UDC 3300
Universal Digital Controller

Specification

Overview

New Power and Flexibility
The UDC 3300 Universal Digital Controller packs new powerful features in the popular 1/4 DIN size while retaining all the simplicity, flexibility, accuracy, and industry-leading MMI of the UDC 3000.

Unmatched new application power includes: two universal analog inputs, two loops of control, two Math equations, two characterizers, and a totalizer. When these are combined with the new Accutune II™ tuning with fuzzy logic overshoot suppression, the result is price/performance leadership.

Application flexibility is assured by the universal analog inputs, universal AC power supply, two digital inputs, RS422/485 ASCII or Modbus RTU communication protocols, simple configuration plus total field upgrade capability for any optional feature.

A new and innovative Maintenance & Diagnostic tool available with Expanded UDC3300 controllers is HealthWatch, a low-cost software program that puts maintenance and diagnostic data at your fingertips so you can monitor vital performance activities to improve your process, predict equipment failure, and minimize downtime.

The bright, dual displays with multi-language prompts (in English, French, German, Spanish, or Italian) make the operator interface easy to read, understand, and operate. Simple keystrokes let you set operating parameters that meet your process control needs. The optional RS422/485 ASCII communications allows the UDC 3300 to be configured and monitored using Honeywell's Windows™-based LeaderLine PC Software (LPCS) personal computer program (future enhancement).

The UDC 3300 is totally compatible with existing UDC 3000 applications and installations. It even uses the same case.

™Windows is a trademark of Microsoft

™Modbus is a trademark of AEG Modicon

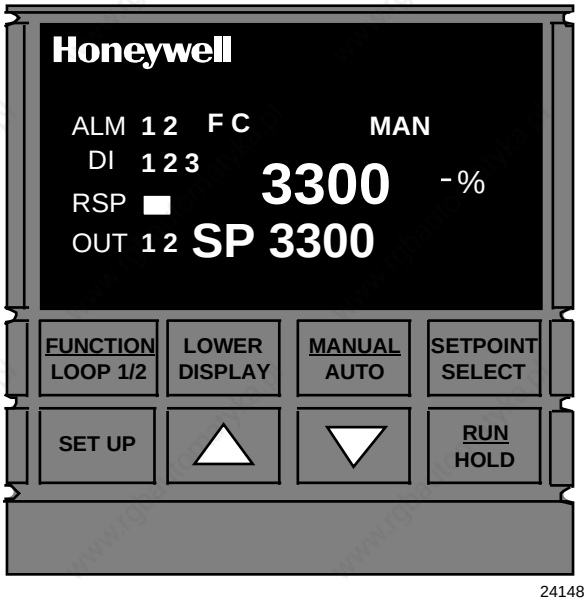

Figure 1—UDC3300 Controller has a sealed faceplate suitable for hosedown applications

Features/Options

High Accuracy—Typically ±0.20% of full scale input with a typical resolution of 15 bits. Can be field calibrated to ±0.05%.

Universal Inputs—Up to two isolated universal inputs accept all thermocouple, RTD, mA, mV, and voltage types. All input types are configurable without switches—no need to calibrate. Alternatively, the second input can be converted into two separate 1-5 volt/4-20 mA high level inputs to provide a total of three analog inputs. All inputs are sampled six times per second (every 166 ms). Inputs can be combined for use with Relative Humidity, % Oxygen, Carbon Potential, Dewpoint sensors, or optional Math Equation. (See Table 1.)

Two Loops of Control (Optional)—Two independent loops or internally cascaded loops in one device.

Features/Options, continued

Math Functions (Optional)

- **Algorithms**—Two pre-configured algorithms for easy implementation into either control loop. They can be linked or used individually and include the capability of using a Ratio and Bias with any input. You can select two from the following menu:

  Feedforward Summer—Uses any input, following a Ratio/Bias calculation, summed directly with the computed PID output value to provide a resultant output to the final control element (standard feature).

  Weighted Average —Computes the weighted average of a PV or SP for the control algorithm from two inputs (standard feature).

  Feedforward Multiplier—Uses any input, multiplied by the calculated PID output to provide a resultant

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Features/Options, continued

Math Functions (Optional)—continued

output which is sent to the final control element (standard feature).

Summer/Subtractor—Will add or subtract inputs with the result used as the derived PV.

Multiplier/Divider—Uses the analog inputs to calculate a derived PV. Available **with** or **without** Square Root.

Input High/Low Select—Specifies the PV input as the higher or lower of the two inputs.

- **Gain Scheduling**—Eight Gain tuning values may be applied to eight Process Variable (PV) bands for ideal tuning on known non-linear processes.
- **8 Segment Characterizers**—Two characterizers are available that can be applied to Input 1, Input 2, Loop 1 Output, or Loop 2 Output.
- **Totalizer**—Calculates and displays the total flow volume as measured by Input 1 or derived by either Math algorithm. Displayed value is eight digits with a configurable scaling factor. The totalizer value may be reset.

Accutune II™—Provides a new, truly plug and play tuning algorithm, which will, at the touch of a button or through a digital input, accurately identify and tune any process including those with deadtime and integrating processes. This speeds up and simplifies start-up plus allows retuning at any setpoint.

Fuzzy Logic—This new feature uses fuzzy logic to suppress process variable overshoot due to SP changes or externally induced process disturbances. It operates independently from Accutune tuning. It does not change the PID constants, but temporarily modifies the internal controller response to suppress overshoot. This allows more aggressive tuning to co-exist with smooth PV response. It can be enabled or disabled depending on the application or the control criteria.

