DIGITAL PRESSURE CONTROL SYSTEM
DPS-300B SERIES – TIME PROPORTIONAL CONTROL

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.

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A. GENERAL INFORMATION

The Hauck Digital Pressure Control System (DPS) continuously monitors and automatically controls dryer draft or furnace pressure by modulating a mechanical exhaust damper. A differential pressure transmitter measures dryer draft or furnace pressure and supplies a 4-20mA signal to the pressure control instrument. The microprocessor-based controller provides duplex time proportional control outputs. Two ten amp solid-state relays are used to drive the exhaust damper actuator. The duration and direction of actuator travel is determined by the difference between measured draft or pressure and the controller's setpoint.

The DPS system has been designed for stand-alone operation or to interface with Hauck BCS burner control systems for dryer applications. It includes provisions for holding the damper closed prior to exhaust fan start-up. The controller has full PID capability and an integral 30Vdc transmitter power supply. Switches are also provided for manual control. See Section E for detailed operating instructions.

A complete DPS system consists of the following items (see **Figure 1**):

- Controller assembly
- Transmitter
- Transmitter signal cable
- Exhaust damper actuator
- Actuator control cable
- Manifold kit (includes transmitter mounting bracket, shutoff cocks, filter and fittings; ¼" OD stainless steel tubing supplied by others).

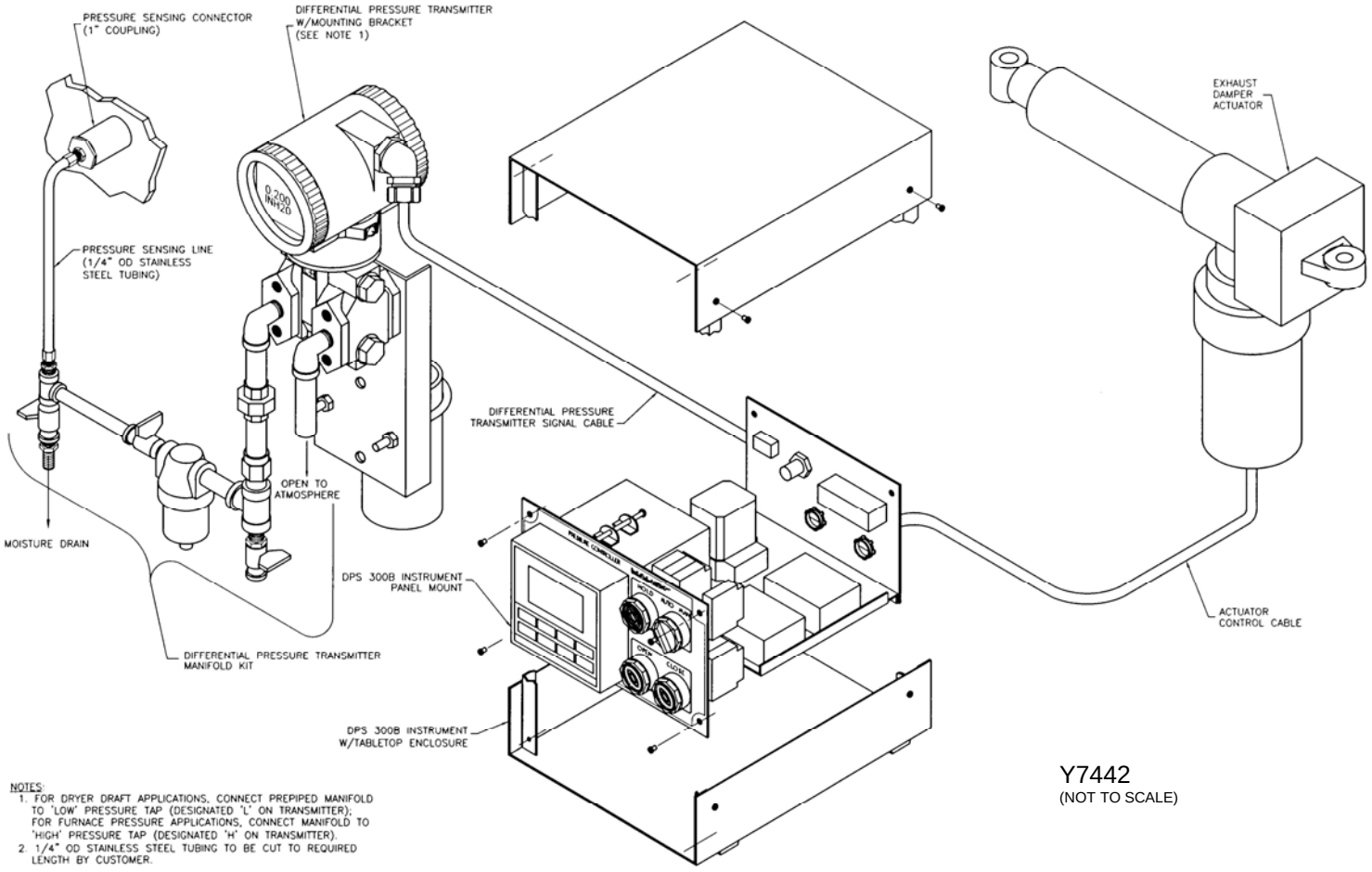

Figure 1. Dryer Pressure Control System Components

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.

C. APPLICABLE DRAWINGS

System Schematic	Y7433
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D. INSTALLATION

CONTROLLER: The controller assembly is available in two versions. The stand alone version should be placed on a flat surface convenient to the operator. The panel mounted version is designed to install in a 4-1/2" H x 6-3/4" W (114mm H x 171mm W) cutout. Reference drawing Y7441 for detailed dimensions.

