZ0705K W960813T	3EZ0704K	EV101
6AAH0060		COMPRESSOR 1/3HP R-404 W/MTG KIT	NEW# NE2134GK1 OR OLD# E2134GK1	CM101
6AAH0069		COMPRESSOR 3/4HP R-404 W/MTG KIT	T-2168-GK1ES	CM201
4AAE0006		CONDENSER ASSY CASCADE		CD101
6ABR0190		CONNECTOR 9 SOCKET HOUSING	1-480274-0	CN3
6ABR0226		CONNECTOR MALE 6P (SOCKET HOUSING)	1-480704-0	CN2
6ABU0129		CONTACTOR 110V 3P 1NO AC1=20, AC3=9	LC1K0910F7	CTCM1
6ABN0290		CONTROLLER/PROGRAMMER 1CH WATLOW F4	F4SH-KKA0-01RG	CONT
6ABR0212		CORD POWER 10' 120V 20A 5-20P	6ABR0212	CORD
6AAZ0003		FAN AXIAL 100 CFM 115V	A-4AXFN / QUOTE 2116	
5AAE0120		FAN BAFFLE PLATE		
6AAZ0141		FAN BLADE 4"DIA 3/16 BORE WORKSPACE	2C953	FAN
6AAZ0048		FAN BLADE 8" CONDENSER	AD8CW35UB	CF101
6AAB0014	A	FILTER DRIER 1/4ODF	023Z5013 DCL 032S	DR101,201
6AAU0002		FUSE CURRENT LIMITING 600V 7A	KTK-7	F3
6AAU0053		FUSE FAST ACTING 1/2A IR 10KA@ 125V	ABC-1/2	F5
6AAU0023		FUSE FAST ACTING 2A IR 10KA@ 125V	ABC-2	F6
6AAU0013		FUSE FAST ACTING 3A IR 10KA@ 125V	ABC-3	F7
6AAU0003		FUSE FAST ACTING 5A IR 10KA 125V	ABC-5	F4
6AAU0018		FUSE THERMAL 216C 6" W/ 4" LEADS	2140201046600	TF1
6ABA0007		GASKET DOOR RED	5AVA-15-WHO/25040308/2041 3010011	DOOR GASKET
6ABA0007		GASKET DOOR RED	5AVA-15-WHO/25040308/2041 3010011	DOOR GASKET
6ABA0099		GASKET WINDOW 5.75 DIA	2041601000210	WINDOW GASKET
6AAK0055		HEATER CORD 24V 16W DFH-1	2060801000110	HT2
6AAK0003		HEATER UNIT FOR ECT-2/3	2060801033600	HT1
6ABR0225		HOUSING SOCKET 3P	1-480304-0	CN4
6AAY0093		MOTOR .017HP 3000RPM 120/100 50/60	24E388W241	FM
6AAY0028		MOTOR 14 WATT UNIT BEARING	SPFBE141	CF101
6ABE0001		PANEL BLANK FOR RECORDER	13178H1002P3A/251 05406	RB1
6ABR0035		PLUG CONNECTOR HOUSING 3 CIRCUIT	1-480700-0	CN1
6AAX0018		PLUG HOLE BLACK FOR SWITCH	8630FBBB	
6ABR0197		PLUG STRAIGHT ENTRY 10A/250VAC 2PWG	704-00/00	
6AAW0009		PORT PLUG SILICONE 4"	2041501057300	
6ABU0046		RELAY 2PDT 25A 120V COIL	G7L-2A-TUB-CB	CTR
6ABU0027		RELAY 4PDT 3A 120V COIL	MY4-120V	CREV1
6ABU0029		RELAY SOCKET 4P (FOR MY4)	PYF14A	SOCKET
6ABU0119		RELAY SS 240V 25A 1P 90-280VAC IN	G240A25/84134011	SSR1

REPLACEMENT PARTS LIST FOR MODEL NO: ECT-3

6ABU0203		RELAY SSR 12-280VAC (4-32VDC INPUT)	GMS-0AC/84130105	SSR2
6ADE0003		RESISTOR 3.9K 5 WATT	02-904.2	R1
6ACX0058		SOCKET BAYONET 24V 5W ECT	21220801	SOCKET
6ABW0047	A	SWITCH DPST 125VAC 16A ILLUM	1555.3109	S1
6AAJ0011		SWITCH PRESSURE HIGH	P20EA-14C	HP201
6AAJ0012		SWITCH PRESSURE LOW	P20-EB-1C	LP101
6ABW0007		SWITCH ROCKER SPST ON/OFF 6A-250V	1801.1102/R30	SW4
6ABW0007		SWITCH ROCKER SPST ON/OFF 6A-250V	1801.1102/R30	SW4
6ABW0009		SWITCH TEMP 80/300C (M4 TAP)	T55-1326901/22010906	OHD
6ACJ0059	A	THERMOCOUPLE 1" SHEATH TYPE 'T'	011204-T-1-180	TC5,6
6ACF0005		TIMER 120V 30SEC 4P	H3Y-4-AC120-30SEC	TRCM
6ACA0020		TRANSFORMER 75VA 100/240/24 50/60HZ	B075LP7JK	T2
6ABG0016		VALVE RELIEF 150 LBS 1/8MPT	3000-150 1/8MPT	RV201
6ABH0052		VALVE SOLENOID 120V 3/8ODF	XWG-3/8ODF-120V	SL204
6AAA0272		VLV ACCESS TUBE EXT	A-31004	



TITLE: EFD 06038
10-22-98 REV. 1.01

DRAWING REVISION
REV A: R.HOSLEY 5/22/03 1. "S1" WIRE CHANGE 2. ADDED LN2 REDUNDANT
B: 8/29/03 B.PATTERSON CORRECT LN2 SOLENOID NUMBERING.
C: 1/17/05 B.PATTERSON ADD OHP/OCP OPTION WIRING.
D: CIRC MTR CHANGE 4/12/2005 R.HOSLEY

MATERIAL

DRAWN B.PATTERSON	DATE 6/12/02	TITLE: ELECTRICAL SCHEMATIC
DESIGNED B.PATTERSON	SCALE N/A	
TOLERANCE N/A	UNITS N/A	MODEL NO. ECT-3