HealthWatch—Consists of three timers and three counters, which can each be assigned to track the following UDC3300 controller functions:

(3) Timers

- Total Operating Time
- Time in Manual or Automatic Mode
- Time in Alarm
- Time of Digital Input Activation
- Time in "Sooting" State

(3) Counters

- Manual Control Mode Counts
- Alarm Trip Counts
- Control Relay Actuations
- Digital Input Actuations
- Outside PV Range Limit Counts
- Failsafe Mode Counts
- Re-tune Counts
- Out of Soak-Band Counts
- Power Cycle Events

Selected Maintenance & Diagnostic data can be accessed from the front panel or via communications. Alarms can be configured to activate when a desired threshold is reached. A security code is required to perform resetting of any of the above listed counter or timer functions.

Auxiliary Output* (Optional)—This isolated Auxiliary Output can be scaled from 4-20 mA for 0 to 100% for any range. It can be configured to represent Input 1, Input 2, PV, active Setpoint, Local SP1, Deviation, or the Control Output. Required for Loop 2 Current Output.

Communications* (Optional)—Provides a communications link between the UDC 3300 and host computer or PLC via the RS422/485 ASCII or Modbus RTU communications option.

Combination Auxiliary Output and RS422/485 Communications*—Provides a single option which has isolated Auxiliary Output plus the ASCII or Modbus RS485 communications described previously with the limitation of 2-wire (half duplex) type communications.

2 Digital Inputs (Optional)—Provides isolated digital input for remote dry contact closure to select one of the following actions for each digital input:

- Manual control mode
- Local setpoint 1
- Local setpoint 2
- Local setpoint 3
- Direct controller action
- Reset of Limit Controller
- Hold SP Ramp/Programming
- Select PID set 2
- PV = Input 2
- PV = Input 3

*Auxiliary output and communications are mutually exclusive unless the combination Auxiliary Output/Communications board is specified.

Features/Options, continued

- To Run - SP Ramp/Program
- External program reset
- Disable PID integral action
- Manual mode, failsafe output
- Disable keyboard To Automatic output value
- Start Timer
- To Auto/Manual Station
- Initiate Tuning
- Initiate PV Hot Start (SPinit)
- Output 1 tracks Input 2
- Output 2 tracks Input 2
- Output 2 overrides Output 1
- To Remote Setpoint
- Display Loop 1/Loop 2
- External reset via Input 2
- To Purge
- Low Fire
- To Latching Manual Mode
- Reset Totalizer

Also a single digital input can allow one of the following selections to be combined with one of the above selections:

- Select PID set 2
- Direct controller action
- Local setpoint 2
- Disable adaptive tune
- Local setpoint 1
- To Run

Auto/Manual Station Plus Back-up Control—You can use a single UDC 3300 to act as both an Auto/Manual Station PLUS a back-up PID Controller, should the primary loop controller fail. Since the PID control is sometimes implemented in the PLC, this feature provides a very cost-effective way to insure the process does not have to shutdown or remain in manual mode if the PLC should fail. Switching from the Auto/Manual Station to the back-up control mode is accomplished using the Digital Input option.

New Alarm Function Features

- Alarms can be configured as latching or non-latching.
- Alarm blocking is also available which allows start-up without alarm energized until after it first reaches the operating region.
- PV rate of change alarm
- Alarm on totalizer value
- Loop break alarm

Three Local Setpoints—Can be configured to provide three local setpoints for each control loop, which are keyboard or optionally remote switch selectable.

Features/Options, continued

Universal Outputs—UDC 3300 provides "out of the box" operations, with no need to open the case. There are no jumpers to connect, no switches to set, and no hardware configuration required.

Universal Switching Power — Operates on any line voltage from 90 to 264 Vac 50/60 Hz without jumpers. 24 Vac/dc instrument power is available as an option.

Moisture Protection —IP65/NEMA 3 rated front face permits use in applications where it may be subjected to moisture, dust, or hose-down conditions.

Limit Control—Provides a latching relay which is activated whenever the PV goes above or below a preset setpoint value. An alarm indicator will light when the output is activated. Reset is through a key on the front of the controller or an external switch. An FM approved model is available.

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

Approval Body Options—FM approval, CSA certification and UL Recognition are available options. UL Recognition applies to regulatory use only.

Timer—This standard feature provides a configurable time period of 0 to 99 hours, 59 minutes. It can be started via the keyboard, alarm 2, or by a digital input. Status is shown on the lower display.

Heat/Cool Capability—Provides split range control with independent PID tuning constants—one for heating, one for cooling—plus mixed output forms.

Setpoint Ramp/Soak Programming (Optional)—Enables you to program and store six Ramp and six Soak segments for setpoint programming. Run or Hold of program is keyboard or remote digital switch selectable.

Setpoint Rate—Lets you define a ramp rate to be applied to any local setpoint change. A separate upscale or downscale rate is configurable. A single setpoint ramp is also available as an alternative.

Dual Displays—Vacuum fluorescent alphanumeric displays and indicators with dedicated PV display.

Features/Options, continued

Deviation Bargraph—"On Control" indication or up to ±10% deviation display.

Thermocouple Failsafe—Configurable upscale or downscale burnout and failsafe output level.

Decimal Point Location—Configurable for none, one, or two places.

Manual/Automatic Modes—Bumpless, balanceless transfer between control modes.

Dedicated Keys—Provide direct access setpoint modes and setpoint program status to simplify and speed operation.

Two Sets of Tuning Constants—Two sets of PID parameters can be configured for each loop and automatically or keyboard selected.

Alarm Selection—None, one, or two relays to activate external equipment when preset high/low setpoints are reached. There is an indicator for each alarm.

Data Security—Five levels of keyboard security protect tuning, configuration, and calibration data, accessed by a configurable 4-digit code. Nonvolatile EEPROM memory assures data integrity during loss of power.

Quality/Support—The UDC 3300 is covered by a 2-year warranty and backed up by a toll-free phone number for technical assistance.

