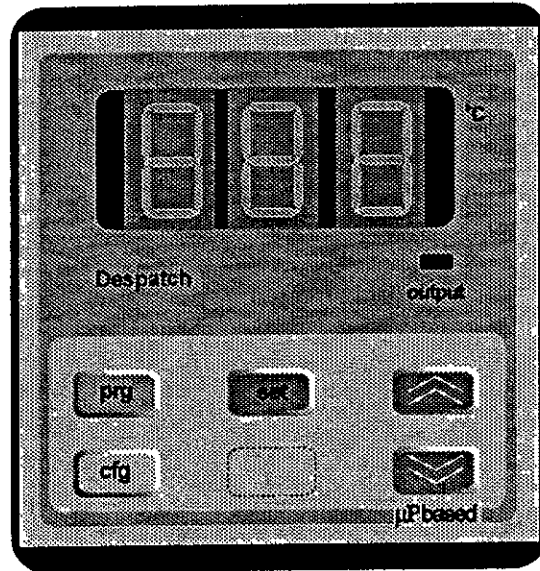


P/N 205233
Rev. 9/95
E-84
U.S. \$15.00

Instruction Manual for the Eliwell Control



Notice

Users of this equipment must comply with operating procedures and training of operation personnel as required by the Occupational Safety and Health Act (OSHA) of 1970, Section 6 and relevant safety standards, as well as other safety rules and regulations of state and local governments. Refer to the relevant safety standards in OSHA and National Fire Protection Association (NFPA), section 86 of 1990.

Caution

Setup and maintenance of the equipment should be performed by qualified personnel who are experienced in handling all facets of this type of system. Improper setup and operation of this equipment could cause an explosion that may result in equipment damage, personal injury or possible death.

Dear Customer,

Thank you for choosing Despatch Industries. We appreciate the opportunity to work with you and to meet your heat processing needs. We believe that you have selected the finest equipment available in the heat processing industry.

At Despatch, our service does not end after the purchase and delivery of our equipment. For this reason we have created the Service Products Division within Despatch. The Service Products Division features our Response Center for customer service. The Response Center will direct and track your service call to ensure satisfaction.

Whenever you need service or replacement parts, contact the Response Center at 1-800-473-7373: FAX 612-781-5353.

Thank you for choosing Despatch.

Sincerely,

Despatch Industries

PREFACE

The INTRODUCTION section provides an overview of the control.

The THEORY OF OPERATION section details the function and operation of the control.

The INSTRUCTIONS section provides details on operating and maintaining the control.

An efficient way to learn about the control would be to read the manual while working with the control. This will give you practical hands-on experience with information in the manual and the control.

While reading this manual, if a term or section of information is not fully understood, look up that item in the appropriate section. Then go back and reread that section again. Information skipped, not understood or misunderstood could create the possibility of operating the equipment in an unsafe manner. This could cause damage to the oven or personnel or reduce the efficiency of the equipment.

NOTE:
Read the entire
INTRODUCTION and
THEORY OF OPERATION
before installing the oven.

WARNING:
Failure to heed warnings in this
instruction manual and on the
oven could result in death,
personal injury or property
damage.

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INTRODUCTION

The microprocessor based single loop controller is capable of measuring, displaying and controlling temperature flow and level from a variety of inputs.

The controller is easy to use. Control functions, alarm settings and other parameters are easily entered through the front keypad. All user's data can be protected from unauthorized changes with its Operating and Configuration mode security system. Battery back-up protects against data loss during AC power outages.

In this application the controller has been factory configured to control temperature and humidity conditions in your Despatch chamber. Under normal conditions, you should not have to reprogram this controller. We have, however, included reprogramming instructions in this manual to help guide you through the process if it should become necessary.

NOTE:
Your control has already been configured at Despatch. Use this manual as a guide.

CAUTION:
Before making changes to your control instrument, consult with Despatch Industries Service Products at 1-800-473-7373

THEORY OF OPERATION

This controller is a microprocessor based digital control instrument.

