

# Helping Deliver an Efficient and Secure Process

## Eurotherm EPC3000 Programmable Controllers

Maintain high standards of production quality and ease your cybersecurity worries



### Product at a glance

The EPC3000 range of programmable single loop process and temperature controllers is designed to optimize efficiency, and repeatability and is certified for cybersecurity communications robustness.

The controllers combine industry-leading control and measurement performance with simplicity of use, while remaining highly flexible.

A simple "Quick Start" configuration code enables fast commissioning using just the instrument HMI. For applications requiring additional processing, user function block wiring provides an extensive range of math, logic, totalizer and specialized functions.

A highly visible three-color display with natural language status and alarm indications is easy and clear for operators to use.

The EPC3000 Controller is highly durable, with battery-free design, prolonging service life.

#### Accuracy and Repeatability

Process inputs are fast and accurate, with exceptional thermal stability, aiding precise and consistent control over long periods without calibration drift. Recalibration and user calibration correction functions are available to further improve accuracy.

The industry-leading Eurotherm PID algorithm delivers fast reacting and repeatable control and has been enhanced in the EPC3000 range to further reduce overshoot. Rapid rise to operating temperature and low oscillation helps improve yield. PID settings may be adjusted to suit specific process operating regions, helping deliver optimum performance.

#### Connectivity and Cybersecurity

The EPC3000 controller range is Ethernet enabled as standard and is the first Eurotherm controller to be designed and certified to meet the stringent cybersecurity requirements of **Achilles® Communications**

**Robustness Testing Level 1.** Ethernet communications are supported via a standard RJ45 connector, providing fast access to process and diagnostic information as well as connectivity to external PLCs, SCADA systems and IIoT technologies.

Modbus RTU serial communication is also supported.

A free PC-based backup and configuration tool uses a USB connection, to power the instrument for convenient desktop configuration.

- Precision furnace control
- Atmosphere control
- Industrial ovens
- Crystal growing
- Composite materials processing
- Heat exchangers
- Automotive paint drying
- Baking ovens
- Precision single loop controller cybersecurity functionality
- Precise (0.1%) accuracy universal input with 50ms sample rate
- Thermocouples, resistance thermometer, mA, mV, V, zirconia inputs
- Exceptional thermal stability
- Fast PID response with minimal overshoot and oscillation
- Up to 8 PID sets available with gain scheduling function
- Multi-programmer function with maximum of 20 programs of 8 steps or 10 programs of 24 steps
- Direct Ethernet RJ45 Connection certified to Achilles® CRT Level 1
- High visibility customizable display
- Quick code setup with application templates
- User function block wiring including math, logic and totalizer
- Extensive range of international approvals
- EN 14597 TR type approval

## Specification

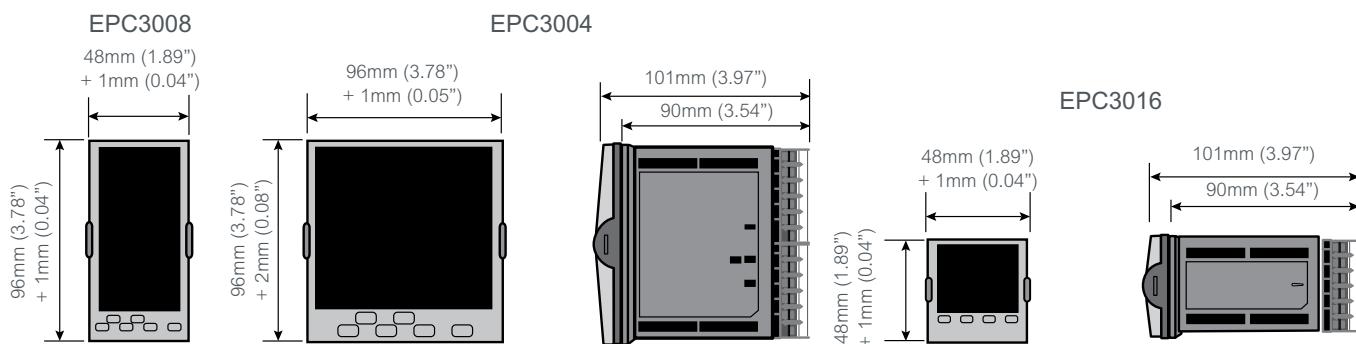
General	
Controller Function	<ul style="list-style-type: none"> <li>Single loop panel mount PID controller range with autotune, on/off, valve positioning (no slidewire required).</li> <li>Zirconia probe atmosphere control.</li> <li>Single loop profile/program.</li> <li>AC Mains voltage and 24Vdc power options.</li> </ul>
Measurement Inputs	1 or 2 inputs. Accuracy $\pm 0.1\%$ of reading (refer to Universal Inputs table).
PID Control	<ul style="list-style-type: none"> <li>2 PID sets are available as standard, with 8 as an optional extension (Each PID set offers a separate proportional band for heat and cool operation).</li> <li>Enhanced Autotuning control with cutback function to minimize overshoot and oscillation. Fast reacting precision control to setpoint changes or after process disturbances.</li> <li>Enhanced valve positioning (unbounded) algorithm.</li> <li>Gain scheduling allows PID selection for a wide range of operating situations, including deviation from setpoint, absolute temperature, output level and others.</li> <li>AC supply voltage monitoring for feedforward function. Process Variable (PV) and Setpoint (SP) feedforward functions.</li> </ul>
Setpoint Programmer/Profiler	<ul style="list-style-type: none"> <li>Options include 20 profiles of 8 steps (20x8), 10x24, 1x24 and 1x8.</li> <li>Holdback ("guaranteed soak"), event outputs, time to target, ramp rate, dwell, step and call segment types.</li> <li>Communication addresses compatible with Eurotherm 2400 programmable Controller.</li> <li>Additional timer functions available.</li> </ul>
User Function Block Wiring	<ul style="list-style-type: none"> <li>Optional totalizer</li> <li>Math</li> <li>Logic and multiplexing</li> <li>BCD conversion</li> <li>Counter/timer and many other special function blocks available including 16 point linearization, zirconia and dual input switchover.</li> </ul>
Additional Functions	<ul style="list-style-type: none"> <li>Digital and analog retransmission functions.</li> <li>CT Input - Monitor partial load failure, load short and open circuit; Dual input functions including switchover, redundant sensor, average, min, max, zirconia.</li> <li>6 Freely configurable alarms with manual, automatic, non-latching and event types plus alarm delay function and blocking.</li> <li>Alarms may be inhibited in standby.</li> <li>5 Recipes with 40 freely selectable parameters switchable from front panel or digital input.</li> <li>Scrolling parameter help and user messages displayed on event.</li> <li>USB backup lead and free configuration software.</li> </ul>
Backup and Configuration Tools	<ul style="list-style-type: none"> <li>Free Eurotherm iTools software for backup and configuration.</li> <li>USB Backup lead available for convenient desktop configuration and back up; powers the instrument with or without a sleeve.</li> <li>iTools also connects using Ethernet Modbus/TCP and serial Modbus RTU.</li> </ul>
"OEM Security"	Helps protect instrument configurations from unauthorized viewing, cloning or backwards engineering.