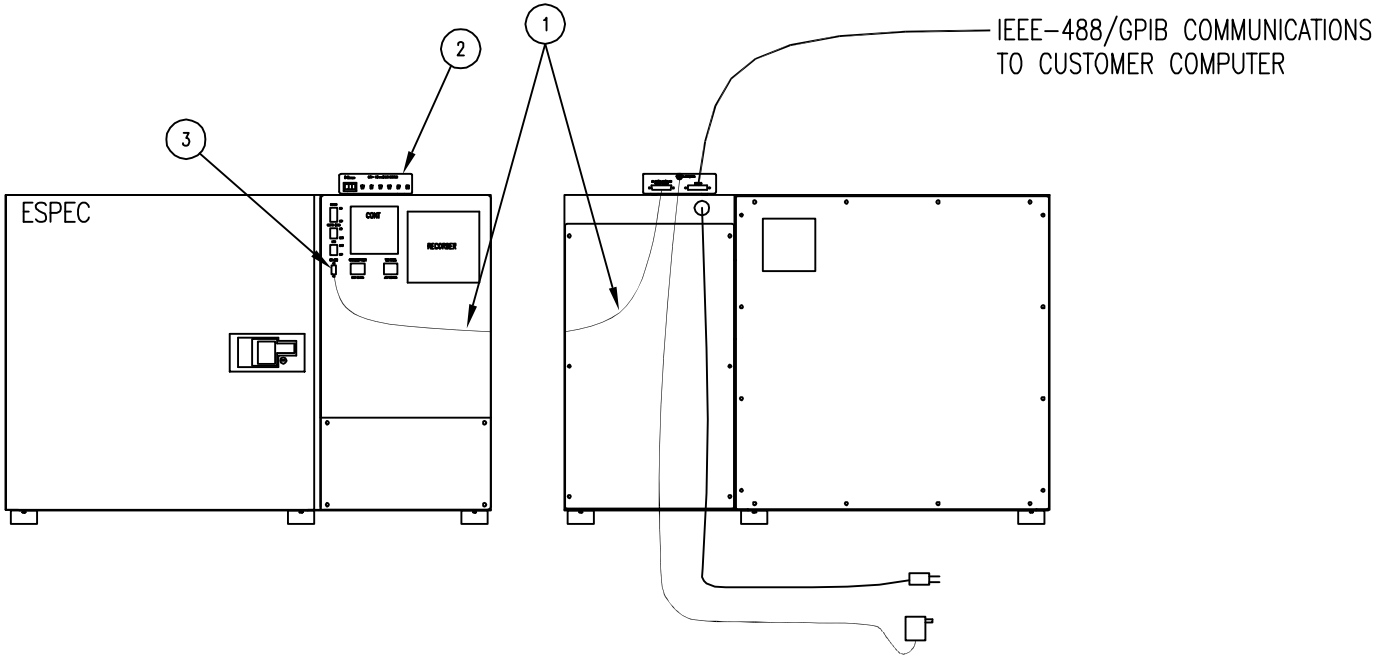
ESPEC

ESPEC NORTH AMERICA, INC.
425 Gordon Industrial Ct.
Byron Center, MI 49315

DRAWING NO. 7AAE0026 1/1

REVISION D

NO.	NAME	NUMBER	QTY.	REMARKS
1	CABLE DB25M-DB9F 2M	6ABN0359	1	
2	GPIB-MODBUS CONVERTER	6ABN0360	1	
3	GENDER CHANGER DB9 M/M	6ABX0033	1	



FRONT VIEW

REAR VIEW

TITLE: EFD 0603B
10-22-98 REV. 1.01

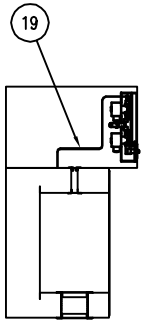
DRAWING REVISION

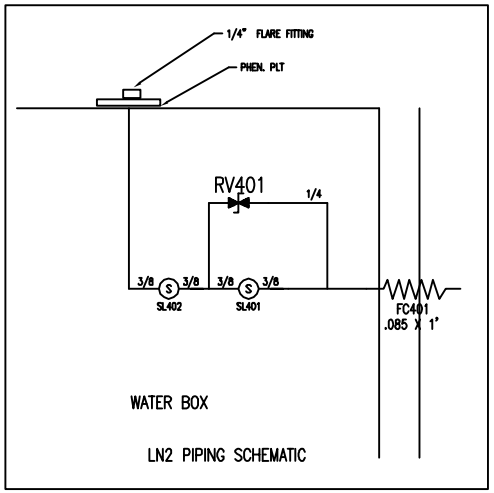
A: 2/6/02 B.PATTERSON
INITIAL RELEASE OF THIS
OPTION W/4899, PREVIOUS
(NON REV) VERSION HAD
EXISTED FOR OLD CHAMBER
CONTROLLER TYPE.

B. 10/3/02 B.PATTERSON
ADD ITEM 3 TO DWG AND BOM.

MATERIAL

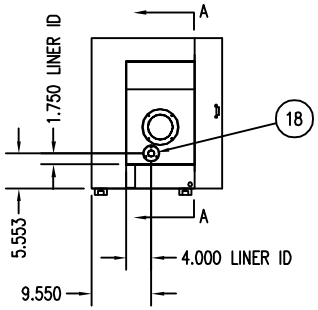
DRAWN B.PATTERSON	DATE 1/28/02	TITLE: GPIB TO MODBUS COMMUNICATIONS OPTION	
DESIGNED B.PATTERSON	SCALE N/A		
TOLERANCE N/A	UNITS N/A	MODEL NO. ECT	
ESPEC 425 Gordon Industrial Ct., S.W. Byron Center, MI 49315		DRAWING NO. ECT-CM1 1/1	REVISION B

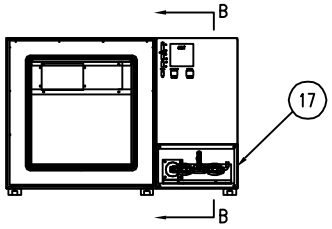


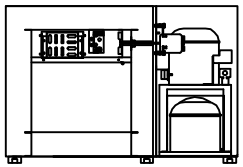


NOTE:
1. RUN CAP TUBE INTO BAFFLE AREA, CAREFULLY BEND END 90° TOWARDS BACK OF FAN.
2. SOLENOID ASSEMBLY (PAGE 2) SHOULD MOUNT TO ELECTRICAL FRONT PANEL (5AAE0116).