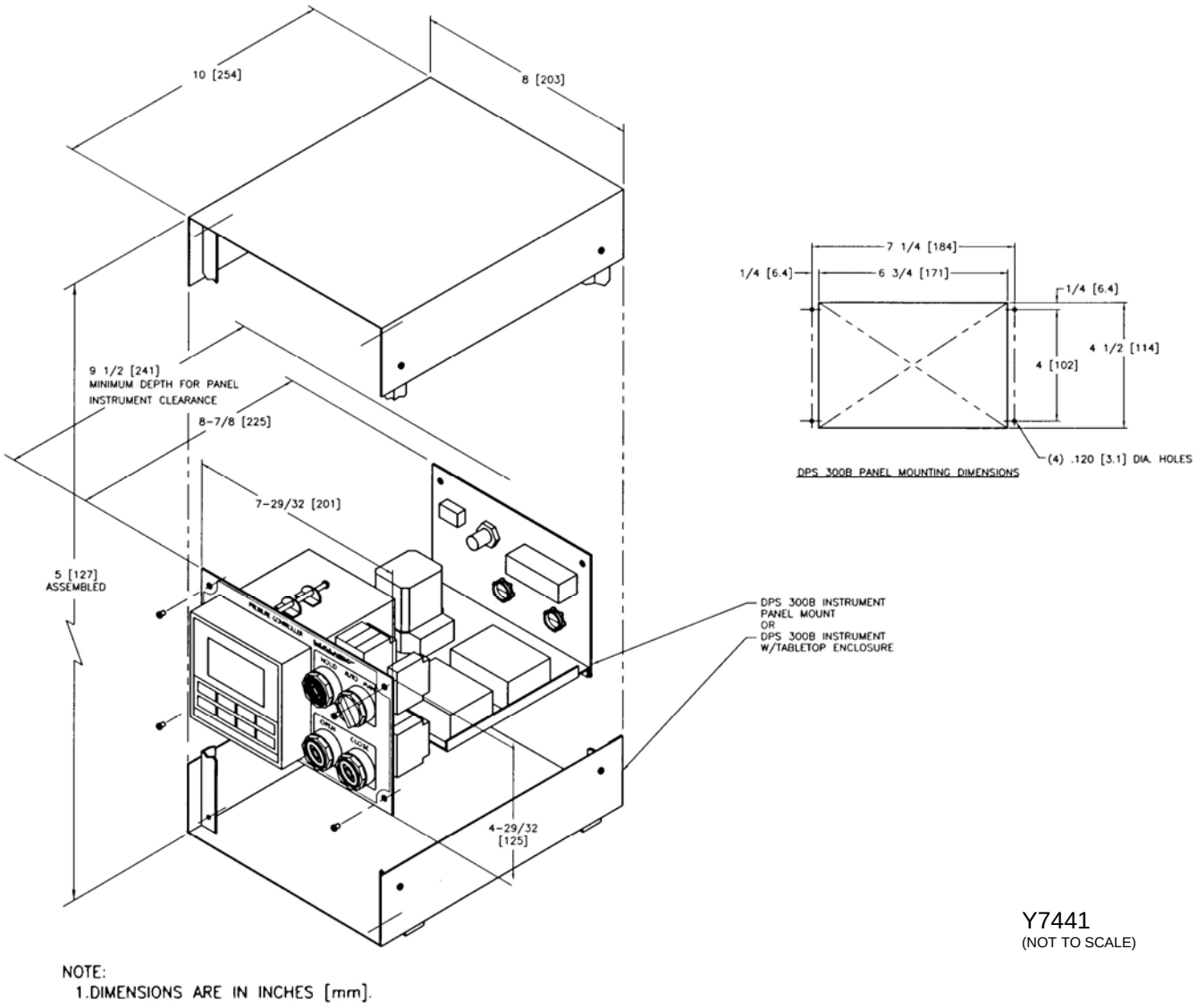


Figure 2. Dimensions

PRESSURE TAP:

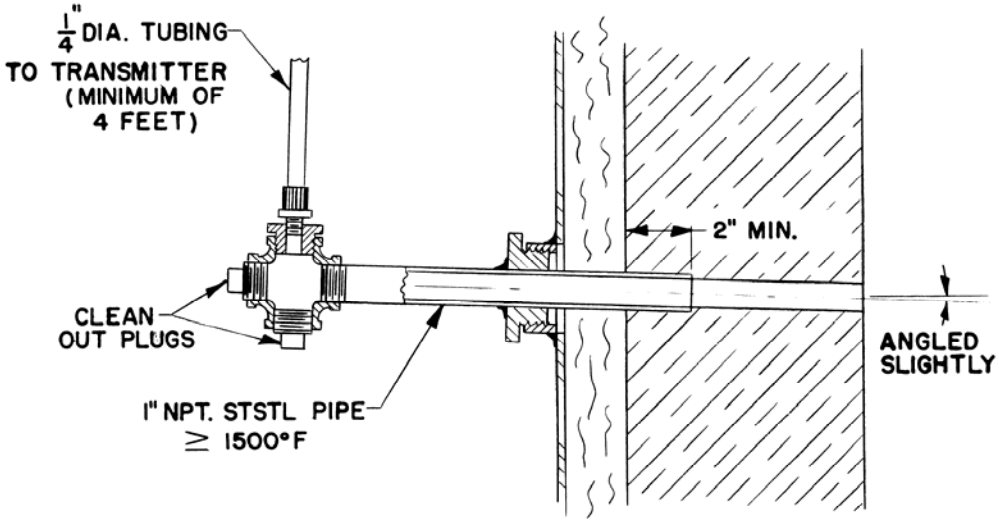
Dryer Applications: The pressure tap should be located in the 2 or 10 o'clock position on the dryer breech and angled downward at approximately 30° from horizontal. Avoid locating the tap behind a top-feed conveyor to prevent material from acting as a filter in sensing dryer draft. Cut a hole in the dryer breeching to accommodate a 1" (DN 25) pipe coupling. The hole should be located midway between the outer edge of the breeching and the outer edge of the combustion chamber or shell.