Function Blocks	Function	Standard	Standard Toolkit Blocks	Enhanced Toolkit Blocks
Instrument	Interface to Instrument wide settings	1	-	-
Loop	Enhanced Eurotherm PID Loop	1	-	-
Programmer*	Ramp/Dwell Programmer	1	-	-
BCD	BCD Conversion	1	-	-
Alarm	General purpose analog alarm monitoring	6	-	-
Recipe	General purpose recipe function	1	-	-
Comms*	Interface to serial and Ethernet communications	2	-	-
AI	Interface to main analog input	2	-	-
IP Monitor	Input monitoring (min, max, other functions)	2	-	-
IO*	Interface to Inputs and Outputs	6	-	-
Option DIO*	Digital I/O options	8	-	-
Remote Input	Interface to remote (communications) input	1	-	-
OR	Eight input logical "OR" operation	8	-	-
CT*	Current transformer	1	-	-
Zirconia*	Zirconia Probe input	1	-	-
Wires*	User wiring	50	200	200
Math2	Two input math functions	-	4	8
Lgc2	Two input logical operations	-	4	8
Lgc8	Eight input logical operations	-	2	4
Timer	Timer based functions	-	1	2
SwitchOver	Input switchover	-	1	1
Mux8	Eight Input multiplexer	-	3	4
Total	Totalizer	-	1	1
Counter	Counter block (32-bit)	-	1	2
UsrVal	User values (freely assignable)	-	4	12
Lin16	16 point linearization	-	2	2

\*Dependent on instrument/options ordered

Environmental Specifications, Standards Approvals and Certifications			
Operating Temperature		0 to 55°C (32 to 131°F)	
Storage Temperature		-20 to +70°C (-4 to 158°F)	
Operating/Storage Humidity		5% to 90% RH non-condensing	
Atmosphere		Non-corrosive, non-explosive	
Altitude		<2000 meters (6562 feet)	
Vibration and Shock		EN 61131-2 (5 to 11.9Hz @ 7mm peak to peak displacement, 11.9-150Hz @ 2g, 0.5 octave min.) EN 60068-2-6 Test FC, Vibration. EN 60068-2-27 Test Ea and guidance, Shock.	
Front of Panel Sealing Protection		Standard bezel: EN 60529 IP65, UL50E Type 12 (equivalent to NEMA 12) Washdown bezel: EN 60529 IP66, UL50E Type 4X (indoor use) (equivalent to NEMA 4X)	
Rear of Panel Protection		EN 60529 IP10	
Electromagnetic Compatibility (EMC)	Emissions	HV Power Supply units to EN 61326-1 Class B – Light industrial LV Power Supply units to EN 61326-1 Class A – Heavy industrial	
	Immunity	EN 61326-1 Industrial	
Approvals and Certification	Europe	CE (EN 61326), RoHS (EN 50581), REACH, WEEE, EN 14597 TR Type Approval	
	USA, Canada	UL, cUL	
	Russia	EAC (CUTR) pending	
	China	RoHS, CCC: Exempt (Product not listed in catalog of products subject to China Compulsory Certification)	
	Global	When subject to the necessary field calibration, EPC3000 series controllers manufactured by Eurotherm are suitable for use in Nadcap applications in all furnace classes, as defined in AMS2750E clause 3.3.1.  Meets accuracy requirements of CQI-9  Achilles® Level 1 CRT Cyber Security Assessment  Schneider Electric Green Premium	
Electrical Safety		EN 61010-1 (installation category II, pollution degree 2)	

## Mechanical Details



Panel cut out and Weight			
	EPC3008	EPC3004	EPC3016
Cut Out Dimension	92mm (-0.0 +0.8) x 45mm (-0.0 +0.6) 3.62" (-0.0 +0.03") x 1.77" (-0.0 +0.02)	92mm (-0.0 +0.8) x 92mm (-0.0 +0.8) 3.62" (-0.0 +0.03") x 3.62" (-0.0 +0.03)	45mm (-0.0 +0.6) x 45mm (-0.0 +0.6) 1.77" (-0.0 +0.02") x 1.77" (-0.0 +0.02)
Product Weight	350g 12.34oz	420g 14.81oz	250g 8.81oz

## Inputs and Outputs

### I/O and Communication Types

I/O and Comms	EPC3016	EPC3008/EPC3004
Analog Inputs	<ul style="list-style-type: none"> <li>• 1 universal input 20Hz</li> <li>• 1 auxiliary input 4-20mA, 0-10V 4Hz (option)</li> </ul>	<ul style="list-style-type: none"> <li>• 1 or 2 (option) universal input 20Hz</li> </ul>
Optional I/O Modules:	<p>Up to 2, freely selectable:</p> <ul style="list-style-type: none"> <li>• Form A Relay Output</li> <li>• Logic I/O</li> <li>• DC Analog Output</li> <li>• TRIAC Output</li> </ul>	<p>Up to 3, freely selectable:</p> <ul style="list-style-type: none"> <li>• Form A Relay Output</li> <li>• Logic I/O</li> <li>• DC Analog Output</li> <li>• TRIAC Output</li> </ul>
Form C Relay Output	1	1
Contact Closure Logic Input	1 (option)	2
Logic I/O (Open Collector)	–	4 or 8 (option)
Current Transformer	1 (option)	1
24V Transmitter Power Supply	–	1
Communications	<p>1 of the following options:</p> <ul style="list-style-type: none"> <li>• EIA-485</li> <li>• EIA-422</li> <li>• EIA-232</li> <li>• Modbus RTU slave (EI Bisynch available with serial comms)</li> <li>• Modbus TCP slave</li> <li>• Modbus TCP Slave + Ethernet/IP Server, or Modbus TCP Slave + BACnet Slave</li> </ul>	<p>2 of the following options:</p> <ul style="list-style-type: none"> <li>• EIA-485 Modbus (or EI Bisynch) and Modbus TCP</li> <li>• Modbus TCP Slave + Ethernet/IP Server, or Modbus TCP Slave + BACnet Slave</li> </ul>