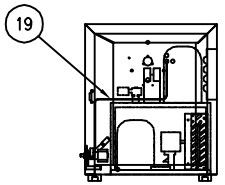
NO.	NAME	NUMBER	QTY.	REMARKS
1	HEX NIPPLE	6AAA0157	1	3/8MPT
2	TEE	6AAA0156	1	3/8FPT
3	UNION BRASS	6AAA0158	1	3/8MPT X 1/4FLARE
4	ELBOW	6AAA0155	1	3/8FPT X 3/8MPT
5	RELIEF VALVE	6ABG0005	1	150 PSIG
6	VALVE SOLENOID	6ABH0011	2	SL401, SL402
7	MALE ELBOW	6AAA0222	1	
8	INLET RING	5AAE0080	1	
9	LN2 DRIP TRAY	5AAE0088	1	
10	LN2 MOUNTING BRACKET	5AAE0087	1	
12	TAG ENGRAVED LN2 INLET	5ABS0006	1	
14	PORT FLANGE	6AAW0004	1	LN2 VENT
15	RELAY 110V AC/DC SPDT 6A	6ABU0310	1	CRLN
16	TIMER ON-DELAY	6ACF0036	1	TRLN
17	ELECTRICAL FRONT PANEL	5AAE0116	1	
18	VENT PORT ASSEMBLY	4AAD0028	1	
19	TUBE CAP	6AAS0016	1 FT	.085 cu
20	SWITCH SPST CHBR LIGHT	6ABW0007	1	NOT SHOWN







SECTION A-A



SECTION B-B

TITLE: EFD 06038
10-22-98 REV. 1.01

DRAWING REVISION

A: 07/23/02 J.BURRESS
1. DELETE INCORRECT ELEC. CALLOUTS ITEMS #15 - 24
2. ADDED ITEMS #15 - 17.
B: 03/10/03 J.BURRESS
1. ADDED ITEM #18 & 19
2. CREATED PAGE 1 DRAWING TO SHOW LN2 MOUNTING & VENT PORT.
3. DELETE ITEM #13-4AAD0017
C: 07/02/03 J.BURRESS
1. ADDED ITEM #20, 6ABW0007
2. ADDED ASSEMBLY NOTE PG 2
3. ADDED PIPING SCHEMATIC.
D: 11/03/03 R.HOSLEY
CHANGED ITEM #15 WAS 6ABU0253
E: 04/13/05 J.BURRESS
1. DELETED ITEM #11,6ADC0002

MATERIAL

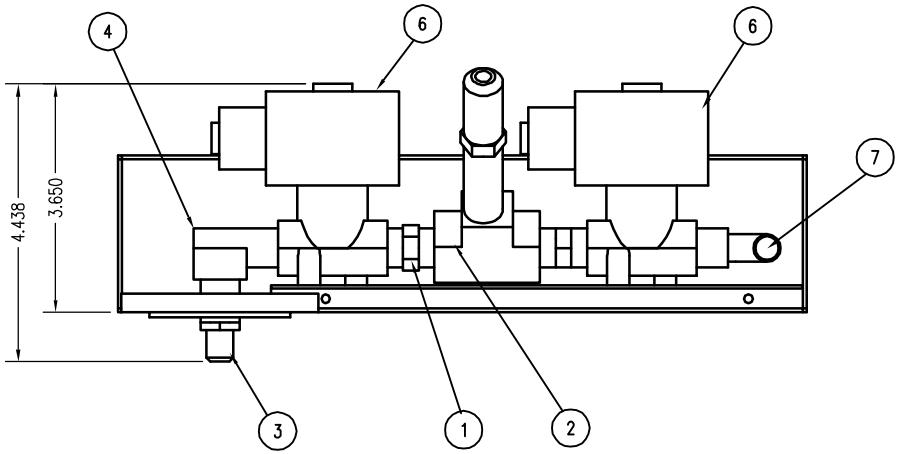
DRAWN J.BURRESS	DATE 01/04/02	TITLE: LN2 OPTION ASSEMBLY	
DESIGNED J.BURRESS	SCALE 1:2		
TOLERANCE	UNITS INCHES	MODEL NO. ECT-3	

ESPEC

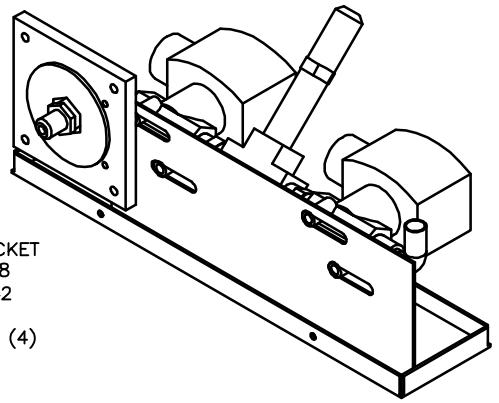
ESPEC NORTH AMERICA, INC.
425 Gordon Industrial Ct.
Byron Center, MI 49315

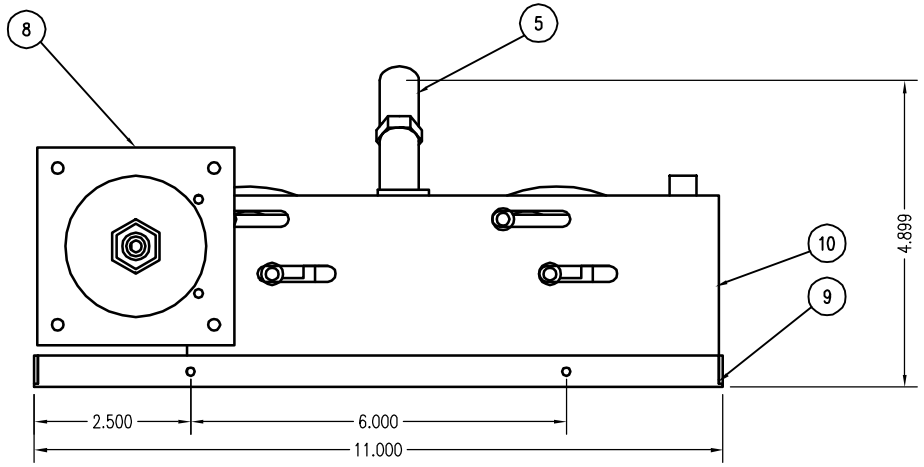
DRAWING NO. ECT-LN 1/2

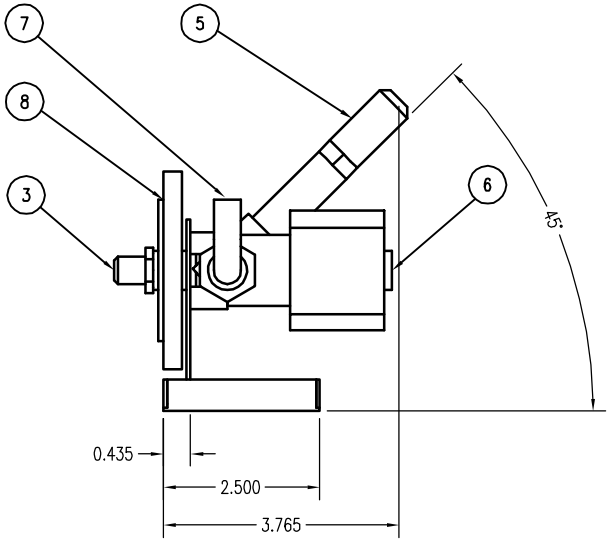
REVISION E



NOTE:
1. 5AAE0087 MOUTNING BRACKET IS POP RIVETED TO 5AAE0088 DRIP PAN, USING (2) SIZE 42 RIVETS.
2. SILICONE RIVETS AND ALL (4) CORNERS.



