

## UDC5000 *Ultra-Pro* Universal Digital Controller

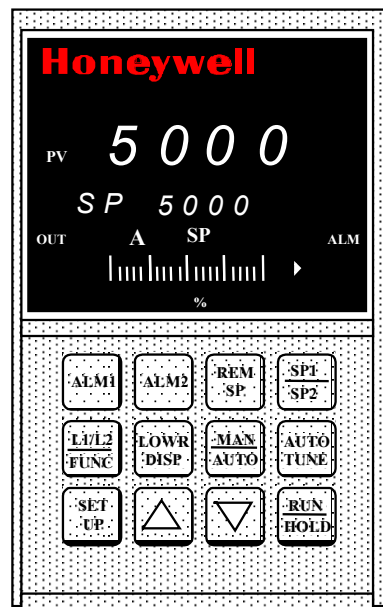
## Specification

### Overview

The UDC5000 Ultra-Pro is a micro-processor-based, stand-alone digital controller that combines the highest accuracy available with unparalleled functionality and performance.

This combination addresses the needs of critical processes and complex applications typical of the high performance arena, where product quality, high throughput, and minimal scrap of expensive materials are prime considerations.

Bright dual displays and English prompts make the operator interface easy to read, understand, and operate. Programmed sequences of displays assure quick and accurate entry of all configurable parameters. Simple keystrokes let you select input and range configuration and change operating parameters to meet your specific process control needs.



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Figure 1 - UDC 5000 Ultra-Pro Controller

### Features

**High Accuracy** -  $\pm 0.05\%$  of fullscale; typically  $\pm 1.0^\circ\text{F}$ . Input resolution 14 bits minimum.

**High Noise Immunity** - The UDC 5000 Ultra-Pro is designed to provide reliable, error-free performance in industrial environments that often affect highly sensitive digital equipment.

**Dual Displays** - Bright, vacuum fluorescent, alphanumeric digital displays. A large six digit upper display is dedicated to the Process Variable and an eight digit lower display shows key selected operating parameters.

**Bargraph Display** - This may be configured to display 0 to 100% Output or Deviation of  $\pm 10\%$  of input span with on-control indication.

**Easy Configuration** - English language prompts, in programmed sequence, provide guidance during configuration. A tactile keyboard provides positive operator feedback.

**Universal Inputs** - All inputs isolated with no range modules or DIP switches. Up to three inputs are available. Input one and two accept up to 10 thermocouple types, RTD's, mA, mV, or Voltage inputs. Input 3 provides a high level input for remote setpoint or math functions.

**Universal Output Model** - provides hardware and software required to configure the output type required for your application. This is a simple, cost effective solution to spares stocking.

#### **Thermocouple Failsafe** -

Keyboard configurable, upscale or downscale burnout and failsafe output level.

**Three Local Setpoints** - Can be configured to provide three local set points which can be selected by the keyboard or the optional remote Digital Input switch.

#### **Two Sets of Tuning Constants** -

Two sets of PID parameters can be configured and automatically selected depending on the PV or Setpoint value.

#### **Diagnostic/Failsafe Outputs** -

Continuous diagnostic routines detect failure modes, trigger a failsafe output value, and identifies the failure to minimize troubleshooting time.

**CE Mark-** Conformity with 73/23/EEC, Low Voltage Directive and 89/336/EEC, the EMC Directive.

**Data Security** - Five levels of keyboard security, accessed by a three digit code, protect tuning, configuration, and calibration data. Non-volatile memory, protected by EEPROM, protects against loss of configuration and calibration data.

**Dedicated Keys** - provide direct access to alarm data, setpoint modes, Autotune, and setpoint program status to simplify and speed operation.

## Optional Features

**AutomaticTuning** - Honeywell's Accutune™ is an option that uses a combination of frequency and time response analysis plus rule-based expert system techniques to continually identify the process. It then automatically adjusts PID Tuning parameters as necessary while controlling at Setpoint in the Automatic mode. An alternative approach is Honeywell's "on demand type" Autotune which is not continuous and adaptive.

### Setpoint Ramp/Soak

**Programming** - Lets you program and store 10 ramp and 10 soak segments to be stored for use as one program or multiple small programs. Run or Hold of program is selected by the keyboard or remote Digital Input switch.

**Auxiliary Output** - provides a 4-20 mA output representing any of six controller parameters for recording or control purposes. The range of the auxiliary output can be easily scaled by the operator. Local indication is also provided at the controller.

**Two Loop Controller** - This provides two independent loops of control with separate prompts and shared display in a cost effective package.

**Internal Cascade Algorithm** - provides internal linking of the primary and secondary controllers in one device.

**Math Options** - You can select from the following:

*Summer/Subtractor* - will add/subtract two inputs with the results as the derived PV.  
*Weighted Average* - computes the weighted average of input one and two.

*Multiplier/Divider* - uses the analog inputs to calculate a derived PV such as a Mass Flow calculation.

*Input High/Low Select* - specifies the PV input as the higher or lower of two inputs.

**Feed Forward** - Also a math option. It uses input 2, following a Ratio/Bias calculation, summed directly with the computed output value to provide a resultant output which is sent to the final control element.