### I/O Specifications

Universal Process Inputs	
Input Types	<p>Thermocouples, Pt100/Pt1000 RTD, 4-20mA, 0-20mA, 10V, 2V, 0.8V, 80mV, 40mV, zirconia (oxygen probe), pyrometers. For other input types, contact your Eurotherm supplier for advice.</p> <p>Accuracy ±0.1% of reading. When subject to the necessary field calibration, EPC3000 series controllers manufactured by Eurotherm are suitable for use in Nadcap applications in all furnace classes as defined in AMS2750E clause 3.3.1. For further information see <a href="http://eurotherm.com/certificates">eurotherm.com/certificates</a>.</p>
Sample Time	<ul style="list-style-type: none"> <li>• Process Inputs 50ms (20Hz)</li> <li>• Thermocouple 62.5ms (16Hz)</li> <li>• RTD 100ms (10Hz)</li> <li>• Automatic cycle time selection</li> </ul>
Mains Rejection (48-62Hz)	<ul style="list-style-type: none"> <li>• Series mode rejection &gt;80dB.</li> <li>• Common mode rejection &gt;150dB</li> </ul>
Sensor Break	AC sensor break. Break detected within 3 seconds worst case.
Input Filtering	OFF to 60 seconds filter time constant.
User Calibration	User 2 point input adjust (offset/gradient), transmitter output scaling.
Thermocouple	<ul style="list-style-type: none"> <li>• K, J, N, R, S, B, L, T as standard, plus 2 downloadable custom curves</li> <li>• Linearization accuracy: refer to User Guide</li> <li>• Cold Junction (CJ) calibration accuracy: ±1.0°C at 25°C (±1.8°F at 77°F) ambient</li> <li>• CJ ambient rejection ratio: better than 40:1 from 25°C ambient</li> <li>• External CJ selectable as 0, 45, 50°C or measurable for EPC3004/EPC3008</li> </ul>

## Inputs and Outputs

Input Ranges	40mV	80mV	0.8V	2V	10V	RTD (Pt100/ Pt1000)	mA
Range Min	-40mV	-80mV	-800mV	-2V	-10V	0Ω (-200°C; -328°F)	-32mA
Range Max	+40mV	+80mV	+800mV	+2V	+10V	400Ω /4000Ω (850°C; 1562°F)	+32mA
Thermal Stability from 25°C (77°F) Ambient	±0.4µV/°C ±13ppm/°C	±0.4µV/°C ±13ppm/°C	±0.4µV/°C ±13ppm/°C	±0.4µV/°C ±13ppm/°C	±0.8µV/°C ±70ppm/°C	±0.01°C/°C ±25ppm/°C	±0.16µA/°C ±113ppm/°C
Resolution	1.0µV unfiltered	1.6µV	16µV	41µV	250µV	0.05 °C (0.09 °F)	0.6µA
Electrical Noise (peak to peak with 1.6s input filter)	0.8µV	3.2µV	32µV	82µV	250µV	0.05 °C (0.09 °F)	1.3µA
Linearity Accuracy (best fit straight line)	0.003%	0.003%	0.003%	0.003%	0.007%	0.033%	0.003%
Calibration Accuracy @25°C (77°F) ambient	±4.6µV ±0.053%	±7.5µV ±0.052%	±75µV ±0.052%	±420µV ±0.044%	±1.5mV ±0.063%	±0.31°C (0.56°F) ±0.023%	±3µA ±1.052%
Input Resistance	100MΩ	100MΩ	100MΩ	100MΩ	57kΩ	—	2.49Ω (1% Shunt)
Bulb Current	—	—	—	—	—	190µA/ 180µA	—

### Remote Setpoint Auxiliary Analog Input (3016 Only)

Range	0 to 10V and 4 to 20mA. Max ranges -1V to 11V and 3.36mA to 20.96mA
Accuracy	<±0.25% of reading ± 1LSD, 14 Bits
Sample Rate	4Hz (250ms)
Functions	<ul style="list-style-type: none"> <li>• Remote setpoint input</li> <li>• Auxiliary analog input</li> </ul>
Thermal Stability	100ppm (typical) < 150ppm (worst case)
Mains Rejection	Common Mode 48-62Hz > 120dB, Series Mode > 90dB
Input Impedance	Voltage 223kΩ. Current 2.49Ω

### Current Transformer Input

Input Range	<ul style="list-style-type: none"> <li>• 0-50mA RMS, 48-62Hz</li> <li>• 10Ω burden resistor fitted inside module</li> </ul>
Measurement Scaling	10, 25, 50 or 100 Amps
Calibration Accuracy	<1% of reading (typical) <4% of reading (worst case)
Input Functions	<ul style="list-style-type: none"> <li>• Partial load failure. SSR open or short circuit.</li> <li>• Other functions including power usage totalization available using soft wiring.</li> </ul>

### Contact Closure Logic Inputs

Thresholds	Open > 400Ω, Closed < 100Ω
Input Functions	<ul style="list-style-type: none"> <li>• Auto/Manual select</li> <li>• SP2 select</li> <li>• Integral hold</li> <li>• Control inhibit</li> <li>• Program run functions</li> <li>• Keylock</li> <li>• Recipe select</li> <li>• PID select</li> <li>• BCD bit</li> <li>• Autotune enable</li> <li>• Standby</li> <li>• PV select plus other functions available using soft wiring.</li> </ul>

## Inputs and Outputs

Logic I/O Modules	
Output Rating	ON 12Vdc 44mA max. Minimum control cycle time 50ms (auto)
Output Functions	Time proportioned heat, time proportioned cool. SSR drive alarm and event outputs, interlock outputs, other functions available using soft wiring.
Contact Closure (input)	Open 500Ω, Closed 150Ω
Input Functions	<ul style="list-style-type: none"> <li>• Auto/Manual select</li> <li>• SP2 select</li> <li>• Integral hold</li> <li>• Control inhibit</li> <li>• Program run functions</li> <li>• Keylock</li> <li>• Recipe select</li> <li>• PID select</li> <li>• BCD bit</li> <li>• Autotune enable</li> <li>• Standby</li> <li>• PV select plus other functions available using soft wiring.</li> </ul>

Logic I/O Open Collector Type (EPC3004/EPC3008 only)	
External DC Power Supply	15V to 35Vdc
Output Limit	Maximum current sinking 40mA
Output Functions	Alarm and event outputs, interlock outputs, other functions available using soft wiring. Cannot be used as a control output.
Voltage Sensing Input	OFF < 1V, ON > 4V. Max 35V, Min -1V
Contact Closure Input	OFF > 28KΩ, ON < 100Ω
Input Functions	<ul style="list-style-type: none"> <li>• Auto/Manual select</li> <li>• SP2 select</li> <li>• Integral hold</li> <li>• Control inhibit</li> <li>• Program run functions</li> <li>• Keylock</li> <li>• Recipe select</li> <li>• PID select</li> <li>• BCD bit</li> <li>• Autotune enable</li> <li>• Standby</li> <li>• PV select plus other functions available using soft wiring.</li> </ul>

Relays (Form A Modules and Form C built in)	
Types	Form A (normally open) Form C (changeover)
Output Functions	Time proportioned heat, time proportioned cool. SSR Drive. Direct valve raise/lower. Alarm and event outputs, interlock outputs, other functions available using soft wiring.
Rating	Min 100mA @ 12V, Max 2A @ 264V AC resistive. External suppression device ("snubber") recommended.

TRIAC Module	
Rating	Min 40mA, 30V RMS, Max 0.75A @ 264V AC resistive.
Output Functions	Time proportioned heat, Time proportioned cool. SSR drive alarm and event outputs, interlock outputs, other functions available using soft wiring.
Surge Rating	Max current surge 30A (<10ms) Max continuous operating voltage 540V peak, 385V RMS. Max surge voltage 800V peak, 565V RMS (< 10ms).

