



# Eurotherm®



Helping Deliver a more Efficient and Secure Process

## Eurotherm EPC3000 programmable controller

### Benefits

The EPC3000 range of programmable single loop process and temperature controllers are 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.

- Complements your PLC and/or can be used stand-alone
- Precision analog measurement
- Flexible communication options
- Easy to deploy
- Can reduce total system costs

### Key Features

- Precision Single Loop Control
- Setpoint Programming
- Math and Logic
- Communication Protocols
  - Modbus Master/Slave (RTU and TCP/IP)
  - EtherNet/IP Server
- Help defend OEM knowledge and IP with OEM Security

[eurotherm.com/epc3000](http://eurotherm.com/epc3000)

Life Is On



# Specifications

| General                        |  |
|--------------------------------|--|
| Controller Function            | <ul style="list-style-type: none"> <li>• Single loop panel mount PID controller range with autotune, on/off and 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 are compatible with Eurotherm 2400 Programmable Controller.</li> <li>• Additional timer functions are 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 the front panel or digital input.</li> <li>• Scrolling parameter help and user messages displayed on event.</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 cable 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.   |

# Specifications

| 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                       |

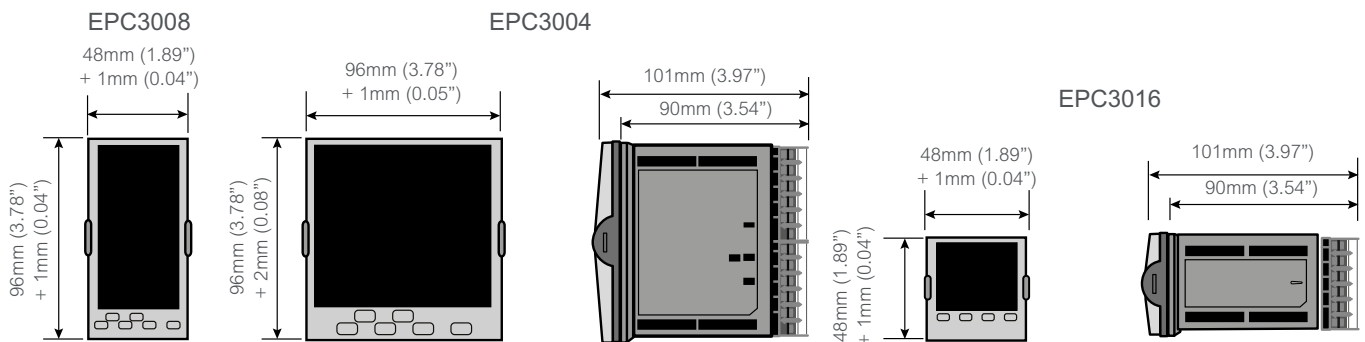
\*Dependent on instrument/options ordered

# Specifications

## 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.)<br>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)<br>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<br>LV Power Supply units to EN 61326-1 Class A – Heavy industrial  |
|                                     | Immunity  | EN 61326-1 Industrial   |
| Approvals and Certification         | Europe  | CE, 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.<br>Meets accuracy requirements of CQI-9<br>Achilles® Level 1 CRT Cyber Security Assessment<br>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)<br>3.62" (-0.0 +0.03") x 1.77" (-0.0 +0.02) | 92mm (-0.0 +0.8) x 92mm (-0.0 +0.8)<br>3.62" (-0.0 +0.03") x 3.62" (-0.0 +0.03) | 45mm (-0.0 +0.6) x 45mm (-0.0 +0.6)<br>1.77" (-0.0 +0.02") x 1.77" (-0.0 +0.02) |
| Product Weight    | 350g<br>12.34oz   | 420g<br>14.81oz   | 250g<br>8.81oz  |

# Specifications

## 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:        | Up to 2, freely selectable: <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>   | Up to 3, freely selectable: <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               | 1 of the following options: <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> <li>• Modbus TCP Master and Slave</li> </ul> | 2 of the following options: <ul style="list-style-type: none"> <li>• EIA-485</li> <li>• Modbus (or EI Bisynch) and Modbus TCP</li> <li>• Modbus TCP Slave + EtherNet/IP Server, or Modbus TCP Slave + BACnet Slave</li> <li>• Modbus TCP Master and Slave</li> </ul> |