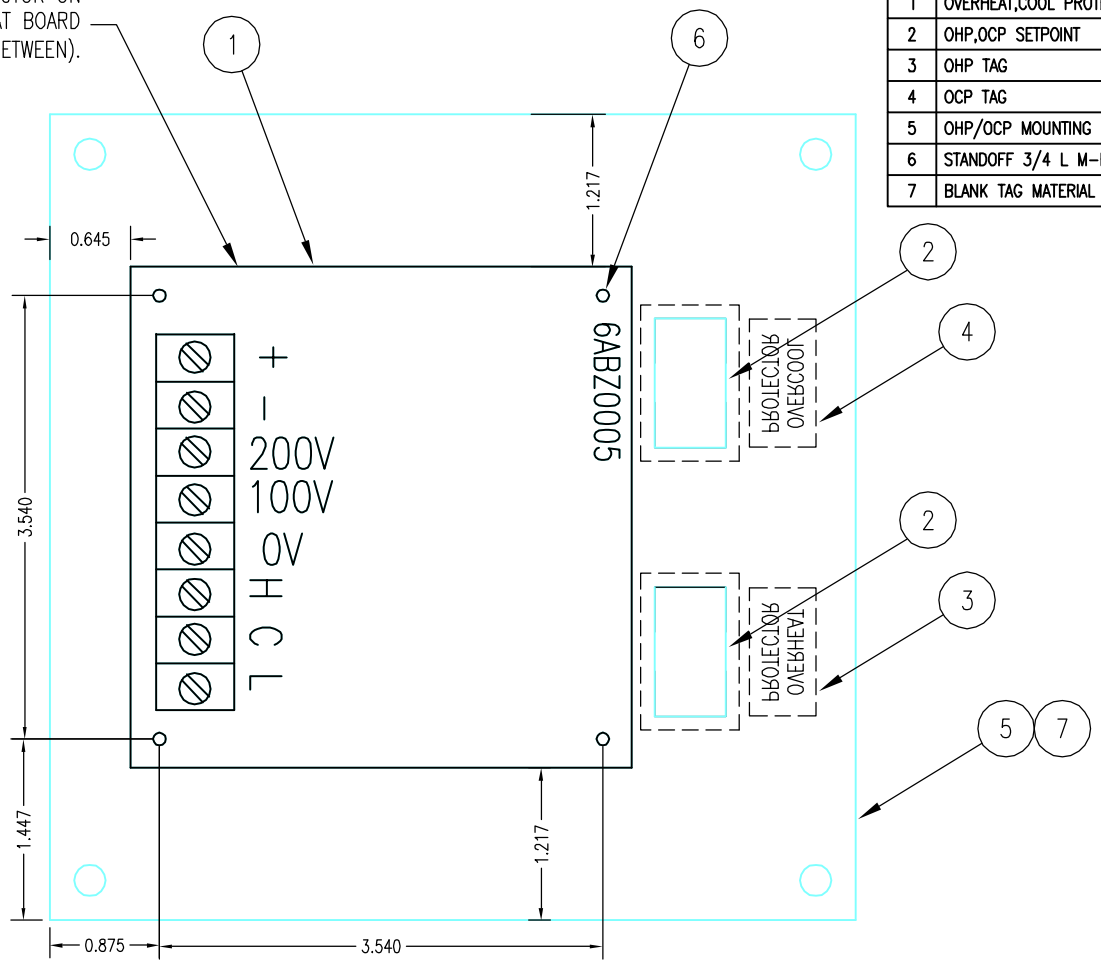




TITLE: EFD 06038
10-22-98 REV. 1.01

DRAWING REVISION					
MATERIAL		DRAWN J.BURRESS	DATE 01/04/02	TITLE: LN2 OPTION ASSEMBLY	
		DESIGNED J,BURRESS	SCALE 1:2		
		TOLERANCE ±0.03	UNITS INCHES	MODEL NO. ECT-3	
ESPEC	ESPEC NORTH AMERICA, INC. 425 Gordon Industrial Ct. Byron Center, MI 49315			DRAWING NO. ECT-LN 2/2	REVISION E

MOUNT OVERCOOL PROTECTOR ON
TOP OF OVERHEAT BOARD
(USE 6ABB0055 SPACERS BETWEEN).



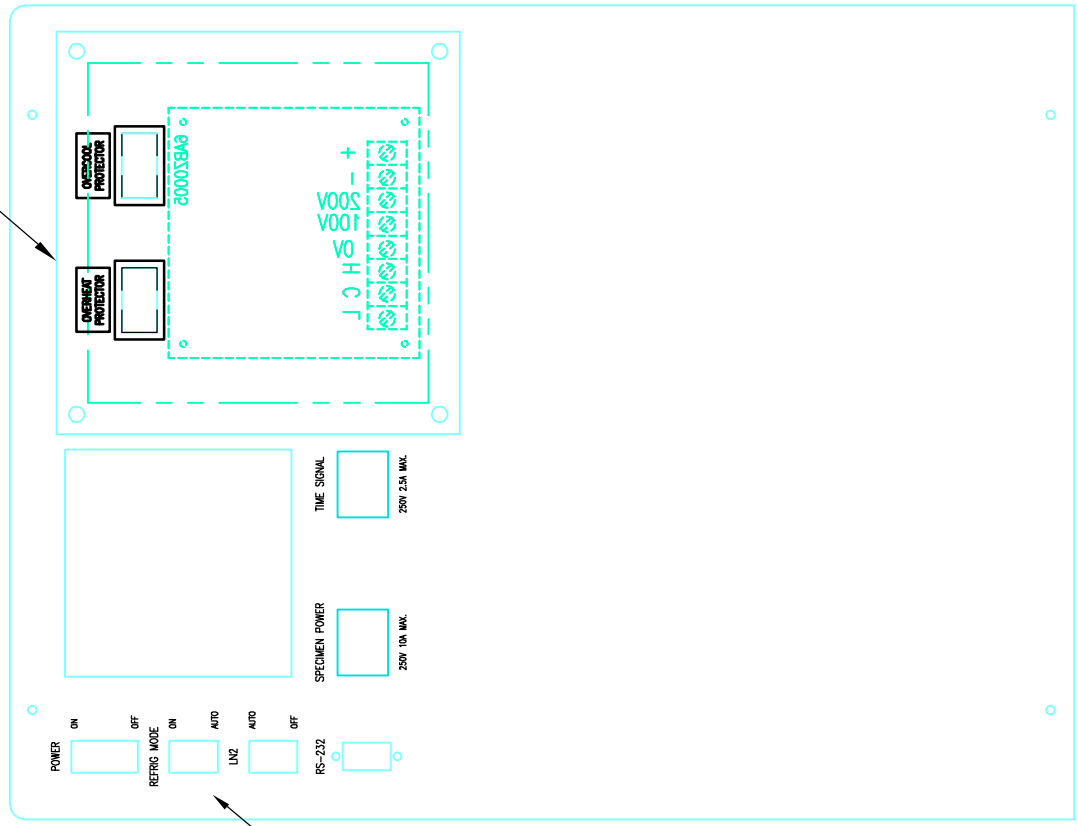
NO.	NAME	NUMBER	QTY.	REMARKS
1	OVERHEAT,COOL PROTECTOR	6ABZ0005	2	
2	OHP,OCP SETPOINT	6ABZ0006	2	
3	OHP TAG	5AAL0876	1	
4	OCP TAG	5AAL0864	1	
5	OHP/OCP MOUNTING BRACKET	5AAE0125	1	
6	STANDOFF 3/4 L M-F 6-32	6ABB0055	8	
7	BLANK TAG MATERIAL	5AAL0920	1	COVER FOR ITEM #5

