



## BCS-3000M BURNER CONTROL SYSTEM



### **WARNING**

These instructions are intended for use only by experienced, qualified combustion start-up personnel.

Adjustment of this equipment and its components, by unqualified personnel, can result in fire, explosion, severe personal injury, or even death.

### **Table of Contents**

SECTION	DESCRIPTION	PAGE
A.	General Information	2
B.	Receiving and Inspection	3
C.	Drawings and Supplemental Literature	3
D.	Installation	3
E.	Adjustments	5
F.	Final Checkout	5
G.	Operation	5
H.	Troubleshooting	7
Appendix A	Fuel Motor Slidewire Calibration	10
Appendix B	UDC3200 Temperature Controller	11
Appendix C	High Temperature Limit	15
Appendix D	Exhaust Flow Limit Installation	16
Appendix E	Stack Thermocouple Installation	17
Appendix F	Material Thermocouple Installation	18
Appendix G	Recommended Spare Parts	19
<b>Attachments: Appropriate Drawings and Schematics</b>		

These instructions are intended to serve as guidelines covering the installation, operation, and maintenance of Hauck equipment. While every attempt has been made to ensure completeness, unforeseen or unspecified applications, details, and variations may preclude covering every possible contingency. **WARNING: TO PREVENT THE POSSIBILITY OF SERIOUS BODILY INJURY, DO NOT USE OR OPERATE ANY EQUIPMENT OR COMPONENT WITH ANY PARTS REMOVED OR ANY PARTS NOT APPROVED BY THE MANUFACTURER.** Should further information be required or desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, contact Hauck Mfg. Co.



**WARNING**

This equipment is potentially dangerous with the possibility of serious personal injury and property damage. Hauck Manufacturing Company recommends the use of flame supervisory equipment and fuel safety shutoff valves. Furthermore, Hauck urges rigid adherence to National Fire Protection Association (NFPA) standards and insurance underwriter's requirements. Operation and regular preventative maintenance of this equipment should be performed only by properly trained and qualified personnel. Annual review and upgrading of safety equipment is recommended.

**A. GENERAL INFORMATION**

The Hauck Burner Control System (BCS) provides burner management and temperature control of a single pilot ignited burner firing on gas, oil or liquid propane (LP). The spark ignited, gas fired pilot is interrupted after the main burner flame has been established. Flame supervision is provided by a Honeywell RM7890A flame relay combined with a R7849A1023 amplifier module and one or two C7027A1049 UV detectors.

A Honeywell UDC3200 series microprocessor based instrument is provided for temperature control. The controller is electronically linked to the burner control motor to automatically adjust the burner firing rate and maintain process temperature near the controller's setpoint.

The Temperature Controller's thermocouple senses the temperature of the material or exhaust gases as it exits the dryer, depending on where it's positioned. The controller generates a position proportional output based on the difference between the setpoint and the process temperature input.

The CONTROL MODE selector switch enables the operator to assign control of the burner. The center, LOW FIRE, position of this switch is used to hold the burner at low fire. The right, MAN (manual) position enables the operator to increase (INC) or decrease (DEC) the burner position via the MANUAL switch. The left, AUTO position enables the Temperature Controller to operate the burner. The alarm contact of the High Temp Limit instrument is used to shut down the burner if the preset high temperature limit is exceeded. An auxiliary temperature limit is also available as an option. Refer to Appendix C for entering the desired alarm setpoints.

**CAUTION**

The **HIGH TEMP LIMIT** alarm setpoint is factory set at 400°F (204 °C). If the system is equipped with a fabric dust collector (baghouse), consult the manufacturer for recommended baghouse temperature limitations.

**NOTE**

High temperature limits will not prevent baghouse fires. They will, when properly installed and adjusted shut off the burner when a given temperature setpoint is exceeded. Outside factors such as chemicals, bag contamination or other ignition sources are beyond the control of the burner management system.

**B. RECEIVING AND INSPECTION**

Upon receipt, check each item on the bill of lading and/or invoice to determine that all equipment has been received. Examine all parts to determine if there has been any damage in shipment. If equipment is to be stored prior to installation, provide a dry storage area.

**IMPORTANT**

For optimum use of the BCS panel, it is suggested that the drawings provided by Hauck be referred to for limit switch and valve installation and wiring. In the event that a recommended switch or valve is not used, it may be necessary to connect jumper wire(s) between appropriate terminals in the control panel or burner junction box. Such determination remains the responsibility of the Customer, based upon his application, accepted safe installation and operating procedures, and any applicable insurance guidelines or governmental regulations.

**C. DRAWINGS AND SUPPLEMENTAL LITERATURE**

Drawing	StarJet	ESIIB	ESIIB w/Fuel Rack
Tabletop Panel Assy.	CY7996	CY7996	CY7996
Drop-in Panel Assy.	CY7997	CY7997	CY7997
System Schematic	CY7986	CY8078	CY8078
Wiring Diagram	CY7995	CY7995	CY7995
External Component Wiring	CY8000	CY8114	CY8079
BCI Panel Assembly	NA	CY7813	CY8034
BCI System Schematic	NA	CY8108	CY8024

**D. INSTALLATION**

1. Locate the tabletop panel on a firm support in an area that is protected from the weather and free from vibration. The drop-in version is designed to install in an existing enclosure. Reference the panel assembly drawings for mounting dimensions and required cutouts.