### I/O Specifications

| Universal Process Inputs  |   |
|---------------------------|---|
| Input Types               | 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.<br><br>Accuracy $\pm 0.1\%$ 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> .  |
| 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: <math>\pm 1.0^{\circ}\text{C}</math> at <math>25^{\circ}\text{C}</math> (<math>\pm 1.8^{\circ}\text{F}</math> at <math>77^{\circ}\text{F}</math>) ambient</li> <li>• CJ ambient rejection ratio: better than 40:1 from <math>25^{\circ}\text{C}</math> ambient</li> <li>• External CJ selectable as 0, 45, <math>50^{\circ}\text{C}</math> or measurable for EPC3004/EPC3008</li> </ul> |

# Specifications

## 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<br>±13ppm/°C | ±0.4μV/°C<br>±13ppm/°C | ±0.4μV/°C<br>±13ppm/°C | ±0.4μV/°C<br>±13ppm/°C | ±0.8μV/°C<br>±70ppm/°C | ±0.01°C/°C<br>±25ppm/°C     | ±0.16μA/°C<br>±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<br>±0.053%      | ±7.5μV<br>±0.052%      | ±75μV<br>±0.052%       | ±420μV<br>±0.044%      | ±1.5mV<br>±0.063%      | ±0.31°C (0.56°F)<br>±0.023% | ±3μA<br>±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> </ul> | <ul style="list-style-type: none"> <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> </ul> | <ul style="list-style-type: none"> <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)<br>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.<br>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.<br>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> |                                  |

# Specifications

## Power, Communications and Operator Interface

### Power and Transmitter Power Supply

| Power Supply, AC Supply Measurement and Transmitter Power Supply |  |
|--|--|
| Controller Supply Voltage  | 100-230Vac +/- 15%, 48 to 62Hz or 24Vac +10%/-15%, 48 to 62Hz or 24Vdc +20%/-15%, max 5% ripple voltage.   |
| Power Supply Rating  | EPC3016 Controller 6W<br>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

| Communications |  |
|----------------|--|
| 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>  |

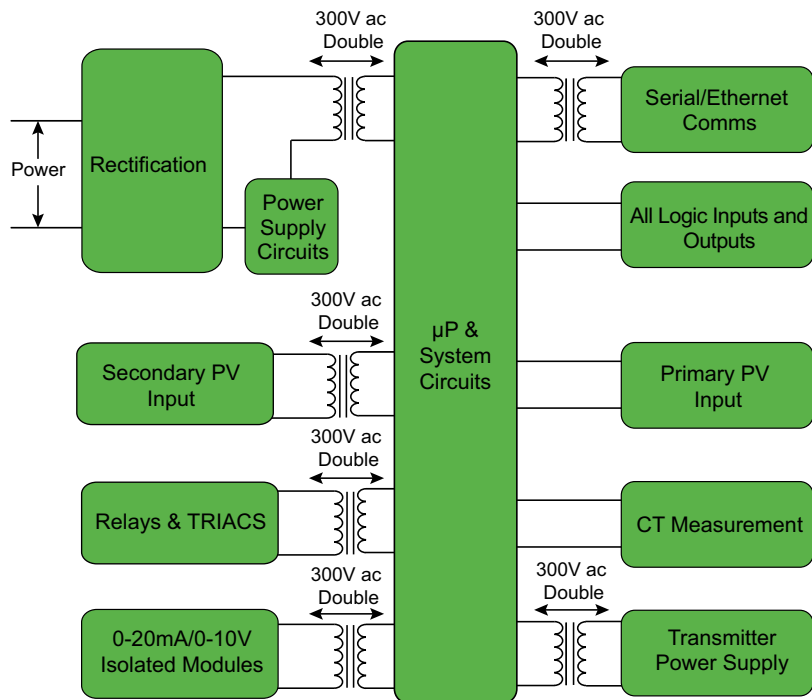
### Operator Interface

| Display and Operation              |  |
|------------------------------------|--|
| 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 <ul style="list-style-type: none"> <li>• Program status indicator (ramp up, ramp down or dwell)</li> <li>• Output indicators</li> </ul>   |
| Additional Display Functions       | <ul style="list-style-type: none"> <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> |