**Transmitter Power** - provides 24Vdc power supply for one or two 4 to 20 mA, 2-wire inputs.

**Digital Input** - Using either one of two remote switches, you can switch on contact closures to:

- Manual mode from Automatic
- Direct control action from reverse
- PID set 2 from PID set 1
- Selects PV = Input 2 from Input 1
- Selects PV = Input 3 from Input 1
- LSP1 from RSP, LSP2 or LSP3
- LSP2 from LSP1, LSP3 or RSP
- Hold from Run during SP Program
- Resume or Run SP Program

**Communications** - provides a communications link between the Ultra-Pro and a Honeywell supplied interface device capable of communicating via RS232C, or direct communication via the RS422/485 communications option to a Host computer.

**Solid State Relays** - Optional externally mounted output form of one or two SPST solid state contacts rated at 2 amps or 10 amps at 120/240 Volts. This option replaces the electromechanical relays.

**Open Collector Outputs** - provides one or two open collector outputs rated at 24Vdc/30mA to replace the electromechanical relays.

## Physical Description

The controller is housed in a metal case with Noryl bezel, that can be panel mounted. The modular construction of the plug-in chassis allows easy access to various printed wiring boards. All power, input and output wiring are connected to screw terminals on the rear terminal panel. It retains full case and wiring compatibility with all previous UDC5000 models.

## Inputs

The analog inputs are sampled 3 times a second. The sampled signal is amplified and then converted to a digital signal which is isolated and passed to the microprocessor. The Ultra-Pro is available with one, two or three inputs. The first, or process variable input, can be one of the various thermocouple, RTD, or linear actuations. The optional second input is isolated and may also accept the same actuations as input one. The optional third input provides a high level, isolated, Math or Remote Setpoint input of 4 to 20 mA or 1 to 5 Volts dc.

All ranges are keyboard selectable. Cold junction compensation is provided. You can select upscale or downscale sensor break protection. A configurable digital filter of 0 to 120 seconds provides input signal damping.

## Outputs

The Ultra-Pro is available with one of the output types listed below:

**Time Proportional** - provides On-Off or Time Proportional (Relay) output.

**Current Proportional** - supplies proportional direct current output for final control elements, which require a 4 to 20 signal. Available with or without alarms.

**Position Proportional** - positions a reversible motor with a feedback slidewire in proportion to the output of the control algorithm.

**Time Proportional Duplex** - depending on which control algorithm you select, this duplex output type can provide On-Off Duplex, Time Proportional Duplex, or 3 Position Step Control. The Time Proportional Duplex output provides independent PID tuning constants and two time proportional outputs: one for heat zone above 50% output, and one for cool zone below 50% output.

**Current Proportional Duplex** - similar to current proportional but provides a second set of tuning parameters and a second current output via the Auxiliary Output option, for the heat/cool zones.

**Current/Relay Duplex (Relay = Heat or Cool)** - a variation of Duplex with one output (Current or Relay) active for 0 to 50% output (Tuning set 2) and the other output (Relay or Current) active for 50 to 100% output (Tuning set 1).

**Universal Output** - A universal Output model lets you use any of the outputs listed above and 2 alarm relays. Included with this model is a 3rd input port or a Position Proportional feedback slidewire port.

## Control Algorithm

The basic characteristic of an automatic controller is its control algorithm - the way it restores the controlled variable to the desired value (setpoint).

Depending on the control output type specified, the controller can be configured for the following control algorithms.

- On-Off
- PID-A Equation
- PID-B Equation
- PD with Manual Reset
- Three Position Step Control

Duplex control can be configured for all algorithms except Three Position Step Control.

## Alarms

Alarm output terminals are located at the rear terminal panel. There are two alarm outputs available to activate external equipment when preset alarm setpoints are reached.

Each of the two alarms can be set to monitor two independent setpoints. Each alarm setpoint can be either high or low alarm. The alarm type can be selected to be any of the three inputs, the primary or secondary loop PV Deviation, or Output, or Shed from communications. It can also be used as an on or off event at the beginning or end of a Ramp/Soak setpoint programming segment.

## Configuration

You decide how the controller is to interact with the process, through simple keystrokes, the functions you want. English language prompts guide the operator through the configuration process assuring quick and accurate entry of all configurable parameters.

## Diagnostics

The controllers have built-in diagnostic tests to ensure reliable operation. Every time power is applied, the microprocessor initiates tests that check the integrity of the information held in various memory locations, and lights all the display segments for a status check. These tests also can be operator initiated through the operator interface. Continuous checks are made to check that the inputs are being sampled, the stored constants are secure, and the measured inputs fall within the established range limits. Test failures are identified by various error indications so the source of the trouble can be easily identified.

## Calibration

The UDC5000 is factory calibrated for all ranges listed in Table 1. When desired, you can perform a field calibration by accessing the required calibration group via the SET UP key. To calibrate, you need only to enter the calibration mode, apply the reference signal and press the CAL key. The calibration is automatically established by the microprocessor, eliminating the need for any mechanical adjustment.