**IMPORTANT**

Operating specifications of 32 to 130 °F (0 to 54 °C), 30 to 95% relative humidity (non-condensing) should be considered in selecting a suitable location for the control panel.

2. Provide 120Vac single phase **grounded neutral** power to the burner control panel. It is recommended that the customer provide a master disconnect switch to interrupt power service to the panel. Maintain polarity as indicated on the drawings provided when connecting the main power source to the panel.
3. Install a heavy gauge (No. 12 AWG minimum) ground wire between the panel ground connector and "Earth" ground.

**IMPORTANT**

A ground wire is also required between the burner junction box and the control panel terminal strip.

4. Determine the burner fuel control motor type and install a jumper:
  - a. From fuse 5 to ground for a Honeywell M6284 or Barber-Coleman EA57 medium torque motor.
  - b. From fuse 5 to fuse 7 for a Barber-Coleman EA71 or EA73 high torque motor.
5. Verify that the **SELECT R4** jumper on the printed circuit board is in the correct position for the burner application. Position **A** (default) holds the fuel motor at low fire during purge while position **B** drives the fuel control motor open until purge time is completed.
6. Wire the fuel valves, valve position limit switches and fuel pressure limit switches as shown on the external component wiring diagram.
7. Install the exhaust fan flow limit switch in the dryer exhaust duct as shown in Appendix D. Wire the normally open contact of the exhaust flow limit to the appropriate terminals in either the burner junction box or the BCS control panel.
8. Install a limit switch on the exhaust damper set to close when the damper is greater than 50% open.
9. Install the stack temperature thermocouple in the dryer exhaust duct to sense exhaust gas temperature. See Appendix E for installation instructions.

**AND / OR**

10. Install a Hauck Rapid Response material temperature thermocouple in the material discharge chute to sense the temperature of the material leaving the dryer. See Appendix F for recommended installation.
11. Connect the thermocouples to the appropriate terminals in the BCS control panel using thermocouple cable of the same type as the Material and/or Stack thermocouples.

**IMPORTANT**

Thermocouple cables must be separated from AC power and control wiring to avoid interference and nuisance shutdowns. Observe polarity when making thermocouple connections. Regardless of thermocouple type, the red wire is always negative. Shielded cable may be used to provide additional protection from AC power and radio frequency (RF) interference. **Only one end of the cable should be grounded.** Use a ground terminal in the BCS panel for this purpose.

12. Install the pilot and main flame scanners on the burner and wire them to the appropriate terminals in the burner junction box. Reference burner instructions for scanner installation details.
13. Refer to the external component wiring diagram for interconnection between the burner junction box and the BCS panel terminal strips.

**IMPORTANT**

**The flame scanner and control motor position feedback signals should be run in a separate cable from the burner junction box to the BCS control panel.** This cable may be run along with thermocouple cables but must be separated from all other AC power and control cables. Shielded cable may be used to provide additional protection from AC power and radio frequency (RF) interference. **Only one end of the cable shield should be grounded.** Use one of the ground terminals in the BCS control panel for this purpose.

## E. ADJUSTMENTS



### **WARNING**

Adjustment of this equipment, by unqualified personnel, can result in fire, explosion, severe personal injury, or even death.

1. Adjust the purge timer, 1TR, for the required purge time (1/2 to 10 minutes).

### **IMPORTANT**

Before igniting the burner, the dryer must be purged to remove possible accumulation of combustible gases. **A minimum of four complete air changes must be supplied.** Multiply the total system volume (dryer, baghouse and exhaust ducts) in cubic feet by four. Divide this value by the burner air capacity in cubic feet per minute. The result will be the required purge time in minutes

2. Perform the fuel motor calibration procedure described in **Appendix A**.  
**Recalibrate annually or whenever a control motor is serviced or replaced.**
3. Verify that all low fire limit switch contacts are closed when the burner is at 0% and open when the burner leaves low fire. Reference the burner operating instructions for switch adjustment.
4. Verify that all purge permissive contacts are closed after the air control valve drives open for purge (Eco-Star and StarJet conversion burners only).

## F. FINAL CHECKOUT

1. Ensure sure that all equipment and components have been installed in accordance with the manufacturer's instructions.
2. Verify all wiring and tighten connections.
3. Confirm all linkage adjustments and insure that control arms and linkage rods are tight.
4. Clean all traps and filters.
5. Check all fuel and air supply lines for leaks.
6. Verify all pressure settings.

## G. PANEL OPERATION

1. Open applicable manual shutoff valves to supply air and fuel to the system.
2. Move the panel **POWER** switch to **ON** and verify that the **FUEL SELECTOR** switch is in the desired position.
  - a. The Temperature Controller, High Temp Limit and flame relay will perform their self-test procedures.
  - b. The burner fuel control motor will drive to its low fire position.
  - c. The **RESET** indicator will come on.
  - d. A "BURNER STOPPED..." message will appear.

