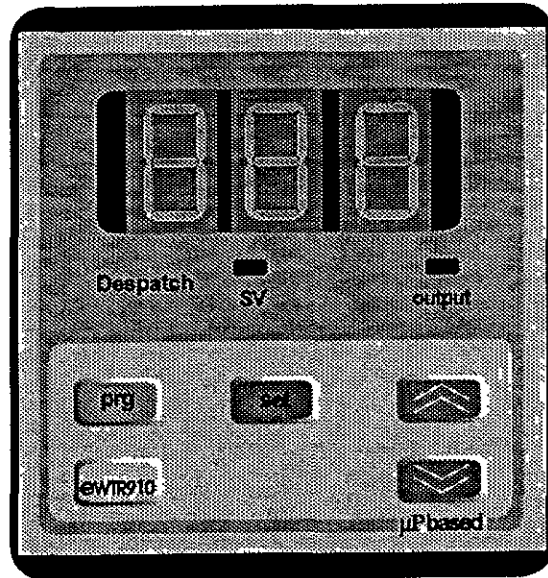


P/N 110639
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E-83
U.S. \$75.00

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 and other parameters are easily entered through the front keypad. All user's data can be protected from unauthorized changes with its Program Parameter 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.

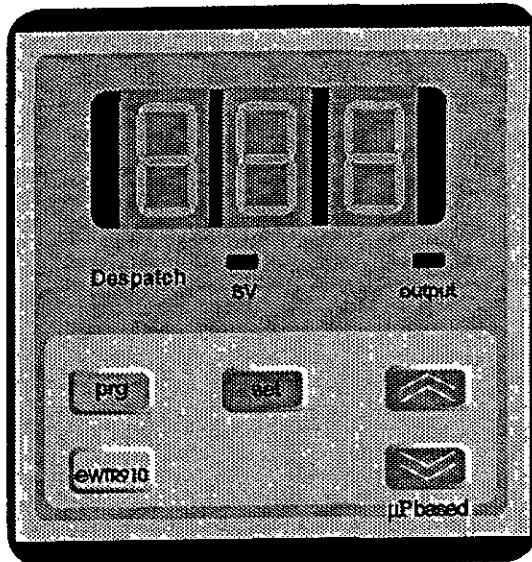


Figure 1 illustrates the CONTROL instrument.

Table 1 CONTROL Instrument Features

| Features | Description |
|-----------------------------|---|
| Main Display | Displays the actual oven temperature or displays the setpoint when the set key is pressed. |
| Program Key and ewtr910 Key | Change operating mode parameters from factory preset values. Allow access to program mode when pressed simultaneously with set key. |
| Set Key | Views the setpoint or in conjunction with the ▲ and ▼ keys 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. |
| LED SV Indicator | Lights when the setpoint value is displayed. |

THEORY OF OPERATION (Cont.)

The Despatch EWTR910 CONTROL instrument is a dual functioning proportional or ON-OFF controller. Due to the physical characteristics of the oven, the CONTROL has been configured as an ON-OFF controller for the LEB ovens and as a proportional controller for the LDB ovens. Initially the CONTROL will allow the heater to operate at full power. However, as the actual oven temperature reaches the setpoint, the CONTROL will cycle the heater on and off, minimizing process temperature fluctuations.

Temperature Scale Conversion (°C/°F)

The CONTROL can be operated in either °F or °C. The following table lists parameter settings used for °F and °C.

Table 2 Temperature Parameter Settings

| Parameter Number | Parameter Name | Setting for °F | Setting for °C |
|------------------|------------------------|----------------|----------------|
| rou | Temperature Scale | F | C |
| LS1 | Lower Setpoint Limit 1 | 122 | 50 |
| HS1 | Upper Setpoint Limit 1 | 400 | 204 |
| Pb | Proportional Band | 13 | 7 |

The CONTROL instrument has been factory preset to operate in °C. If the control temperature setting is changed, the above listed parameter settings must also be changed.

