

Universal Single Loop Process Controller

neuro 202L Plus

Single Loop Uni-Directional/Bi-Directional Control
 Built-in 16 Segment Ramp/Soak Profile
 Optional Remote/Auxiliary Setpoint Input
 Alarms, Retransmission & RS485 Serial Outputs

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Sunlight-Readable
 Large Bright Display



Reduced-Depth
 Aesthetically-Improved
 Enclosure



Pluggable Terminals
 Easy Installation



Isolated
 Retransmission &
 Control / Alarm Outputs



Salient Features

- 2 Rows of JUMBO Bright Green 0.8 inch 7-Segment LED Display, Designed for Sunlight Readability
- Universal Inputs (Thermocouples, RTD Pt100, DC Linear mA/mV/V)
- 24VDC @ 30mA Excitation Voltage for Transmitters
- Built-in Lead Resistance Compensation for RTD Input & CJC for Thermocouple Input
- Programmable Range / Resolution for DC Linear Inputs
- Programmable Input Signal Conditioning (Digital Filter & Zero Offset)
- Self Tune PID (with Auto/Manual Bumpless Transfer), On-Off, and Pulsed On-Off Control
- Uni-Directional / Bi-Directional Control
- Universal Main Control Output (Relay / SSR Drive / mA or V)
- Built-in 16 Segment Ramp / Soak Setpoint Profile
- Optional Remote & Auxiliary Setpoint Input
- Optional Alarms & PV/SP Retransmission Outputs
- RS485 MODBUS RTU Serial Communication Port
- Universal Supply Voltage : 85~264 VAC, 50/60 Hz
- DIN Standard Dimensions (mm) : 96(H) X 96(W) X 84(D)
- Flame-proof Enclosure (Gas Group IIA & IIB) Available

General Information

Product Type Universal Single Loop Process Controller with Alarm, Retransmission, and RS485 Serial Port

Ordering Code

Output 1 1 : Relay / SSR / mA 2 : Relay / SSR / V	
Output 2 0 : None 1 : Relay 2 : SSR 3 : mA 4 : V	
Output 3 0 : None 1 : Relay 2 : SSR 3 : mA 4 : V	
Version 0 : 16 Segment Ramp/Soak Profile 1 : Auxiliary SP 2 : Remote SP	

Example Code : N202L-1130

Output 1 : Relay/SSR/mA
 Output 2 : Relay
 Output 3 : mA
 Version : 16 Segment Ramp/Soak Profile

Quantity 1 Unit

Accessories (Optional) USB to RS485 Converter

Similar Modules neuro 202

Universal Single Loop Process Controller

Operator Interface

Display	2 Rows of 4 Digits, 0.8" Luminous Green, 7 Segment LED
Status Indicators	8 Red LEDs
Keys	4 Tactile Switches PAGE, DOWN, UP, ENTER

PV Input

Sensor/Signal (User Configurable)	Thermocouple : J, K, T, R, S, B, N, E RTD : Pt100, 3 wire DC Linear : 0 - 20 mA, 4 - 20 mA, 0 - 80 mV, 0 - 1.25 V, 0 - 5 V, 0 - 10 V, 1 - 5 V
Accuracy	Thermocouples : ± 0.2% of reading for J, K, T, E (Excluding CJC) ± 0.4% of reading for R, S, B, N (Excluding CJC) CJC : ± 1.5 °C (Specified over 18 to 37 °C) RTD Pt100 : ± 0.2% of reading. Lead Resistance Compensation : Max. 5Ω per Lead for 3-wire RTD DC Linear mV / V / mA : ± 0.1% of reading
Display Resolution	Thermocouples : 1°C Fixed RTD Pt100 : 0.1 / 1°C (Settable) DC Linear Volts / Current : 0.001 / 0.01 / 0.1 / 1 Counts (Settable)
Range	Refer Table 1 for Thermocouples & RTD Inputs Adjustable from -1999 to 9999 Counts for DC Linear mA/mV/V
Zero Offset	User Adjustable over Full Range
ADC	16 Bit (± 32,768 Counts), Sigma-Delta (ΣΔ)
Sampling Time	200mS for 16 Segment Ramp / Soak Profile & Auxiliary SP Versions 300mS for Remote SP Version
Input Resistance	> 8 MΩ for Thermocouples, RTD Pt100 & mV Inputs > 47 KΩ for Voltage Input 249 Ω Precision Shunt for mA Input
Common Mode Rejection	> 100dB at 50/60 Hz
Input Protection	ESD : 8KV EFT : 2KV Surge : 1KV
Input Conditioning	First Order Analog R-C Low-Pass Filter & Settable Digital Low-Pass Filter