TITLE: EFD 06038
10-22-98 REV. 1.01
A- 4/26/06 B.PATTERSON
ADD ITEM TO DRAWING &
BOM.

MATERIAL	GALV. 16 GA.	DRAWN B.PATTERSON	DATE 1/17/05	TITLE: OHP/OCP OPTION	
		DESIGNED B.PATTERSON	SCALE 1:1		
		TOLERANCE ±0.03	UNITS INCHES	MODEL NO.	
ESPEC	ESPEC NORTH AMERICA, INC. 4141 Central Parkway Hudsonville, MI 49426			DRAWING NO. ECT-OHOC 1/2	REVISION A

MOUNT OHP/OCP PANEL IN RECORDER OPTION HOLE.
DRILL 4 CLEARANCE HOLES IN FRONT OF CONTROL
PANEL, MOUNT OHP/OCP PANEL WITH 4 SCREWS.

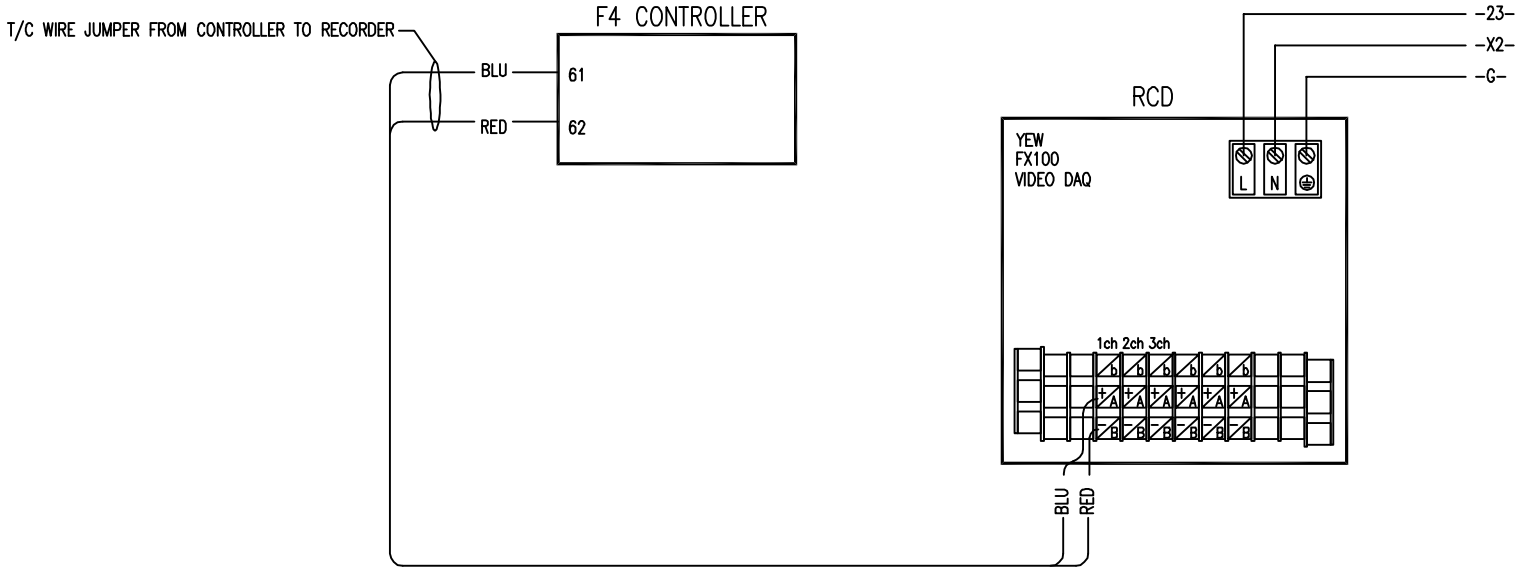
ECT FRONT VIEW



5AAL0221
DECAL

TITLER: EFD 0603B 10-22-98 REV. 1.01	DRAWING REVISION		MATERIAL		
			DRAWN B.PATTERSON	DATE 1/17/05	TITLE: OHP/OCP OPTION MOUNTING DETAIL
			DESIGNED B.PATTERSON	SCALE 1:2	
			TOLERANCE ±0.03	UNITS INCHES	MODEL NO. ECT
		ESPEC	ESPEC NORTH AMERICA, INC. 4141 Central Parkway Hudsonville, MI 49426		DRAWING NO. ECT-OHOC 2/2
					REVISION A

