## INTRODUCTION

**N1200** is an advanced self-adaptive PID controller with an algorithm that constantly monitors the process performance and adjusts PID settings in order to always obtain the best possible control response.

A single model is able to accept most industrial sensors and signals and provides all output types required to control different processes.

All controller configuration can be achieved from the front panel without performing any hardware change.

The multi-purpose inputs and outputs can be combined to provide tremendous versatility with extremely high accuracy in the most demanding applications.



SELF-ADAPTIVE PID CONTROL

CE

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## FEATURES

- Self-adaptive PID control.
- Multi-sensor universal input without any change in hardware or recalibration.
- Square root calculation for linear inputs .
- Outputs: solid state relay pulse, 4-20 mA and 2 SPST relays, 1 SPDT relay (optional).
- Auto-tuning PID parameters .
- Outputs functions can be configured as control, alarm, and PV and SP retransmission.
- Up to 4 timed alarms from 0 to 9999 seconds.
- Alarm functions: minimum, maximum, differential, differential minimum, differential maximum, open sensor, event and disabled.
- Digital input with the following functions:
  - Automatic/Manual control selection;
  - Enable/disable outputs;
  - Remote setpoint selection;
  - Select program 1;
  - Ramp and soak program hold.
- PV or setpoint retransmission in 0-20 / 4-20 mA.
- Automatic/Manual bumpless transfer.
- Heater break alarm (optional).
- Detects any sensor break condition.
- Remote setpoint input: 0-20 mA, 4-20 mA, 0-5 Vdc, 0-10 Vdc.
- Programmable soft-start (0 to 9999 seconds).
- Ramp and soak: 20 programs of 9 segments and possibility to link programs, thus resulting in one program of up to 180 segments.
- Optional serial RS-485 serial communication, Modbus RTU slave protocol, up to 115.2 kbps.
- Supports network of up to 247 slave controllers.
- Context driven menu adjustable to optional features.
- Indelible 8-digit serial number can be viewed from the display.
- Password protected parameters.
- The circuit can be removed without disconnecting wires.
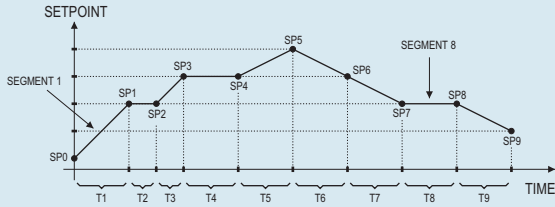- NEMA 4 (IP 65) front bezel with silicone keypad.

## SPECIFICATIONS

- Accepts thermocouples J, K, N, R, T, S, B, E, Pt100 RTD, 0-20 mA, 4-20 mA, 50 mV, 0-5 Vdc and 0-10 Vdc.
- Internal resolution: 32,767 levels (15 bits).
- Displayed resolution: 12,000 levels.
- Dual LED display: red upper display for PV, 10 mm high; green lower display for SV, 8 mm high.
- Sampling: up to 55 measurements/second.
- Control output update: up to 20 ms.
- Isolated 4-20 mA output with up to 32,000 resolution levels (15 bits), 550 ohms maximum load .
- 2 SPST relays 1,5 A / 240 Vac/dc and 1 SPDT relay (optional) 3 A/250 Vac/dc.
- Power supply: 100 to 240 Vac/dc, 50/60 Hz; optional 24 Vac/dc.
- Maximum consumption: 9 VA.
- Operating environment: 5 to 50 °C, 30 to 80% RH.
- Protection: NEMA 4 front bezel (IP65), PC UL94 V-2, case IP20, ABS + PC UL94 V-0.
- Rated CE.
- Dimensions: 48 x 48 x 110 mm.
- Panel cutout: 45.5 x 45.5 mm (1.79 x 1.79 in)
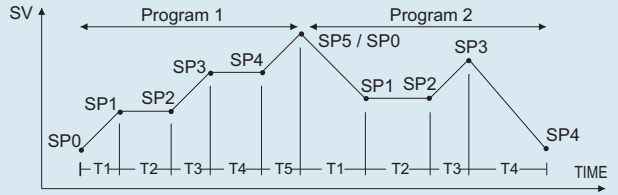- Approximate weight: 150 g (5.29 oz.)