Excitation Voltage

Ratings	24 VDC (± 10%) @ 30 mA
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Alarms

Numbers	2, Independent
Programmable Parameters	Type : Process Low, Process High, Deviation, Window Hysteresis : 1 to 3000 Unit Counts Logic : Normal, Reverse Inhibit : No, Yes
Outputs (Optional)	Relay Change-over Contacts or SSR Drive (Factory Settable) (Output-2 and/or Output-3)

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Retransmission

Parameter Type	Process Value (PV) or Setpoint (SP)
Parameter Value	User Settable through 'Range Low' & 'Range High' Parameters
Output Signal (Output-3)	DC Volts (0-5/10 V) or DC Current (0/4-20 mA)

Control

Type	Self Tune PID or ON-OFF or Pulsed ON-OFF
Mode	Uni-Directional : Heat-only or Cool-only Bi-Directional : Heat + Cool
Control Parameters	<ul style="list-style-type: none"> • ON-OFF : Hysteresis • Self Tune PID : Proportional Band, Integral Time, Derivative Time, Cycle Time, Relative Cool Gain, Power Low, Power High, Overshoot Inhibit • Pulsed ON-OFF : Hysteresis, Pulse Period, Pulse-ON Time
Manual Control	Bump-less Transfer between Auto PID and Manual Control through front panel Key

Ramp/Soak Setpoint Profile

Segments	16, Free Forming Ramp or Soak
Hold Back Band	Common for entire Profile or Independent for each Segment
Repeat Cycles	1 to 9999
Power-fail Recovery	User Programmable for Resumption or Abortion of Profile

Remote Setpoint

Type (User Configurable)	0-20 mA, 4-20 mA, 0-5 V, 0-10 V
Accuracy	± 0.20% of reading ± 1 LSD
Range	Adjustable from -1999 to 9999 Counts
Resolution	0.001 / 0.01 / 0.1 / 1 Counts (Settable)
ADC	16 Bit (± 32,768 Counts), Sigma-Delta ($\Sigma\Delta$)
Sampling Time	300mS
Input Resistance	> 47 K Ω for Voltage Input 47 Ω Precision Shunt for mA Input
Common Mode Rejection	> 100dB at 50/60 Hz
Input Protection	ESD : 8KV EFT : 2KV Surge : 1KV
Input Conditioning	First Order Analog R-C Low-Pass Filter & Settable Digital Low-Pass Filter

Auxiliary Setpoint

No. of Auxiliary Setpoint	1
Switching	Switching between Main & Auxiliary Setpoint through rear panel Digital Input

Digital Input

Type Potential-free Contact Closure (Push button, etc.)

Function	Version	Function
	Ramp / Soak Profile	Remote Start of Profile. Open to Close Contacts : Profile Start Command.
	Auxiliary Setpoint	Switching between Main & Auxiliary Setpoint. Contacts Closed : Auxiliary Setpoint Active. Contacts Open : Main Setpoint Active.
	Remote Setpoint	Switching between Local & Remote Setpoint. Contacts Closed : Local Setpoint Active. Contacts Open : Remote Setpoint Active.

Electrical Specifications for Outputs (Refer Table 2)

Relay	Contact Type : Potential-free Change-over Contacts Contact Rating : 5A Resistive @ 250 VAC Contact Life : > 5,00,000 Operations at Rated Voltage / Current
SSR Drive	12 VDC @ 30 mA
DC Linear	Current : 0-20mA, 4-20mA (into 500 Ohm Maximum) Voltage : 0-5V, 0-10V (into 1KOhm Minimum)
Isolation	All Outputs are Isolated from Power, Analog Inputs & RS485 Port Rating : 1500VAC for 1 second or 250VAC continuous Isolation.

Serial Communication

Port	RS485, 2-wire, Half Duplex, Start-Stop Synchronized
Protocol	MODBUS RTU
Baud Rate	Settable : 4800, 9600, 19200
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

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Physical

Mounting	Plug-in with Panel Mounting Clamps
Overall Dimensions	96(H) X 96(W) X 84(D), mm
Panel Cutout	92(H) X 92(W), mm
Terminals	Screw Type, Pluggable
Weight	400 gm, Appx.