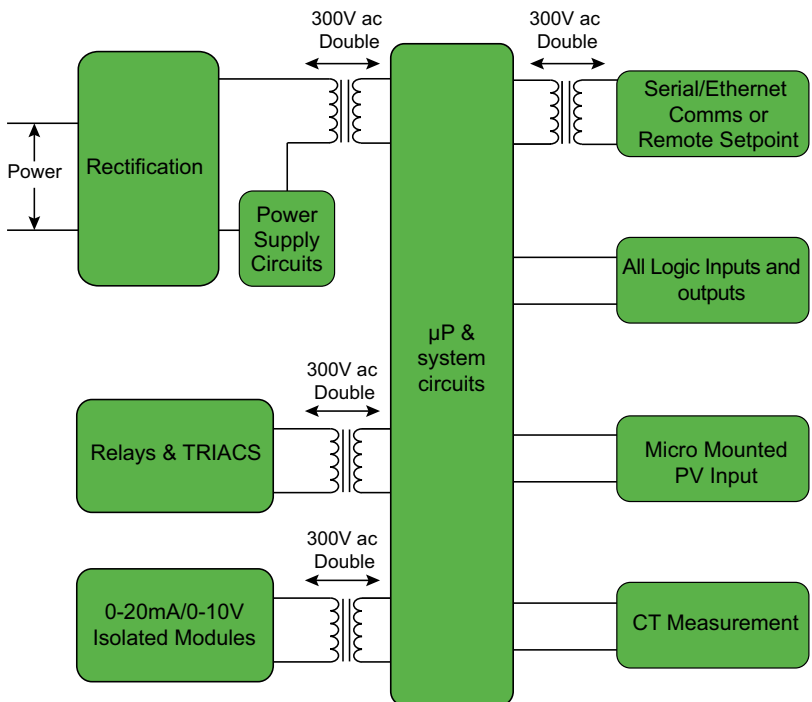


# Specifications

## EPC3008/EPC3004 Isolation



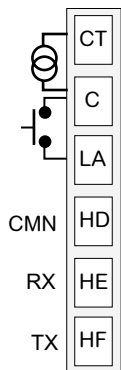
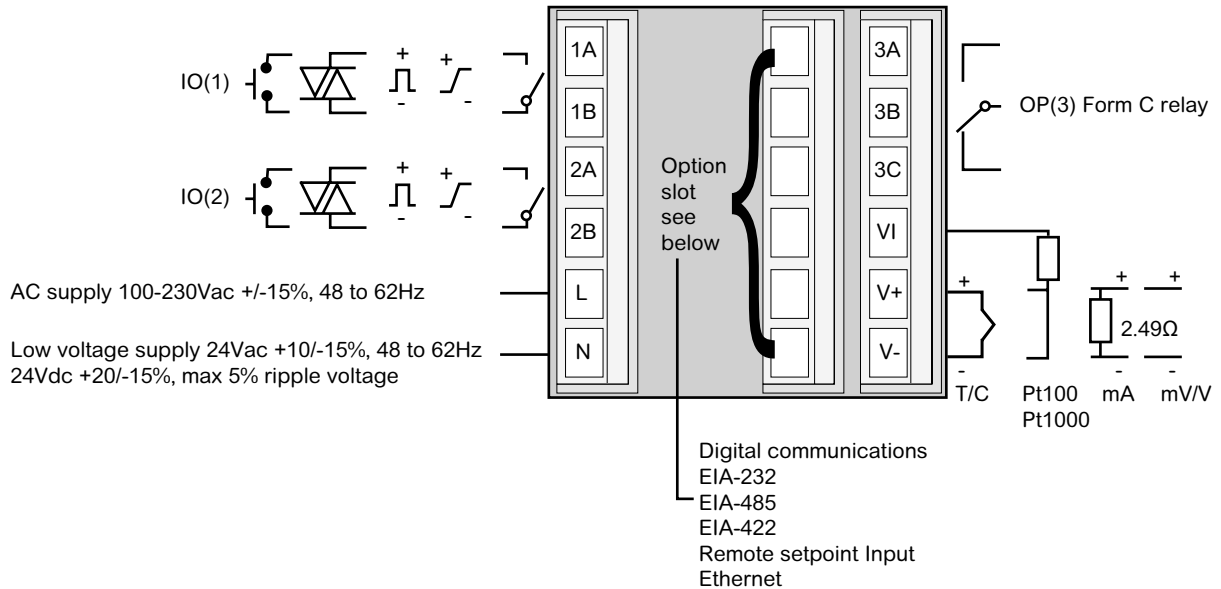
## EPC3016 Isolation