Bush the pipe coupling to accept a 1/4 NPT (DN 3) compression fitting for the 1/4" (25mm) OD stainless steel tubing sensing line. Carefully route the tubing to the transmitter, keeping the line as short as possible and avoiding hot spots along the breeching. Connect the tubing to the transmitter manifold.

Furnace Applications: Pressure taps are generally located near hearth level. Since the natural buoyancy of the heated atmosphere increases furnace pressure above the hearth, maintaining a slightly positive pressure at the hearth assures that the entire furnace will have a positive pressure. The natural buoyancy of a hot atmosphere can be approximated by the following equation:

$$\text{Natural Buoyancy ("wc)} = 0.014693\ (1 - \frac{520}{420 + T})\ \text{x ft}$$

For example, at 6 ft (1.8 m) above the hearth, in a 2000°F (1093°C) furnace, the natural buoyancy would be 0.07"wc (17.4 Pa). Therefore, if the tap was located at this level, the controller would need to be set at 0.08"wc (19.9 Pa) in order to obtain 0.01"wc (2.5 Pa) at hearth level, and the setting would change as the furnace temperature changed. Avoid locating the tap near the door or the flue, or directly across from a burner. Cut a hole in the furnace wall to accommodate a 1" (DN 25) pipe (see Figure 3). Angle the hole slightly downward, to prevent accumulation of dirt or moisture. Bush the pipe coupling to accept a 1/4 NPT (DN3) sensing line. Carefully route the tubing to the transmitter, keeping the line as short as possible and avoiding hot spots along the furnace. Connect the tubing to the transmitter manifold.



S3885
(NOT TO SCALE)

Figure 3. Furnace Pressure Tap Installation

TRANSMITTER AND MANIFOLD KIT: The transmitter must be mounted on a vibration free support and shielded from direct flame radiation. The operating temperature range is -20 to 180°F (-29 to 82°C). Bolt or weld the transmitter mounting bracket to the support **before** mounting the transmitter to the bracket. For maximum accuracy, locate the transmitter within 2 vertical ft (0.6 m) of the pressure tap and use a minimum of 4 ft (1.2 m) of tubing to dissipate heat. For **Dryer Applications**, connect the transmitter manifold to the LOW pressure tap (designated 'L' on the transmitter and leave the HIGH pressure tap (designated 'H' on the transmitter) open to atmosphere as a reference. For **Furnace Applications**, connect the transmitter manifold to the HIGH pressure tap (designated 'H' on the transmitter) and leave the LOW pressure tap (designated 'L' on the transmitter) open to atmosphere as a reference. The open tap must be shielded from wind and other disturbances and should not be in a position to collect dirt or water. The manifold moisture drain should be positioned vertically down.

IMPORTANT
Do not weld on or around the transmitter mounting bracket with the transmitter attached.

IMPORTANT
Verify that power is disconnected before beginning any wiring.

INTERCONNECTING WIRING: Refer to Figure 4 for wiring details. Remove electronic housing cover from the transmitter to access the transmitter terminal strip. The 4-20mA signal from the pressure transmitter to the controller should be run via a shielded cable with the shield grounded at one end only. This cable should be separated from all AC control and power cables to prevent signal interference.

Determine the model number of the exhaust damper actuator and reference the appropriate diagram for connecting the actuator to the DPS terminal strip.
Connect DPS terminal 13 to the appropriate terminal in the burner control system to release the controller from HOLD after the exhaust fan has been started or the furnace purge has been completed. For **Furnace Applications**, it may also be desirable to place the controller in HOLD whenever the furnace door is opened. Provide 115Vac grounded neutral power to terminals L1, L2 and GND of the DPS.