3. Start the combustion air and exhaust fans and all other equipment required for plant operation. After all safety limits have closed, the Purge Relay, R4, will be energized and the air control motor will drive open to prepare for system purge (Eco-Star and StarJet conversion burners only).
4. Place the **CONTROL MODE** selector in the desired position and verify setpoints of both the Temperature Controller and High Temp Limit(s).
5. Momentarily press the **RESET** button to initiate the system purge sequence.
  - a. Run Relay, R1, will be energized.
  - b. The **RESET** indicator will go out.
  - c. A *"WAITING FOR PURGE LIMITS"* message will appear.
6. If all purge permissive contacts are closed:
  - a. The Purge Timer, 1TR, will begin its timed delay and its "Timing" indicator will begin flashing.
  - b. A *"PURGING ...SECONDS"* will appear.
7. After the purge delay has been completed:
  - a. Purge Timer, 1TR, and Purge Latch Relay, R2, will be energized.
  - b. The air control motor will drive closed to prepare for pilot ignition (Eco-Star and StarJet conversion burners only).
  - c. A *"WAITING FOR LOW FIRE LIMITS"* message will appear.
8. When the motor has reached its low fire start position and the burner low fire limit switches have closed:
  - a. A *"PURGE COMPLETE READY to START"* message will appear.
  - b. The **START** pushbutton will flash indicating that the burner is ready to start.
9. Press and hold the **START** pushbutton to begin the burner ignition sequence.
  - a. The RM7890A flame relay will be energized.
  - b. Start Relay, R3, will be energized and a ten second trial for ignition will begin.
  - c. When the *"PILOT ENERGIZED"* message appears, the **START** pushbutton may be released.
  - d. The ignition transformer and pilot solenoid valves will be energized.
10. If a satisfactory pilot flame is detected by the UV scanner:
  - a. Flame signal strength will be displayed on the **FLAME METER** bar.
  - b. Spark Timer, 2T, will be energized and begin timing.
  - c. A *"FLAME ON..."* message will appear.
  - d. Power will be supplied to the main fuel valves.
11. After 2T timer has completed its three-second delay:
  - a. 2TR relay will be energized.
  - b. The Purge Timer, 1TR, will be de-energized and reset.
  - c. The ignition transformer will be de-energized.
12. As soon as the valve open switch contact in the main fuel valve has closed, pilot timer, 3T will begin timing.
13. After the pilot timer has completed its 10-second delay:
  - a. The pilot solenoid valves will be de-energized.
  - b. The pilot scanner will be de-energized.
  - c. The burner control motor will be released from low fire and respond to the motor positioning output of the Temperature Controller.

14. Start material flow to the dryer. Use the [↑] and [↓] keys of the Temperature Controller to manually control the burner firing rate, or press the **MANUAL/AUTO** key on the controller to begin automatic temperature control.
15. The center, **LOW FIRE**, position of the switch will return the burner to its low fire position.
16. In the event of a Temperature Controller failure, the **MAN.** (MANUAL) position of the **CONTROL MODE** selector will enable the Operator to increase (**INC**) or decrease (**DEC**) the burner via the **MANUAL INC/DEC** switch.
17. To terminate burner operation, press the **STOP** pushbutton.
  - a. Run Relay, R1, will be de-energized and the **RESET** indicator will come on.
  - b. Purge Latch Relay, R2, will be de-energized and a “*BURNER STOPPED...*” message will appear.
  - c. The Honeywell RM7890 flame relay will be de-energized.
  - d. All fuel valves will be de-energized.
  - e. The fuel control motor will drive closed.
  - f. Purge Relay, R4, will be energized.

## **H. TROUBLESHOOTING**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
No power to instruments or indicator lights.	L1 fuse blown.	Check for 120Vac between L1 and L2. Replace 10A fuse, L1.
“ <i>PURGE LIMITS HAVE NOT CLOSED. CHECK FOR POWER ON TERM #24.</i> ”	Purge limits are not made.	Check purge limits series: 120Vac on terminals 19, 24F, 24E, 24D, 24C, 24B, 24A and 24.
“ <i>CHECK LOW FIRE LIMIT SWITCHES</i> ”	Low fire limit switch(es) are not made.	Check low fire limit switch(es). Check for 120Vac on terminals 21B, 21A and 21.
Limits are made but air motor does not drive open for purge.(Eco-Star & StarJet Conversion burners only)	Motor positioner fault.	Consult BCI instructions.
“ <i>IGNITION FAILURE RESET REQUIRED</i> ”	No flame established during 10 second pilot trial for ignition. Flame relay fault.	Verify operation of pilot solenoids and ignition transformer. Check pilot adjustment and fuel supply. Check for 120Vac on terminals 8 and 9. Replace flame relay.
“ <i>MAIN FUEL VALVE FAULT</i> ”	Main fuel valve has not opened within 30 seconds. VOS switch fault. 10-second pilot timer fault.	Verify operation of the main fuel valve and the valve open switch (VOS) contact.  Verify operation of 3TR relay (replace 3T timer).