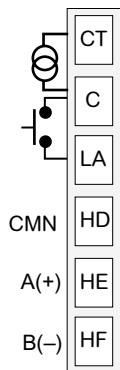
# Specifications

## Rear Terminals

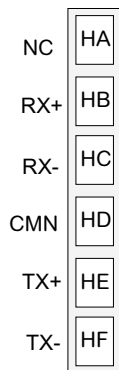
EPC3016



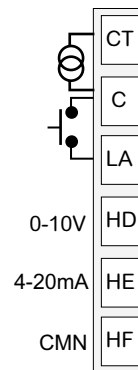
EIA-232  
CT INPUT  
DIGITAL INPUT



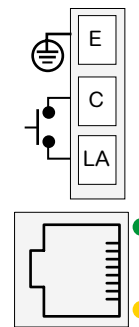
EIA-485  
CT INPUT  
DIGITAL INPUT



EIA-422



RSP INPUT  
CT INPUT  
DIGITAL INPUT



ETHERNET  
DIGITAL INPUT

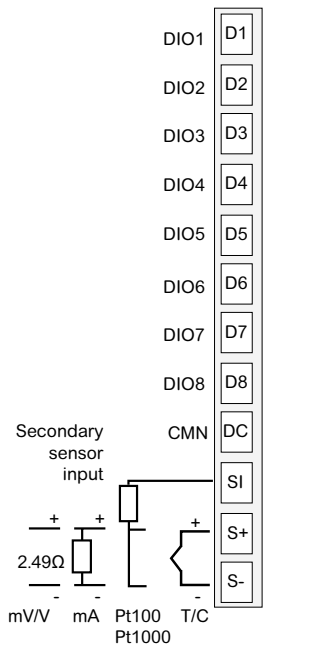
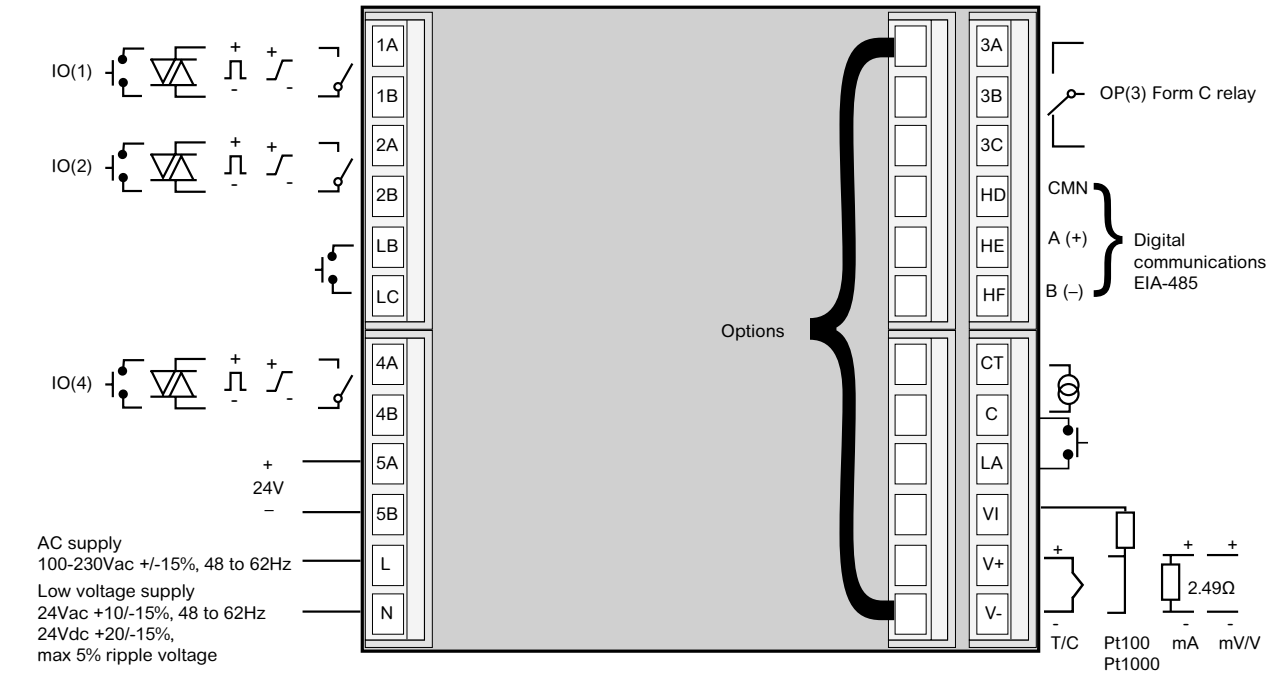
### Key to Symbols Used in Wiring Diagrams