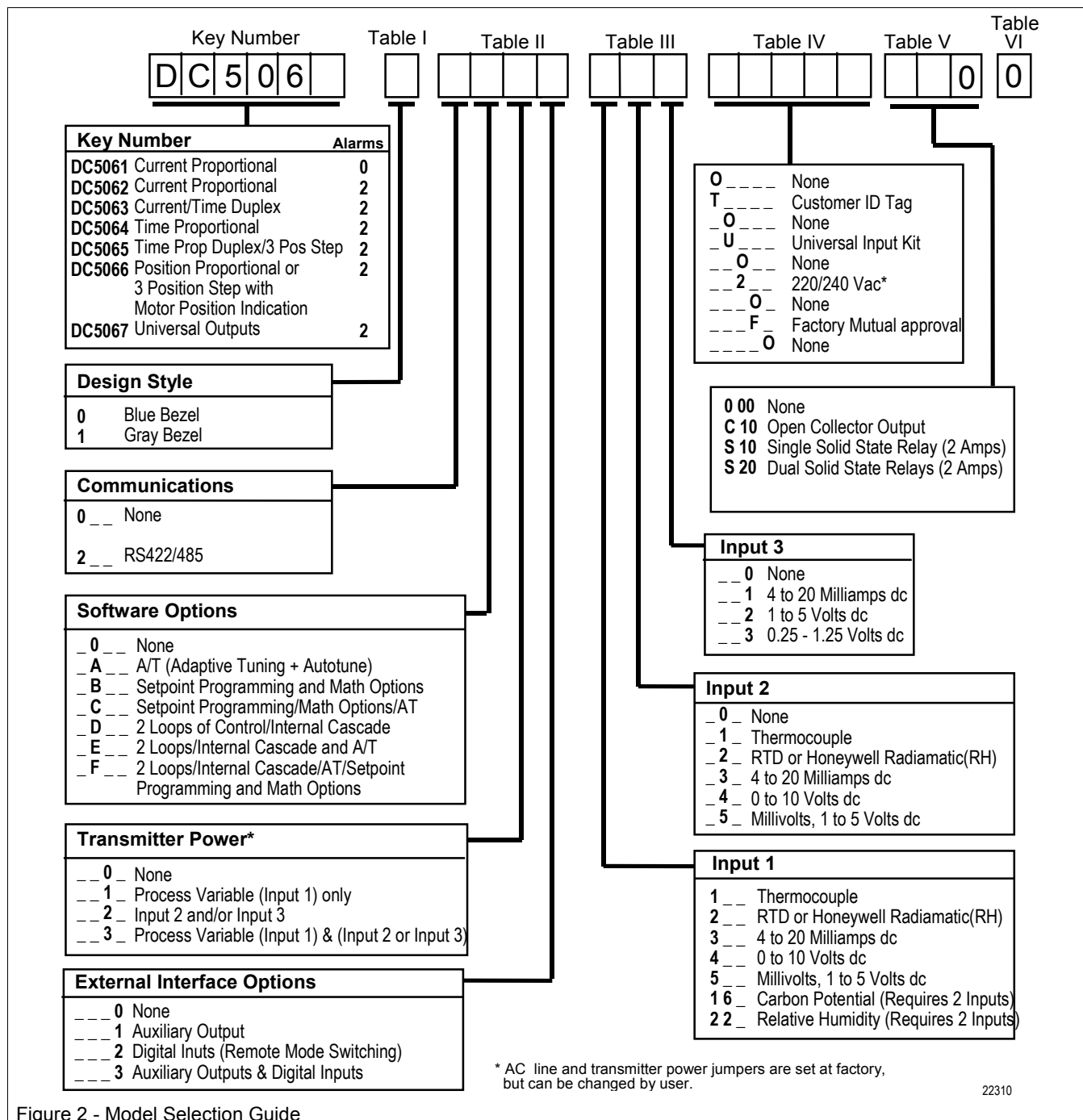


Figure 2 - Model Selection Guide

## Operator Interface (Fig. 3)

**Indicators** - They provide alarm, control mode, and temperature units indication. There is also indication of what Setpoint is active, the status of the control relays, and whether a setpoint program is in Run or Hold mode.