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
"FLAME FAILURE RESET REQUIRED"	Pilot or main burner flame failure. 3 second spark timer fault.	Verify pilot and main burner settings. Verify operation of 2TR relay (replace 2T timer).
"EXHAUST FAN FLT. (TERM 13) CHECK INTERLOCK AND FLOW SWITCH"	Fuse 7 blown. Exhaust Fan fault has occurred.	Check for 120Vac at fuse 7 (replace fuse). Latched on if an exhaust fan fault occurs. Check the exhaust fan flow limit switch (120Vac on terminal 12) <u>and</u> motor starter interlock contact (120Vac on terminal 13)
"COMBUSTION AIR FAULT. (TERM 16) CHECK INTERLOCK & PRESSURE SWITCH"	Combustion Air fault has occurred.	Latched on when a combustion air fault has occurred. For <u>EcoStar II</u> : Check the secondary air interlock contact (120Vac on terminal 14) <u>and</u> the secondary air pressure switch (120Vac on terminal 16) For <u>StarJet &amp; EcoStar</u> : Check the secondary air interlock contact (terminal 14), the primary air interlock (terminal 15), the primary air or compressed air pressure switch (terminal 15A) <u>and</u> the secondary air pressure switch (terminal 16)
"LOW GAS PRESSURE FAULT (TERM 16A) CHECK LOW GAS PRESSURE SWITCH"	Low gas pressure fault.	Check the low gas pressure limit switch (120Vac on terminal 16A)
"HIGH GAS PRESS FAULT (TERM 18) CHECK HIGH GAS PRESSURE SWITCH"	High gas pressure fault.	Check the high gas pressure limit switch (120Vac on terminal 18)
"LOW OIL PRESSURE FAULT (TERM 17D) CHECK OIL PRESSURE SWITCH"	Low oil pressure fault.	Check the low oil pressure limit switch (120Vac on terminal 17D)
"HIGH OIL PRESS FAULT (TERM 17A) CHECK HIGH OIL PRESSURE SWITCH"	High oil pressure fault.	Check the high oil pressure limit switch (120Vac on terminal 17A)
"ATOMIZING AIR FAULT (TERM 17C) CHECK ATOM AIR PRESS SWITCH"	Atomizing or compressed air fault.	Check the low compressed air supply pressure limit (terminal 17B) and the low atomizing air pressure limit switch (terminal 17C)
"OIL TEMPERATURE FAULT (TERM 17E, 18) CHECK OIL TEMP SWITCHES"	Low or high oil temperature	Check the low oil temperature limit (120Vac on terminal 17E) and the high oil temperature limit (terminal 18).



PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
<p><i>"HIGH STACK TEMP. (TERM 39) CHECK STACK TEMP. AND FUEL SELECTION"</i></p>	<p>High stack temperature. Open thermocouple.</p> <p><b>FUEL SELECTOR</b> in center position.</p>	<p>Observe the display EXCEED and OUT indicators on the HIGH TEMP LIMIT instrument. "OPEN" indicates an open thermocouple. Press the RESET key on the instrument to reset the high limit contact.</p> <p>Verify that either <b>OIL</b> or <b>GAS</b> fuel is selected</p>
<p>Flame meter indicates presence of flame when burner is shut off.</p>	<p>Fire in dryer drum. Poor flame meter connection. Defective scanner.</p>	<p>Check for fire in drum.</p> <p>Check flame meter connections.</p> <p>Unplug 3TR relay. If signal disappears replace pilot scanner. If signal remains replace main flame scanner.</p>
<p>Flame relay <b>ALARM</b> led indicator comes on and will not reset.</p>	<p>Improper grounding or voltage polarity.</p> <p>Flame relay failure.</p>	<p>Verify neutral (L2) of 120Vac supply is grounded. Verify that control panel is grounded.</p> <p>Replace flame relay amplifier and/or relay module.</p>
<p><i>"FLAME ON"</i> indication but fuel control motor will not drive.</p>	<p>Fuse 5 blown. Pilot timer failure</p> <p>Control motor failure</p> <p>Controller failure</p>	<p>Check fuse 5 and replace if necessary.</p> <p>Verify 3TR relay is energized and that the <b>CONTROL MODE</b> switch is not in the <b>LOW FIRE</b> position</p> <p>Verify 120Vac between motor terminals L1 and L2.</p> <p>Remove fuse 5 then jumper 32 to ground or 33 to ground in the burner junction box to test motor operation.</p> <p>Move <b>CONTROL MODE</b> switch to <b>MANUAL</b> position.</p>

## **APPENDIX A: FUEL MOTOR SLIDEWIRE CALIBRATION**

The burner fuel control motor incorporates a position feedback slidewire. A signal from the Temperature Controller is connected to the slidewire in order to generate position feedback signal for the control panel. The following calibration procedure must be performed before operating the burner for the first time.

### **RECALIBRATE ANNUALLY OR WHENEVER A CONTROL MOTOR, SLIDEWIRE OR TEMPERATURE CONTROLLER IS SERVICED OR REPLACED.**

1. Turn the panel **POWER** switch to **OFF**. Move the **FUEL SELECTOR** switch to the center (Off) position and place the **CONTROL MODE** selector in the **AUTO** position.
2. Unplug 3TR relay from its socket and place a **temporary** jumper between control panel terminal 47 and Ground for a Honeywell M6284C or Barber Colman EA-57 (Medium Torque). Jumper between 47 and 7 for an Barber Colman EA-71 or EA-73 (High Torque) This will enable the burner control motor to be driven by the Honeywell Temperature Controller without having to fire the burner.
3. Turn the panel power on. Enter the calibration mode on the Temperature Controller by pressing the [**SETUP**] key until the display reads CALIB POSITION.
4. Press the [**FUNCTION**] key to display DISABLE POS PROP then press the [↑] key to change the upper display DO AUTO.
5. Press [**FUNCTION**] to begin motor calibration. The lower display will read ZERO VAL while the upper display will show the slidewire feedback value,
6. Wait for the zero value to stop changing and confirm that the motor is in its low fire position then press [**FUNCTION**] again to advance to SPAN VAL. The control motor will drive open and the upper display value should increase.
7. After the feedback value has stopped increasing, confirm that the motor has reached its high fire position then press [**FUNCTION**] followed by [**LOWER DISPLAY**] to complete the calibration sequence.
8. Turn the panel **POWER** switch **OFF** and return the **FUEL SELECTOR** to the **GAS** or **OIL** position. Replace 3TR relay and remove the temporary jumper from terminal 47.