Transmitter Power—Provides up to 30 volts dc to power a 2-wire transmitter. (Requires use of alarm 2 open collector output selection or auxiliary output.)

Physical Description

The controller is housed in a 5.8-inch deep, black metal case with a dark gray elastomer bezel, that can be panel mounted in a 1/4 DIN cutout. (See Figure 5.) The plug-in chassis allows easy access to the controller board and its various option boards. All power, input, and output wiring are connected to screw terminals on the rear panel. (See Figure 6.) Blue and tan elastomer bezels are optionally available.

Inputs

The analog inputs are sampled six times a second.

The UDC 3300 is available with one or two inputs. The first, or Process Variable input, can be one of the various thermocouple, RTD, Radiamatic or linear actuations. Linear actuations have thermocouple, RTD, and Radiamatic transmitter characterization capability as a standard feature. Linear actuations also have square root capability.

The optional second input is isolated and accepts the same actuations as input one, plus it provides the Slidewire input for Position Proportional control.

The second input can also be converted into two high level inputs (Input 2 and Input 3). This third input is enabled by first configuring Input 2 as a 20 mA or 5 Vdc type (high level) input. Input 3 will then also be available as a high level input.Input 2 or Input 3 can act as a Remote SP or as the Second Control Loop PV Input or as a Math Input.

All actuations and characterizations are keyboard configurable. Cold junction compensation is provided for thermocouple type inputs. Upscale or downscale sensor break protection is keyboard configurable. A configurable digital filter of 0 to 120 seconds provides input signal damping.

Output Types

The following output types are available per the model selection guide:

- Current Output
- Electromechanical Relays (5 amps)
- Solid State Relays (1 amp)
- Solid State Relays (10 amps) externally mounted (optional)
- Open Collector Outputs
- Auxiliary Current Output (optional)

Output Algorithms

The UDC 3300 is available with one or more of the following output algorithms:

Time Proportional—Provides On-Off or Time Proportional (Relay) output.

Current Proportional—Supplies proportional direct current output for final control elements which require a 4-20 mA signal.

Position Proportional—Positions a reversible motor with a feedback slidewire in proportion to the output of the control algorithm. Requires two output relays and the second input. *This output type is not available on controllers used for 2-Loop or Cascade.*

Current Proportional Duplex—Similar to current proportional but provides a second set of tuning parameters and a split range current output or a second current output via the Auxiliary output option, for the heat and cool zones.

Time Proportional Duplex—Depending on which control algorithm you select, this duplex output algorithm can provide On-Off Duplex, Time Proportional Duplex, or Three Position Step Control. The time proportional duplex output provides independent PID tuning constants and two time proportional outputs; one for heat zone above the 50% output, and one for cool zone below 50% output. *Available only on the first control loop.*

Current/Relay Duplex (Relay = Heat)—A variation of Duplex with Current active for 0 to 50% output (PID Set 2) and Relay active 50 to100% output (PID Set 1).

Relay/Current Duplex (Relay = Cool)—A variation of Duplex with Current active for 50 to 100% output and Relay is active for 0 to 50% output.

Universal Output Model—Flexibility of the output algorithms allows the current output with two alarms model (DC330B-KE) to also be configured for current simplex, current duplex, time simplex, time duplex, or three position step control. A relay output model with auxiliary output option (DC330B-EE-2) can also be configured for these output algorithms. Addition of the second input to either of these two models allows Position Proportional Control as well.

Control Algorithms

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

- PID-A
- PID-B
- PD with Manual Reset
- Three Position Step Control (Loop 1 only)

  The Three Position Step Control algorithm allows the control of a valve (or other actuator), with an electric motor driven by two controller output relays; one to move the motor upscale, the other downscale without a feedback slidewire linked to the motor shaft. Features of this algorithm are:

  1. The controller can use all three modes of control (PID).
  2. Three Position Step is an automatic back-up mode to Position Proportional Control if the feedback slidewire signal should fail.

- On-Off (Loop 1 only)

Configuration

You decide how the controller is to interact with the process by selecting, through simple keystrokes, the functions you want.
Multi-language prompts guide the operator step-by-step through the configuration process assuring quick and accurate entry of all configurable parameters. There are no internal jumpers, all configuration is via the keyboard. Five languages are available via configuration: English, French, German, Spanish and Italian.

Control Modes

The controller is capable of operating in five different control modes:

1. Manual (one or two loops)
2. Automatic with Local Setpoint (one or two loops)
3. Automatic with Remote Setpoint (one or two loops)
4. Manual Cascade
5. Automatic Cascade

The manual and automatic control modes with local and remote setpoint, and bumpless, balanceless transfer between modes, are standard with the controller; whereas communications and cascade control are optional at added cost.

Alarms

Alarm output terminals are located at the rear terminal panel. One or two electromechanical alarm relays are 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 either of the inputs, the Process Variable, Deviation, Output, Shed from communications, PV rate of change, Manual Mode activation, or any of the selected HealthWatch Timers and Counters. It can also be used as an On or Off event at the beginning or end of a Ramp/Soak segment. The alarm hysteresis is configurable from 0 to 100% of range.