### SUPPORTED SENSORS AND MAXIMUM RANGES

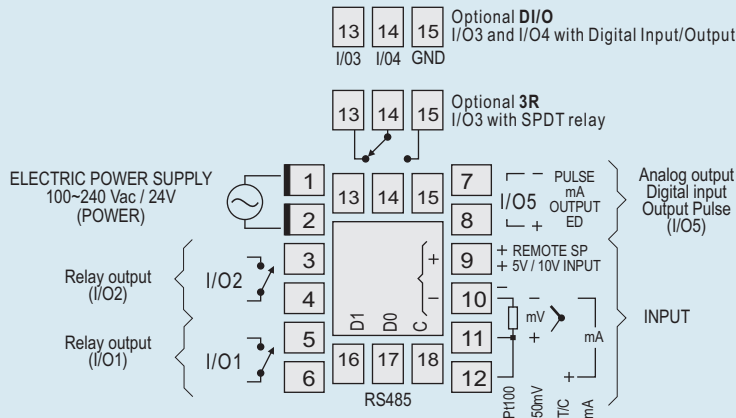| TYPE | FEATURES |
|---|---|
| J | Range: -110 to 950 °C (-166 to 1742 °F) |
| K | Range: -150 to 1370 °C (-238 to 2498 °F) |
| T | Range: -160 to 400 °C (-256 to 752 °F) |
| N | Range: -270 to 1300 °C (-454 to 2372 °F) |
| R | Range: -50 to 1760 °C (-58 to 3200 °F) |
| S | Range: -50 to 1760 °C (-58 to 3200 °F) |
| B | Range: 400 to 1800 °C (752 to 3272 °F) |
| E | Range: -90 to 730 °C (-130 to 1346 °F) |
| Pt100 | Range: -200 to 850 °C (-328 to 1562 °F) |
| 0-20 mA | Linear. Programmable indication of -1999 to 9999 |
| 4-20 mA | Linear. Programmable indication of -1999 to 9999 |
| 0-50 mV | Linear. Programmable indication of -1999 to 9999 |
| 0-5 Vdc | Linear. Programmable indication of -1999 to 9999 |
| 0-10 Vdc | Linear. Programmable indication of -1999 to 9999 |
| 4-20 mA | Non-linear. Indication range according to the associated sensor. |

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## RAMP AND SOAK PROGRAM



## PROGRAM LINKING



## ELECTRICAL CONNECTIONS



## ALARM FUNCTION

| TYPE | DISPLAY | ACTIVATION |
|---|---|---|
| Open sensor (input Error) | iErr | Triggered when the sensor breaks |
| Event (ramp and soak) | rS | Enabled in a specific segment of the program |
| Heater break (resistor Fail) | rFAiL | Indicates failure in the heat resistor |
| Minimum value (Low) | Lo |  |
| Maximum value (High) | Hi |  |
| Differential (band) | diF |  SPAn positive / SPAn negative |
| Minimum differential (deviation Low) | diFL |  SPAn positive / SPAn negative |
| Maximum differential (deviation High) | diFH |  SPAn positive / SPAn negative |

**Alarm functions**

| OPERATION | T1 | T2 | ACTIVATION |
|---|---|---|---|
| Normal operation | 0 | 0 |  |
| Pulse | 1 a 9999 s | 0 |  |
| Delay | 0 | 1 a 9999 s |  |
| Oscillator | 1 a 9999 s | 1 a 9999 s |  |

**Alarm timed functions**

## HOW TO SPECIFY

| Model | Description | Optional 1 (Communication) | Optional 2 (Power Voltage) |
|---|---|---|---|
| N1200 | Version with 2 SPST relays, analog output, 100-240 Vac/dc supply (basic model) | - 485 | - 24 V |
| N1200 - 3R | Version with 2 SPST relays, analog output, 100-240 Vac/dc supply + 1 SPDT relay | | |
| N1200 - I/O DIO | Version with 2 SPST relays, analog output, 100-240 Vac/dc supply + 2 I/O digital channels | | |
| N1200 - HBD | Version with 2 SPST relays, analog output, 100-240 Vac/dc supply + heater break detection | | |

**Example 1:** N1200 - 24 V: basic model with 24 Vca/dc power supply
**Example 2:** N1200 - 3R: model with 2 SPST relays and 1 SPDT relay, 100-240 Vac/dc supply
**Example 3:** N1200 - 3R - 485: model with 2 SPST relays and 1 SPDT relay, 100-240 Vac/dc supply and RS 485 serial communication