**APPENDIX B: UDC3200 SERIES CONTROLLER**

Hauck P/N 302003.

The Honeywell UDC3200 series controller has been configured at the factory with parameters which generally produce accurate temperature control. Before making any field adjustments, other than as noted in this instruction sheet, **PLEASE CONTACT THE HAUCK SERVICE DEPARTMENT.**

**I. OPERATOR INTERFACE**






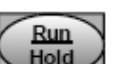




Figure 1 shows the front face of the UDC3200 instrument. This section describes the function of the various displays and keys. Examples are given for changing the controller setpoint and operating the burner in MANUAL. Detailed information is given in the vendor literature supplied with the control panel.



Figure 1

Display Indicators	
<b>3200</b>	Upper display with 4 larger digits shows Process Variable value (normal operation) and special annunciator features. During Configuration, the upper display provides guidance for the operator through prompts (7 – characters)
<b>SP 3200</b>	During normal operation, the lower display shows key-selected operating parameters such as Output, Setpoints, Inputs, Deviation, active Tuning Parameter Set, Timer Status, or minutes remaining in a setpoint ramp (4 digits). During configuration, the lower display provides guidance for the operator through prompts (8-characters).
<b>ALM</b>	Indicates Alarm 1 and/or Alarm 2 conditions exist.
<b>DI</b>	Indicates Digital Input 1 and/or 2 on.
<b>OUT</b>	Indicates Control Relay 1 and/or 2 on.
<b>F</b> Or <b>C</b>	Indicates either degrees Fahrenheit or Centigrade.
<b>MAN</b> Or <b>A</b>	Indicates either Manual or Auto mode.
<b>SP</b>	Indicates Local Setpoint #1. Also, a bar is lighted when the setpoint being used is shown on the lower display.

## Keys & Functions

 <b>Function</b>	Selects functions within each configuration group.	 <b>Man Auto</b>	Selects Manual or Auto mode.
 <b>Setup</b>	Scrolls through the configuration groups.	 <b>SP Select</b>	Hold key down to cycle through configured setpoints.
 <b>Lower Display</b>	Returns Controller to normal display from Set Up mode. Toggles various operating parameters for display.	 <b>Run Hold</b>	Enables Run/Hold of the SP Ramp or Program plus Timer start.
	Increases setpoint or output value. Increases the configuration values or changes functions in Configuration mode groups.		Decreases setpoint or output value. Decreases the configuration values or changes functions in Configuration mode groups.
	Infrared transceiver		NEMA4X and IP66 screw attachment (each corner)

## II. OPERATING THE CONTROLLER

### EXAMPLE 1: CHANGING THE SETPOINT

Press the [**LOWER DISPLAY**] key until **SP** and the current setpoint appears in the lower display.

Press and hold the [**↑**] key to increase the set point value. To make changes more quickly, press the [**↓**] key while holding [**↑**] key. This will shift the changing digit one place to the left.

To decrease the set point value, reverse the above procedure.

### EXAMPLE 2: ADJUSTING THE BURNER FIRING RATE IN THE MANUAL MODE

Press the [**AUTO/MANUAL**] key to place the Controller in the Manual Mode. The **MAN** indicator will come on and the lower display will automatically change to show % **OUT**.

Press and hold the [**↑**] key to increase % Output value. To make changes more quickly press the [**↓**] key while holding [**↑**] key. This will shift the changing digit one place to the left.

To decrease the % Output value, reverse the above procedure.

**TEMPERATURE CONTROLLER CONFIGURATION RECORD SHEET**

<b>SET UP GROUP</b>	<b>LOWER DISPLAY (FUNCTION)</b>	<b>FACTORY CONFIGURATION</b>	<b>FINAL SETTING</b>
<b><u>TUNING</u></b>			
	PROP BD	15.00	_____
	RATE MIN	0.00	_____
	RESET RPM	1.00	_____
	SECURITY	0	_____
	LOCKOUT	NONE	_____
	AUTO MAN	ENABLE	_____
	RUN HOLD	DISABLE	_____
	SP SEL	ENABLE	_____
<b><u>SP RAMP</u></b>			
	SP RAMP	DISABLE	_____
	SP RATE	DISABLE	_____
<b><u>ACCUTUNE</u></b>			
	FUZZY	DISABLE	_____
	ACCUTUNE	DISABLE	_____
<b><u>ALGORITHM</u></b>			
	CONT ALG	PID A	_____
	TIMER	DISABLE	_____
	IN ALG 1	NONE	_____
<b><u>OUT ALG</u></b>			
	OUT ALG	POSITN	_____
	MOTOR TI	40	_____
<b><u>INPUT 1</u></b>			
	IN 1 TYPE	J TC L	_____
	IN 1 HIGH	550.0 F	_____
	IN 1 LOW	20.00F	_____
	RATIO 1	1.000	_____
	BIAS IN 1	0.0	_____
	FILTER 1	1	_____
	BURNOUT 1	UP	_____
<b><u>INPUT 2</u></b>			
	IN 2 TYPE	SLIDEW	_____
<b><u>CONTROL</u></b>			
	PV SOURCE	INPUT 1	_____
	PID SETS	1 ONLY	_____
	LSP'S	1 ONLY	_____
	RSP SRC	NONE	_____
	SP TRACK	NONE	_____
	PWR MODE	MANUAL	_____
	SP HI LIMIT	550.0 F	_____