Refer to the Parameter Programming Mode section for detailed instructions.

INSTRUCTIONS

Entering a Setpoint

1. Press and hold the **set** key.
2. Use the **▲** key and the **▼** key to enter the operating temperature setpoint.
3. Release the **set** key.

Parameter Programming Mode

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

Once the Parameter Programming mode is accessed, the output LED will start blinking on and off. If a particular setting is not allowed, the display will flash. The CONTROL will not allow the display to be altered improperly.

The CONTROL will automatically exit the Parameter Programming mode if no keys are pressed for about 20 seconds. During programming, the output LED should be blinking.

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

Parameter Programming Mode (Cont.)

1. Press the **prg** key, **set** key and the **ewtr910** key simultaneously.

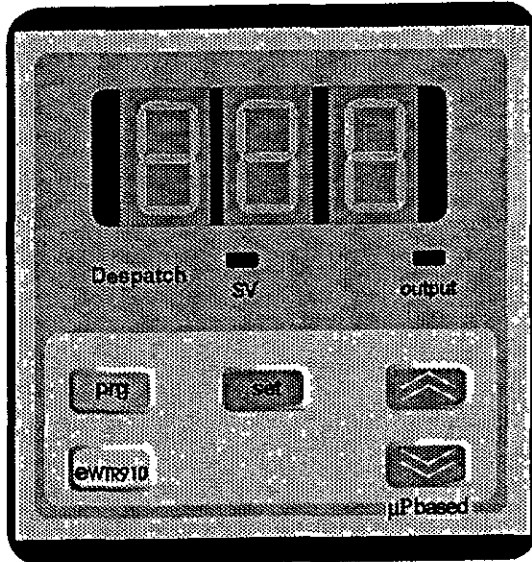


Figure 2 illustrates the CONTROL instrument.

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 is displayed. See Program Mode Outline table.
4. Press and hold the **set** key to view the parameter setting.
5. While holding the **set** key, use the **▲** key and the **▼** key to change the parameter setting to the desired setting.
6. Press the **prg** key, **set** key and **ewtr910** key simultaneously to exit the Parameter Programming mode. The CONTROL will revert back to its normal mode.

Parameter Programming Mode (Cont.)

Table 3 Parameter Program Mode Outline

| Code | Name | LEB Settings | LDB Settings |
|-------|------------------------|----------------|----------------|
| dI | Differential Set | -1 | N/A |
| LS1 | Lower Set 1 (degrees) | 35°C | 50°C |
| HS1 | Higher Set 1 (degrees) | 204°C | 204°C |
| Pb* | Proportional Band | N/A | 7°C |
| It | Integral Time | N/A | 120s |
| dt | Derivative Time | N/A | 0s |
| Sr | Sampling Rate | N/A | 1s |
| rSt | Manual Reset | N/A | 0°C |
| Ar | Anti Reset Windup | N/A | 100°C |
| od | Output Delay | 0 | 0 |
| Ct | Cycle Time | N/A | 20s |
| drb | Dynamic Restart Band | 0 | 0 |
| dSi | Dynamic Set Increment | 1 | 1 |
| dSt | Dynamic Set Time | 1 | 1 |
| CAL | Calibration | 0 | 0 |
| Ft | Function Type | ON | Pi |
| PSE | Probe Selection | FE | FE |
| HC1 | Heat/Cool Output | H | H |
| rP1 | Relay Protection 1 | ro | ro |
| LF1 | LED Function 1 | di | di |
| rou | Readout (degrees) | °C | °C |
| dro | Display Readout | P | P |
| hdd | Half Digit Display | n | n |
| tab.. | Table of Parameters | not adjustable | not adjustable |

*If Pb is not displayed the Function Type must be first set to Pi.

Parameter Programming Mode (Cont.)