Isolated DC Analog Output Module		
	Current Output	Voltage Output
Range	0-20mA	0-10V
Load Resistance	<550Ω	>450Ω
Calibration Accuracy	±(0.5% of reading + 100µA offset)	±(0.5% of reading + 50mV offset)
Resolution	13.5 bit resolution	13.5 bit resolution
Output Functions	<ul style="list-style-type: none"> <li>• SCR/Power control drive</li> <li>• Proportional valve</li> <li>• Retransmission to chart recorder or other instrumentation</li> <li>• Other functions using soft wiring</li> </ul>	
Digital Input (DI), where configured	The DC output module can be configured as contact closure input see "I/O List (io)" on page 106 of User Guide (HA032842). In this case: <ul style="list-style-type: none"> <li>• Retransmission to chart recorder or other instrumentation</li> <li>• Other functions using soft wiring</li> </ul>	

## Power, Communications and Operator Interface

### Power and Transmitter Power Supply

<b>Power Supply, AC Supply Measurement and Transmitter Power Supply</b>	
Controller Supply Voltage	100-230Vac +/- 15%, 48 to 62Hz or 24Vac +10/-15%, 48 to 62Hz 24Vdc +20/-15%, max 5% ripple voltage.
Power Supply Rating	EPC3016 Controller 6W EPC3008/3004 Controller 9W
Power Measurement	Only available in 100-230Vac powered instruments. Measures direct from power supply (no additional connections). Uncalibrated. Electrical noise 0.5V filtered, used by the PID function for power feedforward.
Transmitter Power Supply	24Vdc. 2 to 28mA load. Isolated from system (300V AC double insulation) (EPC3004/EPC3008 only)

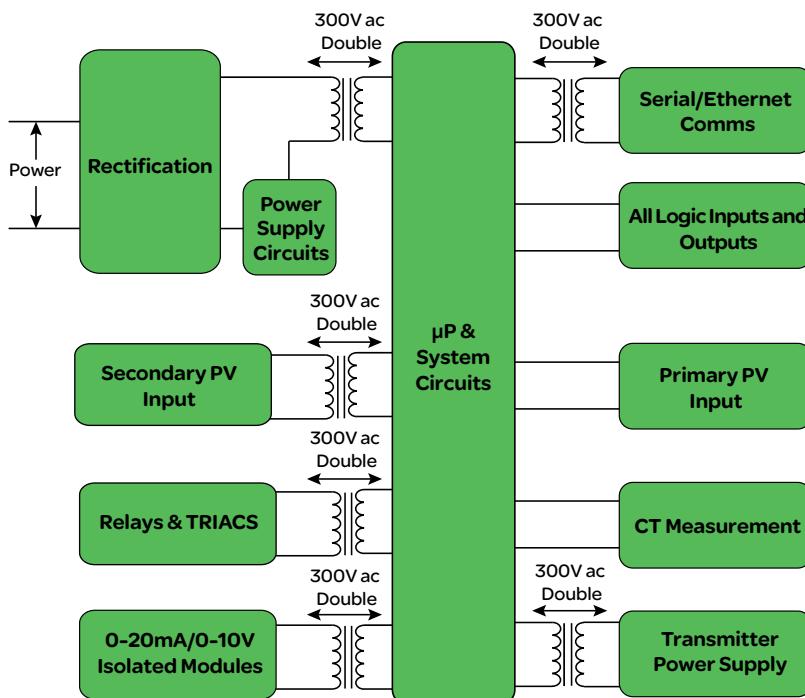
### Communications

<b>Communications</b>	
Ethernet	<ul style="list-style-type: none"> <li>Shielded grounded RJ45 connection supporting 10/100BASE-T auto-sensing</li> <li>Certified to Achilles® communications robustness testing level 1</li> <li>Modbus/TCP, BACNet and Ethernet/IP Protocols</li> <li>Fixed IP address or DHCP</li> <li>Bonjour Auto-Discovery</li> </ul>
Serial	<ul style="list-style-type: none"> <li>EIA-485 Half duplex</li> <li>EIA-422/EIA-232 Full duplex</li> <li>Baud Rates 4800 (EI-Bisynch only), 9600, 19200</li> <li>Modbus RTU 8 data bits, odd/even/no parity selectable</li> <li>EI-Bisynch 7 data bits even parity fixed</li> </ul>

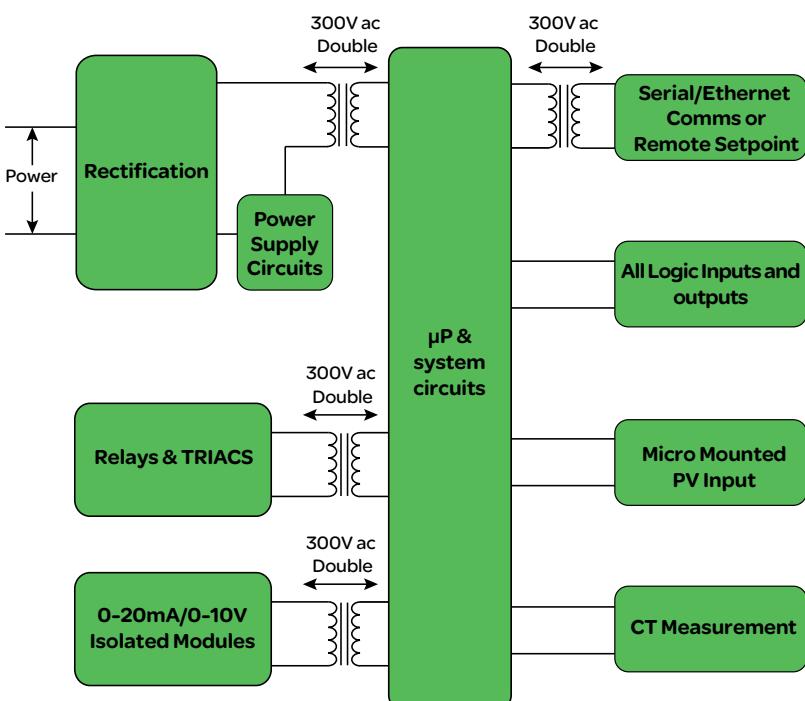
### Operator Interface

<b>Display and Operation</b>	
Type	High visibility LCD with backlight. Flat "washdown" membrane bezel with superior panel sealing, or sculpted bezel with fully tactile keys.
Keyboard	100,000 operations typical
Main PV	<ul style="list-style-type: none"> <li>EPC3016 4 digits, 3 decimal places</li> <li>EPC3008 4.5 digits, 4 decimal places</li> <li>EPC3004 5 digits, 4 decimal places; green/red bicolor (red in alarm)</li> </ul>
Second Line (EPC3004/EPC3008 only)	5 character 16 segment text or numeric
Third Line	16 segment scrolling text or numeric display
Text Character sets	Roman, Simplified Cyrillic
Additional Display Functions	<ul style="list-style-type: none"> <li>Program status indicator (ramp up, ramp down or dwell)</li> <li>Output indicators</li> <li>Alarm indication</li> <li>Units</li> <li>Bar graph (EPC3004, EPC3008 Controllers only)</li> <li>Communications activity indicator</li> </ul>
HMI Functions	<ul style="list-style-type: none"> <li>Configurable display contents</li> <li>Configurable scroll lists for operator/supervisor</li> <li>Configurable scrolling event messages</li> <li>Passcode level protection with lockout period</li> <li>2 Programmable function keys (EPC3004, EPC3008 Controllers only)</li> </ul>

