

## UDC 700 Universal Digital Controller and Indicator

## Specification

### Overview

The UDC 700 is a 1/32 DIN (49 x 25 mm) controller which combines a high degree of technology and quality with a low price. Its large red display provides a large, clear and quick indication of the essential information you need. It is ideally suited for a large number of applications.

An indicator version is also available.

Based on the same technology as the UDC 1000/1500 low price controllers, the UDC 700 is the ideal companion to those controllers for less complex applications requiring UDC performance in a space-limited installation.

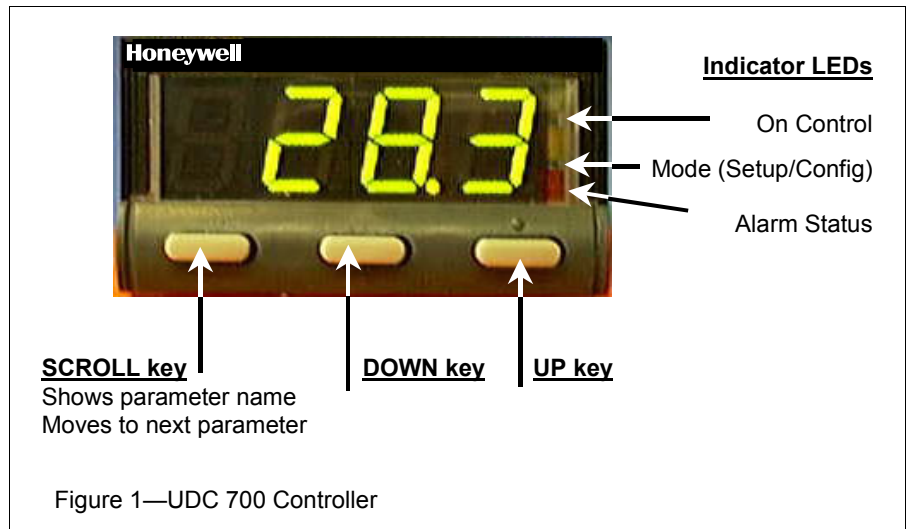


Figure 1—UDC 700 Controller

### Features

**Moisture Resistant Front Face**—Meets NEMA 4/IP66 front face protection against dust and water.

**Universal Power**—Can operate on any line voltage from 90 Vac to 264 Vac at 50/60 Hz. A 24 Vac/dc option is also available.

**Universal Input**—All input types (Thermocouples, RTDs, and Linear DC mA/mVs) are field configurable. The input is isolated from the output except for the SSR Driver.

**Large Display**—A 10 mm (0.4 inch) four-digit red LED display makes the UDC 700 easy to read from a distance and view for configuration.

**Output Types**—Standard outputs available are either a 2 amp Relay Control Output plus an SSR Driver Alarm 1 OR an SSR Driver Control Output plus a 2 amp Relay Alarm 1.

**Alarms**—Alarm 1 is available as a Relay or an SSR Driver. An optional Relay is available as Alarm 2. Alarm 2 is mutually exclusive with communications. The alarm types can be set on PV high, PV low, or Deviation (high or low).

**Configuration**—Easy and full configuration with straightforward menu via the instrument front face or configuration port. No hardware configuration needed.

**Approvals**—UL and CE standard feature.

**RS485 Modbus Communications**—Modbus Communications Protocol is an optional feature which is mutually exclusive with Alarm 2. It is half-duplex and has selectable Baud rate (see page 2). Not field upgradable.