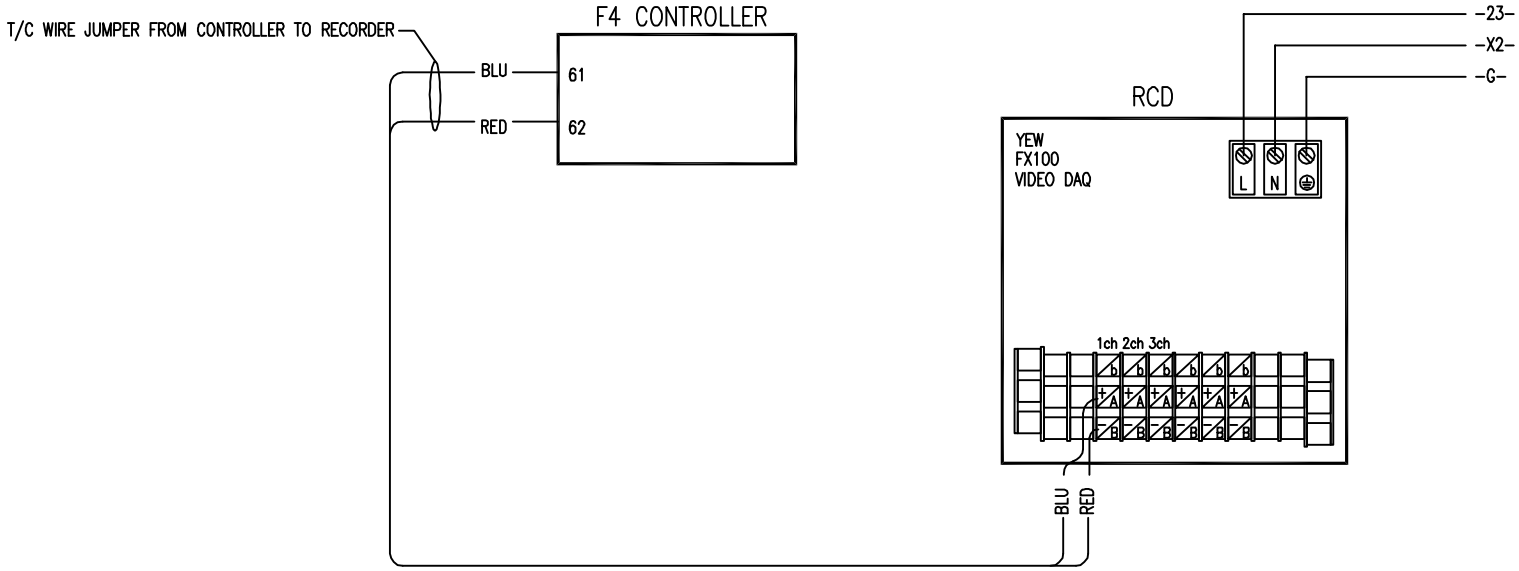
NO.	NAME	NUMBER	QTY.	REMARKS
1	VIDEO RECORDER 3 CHAN	6ABE0073	1	YEW FX100 3 CHAN



TITLER: EFD 0603B
10-22-98 REV. 1.01

DRAWING REVISION					
MATERIAL		DRAWN B.PATTERSON	DATE 3/17/04	TITLE: VIDEO RECORDER OPTION 3 CH	
		DESIGNED B.PATTERSON	SCALE N/A		
		TOLERANCE NA	UNITS NA	MODEL NO. ECT	
	ESPEC NORTH AMERICA, INC. 4141 Central Parkway Hudsonville, MI 49426			DRAWING NO. ECT-RHD3 1/1	REVISION

NO.	NAME	NUMBER	QTY.	REMARKS
1	VIDEO RECORDER 6 CHAN	6ABE0074	1	YEW FX100 6 CHAN

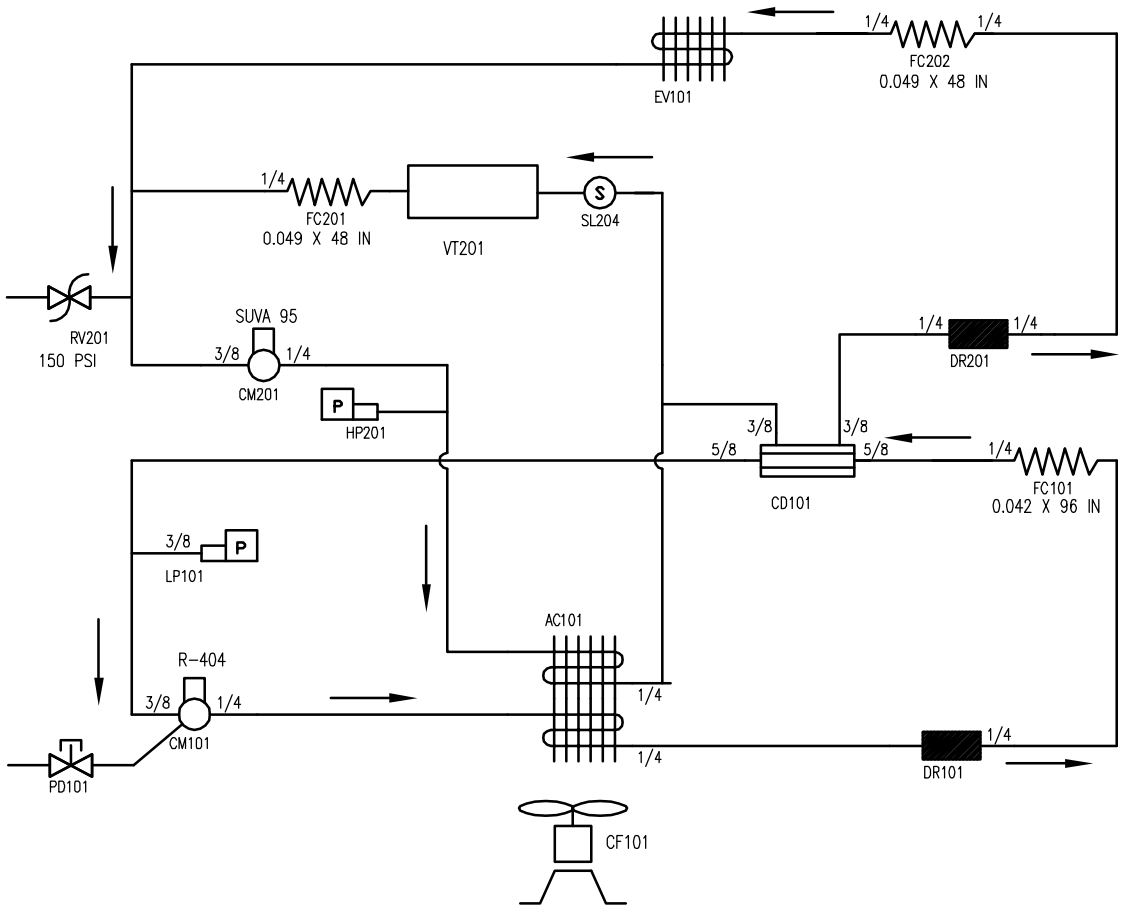


TITLE: EFD 0603B 10-22-98 REV. 1.01

DRAWING REVISION

MATERIAL

DRAWN B.PATTERSON	DATE 3/17/04	TITLE: VIDEO RECORDER OPTION 6 CH	
DESIGNED B.PATTERSON	SCALE N/A		
TOLERANCE NA	UNITS NA	MODEL NO. ECT	
ESPEC ESPEC NORTH AMERICA, INC. 4141 Central Parkway Hudsonville, MI 49426		DRAWING NO. ECT-RHD6 1/1	REVISION



NOTE: INSTALL RELIEF AFTER LEAK CHECKING.
PRESSURIZE TO 100 PSI AND LEAK CHECK RELIEF VALVE.