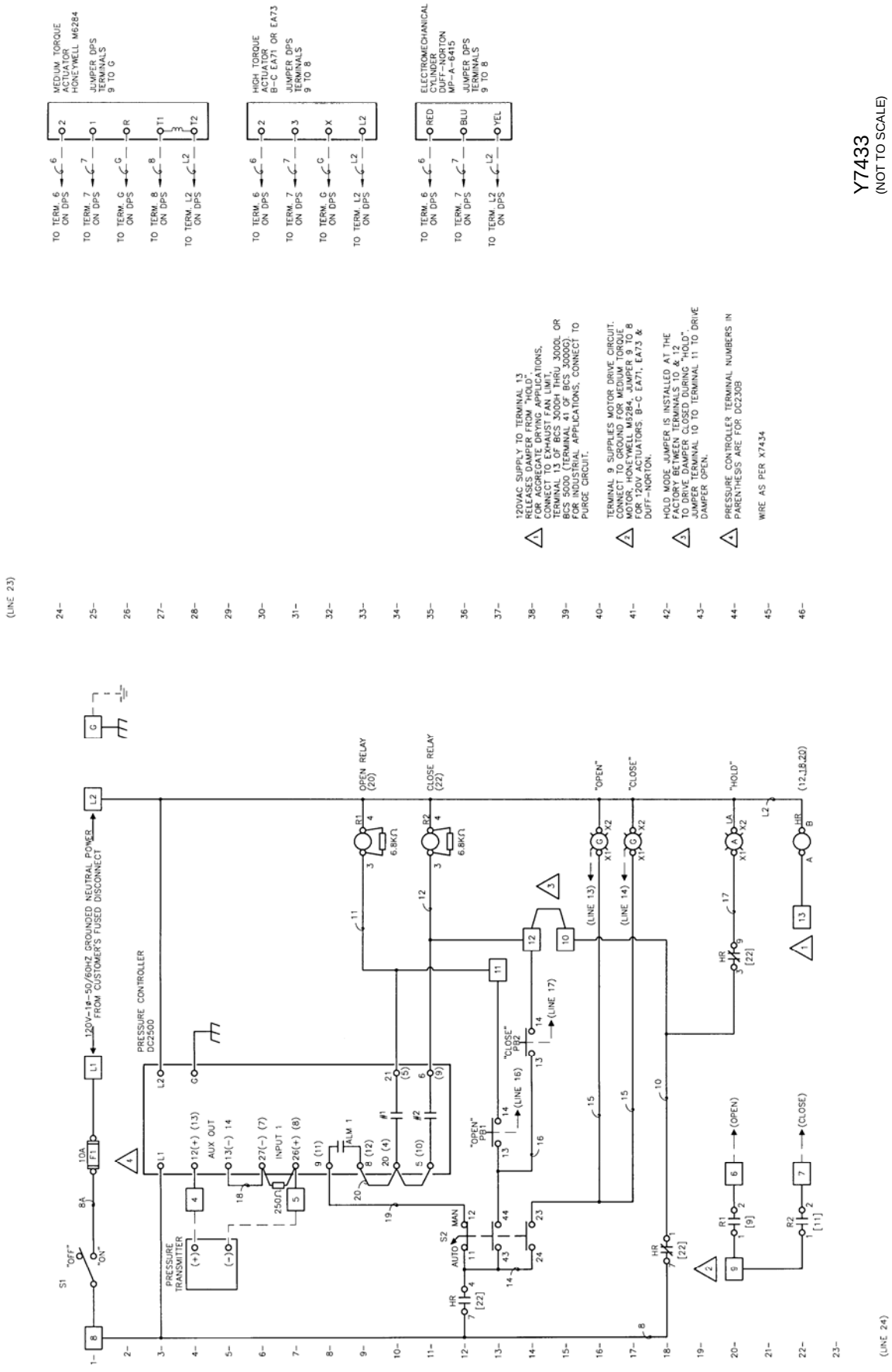


Figure 4. System Schematic

E. OPERATION

UDC2500 CONTROLLER: The Honeywell UDC2500 series controller has been configured at the factory with parameters which generally produce accurate pressure control. Please refer to the following section before making any field adjustments.

Figure 5 shows the front face of the DPS controller. Following are functional descriptions of the displays and operators.

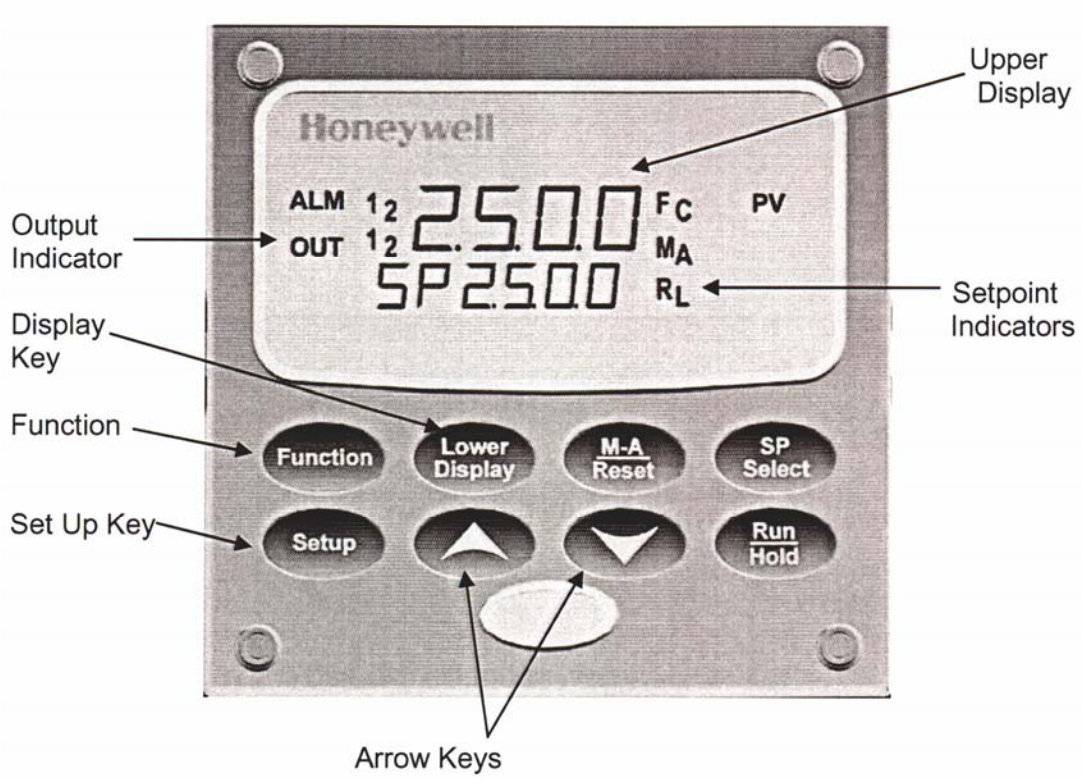


Figure 5. DC2500 Controller

Upper Display: Normally displays drum suction or furnace pressure in "wc. Set-point (SP or 2SP), deviation (DEV) and output (OUT) values may be shown on demand. Parameter values are displayed when in the configuration setup mode.