**Automatic Tuning**—Hands off PID tuning or manual tuning with “pretune” available as standard.

**Two Local Setpoints**—One or two setpoints available and selectable from keypad.

## Specifications

Technical Data	
<b>Accuracy</b>	<i>Measurement:</i> 0.1% of span $\pm 1$ LSD (0.25% for Types J and T) <i>Linearization for T/C and RTD:</i> Better than $\pm 0.2^{\circ}\text{C}$ for decimal range; better than $\pm 0.5^{\circ}\text{C}$ for integer range <i>Cold Junction Compensation (T/C only):</i> Better than $\pm 1^{\circ}\text{C}$
<b>Temperature Stability</b>	0.01% of span per $^{\circ}\text{C}$
<b>Input Signal Failure</b>	<i>For Thermocouple and RTDs:</i> Upscale burnout <i>For Linear Input:</i> Downscale burnout (only applicable to 4-20 mA)
<b>Input Sampling Rate</b>	Four samples per second
<b>Input Filter</b>	<i>Digital Filter:</i> 0.0 (off), from 0.5 to 100.0 seconds in 0.5-second increments
<b>Input Resolution</b>	14 bits approximately, always four times better than display resolution
<b>Input Isolation</b>	Universal input isolated at 2500V from all outputs and from power supply (except for SSR Driver)
<b>Stray Rejection</b>	<i>Common Mode Rejection:</i> $>120$ dB at 50/60 Hz with negligible effect at 264V <i>Serial Mode Rejection:</i> $>500\%$ of span at 50/60 Hz with negligible effect
<b>Approvals</b>	UL and CE
<b>Environmental</b>	<i>EMI Immunity:</i> Meets EN50082-2 part 2 <i>EMI Emission:</i> Meets EN50081-2 part 2 <i>Safety Considerations:</i> Complies with EN61010-1
<b>Front Panel Sealing</b>	NEMA 4/IP66
<b>Power Consumption</b>	4 watts maximum
<b>Physical</b>	<i>Weight:</i> 480 grams (16.9 ounces) maximum <i>Wiring Connection:</i> Screw terminals on the rear of the case (combination head)
<b>Output Type</b>	<b>Type available:</b> <i>Output 1:</i> Electromechanical relay Control Output (SPST) + SSR Driver for Alarm 1 <i>Output 2:</i> SSR Driver Control Output + Electromechanical relay (SPST) for Alarm 1  <b>Electromechanical Relay:</b> SPST contact with 2A at 120V or 240V (resistive load); isolated <i>Lifetime:</i> $>500,000$ operations at rated voltage/current  <b>SSR Driver:</b> $>10$ Vdc into 500 ohms minimum (50 mA maximum); not isolated from input
<b>Alarms</b>	<i>Alarm 1:</i> Relay output (SPST) or SSR Driver output <i>Alarm 2:</i> Relay output (SPST) (mutually exclusive with communications) <i>Alarm Types:</i> PV high or low, Deviation high or low
<b>Tuning Parameters</b>	<i>PB:</i> 5% to 999.9% <i>Reset (Integral Time):</i> 1 sec. to 99 min. 59 sec. and "OFF"; MR = 0-100% <i>Rate (Derivative Time):</i> 0 (OFF) to 9 min. 59 sec.
<b>Communications</b>	RS485, Modbus protocol, Half Duplex, Baud Rate: 1200, 2400, 4800, or 9600. 32 maximum drops.
<b>Control Algorithm</b>	PID or ON/OFF; Direct or Reverse acting <i>ON/OFF Hysteresis:</i> 0.1% to 10.0% of input span.  NOTE: No <b>Manual</b> mode available.

## Specifications, continued

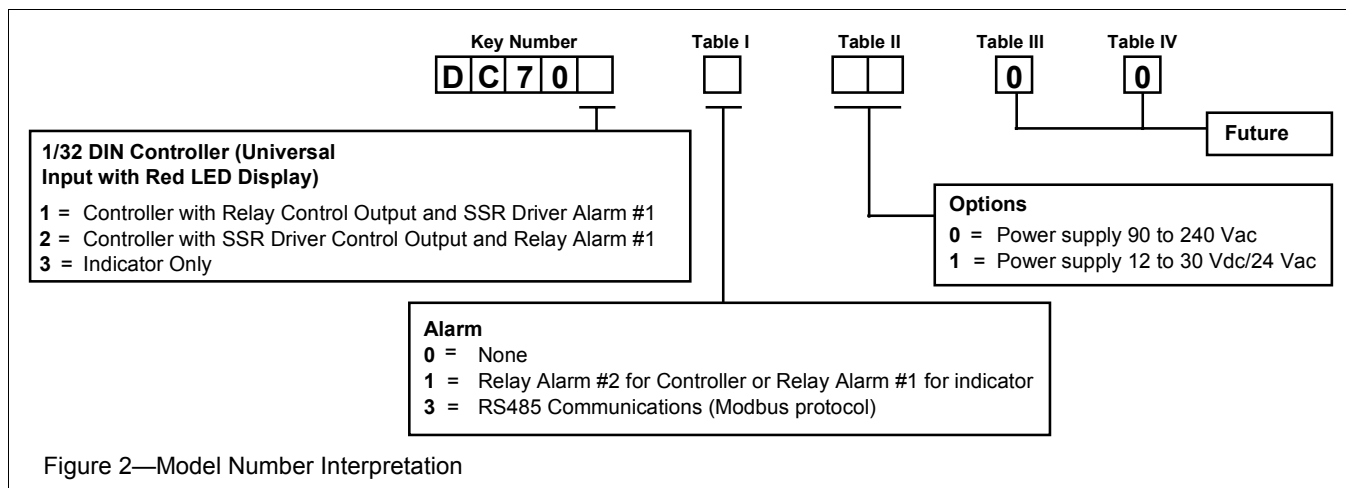
### Input Actuations

Thermocouple Types (Fixed Decimal)		°F	°C
		B	211 to 3315
J		-328 to 2191	-200 to 1200
J		-198.4 to 998.5	-128 to 537
K		-198.4 to 998.0	-128 to 536.7
K		-400 to 2499	-240 to 1371
N		32 to 2550	0 to 1399
R		32 to 3198	0 to 1759
S		32 to 3217	0 to 1770
T		-400 to 753	-240 to 401
T		-198.4 to 753	-128 to 400.6
RTD (3-wire connection) (Fixed decimal)	PT100 (IEC) $\alpha = 0.00385$	-327 to 1475 -198.3 to 998.5	-199 to 802 -127.9 to 557
DC Linear	4-20 mA 0-20 mA 10-50 mV 0-50 mV	-1999 minimum Range 9999 maximum Range With 0, 1, 2, or 3 decimal points	