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

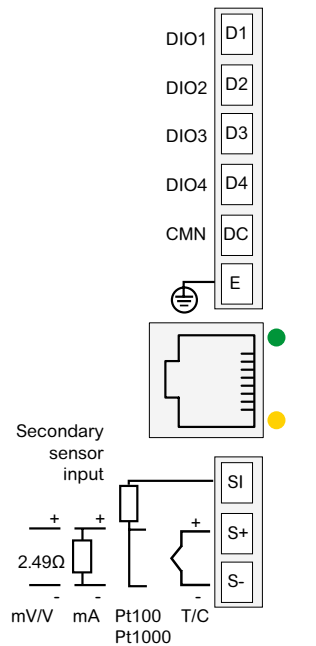
# Specifications

## Rear Terminals

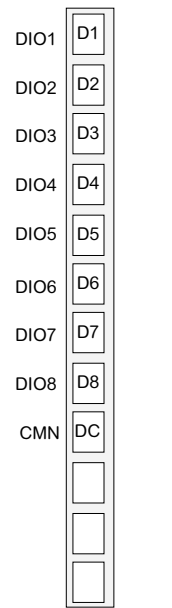
EPC3004 / EPC3008



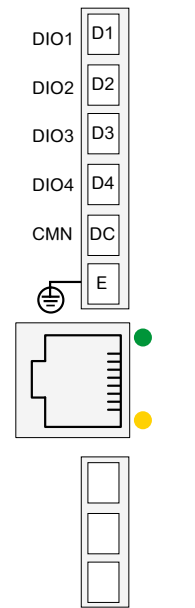
PV INPUT  
8 x DIGITAL IN / OUT



PV INPUT  
ETHERNET  
4 x DIGITAL IN / OUT



8 x DIGITAL IN / OUT



ETHERNET  
4 x DIGITAL IN / OUT

### Key to Symbols Used in Wiring Diagrams

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

# Specifications

## Order Codes EPC3016

|         |    |    |    |   |   |   |   |   |   |    |    |    |
|---------|----|----|----|---|---|---|---|---|---|----|----|----|
| EPC3016 | 1  | 2  | 3  | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|         | 13 | 14 | 15 |   |   |   |   |   |   |    |    |    |

| Model (See Note 1) |                     |
|--------------------|---------------------|
| EPC3016            | 1/16 DIN Controller |

| 1   | Type                                |
|-----|-------------------------------------|
| CC  | Controller Only                     |
| CP  | 1 x 8 Segment Basic Programmer      |
| P1  | 1 x 24 Segment Advanced Programmer  |
| P10 | 10 x 24 Segment Advanced Programmer |
| P20 | 20 x 8 Segment Advanced Programmer  |

| 2  | Supply Voltage   |
|----|--|
| VH | 100 - 230Vac +/-15% (48 to 62Hz)                           |
| VL | 24Vac +10%, -15% (48 to 62 Hz); 24Vdc +20, -15%; 5% Ripple |

| 3  | I/O 1                                  |
|----|--|
| XX | Not Fitted                             |
| L2 | Logic                                  |
| R1 | Relay Output (Without Snubber)         |
| R2 | Relay (Supplied With External Snubber) |
| D1 | DC Output                              |
| T1 | TRIAC (Without Snubber)                |
| T2 | TRIAC (Supplied With External Snubber) |