Lower Display: Displays function groups and operator prompt when in the configuration setup mode. Also displays SP, PV, DEV, and OUT parameter prompts when the DISPLAY key is pressed.

L or R: When the controller is configured for dual setpoints, **L** will be illuminated when SP1 is selected and **R** when SP2 is selected (see Second Setpoint under Adjustments in Section F).

OUT 1 or 2: Indicates the controller output relay has been energized to drive the damper actuator. OUT 1 closes and OUT 2 opens the exhaust damper. Note that these outputs are not functional when the HOLD light is on or MANUAL operation has been selected.

[SET UP: Places the controller in the configuration set up mode. Scrolls through set up groups and enables the [FUNCTION] key to access parameters within each group. The DC2500 instrument has been factory configured by Hauck and should not require field adjustment, except as noted in these instructions.

[FUNCTION]: Used in combination with the [SET UP] key to display and select functions within the set up groups. Also used to toggle between local and remote setpoints or between two local setpoints when so configured.

[DISPLAY]: Allows viewing of local setpoints (SP or 2SP), deviation (DEV) or output (OUT) values. Also used to exit the set up mode and return the controller to its normal operating mode.

[▲] and [▼]: Used to increase or decrease the controller's setpoint or configuration parameter values.

POWER: A power OFF-ON rocker switch is located on the rear of the DPS controller. A 5x20mm 10 Amp fuse protects against overloads and short circuits.

HOLD: For **Dryer Applications**, it is normally desired to hold the exhaust damper in its fully closed position until after the exhaust fan has been started. For **Furnace Applications**, it is normally desired to hold the exhaust damper in its fully open position until the furnace purge has been completed. The DPS control system incorporates a hold relay and circuitry for this purpose. The controller will remain in the hold mode and the HOLD light will remain on until 120Vac is supplied to DPS terminal 13. A factory installed jumper between terminals 10 and 12 'holds' the exhaust damper in the closed position. This jumper may be repositioned between terminals 10 and 11 if it is desired instead to hold the damper open. Note that the DPS system is not operational until **after** the hold relay is energized.

AUTO/MANUAL: A selector switch activates the DPS's manual mode. When selected, the OPEN and CLOSE pushbuttons will be illuminated and may be used to drive the damper actuator. Note that the manual mode is not operational until after the hold relay has been energized and the HOLD light is extinguished.

F. ADJUSTMENTS

DAMPER LINKAGE: Install a temporary jumper between terminals 8 and 13 in order to release the controller from HOLD. Place the selector switch in the MANUAL position and use the MANUAL CONTROL switch to drive the damper actuator and adjust damper linkage. Remove the jumper wires to re-establish normal hold circuit operation.

SETPOINT: Press the [DISPLAY] key until the lower display reads SP. The upper display will show the current setpoint value. Use the [▲] or [▼] key to change the setpoint value if desired. Press [DISPLAY] again to return to the process variable (PV) display.

SECOND SETPOINT (2SP): The DPS can be configured to provide two local setpoints. This feature enables the Operator to preset two setpoints and to toggle between them by pressing the [FUNCTION] key. For example, if it were desired to maintain 0.50" wc draft during system warm-up but use 0.20" wc as the normal operating setpoint, the controller would be configured as follows:

1. Press the [SET UP] key until the controller display reads **SET CONTRL**.
2. Press the [FUNCTION] key once. The lower display will read **LSP'S** and the upper display will read **ONE**.
3. Press the [ ] key to change the upper display to **TWO**.
4. Press [DISPLAY] to exit the setup mode.
5. Press [DISPLAY] until the lower display reads SP then use the [ ] or [ ] key to change the upper display to 0.20 for setpoint 1.
6. Press [DISPLAY] again until the lower display reads 2SP and use the [ ] or [ ] key to set setpoint 2 at 0.50.

To use the 0.50" wc setpoint for system warm-up proceed as follows:

1. Start the exhaust fan and other equipment required for plant operation. Verify that the HOLD, OPEN and CLOSE indicators are off.
2. Press the [FUNCTION] key to toggle between the two setpoints. "**L**" will be illuminated when setpoint 1 is active and "**R**" will illuminate when setpoint 2 is active.

BURNOUT: If the 4-20mA signal from the transmitter fails or is out of range due to over pressure, under pressure, open circuit or short circuit: the lower display will flash **IN1RNG**. The controller may be configured to respond to an input failure in either of the following modes:

- If input 1 burnout is configured as **DOWN**, the controller will energize relay 2 in order to open the exhaust damper.
- If input 1 burnout is configured as **NONE** the controller will de-energize both output relays and the exhaust damper will maintain its last position.

The DPS is configured at the factory for **DOWN** scale burnout. Use the following procedure to change the burnout mode if required.

1. Press [SET UP] until the display reads **SETUP INPUT1**.
2. Press the [FUNCTION] key until the lower display reads **BRNOUT**. The upper display will show the current burnout mode.
3. Use the [▲] key to change the burnout mode to either **NONE** or **DOWN**. Note that **UP** scale burnout will cause the exhaust damper to close if an input failure occurs and is not recommended for aggregate drying applications.
4. Press [DISPLAY] to exit the setup mode and return to normal operation.