## EPC3008/EPC3004 Isolation

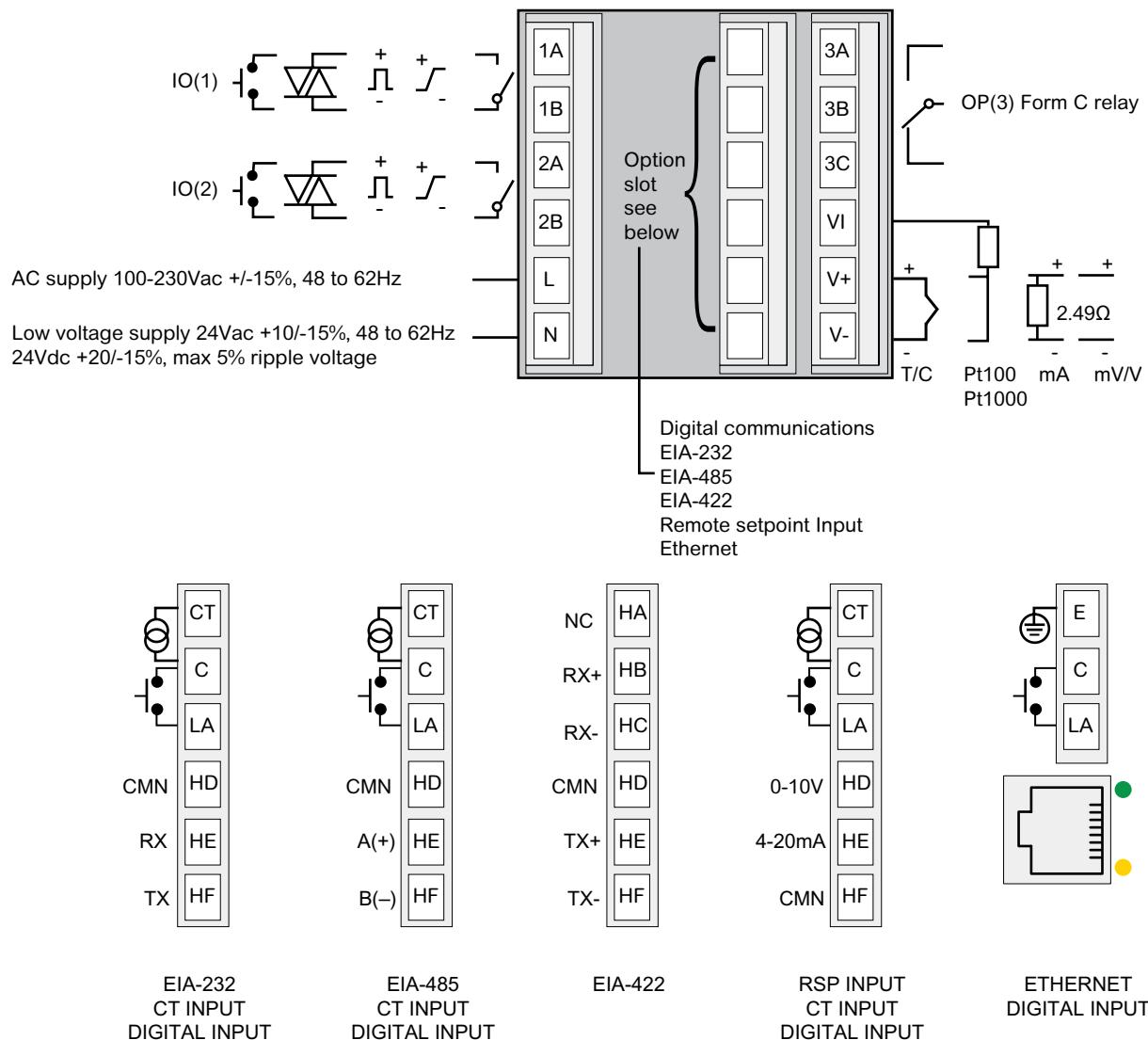


## EPC3016 Isolation



## Rear Terminals

EPC3016

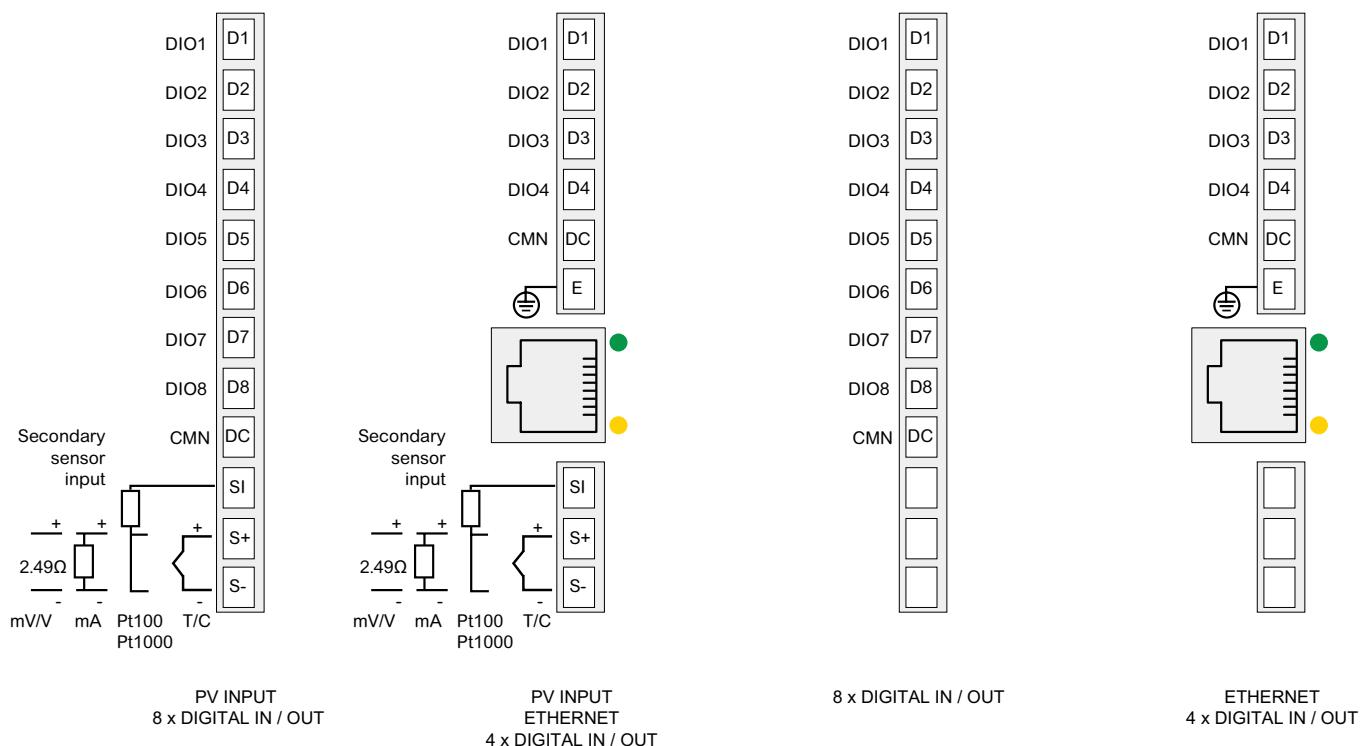
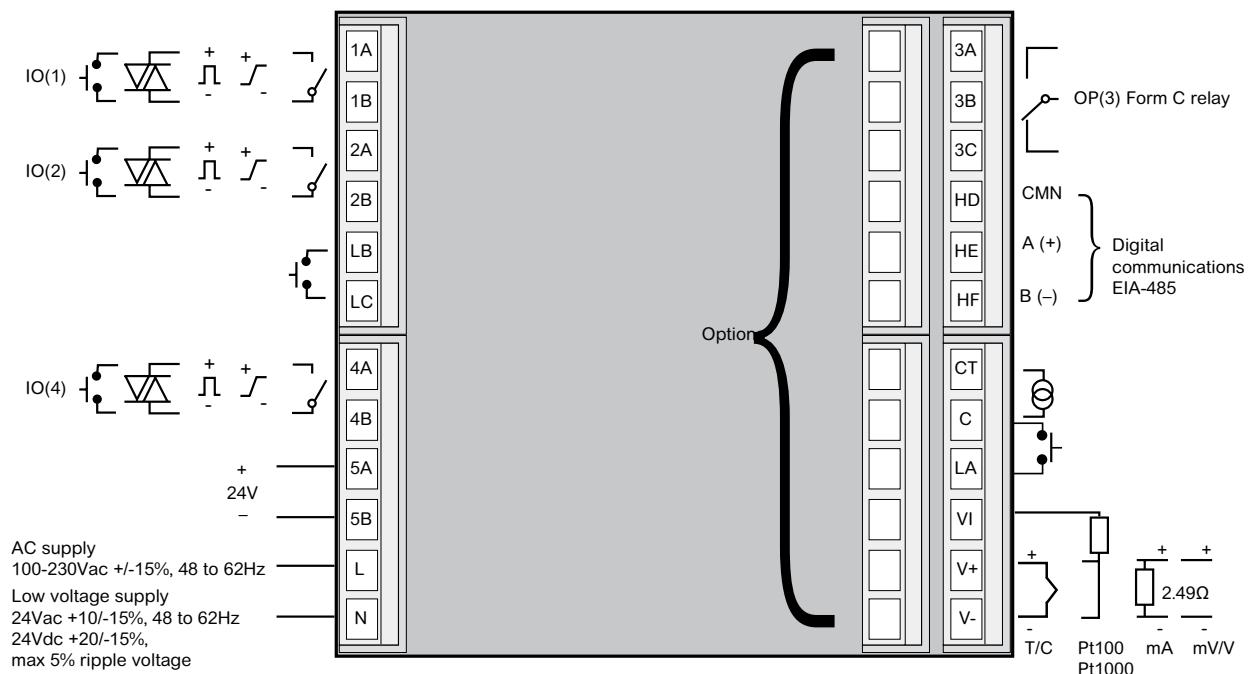


Key to Symbols Used in Wiring Diagrams

	Logic Output (SSR drive)		Relay Output		Contact Input
	0-10V/0-20mA Analog Output		TRIAC Output		Current Transformer Input

## Rear Terminals

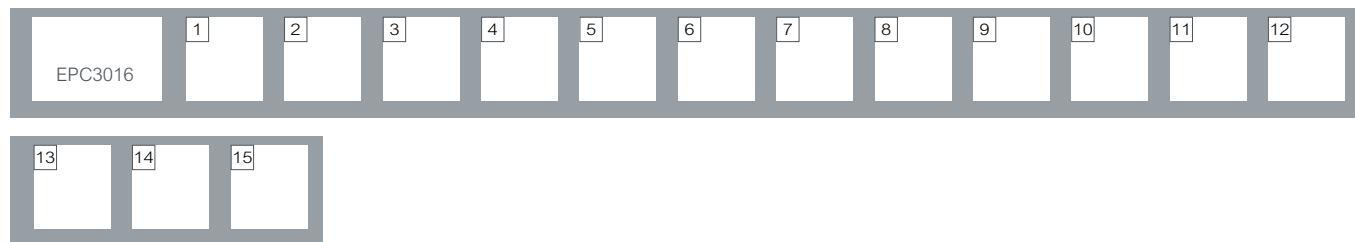
EPC3004 / EPC3008



Key to Symbols Used in Wiring Diagrams

	Logic Output (SSR drive)		Relay Output		Contact Input
	0-10V/0-20mA Analog Output		TRIAC Output		Current Transformer Input

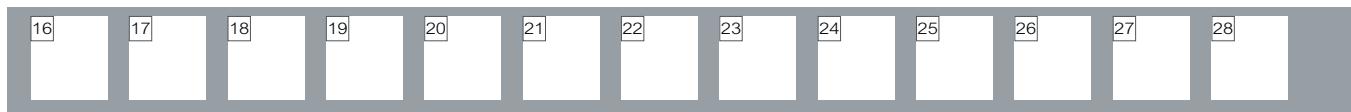
## Order Codes EPC3016



<b>Model (see Note 1)</b>		<b>7</b> <b>Serial Comms Protocol</b>
EPC3016	1/16 DIN Controller	XX Modbus slave (Default) or None EI EI-Bisynch Comms
<b>1 Type</b>		<b>8</b> <b>Ethernet, Comms &amp; Remote SP</b>
CC Controller only		XX None (Default)
CP 1 x 8 Segment Basic Programmer		C1 CT Input, contact closure digital input, and EIA-232
P1 1 x 24 Segment Advanced Programmer		C2 CT Input, contact closure digital input, and EIA-485 (3 wire)
P10 10 x 24 Segment Advanced Programmer		C3 EIA-422 only (5 wire)
P20 20 x 8 Segment Advanced Programmer		CR CT Input, contact closure digital input, RSP Input