TITLE: EFD 06038
10-22-98 REV. 1.01

DRAWING REVISION

A: 7/18/96 RH
CHANGED CAP TUBE
B: 2/12/97 RLH
BYPASS AFTER DESUP

MATERIAL

DRAWN M.R.TIMMER	DATE 10-26-95	TITLE: REFRIGERATION SCHEMATIC	
DESIGNED	SCALE NA		
TOLERANCE ±0.03	UNITS INCHES	MODEL NO. ECT	
ESPEC	ESPEC NORTH AMERICA, INC. 425 Gordon Industrial Ct. Byron Center, MI 49315	DRAWING NO. 7AAE0024 1/1	REVISION B

WATLOW F4 CONTROLLER RECORD SHEET

PID SET CHAN 1 MENU	PID SET 1	
PROPORTIONAL BAND A	4.8°C	
INTEGRAL A/ RESET A	0.11/MIN	
DERIVATIVE A/ RATE A	0.23/MIN	
DEAD BAND A		
HYSTERESIS A		
PROPORTIONAL BAND B		
INTEGRAL B/ RESET B		
DERIVATIVE B/ RATE B		
DEAD BAND B		
HYSTERESIS B		
ALARM SET POINT MENU	ALARM 1 (DEV)	ALARM 2 (PV)
LOW SET POINT		62°C
HIGH SET POINT		400°C
LO DEVIATION	-999°C	
HI DEVIATION	3.0°C	
SYSTEM MENU	SETTING	
GUAR. SOAK BAND 1	3	
GUAR. SOAK BAND 2		
CURRENT TIME		
CURRENT DATE		
PID UNITS	US	
F OR C	C	
SHOW F OR C	YES	
CH1 AUTOTUNE SP	90%	
CH2 AUTOTUNE SP		
INPUT 1 FAIL	0%	
INPUT 2 FAIL		
OPEN LOOP CH1	OFF	
OPEN LOOP CH2		
POWER-OUT TIME	0	
POWER-OUT ACTION	CONTINUES	

INPUT MENU	ANALOG IN 1		
SENSOR	TC		
TYPE	T		
DECIMAL	0.0		
ALTITUDE			
UNITS	TEMP		
SCALE LOW			
SCALE HIGH			
SP LOW LIMIT	-73		
SP HIGH LIMIT	180.0		
CALIBRATION OFFSET	0		
FILTER TIME	1.0		
ERROR LATCH	SELF CLEAR		
CASCADE	OFF		
NAME			
FUNCTION			
CONDITION			
CONTROL OUTPUT MENU	OUTPUT 1A	ALARM 1	ALARM 2
FUNCTION	HEAT		
CYCLE TIME	FIXED 3 SEC.		
PROCESS TYPE			
HI POWER LEVEL	100%		
LO POWER LEVEL	0%		
ALARM NAME		COMP DEV	COMP PV
ALARM TYPE		DEV	PROCESS
ALARM SOURCE		INPUT 1	
LATCHING		ALARM SELF CLEARS	
SILENCING		NO	NO
ALARM HYSTERESIS		1	1
ALARM SIDES		HIGH	LOW
ALARM LOGIC		CLOSE	CLOSE
ALARM MESSAGES		NO	NO
RETRANSMIT SOURCE			
ANALOG RANGE			
LOW SCALE			
HIGH SCALE			
SCALE OFFSET			

DIGITAL OUTPUT MENU	DIGIT OUT 1
NAME	TIME SIG 1
FUNCTION	EVENT
BOOST % POWER	
BOOST DELAY	
COMPRESSUR ON % POWER	
COMPRESSOR OFF % POWER	
COMPRESSOR ON DELAY	
COMPRESSOR OFF DELAY	
COMMUNICATIONS MENU	SETTING
BAUD RATE	19200
ADDRESS	1

FACTORY SETUP

SET LOCKOUT	
SET POINT	FULL ACCESS
OPER. AUTOTUNE PID	PASSWORD
OPER. EDIT PID	PASSWORD
OPER. ALARM SP	PASSWORD
PROFILE	FULL ACCESS
SETUP	PASSWORD
FACTORY	PASSWORD
CHANGE PASSWORD	3132
CLEAR LOCKS	

TITLE: EFD 0803B
10-22-98 REV. 1.01

DRAWING REVISION

A: 1/21/04 KTB
CH6 CHMBR LOW LIMIT

MATERIAL

DRAWN KTB	DATE 10/10/03	TITLE:	WATLOW F4 CONTROLLER RECORD SHEET (CRITERION)
DESIGNED KTB	SCALE 1:1		
TOLERANCE	UNITS INCHES	MODEL NO.	ECT
ESPEC	ESPEC NORTH AMERICA, INC. 425 Gordon Industrial Ct. Byron Center, MI 49315	DRAWING NO.	7AAE0028
		REVISION	A

11. Warranty

ESPEC WARRANTY PROCEDURE

Please follow these steps when requesting warranty service:

- If a chamber fails or you suspect a failure;

    1. For help in identifying the problem before you place a warranty call, follow the steps in the "troubleshooting" section of your manual.
    2. Confirm that all utilities are connected to the chamber and functioning properly.
    3. Locate the ship date on the chamber data tag.
    4. Confirm the chamber is within the warranty period by reading the Warranty Policy in the back of your Chamber User's Manual.

- All warranty calls must be directed to ESPEC Customer Support Department @ 800-5-ESPEC-0 between 8:00 am and 5:00 pm Eastern Time, unauthorized service during the warranty period may void warranty. When placing the call, be sure to have the following information available:

    1. Chamber Model and Serial Number, located on the data tag.
    2. Detailed information on the suspected failure and/or alarm detail.
    3. Operating mode at time of failure, i.e., heating, cooling, temp., humidity.
    4. Detail of program being run at the time of failure and a copy of recorder chart or test data, if available.

- Upon receipt of this information, the Customer Support Department will arrange for appropriate service.

- Certain types of service during the warranty period will require a purchase order prior to service.

The following steps apply when requesting warranty parts:

- Contact the ESPEC Customer Support Department at 800-5-ESPEC-0 between 8:00 am and 5:00 pm Eastern Time.
- To order a replacement part, please provide the following:
    1. The complete ESPEC part number from your replacement parts list.
    2. Model and serial number of the chamber for which the replacement part is being requested.
    3. The specific complaint regarding the failed part.
- The Customer Support Department will authorize the return of the failed material and issue an RMA (Return Material Authorization) number.