TUNING: The DC2500 controller modulates the exhaust damper actuator in order to maintain dryer draft at the setpoint value. The controller output ranges from 0 to 100% and is split between the Open and Close output relays as illustrated in Figure 6.

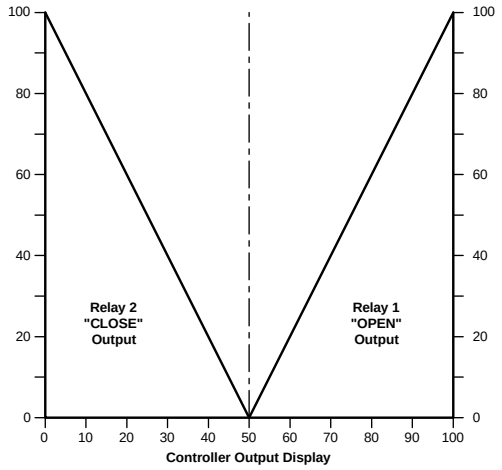


Figure 6. Controller Output Display

Based on the following information, the controller calculates the length of time that the output relays remain energized:

DEVIATION: The difference (+ or -) between the setpoint value and the measured draft.

PROPORTIONAL BAND: Determines the percent output that the controller will produce to correct the error. Decreasing the proportional band will result in a larger output change in response to a deviation from setpoint. The proportional band should be set as low as possible without causing the system to cycle continuously. Changes to the proportional band setting may be made by the following procedure:

1. Press [SET UP] until the display reads **SET UP TUNING**.
2. Press the **[**FUNCTION] key once. The lower display will read **PB** and the upper display will show the current proportional band value.
3. Use the [▲] or [▼] keys to change the proportional band value.
4. Press the [FUNCTION] key three more times until the lower display reads **PB 2.**
5. Use the [▲] or [▼] key again to change proportional band 2 value. Note that **PB** and **PB 2** may be set differently. For example, a lower setting for **PB**, would make the controller more responsive if dryer draft drops below the setpoint value.
6. Press [DISPLAY] to store the new settings and return to normal operation.

CYCLE TIME: Multiplied by the controller output (0 to 100% Open or 0 to 100% Close) to determine the actual on-time of the output relays. Faster actuators will require shorter cycle times to prevent excessive overshoot. Suggested cycle times for standard actuators are listed below.

Actuator	**Cycle Time**
Honeywell Medium Torque	10 seconds
B-C High Torque	5 seconds
Duff-Norton	2 seconds

Change cycle times, if required, by the following procedure:

1. Press [SET UP] until the display reads **SET UP TUNING.**
2. Press the [FUNCTION] key until the lower display reads **CYC T1**. The upper display will show the current cycle time setting.
3. Use the [▲] or [▼] keys to change the cycle time value.
4. Press the [FUNCTION] once more until the lower display reads **CYC2T2**.
5. Use the [▲] or [▼] keys again to change cycle time 2 if necessary. As with proportional band setting, the cycle times may be set differently if desired. A higher setting for **CYC T1** will make the exhaust damper open faster in the event of low dryer draft.
6. Press the [DISPLAY] key to store the new settings and return to normal operation.

INPUT FILTER: The DC2500 controller includes an electronic input filter, which can be used to compensate for disturbances at the pressure tap. If the displayed value is erratic even when the controller is in MANUAL and the damper is stationary, set the input filter to 1 or 2 using the following procedure. **Maximum filter setting should not exceed 2.** If the condition persists relocate the pressure tap.

Change filter time, if required, by the following procedure:

1. Press [SET UP] until the display reads **SET UP INPUT1**.
2. Press the [FUNCTION] key until the lower display reads **FILTR1**. The upper display will show the current filter setting.
3. Use the [▲] or [▼] keys to change the filter setting.
4. Press [DISPLAY] to exit the setup mode and return to normal operation.

TRANSMITTER ZERO:

INVENSYS Turn the DPS power switch on and allow the unit to warm up for at least 5 minutes before adjusting the transmitter zero. Use the shutoff cocks in the transmitter manifold to isolate the transmitter from the dryer or furnace and to open the LOW pressure tap to atmosphere for **Dryer Applications**, or to open the HIGH pressure tap to atmosphere for **Furnace Applications**. The transmitter display and the upper display of the DPS controller should both read 0.00. See Appendix C for transmitter adjustments if necessary.

ASHCROFT Turn the DPS power switch on and allow the unit to warm up for at least 10 minutes before adjusting the transmitter zero. Use the shutoff cocks in the transmitter manifold to isolate the transmitter from the dryer or furnace and to open the LOW pressure tap to atmosphere for **Dryer Applications**, or to open the HIGH pressure tap to atmosphere for **Furnace Applications**. The upper display of the DPS controller should read 0.00. Remove the 3 x 4" (76 x 102mm) front cover from the transmitter and adjust the zero (upper) potentiometer, if required, until the controller reads 0.00. **Do not** adjust the span (lower) potentiometer. Replace the transmitter cover and close the LOW pressure tap for **Dryer Applications**, or close the HIGH pressure tap for **Furnace Applications,** and open the shutoff cocks.