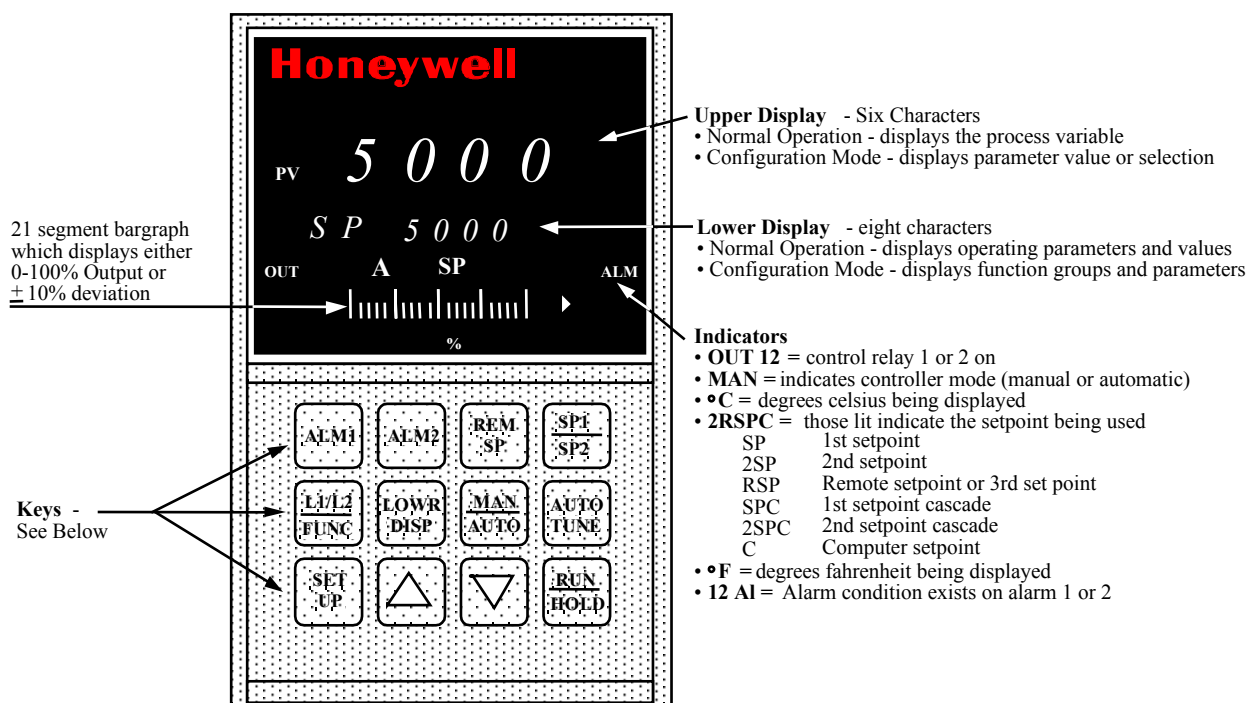
A 21-segment bargraph displays

either  $\pm 10\%$  deviation or 0-100% output.

**Displays** - A 6-character upper display is dedicated to the process variable during normal operation with alternate information displayed when in the configure mode.

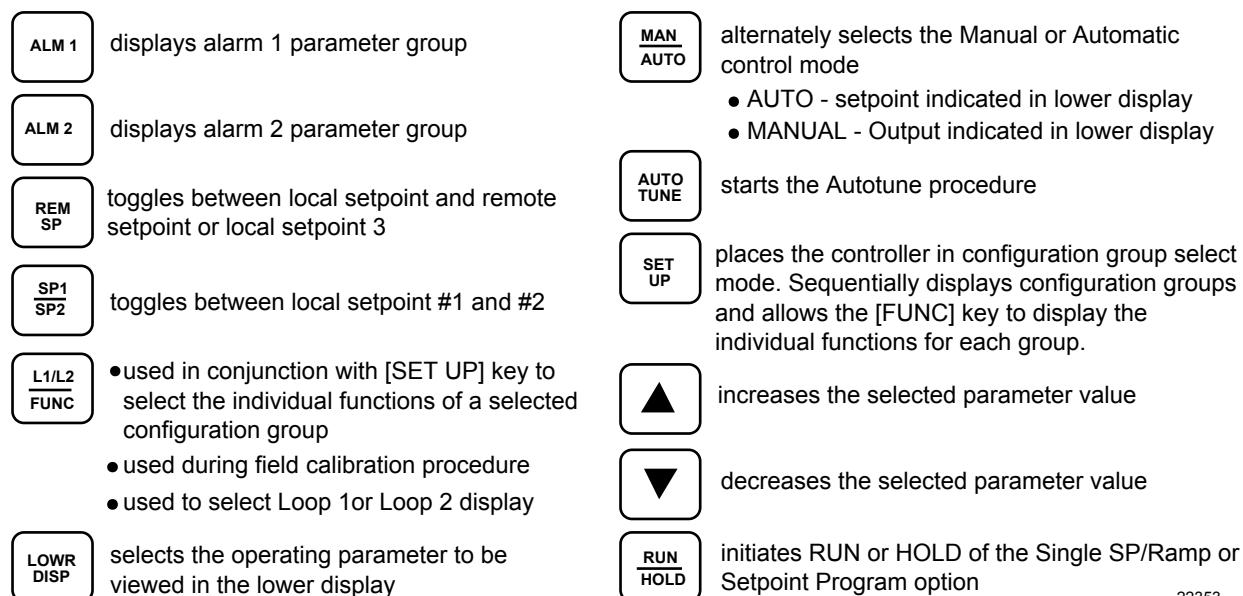
During normal operation, the 8-character lower display shows key-

selected operating parameters such as Output, Setpoints, Inputs, Deviation, active Tuning Parameter Set, or minutes remaining in a setpoint ramp. It also provides guidance, through prompts, for the operator during controller configuration.



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Figure 3 - Operator Interface



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Figure 4 - Key Functions

## Specifications

Performance (Table 1)