		CE Contact closure digital input, Ethernet
<b>2 Supply Voltage</b>		<b>9</b> <b>Ethernet (TCP) Communications Protocol</b>
VH 100 - 230Vac +/-15% (48 to 62Hz)		XX Modbus TCP Slave (Default) or None
VL 24Vac +10%, -15% (48 to 62 Hz); 24Vdc +20, -15%; 5% ripple		ES Ethernet/IP Server and Modbus TCP Slave
		BS BACnet Slave and Modbus TCP Slave
<b>3 I/O 1</b>		<b>10</b> <b>Tool Kit Blocks</b>
XX Not Fitted		XX None (Default 50 wires)
L2 Logic		TK Standard (includes 200 wires)
R1 Relay Output (without snubber)		ETK Enhanced (includes 200 wires)
R2 Relay (supplied with external snubber)		
D1 DC Output		
T1 TRIAC (without snubber)		
T2 TRIAC (supplied with external snubber)		
<b>4 I/O 2</b>		<b>11</b> <b>OEM Security</b>
XX Not Fitted		XXX None (Default)
L2 Logic		OEM OEM Security
R1 Relay Output (without snubber)		
R2 Relay (supplied with external snubber)		
D1 DC Output		
T1 TRIAC (without snubber)		
T2 TRIAC (supplied with external snubber)		
<b>5 Future</b>		<b>12</b> <b>Bezel</b>
X Not fitted		ST Standard
		WD Washdown
<b>6 Future</b>		<b>13</b> <b>Labels</b>
XX Future		XXXXX None (Default)
		Fnnnn Custom Label
<b>14 Specials</b>		<b>15</b> <b>Gain scheduling Sets</b>
		XXXXXX None (Default)
		XX Two Gain Scheduling sets (Default)
		08 Eight Gain Scheduling sets