Environmental

Operating Ambient	0 to 55°C & 5 to 90%RH Non-condensing
Storage Temperature	-10 to +70°C
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

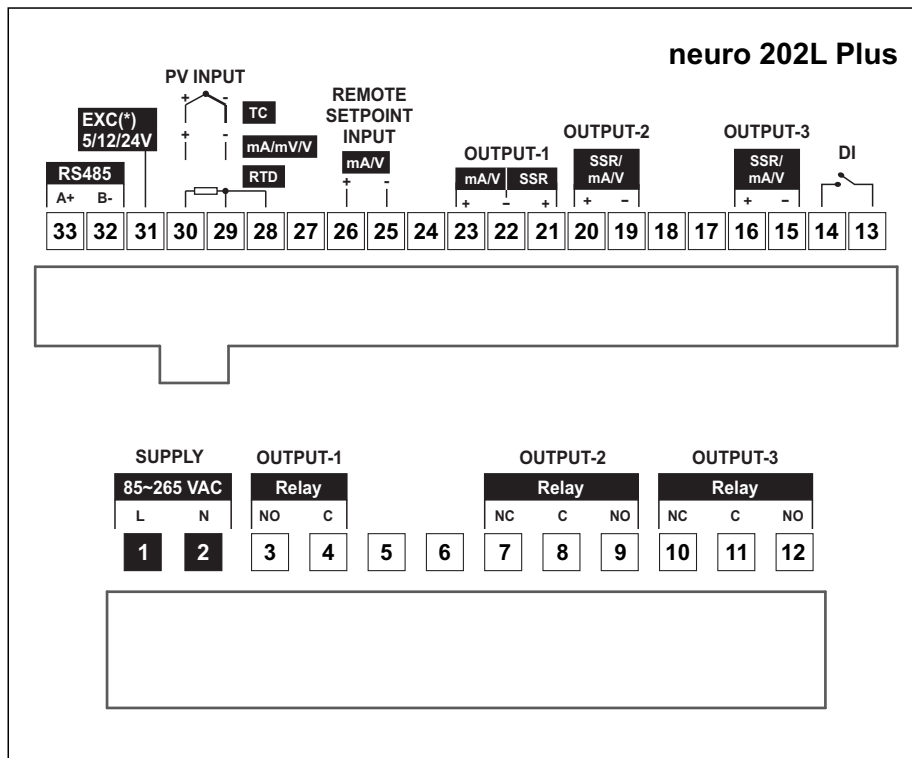






Table 1 : Thermocouple & RTD Input Ranges

Input Type	Range (Min. to Max.)
2 / 3-wire, RTD Pt100	-199.9 to +850.0 °C / -328.0 to +1562.0 °F
Type J Thermocouple (Fe-K)	0.0 to +960.0°C / +32.0 to +1760.0°F
Type K Thermocouple (Cr-Al)	-200.0 to +1376.0°C / -328.0 to +2508.0°F
Type T Thermocouple (Cu-Con)	-200.0 to +387.0°C / -328.0 to +728.0°F
Type R Thermocouple (Pt / Pt-Rh13%)	0.0 to +1771.0°C / +32.0 to +3219.0°F
Type S Thermocouple (Pt / Pt-Rh10%)	0.0 to +1768.0°C / +32.0 to +3214.0°F
Type B Thermocouple (Pt-Rh6% / Pt-Rh30%)	0.0 to +1826.0°C / +32.0 to +3318.0°F
Type N Thermocouple (NiCrSi / NiSi)	0.0 to +1314.0°C / +32.0 to +2397.0°F
Type E Thermocouple (NiCr / Con)	-200.0 to +1000.0°C / -328.0 to +1832.0°F

Table 2 : Output Option Selection & Function Assignments

	Available Types	Function Assignments (User Programmable)
Output 1 (Isolated)	Universal, User Selectable (Isolated from Power, Inputs & RS485 Port) Relay : 5A / 230 VAC, 5A / 30 VDC, Resistive Load SSR : 12 VDC @ 30 mA DC Linear : 0/4 - 20 mA into 500Ω Max., Standard 0 - 5/10 VDC into 1KΩ Min., Optional	✓ Main Control Output
Output 2 (Isolated) (Optional, For Alarm or Bi-Directional Control)	Factory Set (Isolated from Power, Inputs & RS485 Port) Relay : 5A / 230 VAC, 5A / 30 VDC, Resistive Load SSR : 12 VDC @ 30 mA Or DC Linear : 0/4 - 20 mA into 500Ω Max., Standard 0 - 5/10 VDC into 1KΩ Min., Optional	✓ Cool Control Output ✓ Alarm-1 Output ✓ End of Profile Output
Output 3 (Isolated) (Optional, For Alarm or Retransmission)	Factory Set (Isolated from Power, Inputs & RS485 Port) Relay : 5A / 230 VAC, 5A / 30 VDC, Resistive Load SSR : 12 VDC @ 30 mA Or DC Linear : 0/4 - 20 mA into 500Ω Max., Standard 0 - 5/10 VDC into 1KΩ Min., Optional	✓ Alarm-2 Output ✓ End of Profile Output ✓ Retransmission Output

Process Precision Instruments (An ISO 9001 : 2008 Company)

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