Controller Actuation Input 1 and 2		Range		Reference Accuracy		Temp. Stab. 58 to 131 °F or 15 or 55 °C	
		°F	°C	± °F	± °C	± Degrees Error per 1 degree ΔT	
Thermocouples  * Nicrosil-Nisil or Omegalloy™ 14AWG	B	<b>105to 3300</b> 105 to 150 150 to 500 500 to 1000 1000 to 3300	<b>41to 1815</b> 41 to 66 66 to 260 260 to 538 538 to 1815	30.0 20.0 4.0 1.7	17.0 11.0 2.2 1.0	1.67 1.67 0.39 0.18	
	E	<b>-454 to 1832</b> -454 to -202 -202 to 1832	<b>-270to 1000</b> -270 to -130 -130 to 1000	7.0 1.0	3.8 0.5	0.67 0.33	
	J	<b>0 to 1600</b>	<b>18to871</b>	1.0	0.55	0.06	
	K	<b>0 to 2400</b>	<b>18to1316</b>	1.0	0.55	0.09	
	Ni-Ni Moly	<b>32to 2500</b> 32 to 500 500 to 2500	<b>0 to1371</b> 0 to 260 260 to 1371	1.26 0.97	0.7 0.54	0.09 0.07	
	N*	<b>0 to 2372</b>	<b>18to1300</b>	1.0	0.55	0.009	
	R	<b>0 to 3100</b> 0 to 500 500 to 3100	<b>18to1704</b> -18 to 260 260 to 1704	2.5 1.5	1.5 0.9	0.25 0.13	
	S	<b>0 to 3100</b> 0 to 500 500 to 3100	<b>18to1704</b> -18 to 260 260 to 1704	2.5 1.5	1.5 0.9	0.23 0.13	
	T	<b>-300 to 700</b>	<b>-184 to 371</b>	0.8	0.48	0.07	
	W5W26 (W)	<b>0 to 4200</b> 0 to 600 600 to 3600 3600 to 4200	<b>18to 2316</b> 18 to 316 316 to 1982 1982 to 2316	8.5 2.5 4.0	4.7 1.4 2.2	0.17 0.17 0.28	
Platinum RTD 100 ohms 100 ohms low 200 ohms 500 ohms		IEC Alpha = 0.00385	0 to 300	-18 to 149	0.8	0.48	0.05
			-300 to 900	-184 to 482	0.8	0.48	0.05
			-300 to 900	-184 to 482	0.8	0.48	0.05
			-300 to 900	-184 to 482	0.8	0.48	0.05
Milliamperes (dc)		4 to 20	--	± 0.05% F.S.		0.0042% F.S./ °F	
Millivolts (dc)		0 to 10 10 to 50		± 0.05% F.S. ± 0.05% F.S.		0.0042% F.S./ °F 0.0042% F.S./ °F	
Volts (dc)		1 to 5 0 to 10		± 0.05% F.S. ± 0.05% F.S.		0.0042% F.S./ °F 0.0042% F.S./ °F	
Carbon Potential	ZrO <sub>2</sub> Probe	measured carbon potential	0 to2.00% 0.10to1.40%C	± 0.02% carbon (natural gas enriching atmosphere)			
Dewpoint	ZrO <sub>2</sub> Probe	-50 to 100°F	-46 to 38°C				
% Oxygen	ZrO <sub>2</sub> Probe	0-40% O <sub>2</sub>		± 0.05% O <sub>2</sub> (typical)			

### Specifications, (continued)

### Performance, (continued)

Controller Actuation Input 1 and 2 (continued)		Range		Reference Accuracy		Temp. Stab. 58 to 131 °F or 15 or 55 °C	
		°F	°C	± °F	± °C	± Degrees Error per 1 degree ΔT	
Honeywell RH Radiamatic		1400 to 3400 1400 to 2100 2100 to 3400	760 to 1871 760 to 1149 1149 to 1871	4.2 1.4	2.3 0.8	0.17 0.45	
Relative Humidity	Wet/Dry	21 to 212	-6 to 100	0.3	0.2	0.02 °F / °C	
IEC Alpha = 0.00385 100 PT Bulb	% RH	Measured % RH	Dry Bulb Range °F °C		Reference Accuracy 72 °F ± 5° 22 °C ± 3°		Temp. Stab. 53 to 104 °F or 15 to 40 °C
		0 to <20	35 to 212	2 to 93	2% RH		0.11% RH/°F
		20 to 100	35 to 40 >40 to 100 100 to 212	2 to 4 >4 to 38 38 to 93	2% RH 1% RH 1% RH		0.11% RH/°F 0.06% RH/°F 0.03% RH/°F
Third Input		NOTE: Input 3 is isolated from all other inputs and all outputs except the controller current output. It is mutually exclusive with position proportional control (Model DC5066).					
Milliamperes (dc) Volts (dc)		4 to 20 1 to 5			± 0.15% F.S. ± 0.15% F.S.		0.034% RH/°F 0.034% RH/°F

## Design

<p><b>CE Conformity (Europe)</b></p> <p><b>Product Classification:</b></p> <p><b>Enclosure Rating:</b></p> <p><b>Installation Category (Overvoltage Category):</b></p> <p><b>Pollution Degree:</b></p> <p><b>EMC Classification:</b></p> <p><b>Method of EMC Assessment:</b></p> <p><b>Declaration of Conformity:</b></p>	<p>This product is in conformity with the protection requirements of the following European Council Directives: <b>73/23/EEC</b>, the Low Voltage Directive, and <b>89/336/EEC</b>, the EMC Directive. Conformity of this product with any other “CE Mark” Directive(s) shall not be assumed.</p> <p>Class I: Permanently Connected, Panel Mounted Industrial Control Equipment with protective earthing (grounding). (EN 61010-1)</p> <p>Panel Mounted Equipment, IP 00, this controller must be panel mounted. Terminals must be enclosed within the panel. Front panel IP 65 (IEC 529).</p> <p>Category II: Energy-consuming equipment supplied from the fixed installation. Local level appliances, and Industrial Control Equipment. (EN 61010-1)</p> <p>Pollution Degree 2: Normally non-conductive pollution with occasional conductivity caused by condensation. (Ref. IEC 664-1)</p> <p>Group 1, Class A, ISM Equipment (EN 55011, emissions), Industrial Equipment (EN 50082-2, immunity)</p> <p>Technical File (TF)</p> <p>51309306-000.</p>
<p><b>Accuracy</b></p> <p>Inputs 1 and 2</p> <p>Input 3</p>	<p>± 0.05% of span typical (± 1 digit for display) 14 bit resolution typical</p> <p>± 0.15% of span typical (± 1 digit for display) 14 bit resolution typical</p>
<p><b>Temperature Stability</b></p>	<p>± 0.005% for °C typical</p>