Configurable alarm features include:

- Alarm latching or non-latching
- Alarm blocking
- PV rate of change alarm
- Alarm on totalizer value
- Loop break alarm

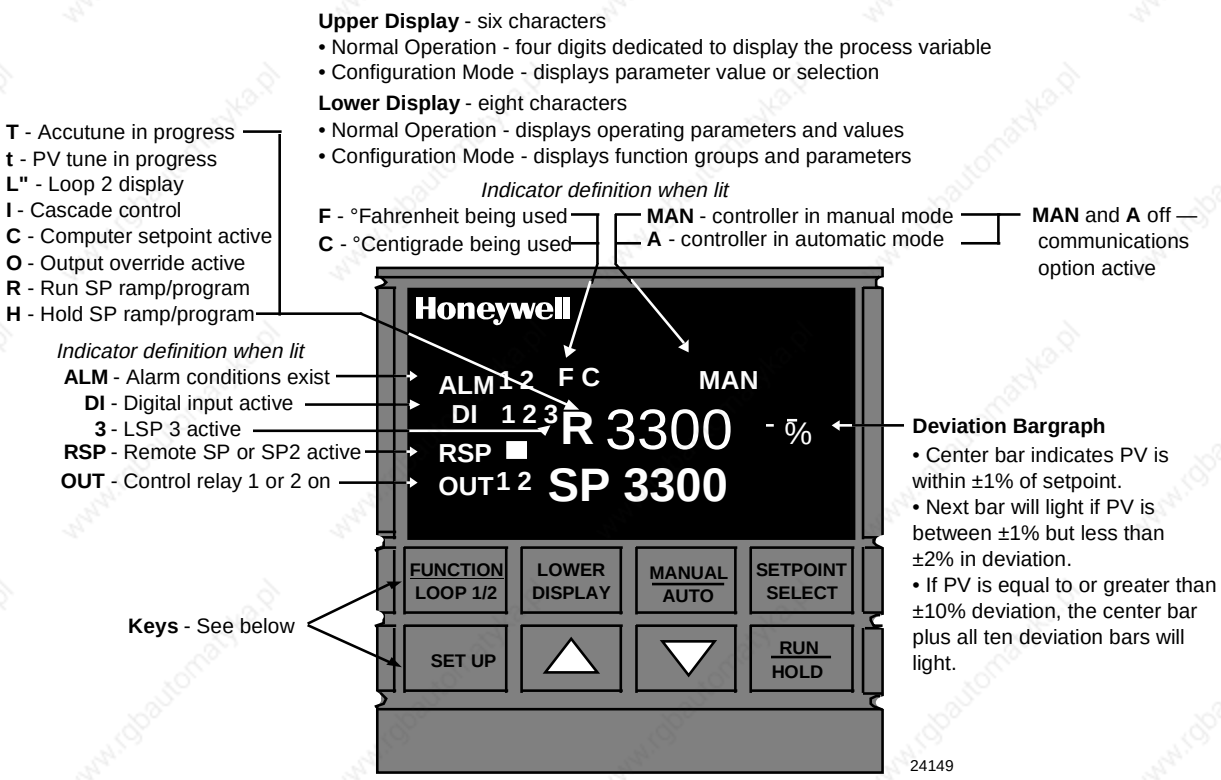


Figure 2—Operator Interface

Operator Interface (Figure 2)

Indicators—Provide alarm, control mode, and temperature unit indication. There is also indication of when Remote 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 deviation to ±10% of span and an "On-Control" indicator.

Displays—A 4-digit upper display is dedicated to the process variable during normal operation with alternate 6-character information displayed when in the configure mode.

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). It also provides guidance, through prompts, for the operator during controller configuration (8-characters).