**CONTROL cont.**

<b>SET UP GROUP</b>	<b>LOWER DISPLAY (FUNCTION)</b>	<b>FACTORY CONFIGURATION</b>	<b>FINAL SETTING</b>
	SP LO LIMIT	20.00 F	_____
	ACTION	REVERSE	_____
	OUT RATE	DISABLE	_____
	OUT HI LIM	100.0	_____
	OUT LO LIM	0.0	_____
	I HI LIM	100.0	_____
	I LO LIM	0.0	_____
	DROPOFF	0.0	_____
	DEADBAND	2.0	_____
	FAILSAFE	0.0	_____
	FAILMODE	NO LATCH	_____
	MAN OUT	0.0	_____
	AUTO OUT	0.0	_____
	PB OR GAIN	PB PCT	_____
	MIN OR RPM	RPM	_____
<b><u>COM</u></b>			
	COM ADDR	3	_____
	COMSTATE	DISABLE	_____
	IRENABLE	ENABLE	_____
	BAUD	19200	_____
	TX DELAY	1	_____
<b><u>ALARMS</u></b>			
	A1S1 TYPE	NONE	_____
	A1S2 TYPE	NONE	_____
	A2S1 TYPE	NONE	_____
	A2S2 TYPE	NONE	_____
	ALARM HYST	0.1	_____
	BLOCK	DISABLE	_____
	DIAGNOST	DISABLE	_____
	A1S1 VALUE	Not Applicable	_____
	A2S1 VALUE	Not Applicable	_____
	A2S2 VALUE	Not Applicable	_____
<b>DISPLAY</b>			
	DECIMAL	NONE	_____
	TEMPUNIT	DEG F	_____
	PWR FREQ	60 HZ	_____
	LANGUAGE	ENGLISH	_____

**APPENDIX C: HIGH TEMPERATURE LIMIT**

Hauck P/N 62823.

The high temperature limit has been configured at the factory and should not require any adjustments. The procedure for changing the limit setpoint and a configuration record are given below. Detailed information is given in the vendor literature supplied with the control panel.



Figure 1 Front Face of High Temperature Limit.

**Changing the limit setpoint**

Hold the SETUP key and press the [↑] key. The lower display will show SLCT and the upper display will read OPTR. Release the SETUP key and press the [↑] key until the upper display reads SETP then press SETUP again to display the current setpoint. Use the [↑] or [↓] keys to change the setpoint.

Hold SETUP and press the [↑] key then release the SETUP key and press the [↑] key until the upper display again reads OPTR; then press SETUP to return to the operating (normal) display.