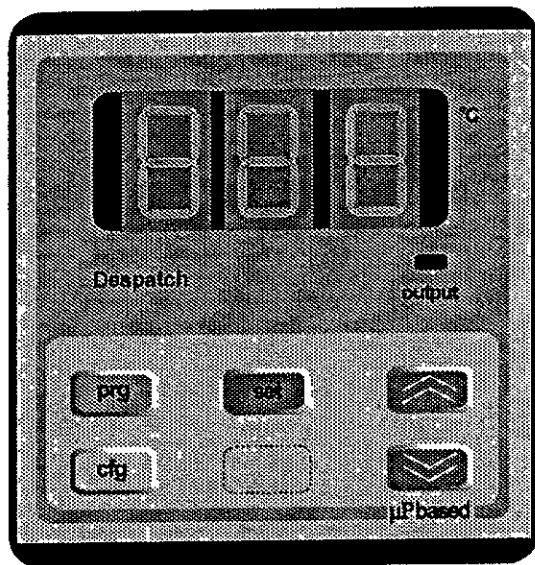


Figure 1 illustrates the CONTROL instrument.

Table 1 CONTROL Instrument Features

Features	Description
Main Display	Displays the actual oven temperature or displays the setpoint when the set key is pressed.
Operating Mode Key	Used when operating mode parameters are changed from factory preset values.
Configure Key	Used when configuration mode parameters are changed from factory preset values.
Hidden Key	Used for access to the configuration mode.
Set Key	Used to view the setpoint or in conjunction with the ▲ key and the ▼ key to change the setpoint.
Down Key (▼)	Decreases a setpoint or mode parameter.
Up Key (▲)	Increases a setpoint or mode parameter.
LED Output Indicator	Lights when the control is calling for heat.

INSTRUCTIONS

Configuration Mode

The instrument parameters are set through the CONFIGURATION mode. In most applications, it is not necessary to alter the settings. However, the following instructions describe how to access, view and, if it is desired, change the instrument parameters.

The CONFIGURATION mode will exit automatically by simply not pressing any keys for about 90 seconds. During programming, the status of the relay output will be in accordance with the OUTPUT PROTECTION 1 parameter set in the CONFIGURATION mode (off).

If a particular instrument setting is not allowed, the display will blink once.

1. Press **cfg** and **hidden** keys simultaneously.
2. Check that the output LED is flashing, indicating that the control is in the program mode.
3. Press the **▲** key until the desired parameter number is displayed (see Configuration Mode Outline for parameter numbers, descriptions and selections).
4. Press and hold the **set** key to view the instrument parameter setting.
5. While holding the **set** key, use the **▲** or **▼** key to change the parameter to the desired setting.
6. To exit the CONFIGURATION mode, press **cfg** and **hidden** keys simultaneously. The CONTROL will revert back to its normal mode.

WARNING:
Make sure you understand what you are changing before doing so. Changing the instrument parameters will alter the functions of the CONTROL.

Configuration Mode (Cont.)