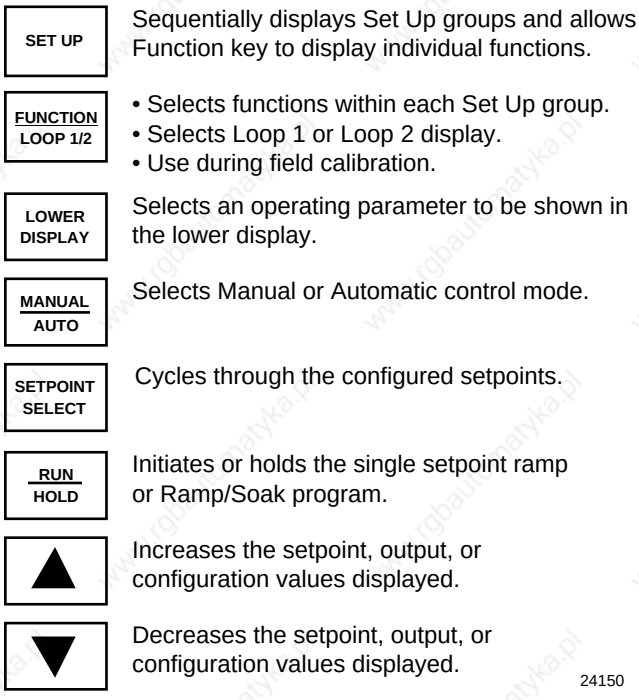


Figure 3—Key Functions

Specifications

Design	
CE Conformity (Europe)	This product is in conformity with the protection requirements of the following European Council Directives: **73/23/EEC**, the Low Voltage Directive, and **89/336/EEC**, the EMC Directive. Conformity of this product with any other "CE Mark" Directive(s) shall not be assumed.
Product Classification:	Class I: Permanently Connected, Panel Mounted Industrial Control Equipment with protective earthing (grounding). (EN61010-1)
Enclosure Rating:	Panel Mounted Equipment, IP 00, this controller must be panel mounted. Terminals must be enclosed within the panel. Front panel IP 65 (IEC 529).
Installation Category (Overvoltage Category):	Category II: Energy-consuming equipment supplied from the fixed installation. Local level appliances, and Industrial Control Equipment. (EN 61010-1)
Pollution Degree:	Pollution Degree 2: Normally non-conductive pollution with occasional conductivity caused by condensation. (Ref. IEC 664-1)
EMC Classification:	Group 1, Class A, ISM Equipment (EN 55011, emissions), Industrial Equipment (EN 50082-2, immunity)
Method of EMC Assessment:	Technical File (TF)
Declaration of Conformity:	51309602-000
Input Accuracy	± 0.20% of full scale typical (±1 digit for display) Can be field calibrated to ±0.05% of full scale typical 15-bit resolution typical
Sampling Rate	Inputs sampled six times a second
Temperature Stability	± 0.01% of Full Scale span / •C change—typical
Input Signal Failure Protection	*Thermocouple Inputs:* Upscale or downscale burnout *Burnout Current:* 0.13 microamps *Failsafe Output Level:* Configurable 0-100%
Input Impedance	*4-20 Milliampere Input:* 250 ohms *0-10 Volt Input:* 200K ohms *All Other:* 10 megohms
Maximum Lead Wire Resistance	*Thermocouples:* 100 ohms/leg *100, 200, and 500 RTD:* 100 ohms/leg *100 Low RTD:* 10 ohms/leg
Stray Rejection	**Common Mode** *AC (50 or 60 Hz):* 120 dB (with maximum source impedance of 100 ohms) or ±1 LSB (least significant bit) whichever is greater with line voltage applied. *DC:* 120 dB (with maximum source impedance of 100 ohms) or a ±1 LSB whichever is greater with 120 Vdc applied. *DC (to 1 KHz):* 80 dB (with maximum source of impedance of 100 ohms) or ±1 LSB whichever is greater with 50 Vac applied. **Normal Mode** *AC (50 or 60 Hz):* 60 dB (with 100% span peak-to-peak maximum)
Alarm Outputs	One SPDT electromechanical relay. A second alarm is available using the second control relay. This is not available with Relay Duplex, Position Proportional, or Three Position Step control. 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, Manual Mode, Failsafe, PV Rate, RSP Mode, Communication Shed, or Output. A single adjustable hysteresis of 0.0 to 100.0% is provided. The alarm can also be set as an ON or OFF event at the beginning of a setpoint ramp/soak segment. *Alarm Relay Contacts Rating* *Resistive Load:* 5 ampere at 120 Vac or 30 Vdc, 2.5A at 240 Vac.
Controller Output Types	**Current Output (Isolated)** Range can be set anywhere between 0 to 21 mA, and as direct or reverse action. *Resolution:* 11 bits for 0 to 21 mA *Accuracy:* 0.5% full scale *Temperature Stability:* 0.1% F.S./°C *Load Resistance:* 0 to 1000 ohms

Specifications, continued

Design (continued)	
Controller Output Types (continued)	**Electromechanical Relays (One or Two)** SPDT contacts. Both Normally Open and Normally Closed contacts are brought out to the rear terminals. Internally socketed *Resistive Load:* 5 amps @ 120 Vac, 30 Vdc, 2.5A at 240 Vac *Inductive Load:* 50 VA @ 120 Vac or 240 Vac *Motor:* 1/6 H.P. **Solid State Relays (One or Two)** SPST solid state contacts consisting of a triac N.O. output. Internally socketed *Resistive Load:* 1.0 amp @ 25°C and 120 or 240 Vac 0.5 amp @ 55°C and 120 or 240 Vac *Inductive Load:* 50 VA @ 120 Vac or 240 Vac *Minimum Load:* 20 milliamps **Open Collector Outputs (One or Two)** *Maximum Sink Current:* 20 mA *Overload Protection:* 100 mA Internally powered @ 30 Vdc Opto-isolated from all other circuits except current output, but not from each other. Socketed jumper assembly replaces relay. **Solid State Relays (10 amps)** One or two externally mounted SPST triac N.O. outputs for use with open collector outputs. *Resistive Load:* 15 amps @ 25°C and 120 or 240 Vac 10 amps @ 55°C and 120 or 240 Vac *Inductive Load:* 50 VA @ 120 Vac or 240 Vac *Motor Rating:* 1 HP @ 25°C 0.75 HP @ 55°C
Controller Output Algorithms	**On-Off or Time Proportional** One relay or open collector output. Control action can be set for direct or reverse. *Time Proportional Relay Resolution:* 3.3 msec On-Off is available on Loop 1 only. **On-Off Duplex, Three Position Step Control, or Time Proportional Duplex—(Loop 1 only)** Two relays or open collector outputs. Control action can be set for direct or reverse. *Time Proportional Relay Resolution:* 3.3 msec **Current Proportional** A single 4-20 mA current output signal which can be configured for direct or reverse action. **Current Proportional Duplex** A single split current output for both heat and cool (4-12 cool, 12-20 heat) or a combination of current proportional output (Heat = 50 to 100% of range) and auxiliary current output (Cool = 0 to 50% of range). Both are 4-20 mA signals which can be set for direct or reverse action. **Position Proportional** Two SPDT electromechanical or solid state relays (recommended) operate any motor having a 100 ohm to 1000 ohm feedback slidewire. **Current/Time Duplex** Variation of time proportional duplex for Heat/Cool applications. Time proportional output (heat or cool) is a relay. Current proportional output (Heat or Cool) is a 4-20 mA signal that can be fed into a negative or positive grounded load of 0 to 1000 ohms and is operational over 50% of range or the entire range.
Digital Inputs (Optional) (Isolated)	+15 Vdc source for external dry contacts or isolated solid state contacts. The Digital Input option detects the state of external contacts for either of the two inputs. On contact closure the controller will respond according to how each digital input is configured. Opening contact causes return to previous state.
Input Filter	*Software*: Single pole lowpass section with selectable time constants, off to 120 seconds available on both analog inputs.