| 4  | I/O 2                                  |
|----|--|
| XX | Not Fitted                             |
| L2 | Logic                                  |
| R1 | Relay Output (Without Snubber)         |
| R2 | Relay (Supplied With External Snubber) |
| D1 | DC Output                              |
| T1 | TRIAC (Without Snubber)                |
| T2 | TRIAC (Supplied With External Snubber) |

| 5 | Future     |
|---|------------|
| X | Not Fitted |

| 6  | Future |
|----|--------|
| XX | Future |

| 7  | Serial Comms Protocol          |
|----|--------------------------------|
| XX | Modbus Slave (Default) Or None |
| EI | EI-Bisynch Comms               |
| SM | Modbus Master and Slave        |

| 8  | Ethernet, Comms & Remote SP                                   |
|----|---|
| XX | None (Default)  |
| C1 | CT Input, Contact Closure Digital Input, and EIA-232          |
| C2 | CT Input, Contact Closure Digital Input, and EIA-485 (3 Wire) |
| C3 | EIA-422 Only (5 Wire)   |
| CR | CT Input, Contact Closure Digital Input, RSP Input            |
| CE | Contact Closure Digital Input, Ethernet                       |

| 9  | Ethernet (TCP) Communications Protocol  |
|----|---|
| XX | Modbus TCP Slave (Default) Or None      |
| ES | EtherNet/IP Server and Modbus TCP Slave |
| BS | BACnet Slave and Modbus TCP Slave       |
| TM | Modbus TCP Master and Slave             |

| 10  | Tool Kit Blocks               |
|-----|-------------------------------|
| XX  | None (Default 50 Wires)       |
| TK  | Standard (Includes 200 Wires) |
| ETK | Enhanced (Includes 200 Wires) |

| 11  | OEM Security   |
|-----|----------------|
| XXX | None (Default) |
| OEM | OEM Security   |

| 12 | Bezel    |
|----|----------|
| ST | Standard |
| WD | Washdown |

| 13    | Labels         |
|-------|----------------|
| XXXXX | None (Default) |
| Fnnnn | Custom Label   |

| 14     | Specials       |
|--------|----------------|
| XXXXXX | None (Default) |

| 15 | Gain scheduling Sets               |
|----|------------------------------------|
| 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



| 16 Application |           |
|----------------|-----------|
| X              | None      |
| 1              | Heat Only |
| 2              | Heat/Cool |
| V              | VPU       |

| 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 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 Future |        |
|-----------|--------|
| X         | Future |

| 20 Future |        |
|-----------|--------|
| XX        | Future |

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

| 22 Digital Input A Function (See Note 2) |                        |
|--|------------------------|
| 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 Future |        |
|-----------|--------|
| XX        | Future |

| 24 Future |        |
|-----------|--------|
| XX        | Future |

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

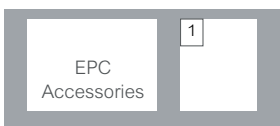
| 26 Future |        |
|-----------|--------|
| XX        | Future |

| 27 Warranty |                   |
|-------------|-------------------|
| XX          | Standard Warranty |

| 28 Certificate of Conformity |   |
|------------------------------|---|
| XX                           | None Required                           |
| CERT1                        | Supplied With Certificate of Conformity |

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

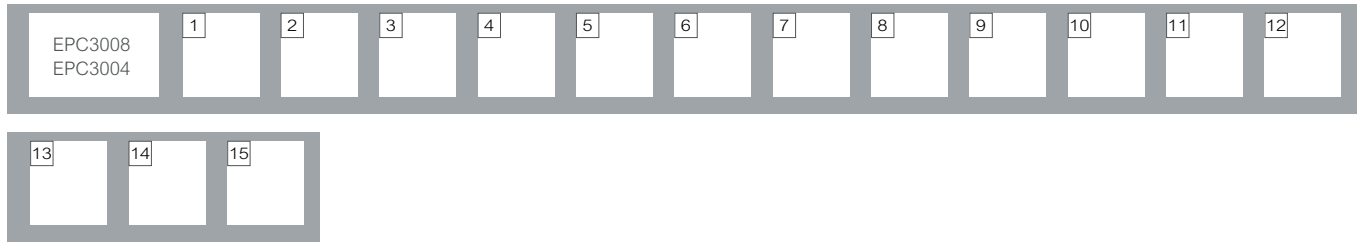
## Accessory Order Codes



| Model  |                 |
|--------|-----------------|
| EPCACC | EPC Accessories |