Note 1. Basic EPC3016 Model includes one Form C Relay

## Quick Start Codes EPC3016



<b>16</b>	<b>Application</b>
X	None
1	Heat only
2	Heat/Cool
V	VPU

<b>21</b>	<b>CT Input Range</b>
X	Not Used
1	10A
2	25A
5	50A
6	100A
7	1000A

<b>17</b>	<b>Input 1 Sensor Type</b>
X	Not required
M	Linear 0 to 80mVdc
V	Linear 0 to 10Vdc
2	Linear 0 to 20mA
4	Linear 4 to 20mA
B	Type B Thermocouple
J	Type J Thermocouple
K	Type K Thermocouple
L	Type L Thermocouple
N	Type N Thermocouple
R	Type R Thermocouple
S	Type S Thermocouple
T	Type T Thermocouple
P	Pt100
W	Pt1000

<b>22</b>	<b>Digital Input A Function (see Note 2)</b>
X	Not Used
W	Alarm Acknowledge
M	Auto/Manual
R	Programmer Run/Hold
L	Keylock
K	Loop Track
P	Local Setpoint Select
T	Programmer Reset
U	Remote Setpoint Select
V	Recipe Select

<b>18</b>	<b>Input 1 Range</b>
X	Not required
F	Full range
1	0 to 100°C or 32 to 212°F or 273 to 373K
2	0 to 200°C or 32 to 392°F or 273 to 473K
3	0 to 400°C or 32 to 752°F or 273 to 673K
4	0 to 600°C or 32 to 1112°F or 273 to 873K
5	0 to 800°C or 32 to 1472°F or 273 to 1073K
6	0 to 1000°C or 32 to 1832°F or 273 to 1273K
7	0 to 1200°C or 32 to 2192°F or 273 to 1473K
8	0 to 1300°C or 32 to 2552°F or 273 to 1573K
9	0 to 1600°C or 32 to 2912°F or 273 to 1873K
A	0 to 1800°C or 32 to 3272°F or 273 to 2073K

<b>23</b>	<b>Future</b>
XX	Future

<b>24</b>	<b>Future</b>
XX	Future

<b>25</b>	<b>Units</b>
X	Use Default (Degrees Celsius)
C	Degrees Celsius
F	Degrees Fahrenheit
K	Kelvin

<b>26</b>	<b>Future</b>
XX	Future

<b>27</b>	<b>Warranty</b>
XX	Standard warranty

<b>28</b>	<b>Certificate of Conformity</b>
XX	None required
CERT1	Supplied with Certificate of Conformity

Note 2. Requires purchase of Communications Option (Field 8) with "Dig In"

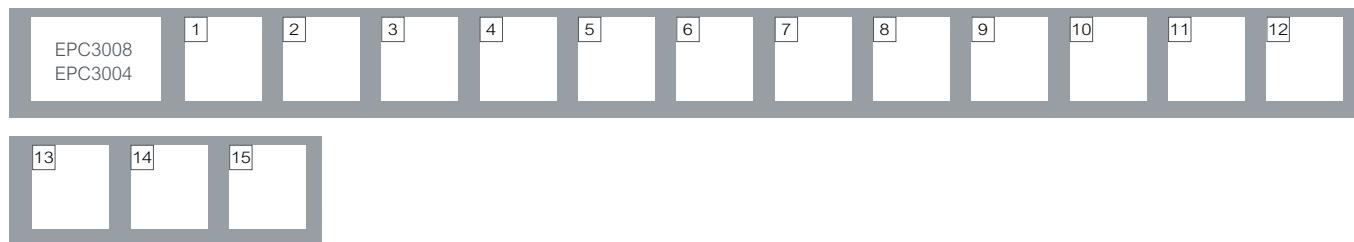
## Accessory Order Codes



<b>Model</b>
EPCACC EPC Accessories

<b>1</b>	<b>Accessories</b>
RES2R9	2.49Ω Resistor
RES250	250Ω Resistor
RES500	500Ω Resistor
SNUBBER	RC SNUBBER
USBCONF	USB Backup lead
CTR10A	Current transformer 10A Primary
CTR25A	Current transformer 25A Primary
CTR50A	Current transformer 50A Primary
CTR100A	Current transformer 100A Primary
ITOOLS	iTools configuration Software