APPENDIX A: Controller Configuration Record

SET UP GROUP	FUNCTION PROMPT	FACTORY SETTING	FINAL SETTING
TIMER	TIMER	DIS	
TUNING	PB	50.00	
	RATET	0.00	
	MANRST	50	
	PB2	50.00	
	RATE2T	0.00	
	CYCT1	Note (1)	
	CYCT2	Note (1)	
	SECUR	0	
	LOCK	CAL	
SPRAMP	SPRAMP	DIS	
ATUNE	FUZZY	DIS	
	TUNE	DIS	
ALGOR	CTRALG	PDMR	
	TIMER	DIS	
OUTALG	OUTALG	RLYD	
	RLY TY	MECH	
INPUT1	IN1TYP	4-20	
	XMITR1	LIN	
	IN1 HI	Note (2)	
	IN1 LO	Note (3)	
	RATIO1	1.0	
	BIAS1	0.0	
	FILTR1	1	
	BRNOUT	DOWN	
CONTRL	LSP'S	ONE	
	SP TRK	NONE	
	PWR UP	ALSP	
	SP HI	Note (2)	
	SP LO	Note (3)	
	ACTION	REV	
	OUT HI	100.0	
	OUT LO	0.0	
	D BAND	2.0	
	FAILSF	50.0	
	PborGN	PB	
	MINRPM	RPM	
OPTIONS	AUXOUT	OUT	
	0 PCT	105.0	
	100 PCT	105.0	
	CRANGE	4-20	
	DIGIN1	NONE	

SET UP GROUP	FUNCTION PROMPT	FACTORY SETTING	FINAL SETTING
COM	ComADR	3	
	COMSTA	DIS	
	IRENAB	DIS	
	BAUD	19.2K	
	TX DLY	1	
ALARMS	A1S1TY	NONE	
	A1S2TY	NONE	
	A2S1TY	NONE	
	A2S2TY	NONE	
	ALHYST	0.1	
	BLOCK	DIS	
	DIA AL	DIS	
DISPLAY	DECMAL	TWO	
	UNITS	NONE	
	FREQ	60	
	DISPLAY	PR N	
	LNGUAG	ENGL	
CALIB	AUX OUT		
	ZEROVAL	4095	
	SPANVAL	4095	

NOTES:

(1) 10 seconds for Honeywell M6284 or B-C EA57 medium torque
5 seconds for Barber-Colman high torque
2 seconds for Duff-Norton
5 seconds for all others

(2) 0.20 for -0.2 to +0.2"wc transmitter range
0.50 for -0.5 to +0.5"wc transmitter range
1.00 for 0.0 to 1.0"wc transmitter range
3.00 for 0.0 to 3.0"wc transmitter range
5.00 for 0.0 to 5.0"wc transmitter range

(3) -0.20 for -0.2 to +0.2"wc transmitter range
-0.50 for -0.5 to +0.5"wc transmitter range
0.00 for 0.0 to 1.0"wc transmitter range
0.00 for 0.0 to 3.0"wc transmitter range
0.00 for 0.0 to 5.0"wc transmitter range

MODEL NUMBER:

DC2500-EE-1000-200-00000-00-0

APPENDIX B: On-Time Calculations and Effects of Tuning Parameters

The following examples illustrate the calculations preformed by the controller to determine output relay operation. Various deviations, proportional bands and cycle times are used to show their effect on the control action.

DRYER EXAMPLE 1:

Dryer Draft (PV):	0.30"wc
Setpoint (SP):	0.20"wc
Transmitter Range:	1.00"wc (0.00" to 1.00"wc)
Proportional Band:	50%
Cycle Time (CT):	5.0 seconds (CYC T1 and CYC2T2)

Since the measured draft is greater than the setpoint the deviation is a negative value and the controller will respond by energizing **OUT 2** in order to close the exhaust damper. The on time of output relay 2 is calculated as follows:

DEV = (SP - PV)
= (0.20") - (0.30")
= -0.10"

$$\text{Output} = \frac{\text{DEV}}{(\text{PB} \times \text{RG})}$$

$$= \frac{-0.10}{(0.50 \times 1.0)}$$

= -0.20 Displayed as OUT 30.0 (50 - 20)

On Time = CT x Output
= 5 x 0.20
= 1.0 seconds

Result: Relay 2 will be on for 1.0 second and off for 4.0 seconds.

DRYER EXAMPLE 2:

Same as example 1 except Proportional Band = 80% (0.80)

DEV = -0.10" (same as example 1)

$$\text{Output} = \frac{-0.10}{(0.80 \times 1.0)}$$

= -0.125 Displayed as OUT 37.5 (50 - 12.5)
(Output decreases due to Pb increase)

On Time = 5 x 0.125

= 0.625 seconds (On time decreases)

Result: Relay 2 will be on for 0.625 seconds and off for 4.375 seconds.

DRYER EXAMPLE 3:

Same as example 1 except Cycle Time = 10 seconds.

DEV = -0.10" (same as example 1)
Output = -0.20 (same as example 1)
On Time = 10 x 0.20
= 2.0 seconds (on time increases due to cycle time increase)

Result: Relay 2 will be on for 2 seconds and off for 8 seconds.

DRYER EXAMPLE 4:

Same as example 1 except Dryer Draft = 0.15"wc.
Since the measured draft is now less than the setpoint, the deviation is a positive value and the controller will energize Relay 1 in order to open the exhaust damper. The on time of relay 1 is calculated as follows:

DEV = (0.20") - (0.15")
= 0.05"

$$\text{Output} = \frac{0.05"}{(0.50 \times 1.0)}$$
= 0.10 Displayed as OUT 60.0 (50 + 10)

On Time = 5 x 0.10
= 0.5 seconds

Result: Relay 1 will be on for 0.5 seconds and off for 4.5 seconds.

