

# Enhanced Autoclave Sterilization Controller

## Clavex Pro / Clavex Pro 96

Dual Analog Input Channels for Temperature & Pressure Measurement  
Digital Inputs for Cycle Start & Low Water Level Detection  
Digital Outputs (SSR Drive/Relay) for Heating, Air Exhaust & Alarm  
1/16 DIN (48x48) & 1/4 DIN (96x96) Size Options

### Process Precision Instruments

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48 x 48



96 x 96



### Salient Features

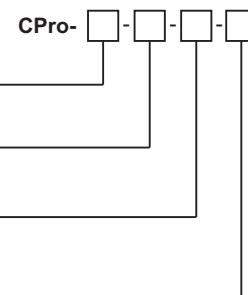
- 1/16 DIN (48x48) & 1/4 DIN (96x96) Size Options
- 2 Rows of Bright Green 7-Segment LED Display, Designed for Sunlight Readability (0.36" for 48 x 48 / 0.8" for 96 x 96)
- RTD Pt100 Temperature Input with 0.1°C or 1°C Resolution
- DC mA / V Input for Pressure Measurement (96x96 only)
- Programmable Input Signal Conditioning (Digital Filter & Zero Offset)
- Digital Inputs for Low Water Level Detection & Remote Cycle Start Command
- Digital Outputs for Heating, Air Exhaust & Alarm
- Programmable Sterilization Timer with Guaranteed Soak Time
- High Temperature Safety Alarm
- Automatic Cycle Abortion at High Temperature Limit
- Computed Saturated Steam Pressure Display
- RS485 MODBUS RTU Serial Communication Port
- Universal Supply Voltage : 85~264 VAC, 50/60 Hz
- DIN Standard Dimensions (mm) :  
**Clavex Pro** : 48(H) X 48(W) X 94(D)  
**Clavex Pro 96** : 96(H) X 96(W) X 84(D)
- Available in Flame-proof (Gas Group IIA & IIB) Enclosure

### General Information

**Product Type** Enhanced Autoclave Sterilization Controller

#### Ordering Code

| Size                | 48 : 48 x 48    96 : 96 x 96          |
|---------------------|---------------------------------------|
| Heater Output       | 1 : Relay    2 : SSR                  |
| Air Exhaust Output  | 1 : Relay    2 : SSR                  |
| Option (96x96 only) | 0 : None<br>1 : Pressure Input (mA/V) |



**Example Code : CPro-48-2-1-0**

Size : 48 x 48

Heater Output : SSR

Air Exhaust Output : Relay

Option : None

**Quantity** 1 Unit

**Accessories** (Optional) USB to RS485 Converter

# Enhanced Autoclave Sterilization Controller

## Operator Interface

|                   |                                                                                                                                                                            |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Display           | <b>Clavex Pro</b> : 2 Rows of 4 Digits, 0.36" Height Luminous Green, 7 Segment LED<br><b>Clavex Pro 96</b> : 2 Rows of 4 Digits, 0.8" Height Luminous Green, 7 Segment LED |
| Status Indicators | 8 Red LEDs                                                                                                                                                                 |
| Keys              | 4 Tactile Switches<br>PAGE, DOWN, UP, ENTER                                                                                                                                |

## PV Inputs

|                           |                                                                                                                                                                         |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature Input         | RTD Pt100, 3 wire                                                                                                                                                       |
| Pressure Input (Optional) | User Programmable : 0-20 mA, 4-20 mA, 0-5 V, 0-10 V, 1-5 V<br>(Available only in <b>Clavex Pro 96</b> )                                                                 |
| Transmitter Excitation    | 24 VDC @ 30 mA (Available only if Pressure Input is ordered)                                                                                                            |
| Accuracy                  | <b>RTD Pt100</b> : $\pm 0.25\%$ of reading.<br>Lead Resistance Compensation : Max. 5 $\Omega$ per Lead for 3-wire RTD<br><b>DC Linear V/mA</b> : $\pm 0.1\%$ of reading |
| Display Resolution        | <b>RTD Pt100</b> : 0.1 / 1°C (Settable)<br><b>DC Linear V/mA</b> : 0.001 / 0.01 / 0.1 / 1 Counts (Settable)                                                             |
| Range                     | <b>RTD Pt100</b> : -199 to +600°C or -199.9 to 600.0°C<br><b>DC Linear V/mA</b> : Adjustable from -1999 to 9999 Counts                                                  |
| Zero Offset               | User Adjustable over Full Range                                                                                                                                         |
| ADC                       | 16 Bit ( $\pm 32,768$ Counts), Sigma-Delta ( $\Sigma\Delta$ )                                                                                                           |
| Sampling Time             | 200mS (5 Samples per Second)                                                                                                                                            |
| Input Resistance          | > 8 M $\Omega$ for RTD Pt100 Inputs<br>> 47 K $\Omega$ for Voltage Input<br>249 $\Omega$ Precision Shunt for mA Input                                                   |
| Input Protection          | ESD : 8KV EFT : 2KV Surge : 1KV                                                                                                                                         |
| Input Conditioning        | First Order Analog R-C Low-Pass Filter & Settable Digital Low-Pass Filter                                                                                               |