Specifications, continued

Design (continued)	
Auxiliary Linear Output (Optional) *(Isolated)*	21 mA dc maximum into a negative or positive grounded load or non-grounded load of 0 to 1000 ohms. Output range can be set anywhere between 0 to 21 mA, and as direct or reverse action. It can be configured to represent either Input, PV, Setpoint, Deviation, or Control output. The range of the auxiliary output, as a function of the selected variable, can be scaled. This output can be used as a second current output for current duplex outputs. *Resolution:* 12 bits over 0 to 21 mA *Accuracy:* 0.05% of full scale *Temperature Stability:* 0.0075% F.S./°C *Load Resistance:* 0 to 1000
Communications Interface (Optional)	
DMCS	*Baud Rate:* 19200 baud *Length of Link:* 4000 ft. maximum *Link Characteristics:* Two-wire, multi-drop proprietary protocol, 31 drops maximum
RS422/485 ASCII	*Baud Rate:* 300, 600, 1200, 2400, 4800, 9600, or 19200 baud *Parity:* Odd or Even *Length of Link:* 4000 ft. maximum *Link Characteristics:* Two-wire (half duplex) or four-wire (full duplex), multi-drop RS422 ASCII , 15 drops maximum or up to 31 drops for shorter link length.
RS422/485 Modbus RTU	*Baud Rate:* 300, 600, 1200, 2400, 4800, 9600, 19200 baud selectable *Data Format:* Floating point or integer *Length of Link:* 4000 ft. maximum *Link Characteristics:* Two-wire, multi-drop Modbus RTU protocol, 15 drops maximum or up to 31 drops for shorter link length.
Combination Auxiliary Output/Communications	Provides as a single option the isolated Auxiliary Output and the ASCII or Modbus RS485 communications described above. Two-wire (half duplex) type communications only.
Digital Displays	Vacuum fluorescent, alphanumeric. A six-character upper display dedicated to the process variable (4 digits). Alternate information displayed during configuration mode. A eight-character lower display primarily shows key selected operating parameters (4 digits). Also provides guidance during controller configuration.
Indicators	Alarm Relay Status (ALM 1 or 2) Control Mode (A or MAN) Temperature Units (F or C) Remote Set Point or SP2 Active (RSP) Third Local Setpoint Active (3) Control Relay Status (OUT 1 or 2) Digital Input Status (DI 1 and 2)
Bargraph	21-segment, vertical Deviation bargraph Center bar lit when “on” control Deviation to ±10% of PV span in 1% increments
Modes of Operation	Manual (1 or 2 Loops) Automatic with local setpoint (1 or 2 Loops) Automatic with remote setpoint (1 or 2 Loops) Manual cascade (2 Loops) Automatic cascade (2 Loops)
Dimensions	See Figure 5.
Mounting	Panel-mounted, 5.82-inch depth
Wiring Connections	Screw terminals on the rear of the case. (See Figure 6.)
Power Consumption	18 VA maximum (90 to 264 Vac); 12 VA maximum (24 Vac/dc)
Power Inrush Current	10A maximum for 4 ms (under operating conditions) **CAUTION** When applying power to more than one UDC 3300, make sure that sufficient power is supplied. Otherwise, the controllers may not start up normally due to voltage drop from the inrush current.
Weight	1.3 kg (3 lbs.)

Specifications, continued

Environmental and Operating Conditions

Parameter	Reference	Rated	Operative Limits	Transportation and Storage
Ambient Temperature	25 ± 3°C 77 ± 5°F	15 to 55°C 58 to 131°F	0 to 55°C 32 to 131°F	–40 to 66°C –40 to 151°F
Relative Humidity	10 to 55*	10 to 90*	5 to 90*	5 to 95*
Vibration Frequency (Hz) Acceleration (g)	 0 0	 0 to 70 0.4	 0 to 200 0.6	 0 to 200 0.5
Mechanical Shock Acceleration (g) Duration (ms))	 0 0	 1 30	 5 30	 20 30
Voltage (Vdc)	+24 ±1	20 to 27	20 to 27	- -
Voltage (Vac) **90 to 264 Vac** (CSA models rated to 250V max.) **24 Vac**	 120 ±1 240 ±2 24 ± 1	 90 to 264 20 to 27	 90 to 264 20 to 27	 - - - - - -
Frequency (Hz) (For Vac)	50 ±0.2 60 ±0.2	49 to 51 59 to 61	48 to 52 58 to 62	- - - -

* The maximum rating only applies up to 40°C (104°F). For higher temperatures, the RH specification is derated to maintain constant moisture content.

Table 1—Input Actuations

PV Input	Range °F	Range °C
Thermocouples (Per ITS-90)		
B	0 to 3300	–18 to 1816
E	–454 to 1832	–270 to 1000
E (low)	–200 to 1100	–129 to 593
J	0 to 1600	–18 to 871
J (low)	20 to 770	–7 to 410
K	0 to 2400	–18 to 1316
K (low)	–20 to 1000	–29 to 538
NiNiMoly (NNM68)	32 to 2500	0 to 1371
NiNiMoly (low)	32 to 1260	0 to 682
NiMo-NiCo (NNM90)	32 to 2500	0 to 1371
NiMo-NiCo (low)	32 to 1260	0 to 682
Nicrosil Nisil (NIC)	0 to 2372	–18 to 1300
R	0 to 3100	–18 to 1704
S	0 to 3100	–18 to 1704
T	–300 to 700	–184 to 371
T (low)	–200 to 500	–129 to 260
W5W26	0 to 4200	–18 to 2315
W5W26 (low)	0 to 2240	–18 to 1227
Honeywell Radiamatic		
Type RH	0 to 3400	–18 to 1871
Type RI	0 to 9999 max.*	–18 to 9999 max.*

*User enters the range manually per RI type and application.