## Specifications, (continued)

### Design, continued

<b>Input Open Circuit Protection</b>	<i>Thermocouple and 0-10 millivolt Input:</i> Upscale or downscale burnout available <i>Burnout Current:</i> 0.6 microamps maximum
<b>Input Impedance</b>	<i>Thermocouple and 0-10 millivolt input:</i> 10 megohms <i>4-20 milliampere input:</i> 62.5 ohms <i>0-10 volt input:</i> 200K ohms
<b>Stray Rejection</b>	<p><i>Common Mode:</i> AC (50 or 60 Hz): 120 db (with maximum source impedance of 100 ohms) or <math>\pm 1</math> LSB (least significant bit) whichever is greater. DC: 120 db (with maximum source impedance of 100 ohms) or <math>\pm 1</math> LSB (least significant bit) whichever is greater. DC to 1KHz: 80 db (with maximum source impedance of 100 ohms) or <math>\pm 1</math> LSB (least significant bit) whichever is greater.</p> <p><i>Normal Mode</i> AC (50 or 60 Hz): 60 db (with 100% span peak-to-peak maximum)</p>
<b>Controller Output</b>	<p><b>Current</b> 4 to 20 mA dc into a negative or positive grounded or non-grounded load of 0 to 1000 ohms. Range can be set between 0 to 21 mA, and as direct or reverse action. Proportional Range can be set between 0 to 21 mA, and as direct or reverse action. <i>Resolution:</i> 10 bits <i>Accuracy:</i> 0.5% full scale <i>Temperature Stability:</i> 0.1% F.S. / °C</p> <p><b>Position Proportional or 3 Position Step</b> Two SPDT electromechanical relays operate motor having a 100 ohm to 1000 ohm slidewire. 3PSTEP does not use a feedback slidewire. <i>Relay contact Ratings</i> <i>Resistive Load:</i> 7 amps @ 120 Vac, 240 Vac or 30 Vdc <i>Inductive Load:</i> 50 VA @ 120 Vac or 240 Vac <i>Position Resolution:</i> 10 bits <i>Position Accuracy:</i> 0.5% FS <i>Hysteresis:</i> 0.1%</p> <p><b>On-Off or Time Proportional</b> One SPDT electromechanical relay. Control action can be set as direct or reverse; and relay action can be set as energized or de-energized when process variable exceeds the setpoint. Minimum relay on-time and off-time for time proportioning models: 50 mSec. <i>Time Proportioning Relay Resolution:</i> 4.44 mSec. <i>Relay Contact Ratings:</i> <i>Resistive Load:</i> 7 amps @ 120 Vac or 240 Vac <i>Inductive Load:</i> 50 VA @ 120 Vac or 240 Vac <i>Open Collector Output:</i> 24 Vdc (30 mA Max.) <i>Solid State Relay Option (external mounted):</i> 3 amps at 25 °C for 120/240 Vac (2 amps at 55 °C)</p> <p><b>Current Time Duplex</b> Variation of time proportional duplex for heat/cool applications. Time proportional output (heat or cool) is a SPDT electromechanical relay active over 50% of range. Current proportional output (heat or cool) is a 0-20 mA signal that can be fed into a negative or positive grounded load of 0 to 1000 ohms and is operational over the entire range. <i>Relay Contact Ratings:</i> <i>Resistive Load:</i> 7 amps @ 120 Vac, 240 Vac or 30 Vdc <i>Inductive Load:</i> 50 VA @ 120 Vac or 240 Vac <i>Current Proportional</i> <i>Resolution:</i> 10 bits <i>Accuracy:</i> 0.5% fullscale <i>Temperature Stability:</i> 0.1% fullscale/ °C</p>