FURNACE EXAMPLE 1:

Furnace Pressure (PV):	0.12"wc
Setpoint (SP):	0.02"wc
Transmitter Range:	1.00"wc (-0.5" to +0.5"wc)
Proportional Band:	50%
Cycle Time (CT):	5.0 seconds (CYC T1 and CYC2T2)

Since the measured pressure is greater than the setpoint the deviation is a negative value and the controller will respond by energizing **OUT 1** in order to open the exhaust damper. The on time of output relay 1 is calculated as follows:

DEV = (SP - PV)
= (0.02") - (0.12")
= -0.10"

$$\text{Output} = \frac{DEV}{(PB \times RG)}$$
$$= \frac{-0.10}{(0.50 \times 1.0)}$$
= -0.20 Displayed as OUT 30.0 (50 - 20)

On Time = CT x Output
= 5 x 0.20
= 1.0 seconds

Result: Relay 1 will be on for 1.0 second and off for 4.0 seconds.

FURNACE EXAMPLE 2:

Same as example 1 except Proportional Band = 80% (0.80)

DEV = -0.10" (same as example 1)

$$\text{Output} = \frac{-0.10}{(0.80 \times 1.0)}$$

= -0.125 Displayed as OUT 37.5 (50 - 12.5)
(Output decreases due to Pb increase)

On Time = 5 x 0.125

= 0.625 seconds (On time decreases)

Result: Relay 1 will be on for 0.625 seconds and off for 4.375 seconds.

FURNACE EXAMPLE 3:

Same as example 1 except Cycle Time = 10 seconds.

DEV = -0.10" (same as example 1)
Output = -0.20 (same as example 1)
On Time = 10 x 0.20

= 2.0 seconds (on time increases due to cycle time increase)

Result: Relay 1 will be on for 2 seconds and off for 8 seconds.

FURNACE EXAMPLE 4:

Same as example 1 except Furnace Pressure = -0.03"wc.
Since the measured pressure is now less than the setpoint, the deviation is a positive value and the controller will energize Relay 2 in order to open the exhaust damper. The on time of relay 2 is calculated as follows:

DEV = (0.02") - (-0.03")

= 0.05"

$$\text{Output} = \frac{0.05"}{(0.50 \times 1.0)}$$

= 0.10 Displayed as OUT 60.0 (50 + 10)

On Time = 5 x 0.10
= 0.5 seconds

Result: Relay 2 will be on for 0.5 seconds and off for 4.5 seconds.

APPENDIX C: Draft Transmitter Adjustments

The **NEXT** and **ENTER** buttons located below the Lcd display may be used to adjust or reconfigure the draft transmitter if required. Wait 1 or 2 seconds between each button press to allow the display to update.

ZEROING

Allow the unit to warm up for at least 5 minutes before adjusting the transmitter zero. Use the shutoff cocks in the transmitter manifold to isolate the transmitter from the dryer and to open the LOW pressure tap to atmosphere. If the transmitter display does not read 0.00 IN H2O use the following procedure to zero the transmitter.

- Press the **NEXT** button one time to change the lower display to **CALIB**.
- Press **ENTER** to change the lower display to **CAL AT0**.
- Press **ENTER** and the lower display will read **AT0 DONE**.
- Press **NEXT** to step through the remaining calibration options until the lower display reads **SAVE**.
- Press **ENTER** to save the new zero calibration and exit the calibration mode. Note that calibration changes can be discarded by pressing **ENTER** when the lower display reads **CANCEL** instead of **SAVE**

4 MA ADJUSTMENT

Verify that when the transmitter reads 0.00, the DPS controller display also reads 0.00. If necessary, adjust the transmitter 4 mA value using the following procedure.

- Press the **NEXT** button one time to change the lower display to **CALIB**.
- Press **ENTER** to change the lower display to **CAL AT0**.
- Press **NEXT** until the lower display reads **ADJ 4MA**.
- Press **ENTER** and the lower display will read **A 4MA ^^.**
- If the DPS display reads less than 0.00, increase the 4 mA calibrations as follows:
    - Press **NEXT** to change the lower display to **A 4MA ^.**
    - Each press of the **ENTER** button will slightly increase the transmitter output and the DPS display should increase until it reads 0.00.
- If the DPS display reads greater than 0.00, decrease the 4 mA calibrations as follows:
    - Press **NEXT** to change the lower display to **A 4MA v.**
    - Each press of the **ENTER** button will now slightly decrease the transmitter output and the DPS display should decrease until it reads 0.00.
- Press **NEXT** to step through the remaining calibration options until the lower display reads **SAVE**.
- Press **ENTER** to save the new zero calibration and exit the calibration mode. Note that calibration changes can be discarded by pressing **ENTER** when the lower display reads **CANCEL** instead of **SAVE.**

CONFIGURATION PARAMETERS

The transmitter has been factory configured and should not require any field modifications. The following parameter settings are provided for reference only.

PARAMETER	LOWER DISPLAY	UPPER DISPLAY
External Zero (Not applicable)	EX ZERO	EXZ DIS
Output Direction	OUT DIR	FORWARD
Output Mode	OUTMODE	LINEAR
Output Failsafe	OUTFAIL	FAIL LO
Signal Dampening	DAMPING	NO DAMP
Display Engineering Units	DISP EGU	USE EGU
Select Engineering Units	EGU SEL	INH2O
Lower Range Value	EGU LRV	00.00
Upper Range Value	EGU URV	1.00, 3.00 or 5.00