| 1 Accessories |                                  |
|---------------|----------------------------------|
| 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



| Model (See Note 3) |                    |
|--------------------|--------------------|
| EPC3008            | 1/8 DIN Controller |
| EPC3004            | 1/4 DIN Controller |

| 1 Type |                                     |
|--------|-------------------------------------|
| CC     | Controller Only                     |
| CP     | 1 x 8 Segment Basic Programmer      |
| P1     | 1 x 24 Segment Advanced Programmer  |
| P10    | 10 x 24 Segment Advanced Programmer |
| P20    | 20 x 8 Segment Advanced Programmer  |

| 2 Supply Voltage |  |
|------------------|--|
| VH               | 100 - 230Vac +/-15% (48 to 62Hz)                           |
| VL               | 24Vac +10%, -15% (48 to 62 Hz); 24Vdc +20, -15%; 5% Ripple |

| 3 I/O 1 |  |
|---------|--|
| XX      | Not Fitted                             |
| L2      | Logic                                  |
| R1      | Relay Output (Without Snubber)         |
| R2      | Relay (Supplied With External Snubber) |
| D1      | DC Output                              |
| T1      | TRIAC (Without Snubber)                |
| T2      | TRIAC (Supplied With Snubber)          |

| 4 I/O 2 |  |
|---------|--|
| XX      | Not Fitted                             |
| L2      | Logic                                  |
| R1      | Relay Output (Without Snubber)         |
| R2      | Relay (Supplied With External Snubber) |
| D1      | DC Output                              |
| T1      | TRIAC (Without Snubber)                |
| T2      | TRIAC (Supplied With External Snubber) |

| 5 I/O 4 |   |
|---------|---|
| XX      | Not Fitted                                    |
| L2      | Logic   |
| 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)        |

| 6 Future |        |
|----------|--------|
| XX       | Future |

| 7 Serial Comms Protocol |                         |
|-------------------------|-------------------------|
| XX                      | Modbus Slave (Default)  |
| EI                      | EI-Bisynch Comms        |
| SM                      | Modbus Master and Slave |

| 8 Ethernet, Comms & Remote SP |  |
|-------------------------------|--|
| XX                            | None (Default)   |
| I8                            | Second PV Input; 8 Digital Input/Outputs:                      |
| D8                            | 8 Digital Input/Outputs Only                                   |
| E4                            | Ethernet (Modbus TCP Slave) 4 x Digital I/O Only;              |
| IE (See Note 4)               | Second PV Input; Ethernet (Modbus TCP Slave) + 4 x Digital I/O |

| 9 Ethernet (TCP) Communications Protocol |   |
|--|---|
| XX                                       | Modbus TCP Slave (Default) or None      |
| ES                                       | EtherNet/IP Server and Modbus TCP Slave |
| BS                                       | BACnet Slave and Modbus TCP Slave       |
| TM                                       | Modbus Master and Slave                 |

| 10 Tool Kit Blocks |                               |
|--------------------|-------------------------------|
| XX                 | None (Default 50 Wires)       |
| TK                 | Standard (Includes 200 Wires) |
| ETK                | Enhanced (Includes 200 Wires) |

| 11 OEM Security |                |
|-----------------|----------------|
| XXX             | None (Default) |
| OEM             | OEM Security   |

| 12 Bezel |          |
|----------|----------|
| ST       | Standard |
| WD       | Washdown |

| 13 Labels |                |
|-----------|----------------|
| XXXXX     | None (Default) |
| Fnnnn     | Custom Label   |

| 14 Specials |                |
|-------------|----------------|
| XXXXXX      | None (Default) |

| 15 Gain scheduling Sets |                                    |
|-------------------------|------------------------------------|
| XX                      | Two Gain Scheduling Sets (Default) |
| 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<br>(Requires PV2 and Zirconia) |
| D              | Dew Point Controller<br>(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 D7 = BCD Inputs 1 to 3, 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                           |
| CERT1                        | Supplied With Certificate of Conformity |

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

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

[eurotherm.com/epc3000](http://eurotherm.com/epc3000)



Life Is On

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