Specifications, (continued)	
Design, (continued)	
<b>Alarm Output</b>	<p>Two SPST electromechanical relays. Normally open or normally closed contacts are selectable internally for each relay. Up to four setpoints are independently set as high or low alarm, two for each relay. Setpoint can be on any input, process variable, deviation, or output of primary or secondary loop. Relay action can be set as direct or reverse. A single adjustable hysteresis of 0.0 to 5.0% is provided. The controller can also be set to alarm on shed from communications or as an on or off event at the beginning or end of a setpoint Program Ramp/Soak segment.</p> <p><i>Relay Contact Ratings</i>  <i>Resistive Load:</i> 5 amperes at 120 Vac , 240 Vac or 30 Vdc</p>
<b>Auxiliary Linear Output (Optional)</b>	<p>4 to 20 mAdc into a negative or positive grounded load or non-grounded load of 0 to 1000 ohms.</p> <p>Output range can be set between 0 to 21 mA maximum, and as direct or reverse action. The range of the auxiliary output, as a function of the selected variable, can be scaled. This output can be used as output for Input1, Input2, Input3, PV, the setpoint, deviation.</p> <p><i>Resolution:</i> 12 bits  <i>Accuracy:</i> 0.05% of full scale  <i>Temperature Stability:</i> 0.0074% / °C  <i>Ripple:</i> 0.1% peak to peak maximum</p>
<b>Communications Interface</b> <b>RS422/485</b>	<p><i>Baud Rate:</i> 300, 600, 1200, 2400, 4800 baud  <i>Parity:</i> Odd or even  <i>Length of Link</i> 4000 ft. maximum  <i>Link Characteristics:</i> Two wire, multi-drop RS422 ASCII protocol, 15 drops maximum</p>
<b>Remote Mode Switching</b>	<p>+20 Vdc source for external dry contacts for isolated solid state contacts. Contact #1 and #2 can each be configured for one of the following to occur upon contact closure:</p> <ul style="list-style-type: none"> <li>• <i>Manual</i> - places the controller in manual mode from automatic mode.</li> <li>• <i>Local Setpoint (LSP)</i> - switches to local setpoint control from RSP, LSP#2 or LSP#3.</li> <li>• <i>2nd Local Setpoint</i> - switches to LSP#2 from LSP#1, LSP#3, or RSP.</li> <li>• <i>Direct/Reverse</i> - switches to direct from reverse control action.</li> <li>• <i>Run/Hold</i> - switches to HOLD from RUN during setpoint ramp/soak programming.</li> <li>• <i>PID Set</i> - selects PID Set 2.</li> <li>• <i>Input 2</i> - selects input 2 = PV</li> <li>• <i>Input 3</i> - selects input 3 = PV</li> <li>• <i>Resume or Run Setpoint Program</i></li> </ul>
<b>Transmitter Power</b>	<p>The output is 24V ± 1.3V and will supply 50 mA maximum (two 2-wire transmitters). The output is protected from external short circuits and includes an inductor capacitor filter to block high frequency noise.</p> <p>NOTE: The inputs using this option are isolated from ground, but not from each other.</p>
<b>Sampling Rate</b>	Inputs sampled 3 times a second.
<b>Input Filter</b>	<p><i>Hardware:</i> Dual slope integration provides greater than 60 dB attenuation at 60Hz.</p> <p><i>Software:</i> Single pole lowpass filter with selectable time constants, 0 to 120 seconds.</p>
<b>Digital Displays</b>	<p>Vacuum fluorescent, alphanumeric.</p> <p>A four digit, 10mm display dedicated to the process variable.</p> <p>Alternate 6 digit information displayed during configuration mode.</p> <p>A eight digit 7.5mm display shows key selected operating parameters.</p> <p>Also provides guidance during controller configuration.</p>

## Specifications, (continued)

### Design, (continued)

<b>Display Indicators</b>	See Figure 3.
<b>Bargraph</b>	Blue, 21 segment, displays either output or deviation Deviation: to $\pm 10\%$ of PV span with "On-control" indication Output: 0 to 100% in 5% increments
<b>Modes of Operation</b>	Manual (1 or 2 loops) Automatic with Local Setpoint (1 or 2 loops) Automatic with Remote Setpoint (1 or 2 loops) Manual Cascade Automatic Cascade
<b>Dimensions</b>	See Figure 5.
<b>Power Consumption</b>	13 VA
<b>Weight</b>	2.2 kg (4.8 lbs.)