PV Input	Range °F	Range °C
RTD IEC Alpha = 0.00385		
100 ohms	–300 to 1200	–184 to 649
100 ohms (low)	–300 to 300	–184 to 149
200 ohms	–300 to 1200	–184 to 649
500 ohms	–300 to 1200	–184 to 649
Linear		
Milliamps	4 to 20 mA 0 to 20 mA	
Millivolts	0 to 10 mV 0 to 50 mV	
Volts	1 to 5 V 0 to 5 V 0 to 10V	
Carbon	0 to 1250 mV	
Oxygen	–30 to 510 mV	

General Reference Data

Isolation (Functional)	*AC Power:* Is electrically isolated from all other inputs and outputs to withstand a HIPOT potential of 1900 Vdc for 2 seconds per Annex K of EN61010-1. *Analog Inputs and Outputs:* Are isolated from each other and all other circuits at 850 Vdc for 2 seconds. *Digital Input and Digital Output:* Are isolated from all other circuits at 850 Vdc for 2 seconds. *Relay Contacts:* With a working of 115/230 Vac, isolated from each other and all other circuits at 345 Vdc for 2 seconds.
Surge Withstand Capability (SWC)	*Immunity:* 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. The instrument is capable of meeting these test levels with no component failures, no reset, and no incorrect outputs.
Radio Frequency Interference (RFI)	*Immunity*: No effect on performance from a 5 W walkie-talkie operated at 27, 151 or 450 MHz, one meter from the controller.