**CONFIGURATION RECORD SHEET**

SLCT = CONF                      ULOC = 20

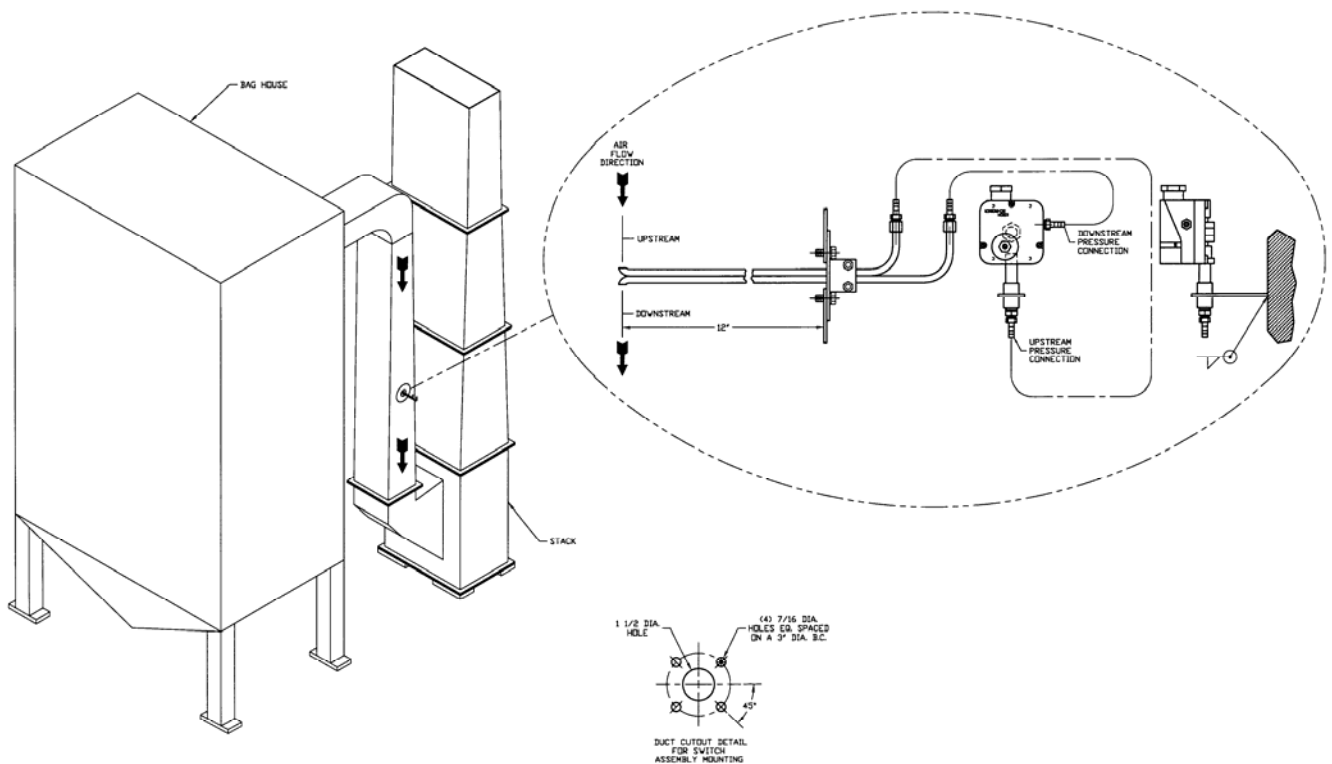
LOWER DISPLAY (FUNCTION)	FACTORY CONFIGURATION	FINAL SETTING
INPT	J.F	_____
RUL	999.9	_____
RLL	-199.9	_____
OFFS	0.0	_____
CTRL	HI	_____
SPUL	999.9	_____
SPLL	-199.9	_____
ALA1	P_HI	_____
PHA1	999.9	_____
AHY1	0.1	_____
ALA2	P_LO	_____
PLA2	-199.9	_____
AHY2	0.1	_____
USE2	A1_D	_____
USE3	A2_D	_____
DISP	ENAB	_____
CLOC	20	_____
AHY2	0.1	_____
AHY2	0.1	_____

## APPENDIX D: EXHAUST FAN FLOW LIMIT SWITCH INSTALLATION

Mount the exhaust fan flow switch in the dryer exhaust duct as shown below.

Installation:

1. Cut a 2" hole in the duct where the pitot tube will be located.
2. For "blind" applications, mark two of the holes using one half of the mounting flange.
3. Reach through the 2" hole to hold the nuts in place to mount the plate half. Use silicone sealant as a gasket. Tighten the nuts and bolts securely. Insert the pitot approximately 12" into the duct and hold in place.
4. Using the second half of the flange, tighten the 1/4-20 bolts to hold the pitot in place.
5. **WARNING! Do not** fasten both halves of the flange. One side is left unbolted for removal and cleaning of Pitot tube.
6. For other applications, weld the four duct mounting nuts to the inside of the ductwork using the flange as a pattern.
7. Use silicone caulk as a gasket.
8. Remote mount the pressure switch to a vibration and heat free location. Connect the plastic tubing from the pitot to the switch connecting the upstream side of the pitot to the bottom of the switch and the downstream side of the pitot to the top side of the switch. Wire switch per schematic.

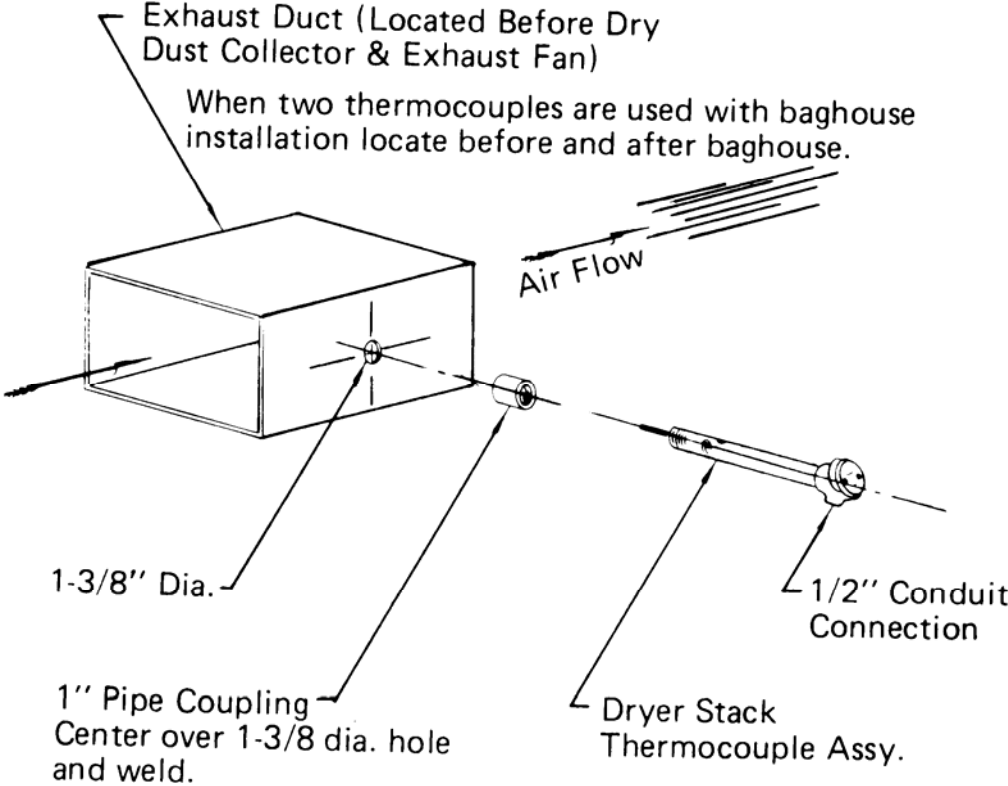


Y6909  
(NOT TO SCALE)