### Environmental and Operating Conditions

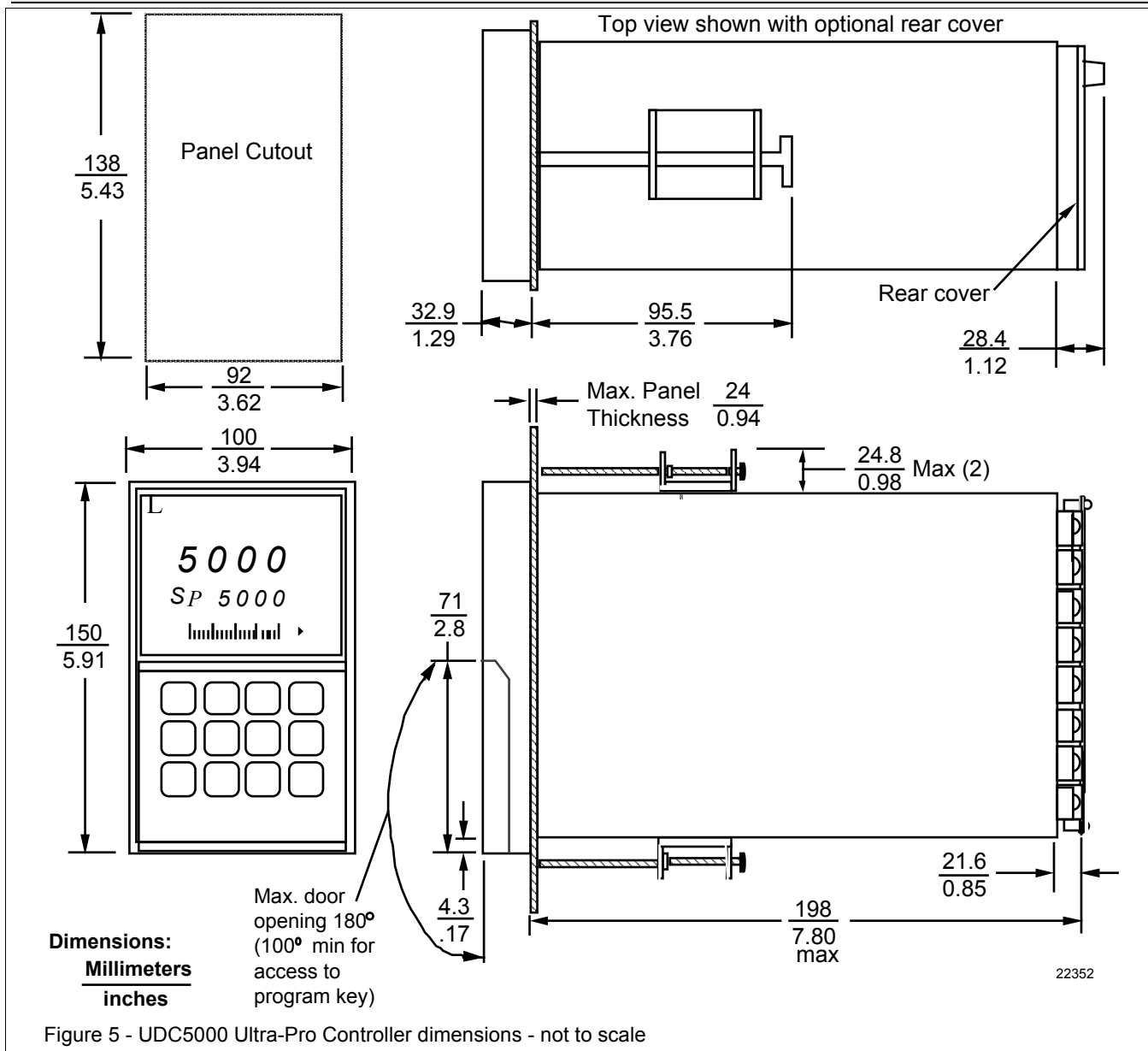
Parameter	Reference	Rated	Operative Limits	Transportation and storage
<b>Ambient Temperature</b>	$22 \pm 3^{\circ}\text{C}$ $72 \pm 5^{\circ}\text{F}$	$15$ to $55^{\circ}\text{C}$ $58$ to $131^{\circ}\text{F}$	$0$ to $60^{\circ}\text{C}$ $32$ to $140^{\circ}\text{F}$	$-40$ to $66^{\circ}\text{C}$ $-40$ to $151^{\circ}\text{F}$
<b>Relative Humidity</b>	10 to 55*	10 to 90*	5 to 90*	5 to 95*
<b>Vibration</b>				
Frequency (Hz)	0	0 to 70	0 to 200	0 to 200
Acceleration (g)	0	0.1	0.2	0.5
<b>Mechanical Shock</b>				
Acceleration (g)	0	1	5	20
Duration (ms))	0	30	30	30
<b>Voltage (Vac)</b>	$120 \pm 1$ $240 \pm 2$	$102$ to $132$ $204$ to $264$	$85$ to $132$ $170$ to $264$	-- --
<b>Frequency (Hz)</b>	50 60	$49$ to $51$ $59$ to $61$	$48$ to $52$ $58$ to $62$	-- --
<b>Transmitter Supply Voltage (at input terminals)</b>	24	22 to 26	22 to 26	--

\* The maximum rating only applies up to  $40^{\circ}\text{C}$  ( $104^{\circ}\text{F}$ ). For higher temperatures, the RH specification is derated to maintain constant moisture content.

### General Reference Data

<b>Isolation (Functional)</b>	<i>AC Power</i> : is electrically isolated from all other inputs and outputs to withstand a HIPOT potential of 1900Vdc for 2 seconds per Annex K of EN61010-1. <i>Analog Inputs 1 and 2 and Outputs</i> : are isolated from each other and all other circuits at 850Vdc for 2 seconds. <i>Input 3</i> is not isolated from the current output. <i>Digital Inputs and Outputs</i> : Isolated from all other circuits to 850Vdc for 2 seconds
<b>Radio Frequency Interference (RFI)</b>	<i>Immunity</i> : No effect on performance from a 5 W walkie-talkie operated at 27, 151 or 450 MHz, one meter from the controller.
<b>Surge Withstand Capability (SWC)</b>	ANSI/IEEE C37.90.1, Surge Withstand Capability (SWC) (Formerly IEEE 472) Mains power input and relay contact outputs: 2.5 kV, Common Mode and Differential Mode. All other circuits: 1.0 kV, Common Mode and Differential Mode.

## Dimensions



## Ordering Information

Honeywell offers a full line of Sensors, Transmitters, and Final Control Devices for use with the UDC5000 Universal Digital Controller. These devices include:

- Thermocouples, RTD's
- Pressure Transmitters,
- Flow Transmitters,
- Liquid Level Transmitters.
- Valve, Actuators, and Electric Motors.

For more information, contact your nearest Honeywell Response Center or

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*Specifications are subject to  
change without notice.*