### Environmental and Operating Conditions

Parameter	Reference Conditions	Operative Limits	Transportation and Storage
Ambient Temperature	20 ± 2°C 68 ± 4°F	0 to 55°C 32 to 131°F	-20 to 80°C -4 to 176°F
Relative Humidity	60-70%	20-95% non-condensing	
Voltage	90 to 240 Vac ±1%	90 to 264 Vac 24 Vac or 12 to 30 Vdc	
Frequency	50 Hz	50-60 Hz	
Source Resistance	<10 ohms for thermocouple	1000 ohms maximum for thermocouple	
Lead Resistance for RTD	<0.1 ohm/lead (PT100)	50 ohms per lead maximum balanced (PT100)	

## Model Number Interpretation



### External Dimensions and Panel Cutout

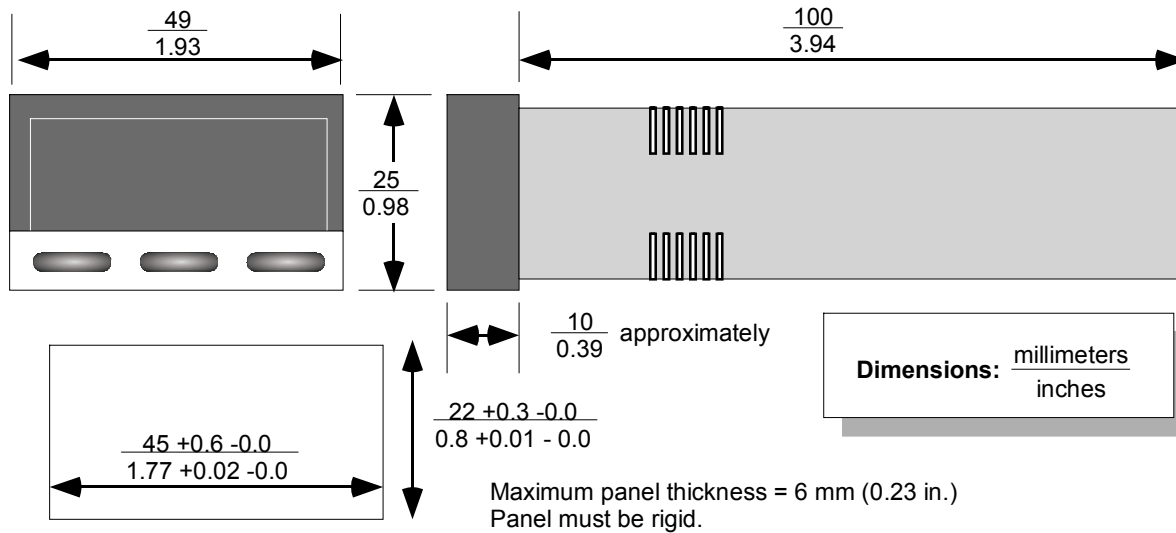


Figure 3—UDC 700 Controller Cut-out Dimensions – not to scale

### Wiring Diagram

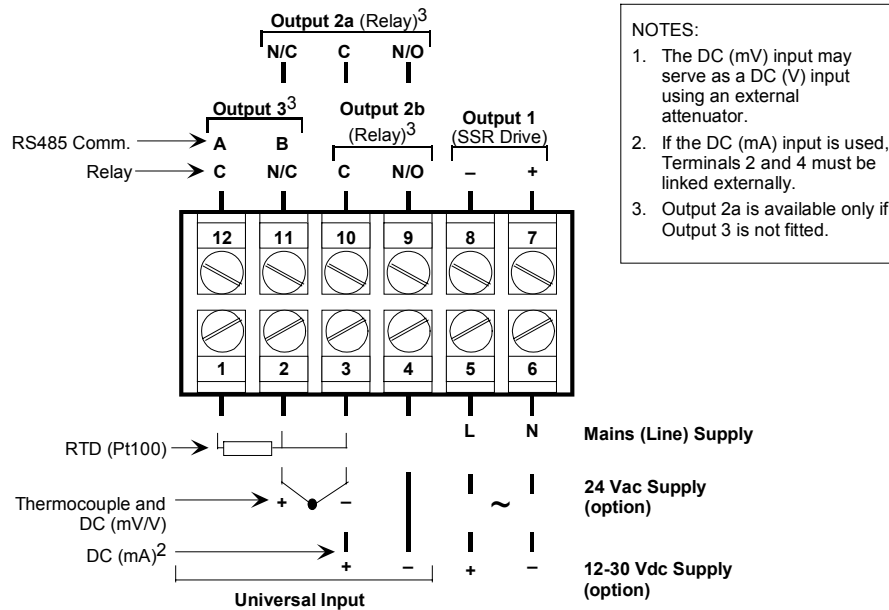


Figure 4—External Wiring Diagram

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