Table 2 Configuration Mode Instrument Parameters

Parameter Number	Parameter/Description	Setting Selections	Factory and Suggested Setting
0	SENSOR PROTECTION 1 - The status of the output relay in the event of a thermocouple (sensor) error.	0 = Off 1 = On	0 = Off
10	SENSOR PROTECTION 2 - This parameter is ignored since the control has one output relay.	0 = Off 1 = On	0 = Off
20	OUTPUT PROTECTION 1 - The status of the output relay in the event of non-sensor error.	0 = Off 1 = On	0 = Off
30	OUTPUT PROTECTION 2 - This parameter is ignored since the control has one output relay.	0 = Off 1 = On	0 = Off
40	INPUT TYPE - The control is a thermocouple input type unit, and only accepts thermocouple input.	0 = V or I 1 = T/C	1 = T/C
50	SETPOINT DEPENDENCY - This parameter is ignored since the control is for heating applications only.	0 = Independent 1 = Dependent	0 = Independent
60	DISPLAY SETTING - The control displays either the actual or setpoint temperature during processing. The control displays the alternate temperature when the set key is pressed.	0 = Actual Oven Temperature 1 = Setpoint Temperature	0 = Actual Oven Temperature
70	TEMPERATURE SCALE - The control operates in °C or °F. To change setting, see the section on temperature scale change.	0 = °C 1 = °F	0 = °C
80	OUTPUT RELAY 1 - The relay must be operated in a heating (reverse) condition.	0 = Reverse 1 = Direct	0 = Reverse
90	OUTPUT RELAY 2 - This parameter is ignored since the control has one output relay.	0 = Reverse 1 = Direct	0 = Reverse
100	NOT ALLOWED		
110	ANALOG OUTPUT - This parameter is ignored since the control has a relay output.	0 = Tracking 1 = Deviation	0 = Tracking
120	THERMOCOUPLE TYPE - The type of thermocouple input into the control instrument.	0 = J 1 = K 2 = S	0 = J
130	CONTROL MODE SELECTION - The type of control used to maintain setpoint temperature. Proportional control is recommended for the LDB series.	0 = On-Off 1 = Dead Band 2 = Proportional	2 = Proportional*
140	LOWER SETPOINT LIMIT 1 - The minimum allowed setpoint temperature for processing.	0 - 999 Degrees	50°C**
150	UPPER SETPOINT LIMIT 1 - The maximum allowed setpoint temperature that can be entered for processing.	0 - 999 Degrees	204°C
160	LOWER SETPOINT LIMIT 2 - This parameter is ignored since the control has one relay output.	0 - 999 Degrees	50°C**
170	UPPER SETPOINT LIMIT 2 - This parameter is ignored since the control has one relay output.	0 - 999 Degrees	204°C

* 0 = On-Off for LEB ovens.

** 35°C for LEB ovens.

Operating Mode

The control parameters are set through the OPERATING mode. In most applications, it is not necessary to alter oven settings. However, the following instructions describe how to access, view and, if it is desired, change the control parameters.

The OPERATING mode will exit automatically by simply not pressing any keys for about 90 seconds. During programming, the status of the relay output will be in accordance with the OUTPUT PROTECTION 1 parameter set in the CONFIGURATION mode (off).

WARNING:
Make sure you understand what you are changing before doing so. Changing the control parameters will alter the control capability of the CONTROL.

If a particular control setting is not allowed, the display will blink once.

1. Press **opr** and **set** keys simultaneously.
2. Check that the output LED is flashing, indicating that the control is in the program mode.
3. Press the **▲** key until the desired parameter number is displayed (see Operating Mode Outline for parameter numbers, descriptions and selections).
4. Press and hold the **set** key to view the control parameter setting.
5. While holding the **set** key, use the **▲** or **▼** keys to change the parameter to the desired setting.
6. To exit the OPERATING mode, press **opr** and **set** keys simultaneously. The CONTROL will revert back to its normal mode.

Operating Mode (Cont.)

Table 3 Operating Mode Control Parameters

Parameter Number	Parameter/Description	Setting Selections	Factory and Suggested Setting
0	SWITCHING DIFFERENTIAL 1 - A negative value is used for heating applications using on-off control. A positive value is used for proportional control. Proportional control is recommended for the LDB series.	-99° to 999°	+1*
10	SWITCHING DIFFERENTIAL 2 - This parameter is ignored since the control only has one output relay.	-99° to 999°	+1*
20	OFFSET - The number of degrees the control will offset the display from the sensor input. This parameter is used to align the oven's actual chamber temperature with the display appearing on the control. The ± sign determines whether the adjustment is made upward or downward (see Calibration).	-99° to 999°	0 = See calibration
30	TIME DELAY - Delays the actual switching of the output.	0-250 seconds	0
40	CYCLE TIME - Applies to instruments set up for proportional control. The cycle time refers to amount of time between relay output activations.	0-250 seconds	20 seconds
50	PROPORTIONAL BAND - The width of the temperature band around the setpoint. The proportional band is referred to as the gain of the system. Used in proportional control.	0° to 999°	7°C
60	MANUAL RESET - The amount of degrees that the user can move the proportional band so the control will control at setpoint. Used in cases where the actual controlled temperature is shifted up or down relative to the setpoint temperature.	-99° to 999°	0
70	LOW END ANALOG OUTPUT - This parameter is ignored since the control is a relay output device.	-99° to 999°	0
80	HIGH END ANALOG OUTPUT - This parameter is ignored since the device control is a relay device.	-99° to 999°	0

* Minus one for LEB ovens.