Model Number Interpretation

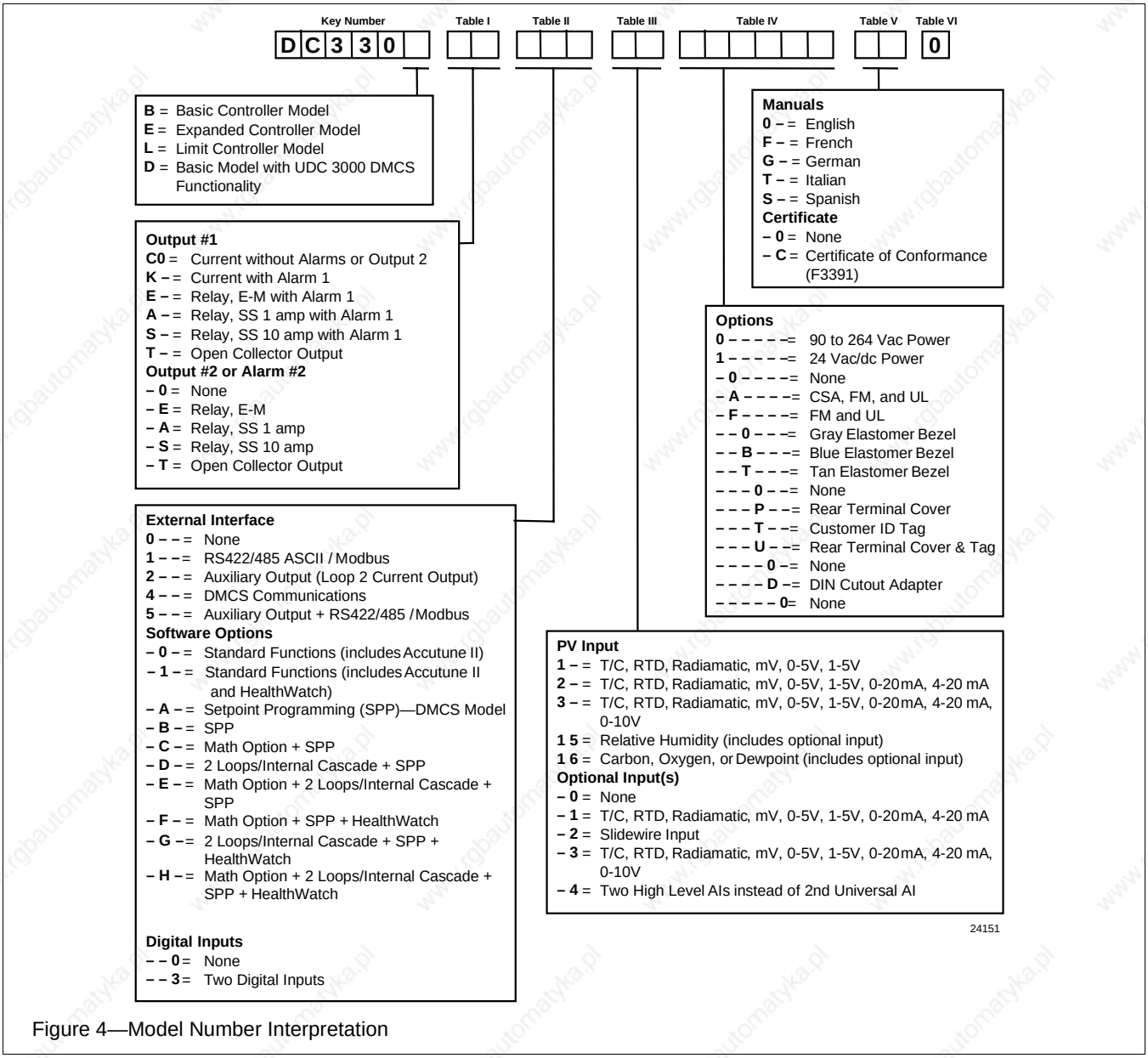


Figure 4—Model Number Interpretation

Dimensions

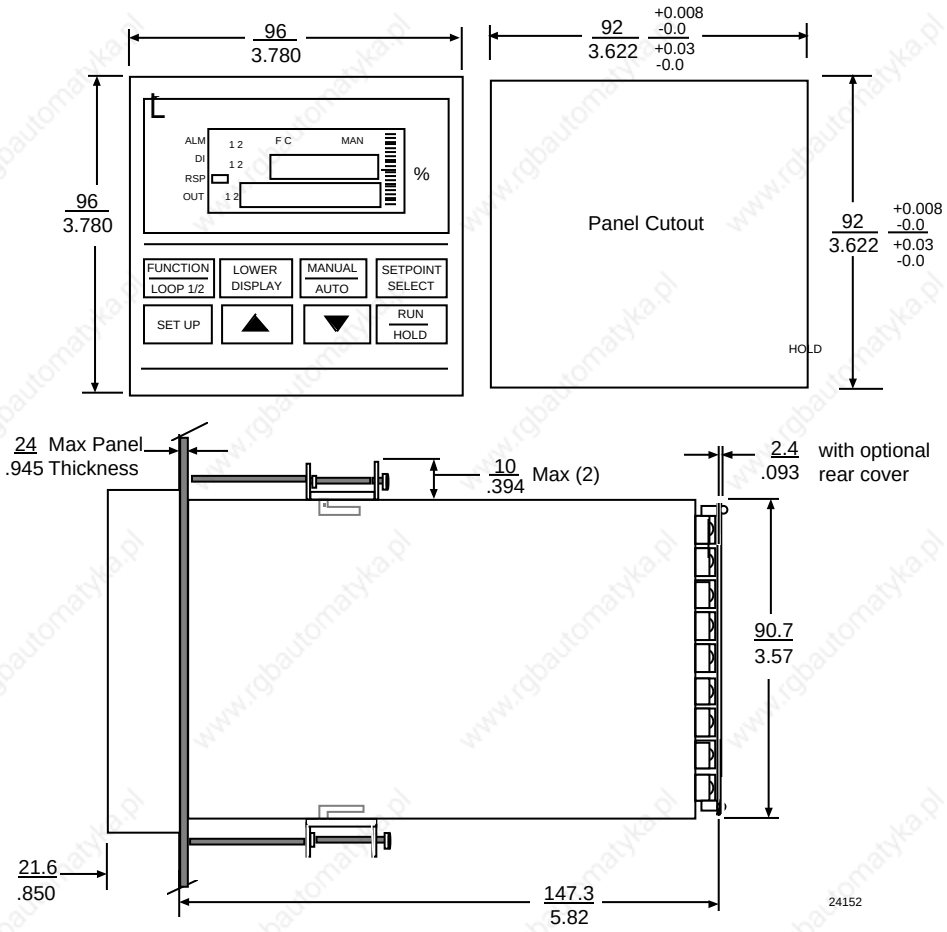
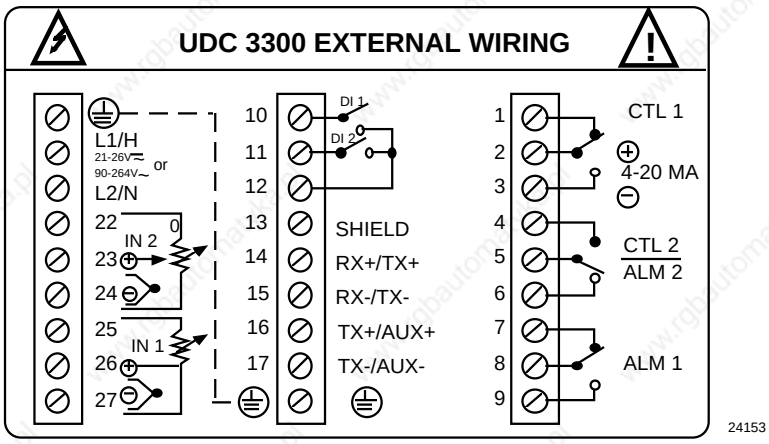


Figure 5—UDC 3300 Controller Dimensions – not to scale

Wiring Diagram



NOTE:
The product manual should be consulted for specific details and precautions regarding wiring.

Figure 6—External Wiring Diagram

Ordering Information

For the complete ordering information, request Model Selection Guide 51-51-16-54 for UDC 3300 Universal Digital Controller.

Honeywell offers a full line of Sensors, Transmitters, and Final Control Devices for use with the UDC 3300 Universal Digital Controller. These devices include:

- Thermocouples,
- RTDs,
- Pressure Transmitters,
- Flow Transmitters,
- Liquid Level Transmitters,
- Valves,
- Actuators, and
- Electric Motors.

Specifications are subject to change without notice.

Distributor :

For more information, contact your nearest Honeywell Response Center listed below.

Honeywell

Industrial Automation and Control
Honeywell Inc.
In the U.S.A.: Honeywell Industrial Automation and Control, 16404 North Black Canyon Hwy., Phoenix, AZ 85023, (800) 343-0228
In Europe: Honeywell S.A., 80084 Amiens Cedex 2, (33) 22.54.56.56
Honeywell Control System Ltd., Honeywell House, Bracknell, UK-RG 12 1 EB, (44) 1344 826000
In Japan: Yamatake-Honeywell Co. Ltd., Nagai Int'l Bldg., 2 - 12 - 19 Shibuya-Ku, Tokyo 150 Japan, 81-3-3486-2051
In Asia: Honeywell Asia Pacific Inc., Room 3213-3225, Sun Hung kai Centre, No. 30 Harbor Road, Wanchai, Hong Kong, (852) 829-8298
In the Mediterranean: Africa and Middle East Region, Honeywell SpA, Via Vittor Pisani 13, 20124 Milano, Italy (39-2) 67731
Honeywell Pacific Division: Honeywell Pty Ltd., 5 Thomas Holt Drive, North Ryde Sydney, NSW Australia 2113, (61-2) 353 7000
In Canada: The Honeywell Centre, 155 Gordon Baker Road, Ontario M2H 3N7, 1-800-461-0013
In Latin America: Honeywell Inc.,14505 Commerce Way, Suite 500, Miami Lakes, Florida 33016-1556, (305) 364-2300