## Sterilization Timer

|                     |                                                    |
|---------------------|----------------------------------------------------|
| Operation Mode      | Soak Time at Sterilization Setpoint with Hold Band |
| Range               | 1 to 999 Minutes                                   |
| Power-fail Recovery | Settable : Resume / Reset / Abort                  |

## Heater (Sterilization) Control

|                    |                                    |
|--------------------|------------------------------------|
| Type               | ON-OFF                             |
| Mode               | Heat Control                       |
| Control Parameters | Sterilization Setpoint, Hysteresis |
| Output             | Relay or SSR (Factory Settable)    |

# Enhanced Autoclave Sterilization Controller

## Air Exhaust Control

|                    |                                 |
|--------------------|---------------------------------|
| Control Type       | ON-OFF                          |
| Control Parameters | Air Outlet Temperature Setpoint |
| Output             | Relay or SSR (Factory Settable) |

## Water Level Monitoring

|                  |                                                                                 |           |             |
|------------------|---------------------------------------------------------------------------------|-----------|-------------|
| Input            | Digital Potential-free Contacts Input with programmable OPEN or CLOSE Logic.    |           |             |
| Function         | Alarm Alert, Cycle Abort & Control Outputs Cut-off on Low Water Level Detection |           |             |
| Input Protection | ESD : 8KV                                                                       | EFT : 2KV | Surge : 1KV |

## Cycle Start Digital Input

|                  |                                                                      |           |             |
|------------------|----------------------------------------------------------------------|-----------|-------------|
| Input            | Potential-free Contacts Input with programmable OPEN or CLOSE Logic. |           |             |
| Function         | Start Autoclave Cycle                                                |           |             |
| Input Protection | ESD : 8KV                                                            | EFT : 2KV | Surge : 1KV |

## Alarms

|           |                                                                   |
|-----------|-------------------------------------------------------------------|
| Functions | High Temperature Deviation, End-of-Sterilization, Low Water Level |
| Output    | Relay Change-over Contacts                                        |

## Electrical Specifications for Outputs

|           |                                                                                                                                                                  |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relay     | Contact Type : Potential-free Change-over Contacts<br>Contact Rating : 5A Resistive @ 250 VAC<br>Contact Life : > 5,00,000 Operations at Rated Voltage / Current |
| SSR Drive | 12 VDC @ 30 mA                                                                                                                                                   |

## Serial Communication

|                     |                                                     |
|---------------------|-----------------------------------------------------|
| Port                | RS485, 2-wire, Half Duplex, Start-Stop Synchronized |
| Protocol            | MODBUS RTU                                          |
| Baud Rate           | Settable : 4800, 9600, 19200 bps                    |
| ID                  | Settable : 1 to 127                                 |
| Parity              | Settable : None, Even, Odd                          |
| Max. Units per Loop | 31                                                  |
| Max. Distance       | 1200 Meters                                         |

## Power Supply

|              |                     |
|--------------|---------------------|
| Type         | Switch Mode (SMPS)  |
| Line Voltage | 85~264 VAC, 50/60Hz |
| Consumption  | 5 VA Max            |