Temperature Scale Conversion (°C/°F)

The CONTROL instrument has been factory preset to operate in °C. If the user would like to operate the oven in °F, the following parameter settings should be used since a change in temperature scale effects certain instrument and control parameters. A detailed procedure to access, view and change the following parameters is included in this manual. If the CONTROL is reverted back to °C, then the parameters should be changed back to their original settings.

Configuration Mode

The following settings are used to set the CONTROL for °C or °F

Table 4 Configuration Mode

Parameter Number	Parameter Name	Setting for °F	Setting for °C
7	Temperature Scale	1	0
14	Lower Setpoint Limit 1	122	50
15	Upper Setpoint Limit 1	400	204

Operating Mode

The following settings are used to set the CONTROL for °C or °F

Table 5 Operating Mode

Parameter Number	Parameter Name	Setting for °F	Setting for °C
2	Offset	Factory Setting x 1.8*	Factory Setting*
5	Proportional Band	13	7

* The user may wish to recalibrate the CONTROL for their own operating conditions (see section on Calibration).

Calibration

The CONTROL instrument has been tested and calibrated at the factory. Under normal operating conditions, recalibration should not be necessary. However, if the instrument does not comply with known standards, OR if the user would like to recalibrate the CONTROL for a specific operating condition, then recalibration is easily accomplished.

(Equipment needed: Temperature Measuring Device with a Compatible Temperature Sensor)

1. Verify that the OFFSET programmed in the CONTROL is zero. Refer to Instructions on viewing the parameter in the OPERATING mode section.
2. Locate the temperature sensor of the temperature measuring device at the center of the chamber.
3. Operate the oven until it reaches the desired operating temperature and the CONTROL is regulating. The user may wish to have a loaded chamber with a standard amount of product to simulate a specific operating condition. It will take several minutes for the unit to stabilize at the controlled temperature.
4. Subtract the average controlled temperature (number appearing on the CONTROL display) from the actual oven temperature (number appearing on the temperature measuring device display). The CONTROL and the device must be in the same scale (°C or °F).

Actual Oven Temperature - Controlled Temperature = ?

5. Enter the calculated value from Step 4 as the new OFFSET VALUE in OPERATING mode.

Replacement

(Tools needed: one quarter (1/4) inch socket set screwdriver)

1. Disconnect power.
2. Remove screws with 1/4 inch socket from the face of the control panel and slide it forward.
3. Remove wires from the old control instrument, noting which numbered wires connect to which terminals. Terminals 13 and 15 are used for heating.

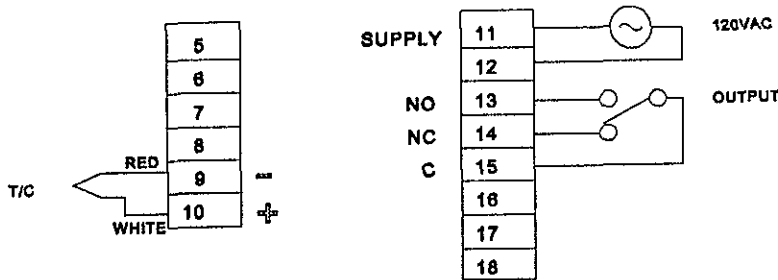


Figure 2 illustrates the connections to the CONTROL instrument.

4. Disconnect the CONTROL mounting bracket.
5. Remove old CONTROL instrument from control panel.
6. Install new CONTROL instrument into the control panel.
7. Secure CONTROL mounting bracket.
8. Reattach wires to the new CONTROL instrument. Make sure that the wires are connected correctly.
9. Replace control panel.

Troubleshooting

Problem	Solution
Temperature readout does not increase when the heater is on.	Check the thermocouple leads for problems. Be sure that the thermocouple leads are not shorted together on the back of the instrument.
Temperature Readout is displaying <i>EEE</i> .	The thermocouple is open. Repair or replace.