## Order Codes EPC3008 / EPC3004

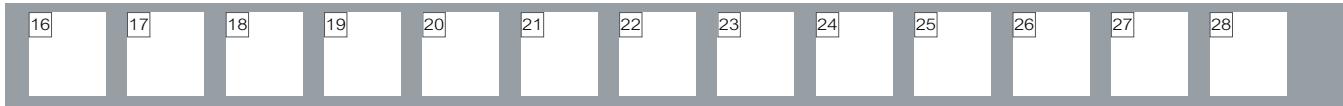


<b>Model (see Note 3)</b>		<b>7</b> Serial Comms Protocol
EPC3008	1/8 DIN Controller	XX Modbus slave (Default)
EPC3004	1/4 DIN Controller	EI EI-Bisynch Comms
<b>1 Type</b>		<b>8</b> Ethernet, Comms & Remote SP
CC	Controller only	XX None (Default)
CP	1 x 8 Segment Basic Programmer	I8 Second PV Input; 8 Digital Input/Outputs:
P1	1 x 24 Segment Advanced Programmer	D8 8 Digital Input/Outputs only
P10	10 x 24 Segment Advanced Programmer	E4 Ethernet (modbus TCP slave) 4 x digital I/O only;
P20	20 x 8 Segment Advanced Programmer	IE (see Note 4) Second PV Input; Ethernet (Modbus TCP slave) + 4 x Digital I/O
<b>2 Supply Voltage</b>		<b>9</b> Ethernet (TCP) Communications Protocol
VH	100 - 230Vac +/-15% (48 to 62Hz)	XX Modbus TCP Slave (Default) or None
VL	24Vac +10%, -15% (48 to 62 Hz); 24Vdc +20, -15%; 5% ripple	ES Ethernet/IP Server and Modbus TCP Slave
<b>3 I/O 1</b>		<b>10</b> Tool Kit Blocks
XX	Not Fitted	XX None (Default 50 wires)
L2	Logic	TK Standard (includes 200 wires)
R1	Relay Output (without snubber)	ETK Enhanced (includes 200 wires)
R2	Relay (supplied with external snubber)	
D1	DC Output	
T1	TRIAC (without snubber)	
T2	TRIAC (supplied with snubber)	
<b>4 I/O 2</b>		<b>11</b> OEM Security
XX	Not Fitted	XXX None (Default)
L2	Logic	OEM OEM Security
R1	Relay Output (without snubber)	
R2	Relay (supplied with external snubber)	
D1	DC Output	
T1	TRIAC (without snubber)	
T2	TRIAC (supplied with external snubber)	
<b>5 I/O 4</b>		<b>12</b> Bezel
XX	Not Fitted	ST Standard
L2	Logic	WD Washdown
R1	Relay Output (without snubber)	
R2	Relay Output (supplied with external snubber)	
D1	DC Output	
T1	TRIAC (without snubber)	
T2	TRIAC (supplied with external snubber)	
<b>6 Future</b>		<b>13</b> Labels
XX	Future	XXXXX None (Default)
		Fnnnn Custom Label
<b>14 Specials</b>		<b>14</b> Specials
XXXXXX		XXXXXX None (Default)
<b>15 Gain scheduling Sets</b>		<b>15</b> Gain scheduling Sets
XX		XX Two Gain Scheduling sets (Default)
08		08 Eight Gain Scheduling sets

Note 3. Base EPC3008/4 Model includes EIA-485 Modbus RTU Slave communications, 1 Form C Relay, 2x Contact Closure Digital inputs, 1 Current Transformer Input, and 24Vdc Transmitter Power Supply

Note 4. Digital I/O on Ethernet, 2nd Input & Option I/O cannot be used for PID control output

## Quick Start Codes EPC3008 / EPC3004



16 Application	
X	None (exit quick code)
1	Heat only (Default)
2	Heat/ Cool
V	VPU heat only
C	Carbon Potential Controller (requires PV2 and Zirconia)
D	Dew Point Controller (requires PV2 and Zirconia)

17 Input 1 Sensor Type	
X	Not required
M	Linear 0 to 80mVdc
V	Linear 0 to 10Vdc
2	Linear 0 to 20mA
4	Linear 4 to 20mA
B	Type B Thermocouple
J	Type J Thermocouple
K	Type K Thermocouple
L	Type L Thermocouple
N	Type N Thermocouple
R	Type R Thermocouple
S	Type S Thermocouple
T	Type T Thermocouple
P	Pt100
W	Pt1000

18 Input 1 Range	
X	Not required
F	Full Sensor range
1	0 to 100°C or 32 to 212°F or 273 to 373K
2	0 to 200°C or 32 to 392°F or 273 to 473K
3	0 to 400°C or 32 to 752°F or 273 to 673K
4	0 to 600°C or 32 to 1112°F or 273 to 873K
5	0 to 800°C or 32 to 1472°F or 273 to 1073K
6	0 to 1000°C or 32 to 1832°F or 273 to 1273K
7	0 to 1200°C or 32 to 2192°F or 273 to 1473K
8	0 to 1300°C or 32 to 2552°F or 273 to 1573K
9	0 to 1600°C or 32 to 2912°F or 273 to 1873K
A	0 to 1800°C or 32 to 3272°F or 273 to 2073K

19 Input 2 Sensor Type (see note 5)	
X	Not required
M	Linear 0 to 80mVdc
V	Linear 0 to 10Vdc
2	Linear 0 to 20mA
4	Linear 4 to 20mA
B	Type B Thermocouple
J	Type J Thermocouple
K	Type K Thermocouple
L	Type L Thermocouple
N	Type N Thermocouple
R	Type R Thermocouple
S	Type S Thermocouple
T	Type T Thermocouple
P	Pt100
W	Pt1000
Z	Zirconia (HiZ)

20 Input 2 Range (see note 5)	
X	Not required
F	Full range
1	0 to 100°C or 32 to 212°F or 273 to 373K
2	0 to 200°C or 32 to 392°F or 273 to 473K
3	0 to 400°C or 32 to 752°F or 273 to 673K
4	0 to 600°C or 32 to 1112°F or 273 to 873K
5	0 to 800°C or 32 to 1472°F or 273 to 1073K
6	0 to 1000°C or 32 to 1832°F or 273 to 1273K
7	0 to 1200°C or 32 to 2192°F or 273 to 1473K
8	0 to 1300°C or 32 to 2552°F or 273 to 1573K
9	0 to 1600°C or 32 to 2912°F or 273 to 1873K
A	0 to 1800°C or 32 to 3272°F or 273 to 2073K

21 CT Input Range	
X	Not Used
1	10A
2	25A
5	50A
6	100A
7	1000A

22 Digital Input A Function	
X	Not Used
W	Alarm Acknowledge
M	Auto/Manual
R	Programmer Run/Hold
L	Keylock
K	Loop Track
P	Local Setpoint Select
T	Programmer Reset
U	Remote Setpoint Select
V	Recipe Select

23 Digital Input B Function	
X	Not Used
W	Alarm Acknowledge
M	Auto/Manual
R	Programmer Run/Hold
L	Keylock
K	Loop Track
P	Local Setpoint Select
T	Programmer Reset
U	Remote Setpoint Select
V	Recipe Select

24 Programmer I/O Configuration (see Note 6)	
X	Not Used/fitted
1	D1 to D8 Programmer Event Outputs 1 to 8
2	D1 to D4 = Programmer Event Outputs 1 to 4, D5 to D7 = BCD Inputs 1 to 3, D8 = Programmer Run/Hold. BCD Output to Program Number
3	D1 to D4 = Programmer Event outputs 1 to 4, D5 to D8 = Programmer Run, Hold, Reset, Advance respectively
4	D1 to D4 = Programmer Event inputs 1 to 4, D5 to D7 Programmer Run/Hold, Reset, Advance respectively, D8 Not Used. BCD Output to Program Number
5	D1 to D8 = BCD Inputs 1 to 8. BCD Output to Recipe Recall
6	D1 to D4 = BCD Inputs 1 to 4, D5 - D8 = Not used. BCD Output to Recipe Recall
7	D1 to D4 Programmer Run, Hold, Reset, Advance respectively, D5 - D8 = Not used
8	D1 to D3 Programmer Run, Hold, Reset respectively, D4 - D8 = Not Used
9	D1 to D4 = Programmer Event Outputs, D5 to D8 = Not Used

25 Units	
X	Use Default (Degrees Celsius)
C	Degrees Celsius
F	Degrees Fahrenheit
K	Kelvin

26 Future	
XX	Future

27 Warranty	
XX	Standard warranty

28 Certificate of Conformity	
XX	None required Supplied with Certificate of Conformity

Note 5. Requires purchase of 2nd Input (Field 8)

Note 6. Requires purchase of Option I/O (Field 8)

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