**APPENDIX E: STACK THERMOCOUPLE INSTALLATION**

Install a Hauck stack temperature thermocouple in the dryer exhaust duct to sense exhaust gas temperatures.

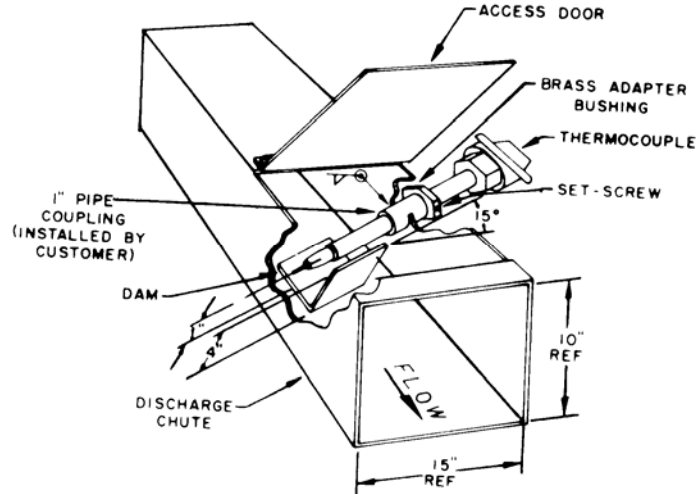


Drawing showing placement of thermocouple in exhaust duct.

**NOTE**  
Thermocouple cables must be separated from AC power and control wiring to avoid interference and nuisance shutdowns. Observe polarity when making thermocouple connections. Regardless of TC type, the red wire is always negative.

## APPENDIX F: MATERIAL THERMOCOUPLE INSTALLATION

Install a Hauck Rapid Response Material Temperature Thermocouple in the material discharge chute to sense the temperature of the material leaving the dryer. Wire the thermocouple to the proper terminals in the panel.



Drawing showing the placement of the thermocouple and "dam" in the dryer discharge chute.

### IMPORTANT

A small clearance (1" maximum) should be provided under the thermocouple so material will not be trapped between the thermocouple and the chute. Trapped material will cause a heat loss path and the thermocouple will give erroneous readings.

The thermocouple should make good contact with the material but not be subject to severe abrasion caused by high velocities. If the material is moving so fast that it bounces and leaves air adjacent to the thermocouple, the temperature it senses will be lower than the material. It may be necessary to place a dam in the chute so that the thermocouple is in a relatively slow moving area next to the dam. The dam must only be wide enough and high enough to create a localized area of build-up where the material loses velocity BUT DOES NOT STOP FLOWING. The thermocouple must not be located in a stagnant zone or erroneous temperature readings will result. Because of the large number of variables involved, it is impossible to set down any exact size or location of the dam that will always work. Field experimentation will be necessary if good results are to be obtained. It is advisable to tack weld the dam in place so that it can be easily modified if it fails to perform satisfactorily.

### NOTE

During normal operation, the thermocouple should be rotated once a month to expose a different area of its surface to the abrasive forces of the material. This procedure will increase the effective life of the thermocouple. If excessive wear occurs, a protective tube may be added to shield the shaft in the region of the high velocity flow.

**Thermocouple cables must be separated from AC power and control wiring to avoid interference and nuisance shutdowns. Observe polarity when making thermocouple connections. Regardless of TC type, the red wire is always negative.**

**APPENDIX G: RECOMMENDED SPARE PARTS**

<b>PART NO.</b>	<b>QTY.</b>	<b>DESCRIPTION</b>
302263	1	Flame relay, Honeywell RM7890A
56650	1	Amplifier, Honeywell R7849A1023
20579	2	Scanner, Honeywell C7027A1049
302003	1	Controller, Honeywell UDC3200
62823	1	High temperature limit, Partlow P1161-111000
17292	2	Relay 3PDT, P&B KUP 14A35 or equal
61961	1	Purge timer, ATC 407B-100-F3K
40744	1	Timer, 10 second solid state, Omnetics MMS115A19-1/2B
40747	1	Timer, 3 second solid state, Omnetics MMS115A1Z3B
55167	5	Fuse, 7A, 1/4 x 1-1/4, Littlefuse type 313007
48044	5	Fuse, 10A, 1/4 x 1-1/4, Littlefuse 312010
43508 --- or --- 43508R2037	1	Material thermocouple, Hauck TC100A-J --- or --- Material thermocouple, Hauck TC100A-K
43868 --- or --- 45474	1	Stack thermocouple, Hauck TC200A-J --- or --- Stack thermocouple, Hauck TC200A-K

This page left intentionally blank.