# Enhanced Autoclave Sterilization Controller

## Physical

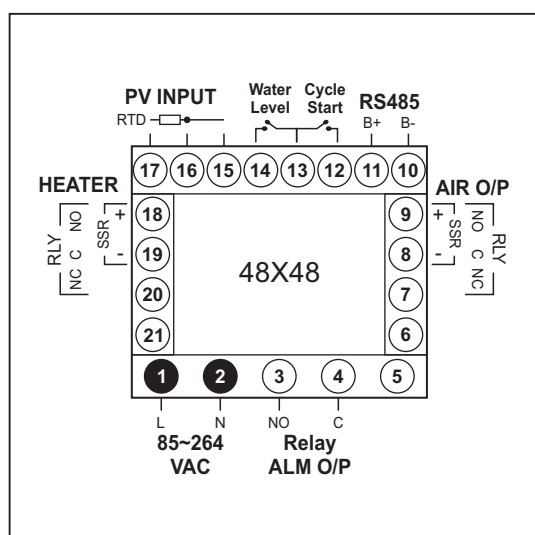
|                    |                                               |                                                  |
|--------------------|-----------------------------------------------|--------------------------------------------------|
| Mounting           | Plug-in with Panel Mounting Clamps            |                                                  |
| Overall Dimensions | <b>Clavex Pro</b> : 48(H) X 48(W) X 94(D), mm | <b>Clavex Pro 96</b> : 96(H) X 96(W) X 84(D), mm |
| Panel Cutout       | <b>Clavex Pro</b> : 45(H) X 45(W), mm         | <b>Clavex Pro 96</b> : 92(H) X 92(W), mm         |
| Terminals          | Screw Type, Pluggable                         |                                                  |
| Weight             | <b>Clavex Pro</b> : 200 gm, Approx.           | <b>Clavex Pro 96</b> : 400 gm, Approx            |

## Environmental

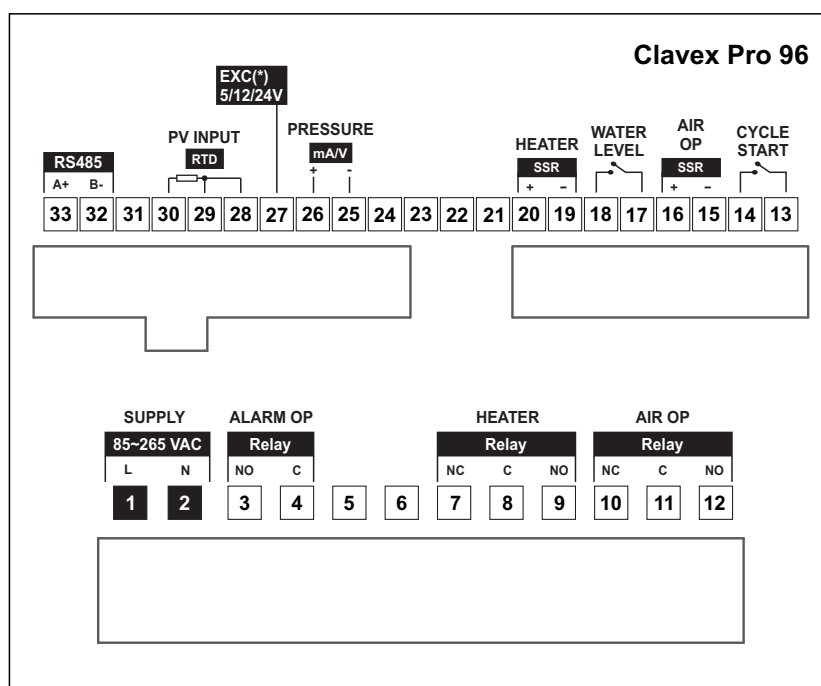
|                     |                                                                                                                                                             |  |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Operating Ambient   | 0 to 55°C & 5 to 90%RH Non-condensing                                                                                                                       |  |
| Storage Temperature | -10 to +70°C                                                                                                                                                |  |
| EMC Standards       | EN50081-2 & EN 50082-2 Generic Stds for Industrial Environment                                                                                              |  |
| Safety Standards    | Meets EN61010, Installation Catagory II                                                                                                                     |  |
| Atmospheres         | Not Suitable for use in Corrosive or Explosive Atmospheres. The Panel in which the Instrument is Mounted must be free of Electrically Conductive Pollution. |  |

## Terminations

**Clavex Pro : 48x48**



**Clavex Pro : 96x96**



## Process Precision Instruments (An ISO 9001 : 2008 Company)

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