1. Put the RMA number on the packing list along with the name and phone number of a contact person.
2. All parts being returned may be shipped freight collect via:

    0 – 70 lbs. – UPS surface
    71 lbs. and over – Contact ESPEC for routing instructions

    Any other means of shipment will result in an additional charge to the customer.

- Any failed part, replaced under terms of the warranty, and not returned to ESPEC when an RMA is issued, will be invoiced at the current price.

- All parts are shipped FOB Hudsonville, MI 49426.

This warranty policy is applicable to chamber models beginning with ES, EN, ETS and ECT.

ACCEPTANCE LIMITED TO FOLLOWING TERMS: A party seeking to purchase ESPEC NORTH AMERICA, INC. products (the "Buyer") is strictly limited to the following terms. These terms supersede all prior agreements and understandings between the parties, and these terms shall not be varied or waived without the express written authorization of ESPEC NORTH AMERICA, INC. ("ESPEC").

TECHNICAL INFORMATION/SPECIFICATIONS: All commercial and technical details and information furnished by ESPEC relating to its products, including without limitation, drawings, weights and dimensions, and all performance specifications quoted by ESPEC, are approximations only unless specifically provided to the contrary.

PRICES: The prices for goods to be sold do not include sales, use, excise or any other taxes, charges or expenses related to the sale, delivery, use or consumption of the goods to be sold. The Buyer agrees to directly pay when due all such taxes, charges or expenses to the extent possible and to promptly reimburse ESPEC for all such taxes, charges or expenses which ESPEC pays.

The prices for the goods to be sold are based on details, information and specifications provided by the Buyer, including without limitation, the delivery date and place for the goods, engineering standards and installation site conditions. All such details, information and specifications are assumed to be proper, correct and complete. Any addition to or impropriety, incorrectness, incompleteness or change in any such details, information and specifications may result in a change in the purchase price for the goods sold, which change ESPEC may unilaterally make and Buyer shall pay.

Except as otherwise specifically provided, the purchase price shall be paid by the Buyer in U.S. dollars.

PAYMENT TERMS: Full payment for the goods shall be due within 30 days after ESPEC delivers the goods alongside the carrier at ESPEC's plant.

ESPEC may impose a late charge for each payment under a Contract of Sale not made when due in an amount not to exceed 5% and may charge interest on any late payment from the due date at the highest rate permitted by law.

Buyer shall repay ESPEC all attorney's fees ESPEC incurs collecting late payments or unpaid accounts.

LIMITED WARRANTY: A limited warranty is given by ESPEC to the original buyer of new ESPEC equipment. Subject to the conditions and limitations below, ESPEC warrants that the equipment manufactured by ESPEC is free from defects in material and workmanship which would render the equipment unfit for normal and recommended use.

This limited warranty is effective only for the 360 days after the date of shipment.. During this period, ESPEC will provide repaired or replacement parts without charge. This warranty covers all components, labor, installation and associated expenses for the replacement parts, subject to the exceptions below.

This limited warranty does not cover:

1) Parts, labor and installation for the following components: light bulbs, port plugs, fuses, deionizer cartridges, wiper blades, plug-in relays, wick socks, water filters, plug-in timers, fasteners, recorder pens, chart paper, nor water level, flow regulated or height level adjustments.

2) Defects or damages arising as the result of shipment by common carriers or private transportation unless ESPEC contractually assumes the risk of damage to the equipment during shipment.

3) Defects, damages or malfunctions caused by parties other than ESPEC, including but not limited to defects, damages or malfunctions arising as the result of improper utilities, mishandling, modification, abuse, misuse, neglect, intentional damage, improper repair, loss of refrigerant or improper maintenance, start-up or installation of the equipment.

4) Defects or damages arising as the result of accident, flood, fire, earthquake or other act of God.

This is the EXCLUSIVE remedy as between you and the Company with respect to the equipment provided to you, and ESPEC SHALL NOT BE LIABLE FOR LOSS OR DAMAGE TO PROPERTY INCLUDING LOSS OR DAMAGE CAUSED BY FIRE OR EXPLOSION OR FOR ANY ASSOCIATED INCIDENTAL OR CONSEQUENTIAL LOSS OR EXPENSE, due directly or indirectly to the use of the equipment.

Except as described above, ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, including the implied warranty of MERCHANTABILITY are disclaimed and excluded.

This limited warranty is only valid in the contiguous states of the United States of America and a 150 mile radius from the following Canadian cities; Vancouver, Toronto, Windsor and Ottawa.

INDEMNIFICATION: Buyer shall defend, indemnify and hold seller harmless from and against all claims, liabilities, losses, damages, settlement expenses, and/or attorney's fees, for injury or death of any person and/or the damage or loss of any property allegedly or actually resulting from or arising out of the use or failure of the equipment unless such losses are solely and completely the result of ESPEC's negligence. Without limiting the foregoing in any respect, Buyer's indemnification duty shall arise out of any misuse of the equipment or any other negligent or wrongful act or omission of the Buyer or its employees, agents, and/or subcontractors, or any person or entity who purchases or gains access to the equipment through the Buyer whether or not ESPEC or any other person or entity is jointly negligent in the design, manufacture, instruction, training,

provision of warnings, selection, delivery, repair, maintenance, possession, use, operation or return of the equipment.

DELIVERY/RISK OR LOSS: The risk of loss with respect to the goods to be sold will pass to the Buyer at ESPEC's plant upon the delivery of the goods alongside the designated carrier; and all shipping costs, losses, liabilities and damages and all insurance and delivery obligations with respect to the goods once delivered by ESPEC alongside the carrier at ESPEC's plant, are the Buyer's risk and responsibility, although ESPEC will give reasonable assistance to the Buyer in tendering claims to the carrier.

GOVERNING LAW: Any offer made by ESPEC or any contract entered into by ESPEC and the Buyer shall be construed and interpreted only according to the laws of the State of Michigan, U.S.A., including without limitation, the Uniform Commercial Code as in effect in the State of Michigan, U.S.A. In that regard, Buyer and Seller specifically agree and acknowledge that the provisions of the United Nations Convention on Contracts for the International Sale of Goods shall not apply to the rights and obligations of the parties under the Contract.

VENUE: The Buyer hereby agrees that any suit or claim relating to the sale or operation of ESPEC's products shall be filed in the Michigan Circuit Court for Kent County or in the Federal Court for the Western District of Michigan.

Std/360/360 EFD 0897 0419/07 Rev

Criterion ECT-3 Standard Chamber
Instruction Manual

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