- d1 Differential Set - Active in ON/OFF control mode only. Must be set with a negative value when in the heating mode.
- LS1 Lower Set 1 - This is the lower setpoint limit below which the user cannot change the setpoint.
- HS1 Higher Set 1 - The maximum setpoint limit for chamber. The user cannot set the setpoint above the maximum setpoint.
- Pb Proportional Band - Expressed in degrees. This value determines the band width on both sides of the setpoint within which the control provides proportional control.
- It Integral Time - Expressed in seconds. This parameter corrects for errors in actual temperature versus the setpoint.
- Dt Derivative Time - Expressed in seconds. This effect of the derivative time is in direct proportion to the time setting.
- Sr Sampling Rate - Expressed in seconds. Time between two successive read-outs. Recommended setting is 1.
- rSt Manual Reset - Expressed in degrees. This allows the proportional band to be moved up or down.
- Ar Anti-reset Windup - This is the half-band in which the integral action takes place. The higher the setting, the stronger the integral action.
- od Output Delay - This provides a delay selection for the outputs in applications where noise may cause brief erroneous signals from the sensor to the controller.
- Ct Cycle Time - Expressed in seconds. This is the total time on one ON/OFF cycle of the relay during the proportional action.
- drb Dynamic Restart Band - This is a soft start function. When temperature falls below or rises above this restart band, another soft cycle is initiated. The value of this parameter represents half of the total band.

Parameter Programming Mode (Cont.)

dSi Dynamic Set Increment - Expressed in degrees of the setpoint. This parameter represents the dynamic increase of the setpoint. See Dynamic Restart Band. A setting of 0 disables this function.

dSt Dynamic Set Time - Time value between two successive dynamic setpoint increases.

CAL Calibration - 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 \pm sign determines whether the adjustment is made upward or downward. See Calibration at the end of this addendum.

Ft Function Type - Control mode selection.
on = ON/OFF control,
Pi = PID control
This oven operates only with the ON/Off control setting.

PSE Probe Selection - Input type. FE = J T/C, Cr = K T/C, rh = S T/C

HC1 Heat/Cool Output - Heating = H, Cooling = C. Set to Heating (H) for heating applications.

rP1 Relay Protection 1 - Determines the status of the relay in the event of a sensor error.
ro = relay open (factory setting)
rc = relay closed
Use the ro setting for heating applications.

LF1 LED Function 1 - Determines whether the light is on or off when the relay is energized.
di = direct, light is ON when output relay is energized
in = reverse, light is OFF when the output relay is energized

rou Readout (degrees)
C = degrees Celsius
F = degrees Fahrenheit

dro Display Readout
P = Process value
S = Setpoint value

Parameter Programming Mode (Cont.)

hdd Half-Digit Display - The right most digit can be set to read-out in 0 or 5 only automatically rounding to the nearest value.

tAb Table of Parameters - Factory setting, cannot be changed.

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 CAL (Calibration) programmed in the CONTROL is 0. Refer to the section on parameter programming.
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. Allow at least 30 minutes of operation at the stabilized temperature before proceeding.
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 ($^{\circ}\text{C}$ or $^{\circ}\text{F}$).

Actual Oven Temperature - Controlled Temperature = calculated value

5. Enter the calculated value from Step 4 as the new CAL (Calibration) value in the parameter program 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.

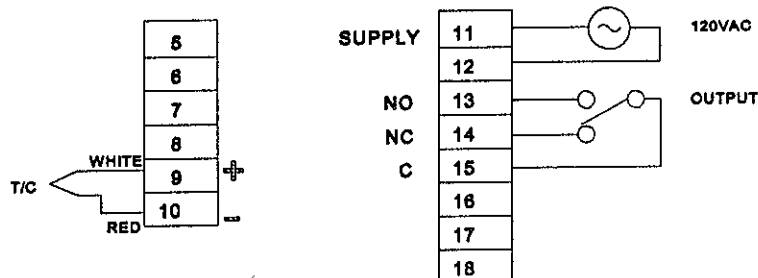


Figure 3 illustrates the connections to the CONTROL instrument.

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 EEE. | The thermocouple is open. Repair or replace. |