neuro 102Plus

Advanced Universal Single Loop Process Controller

PPI The Perfection Experts

neuro 102 Plus
48X48

neuro 102V Plus
96X48

neuro 102L Plus
96X96

Features

- Universal Process Input
- Self Tune PID (with Auto/Manual Bump-less Transfer), On-Off or Pulsed On-Off Control
- Isolated Control Outputs
- Ramp/Soak Setpoint Profile
- Remote & Auxiliary Setpoint Input
- PV/SP Retransmission Output
- Process Alarms & Serial Communication Port
- Various DIN Standard Sizes

Notes

- Ramp/Soak Profile, Auxiliary Setpoint & Remote Setpoint are optional features and are mutually exclusive. That is, the controller can be shipped with only one of 3 options fitted.
- The option Remote Setpoint is available in models neuro102V Plus & neuro102L Plus only
- If neuro 102 Plus is ordered with Auxiliary Setpoint option, then RS485 Serial Communication port will not be available.

Specifications

Display	
Digital Readout	**For neuro 102 Plus & neuro 102V Plus** Upper Readout : 4 digits, 0.39” Bright Red LED, 7 Segment Lower Readout : 4 digits, 0.32” Luminous Green LED, 7 Segment **For neuro 102L Plus** Upper Readout : 4 digits, 0.52” Bright Red LED, 7 Segment Lower Readout : 4 digits, 0.52” Luminous Green LED, 7 Segment
Status Indicators	5 Red LEDs (3mm Round)
Keys	
Type	4 Tactile Switches
Functions	PAGE, DOWN, UP, ENTER

Sensor / Signal Input	
Type (User Programmable) **(No Jumper settings)**	Thermocouple : J, K, T, R, S, B, N 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
Corrections	• In-built Cold-Junction Compensation for Thermocouples • In-built Lead Resistance Compensation for RTD (Upto 22 Ohms in each lead)
Accuracy	For Thermocouples & RTD : ± 0.25% of reading ± 1°C For DC Linear Volts / Current : ± 0.25% of reading ± 1 LSD
Display Range	Refer Table 1 for Thermocouples & RTD Inputs Adjustable from -1999 to 9999 Counts for DC Linear mA/mV/V
Display Resolution (User Programmable)	Thermocouples : 1°C Fixed RTD Pt100 : 0.1 / 1°C DC Linear Volts / Current : 0.001 / 0.01 / 0.1 / 1 Counts
Zero Offset	User Adjustable over Full Range
ADC	16 Bit (±32,768 Counts), Sigma-Delta (ΣΔ)
Sampling Time	200mS (5 Samples per Second)
Input Resistance	> 8 MOhm
Common Mode Rejection	> 100dB at 50/60 Hz
Signal Conditioning	R-C Analog Filter with Programmable Digital Low-Pass Filter
Alarms	
Numbers	2, Independent
Programmable Parameters	Mode : Process Low, Process High, Deviation, Window Logic : Normal, Reverse Hysteresis : 1 to 9999 Unit Counts Inhibit : No, Yes
Outputs (Optional)	Relay Change-over Contacts or SSR Drive (Jumper Selectable) Output-2 (OP-2) for Alarm-1, Output-3 (OP-3) for Alarm-2
Retransmission	
Parameter Type	Process Value (PV) or Setpoint (SP)
Parameter Value	User Settable through 'Range Low' & 'Range High' Parameters
Output Signal **(Optional on Output-3)**	DC Volts (0-5/10 V) or DC Current (0/4-20 mA)
Control	
Type	Self Tune PID, ON-OFF, Pulsed ON-OFF
Mode	Heat only, Cool only, Heat & Cool
Control Parameters	• 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

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 Programmable) **(No Jumper settings)**	DC Linear : 0-20 mA, 4-20 mA, 0-5 V, 0-10 V
Accuracy	± 0.25% of reading ± 1 LSD
Setpoint Range	Adjustable from -1999 to 9999 Counts
Display Resolution (User Programmable)	0.001 / 0.01 / 0.1 / 1 Counts
ADC	16 Bit (±32,768 Counts), Sigma-Delta (ΣΔ)
Sampling Time	200mS (5 Samples per Second)
Input Resistance	> 8 MOhm
Common Mode Rejection	> 100dB at 50/60 Hz
Signal Conditioning	R-C Analog Filter

Auxiliary Setpoint

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

Digital Input

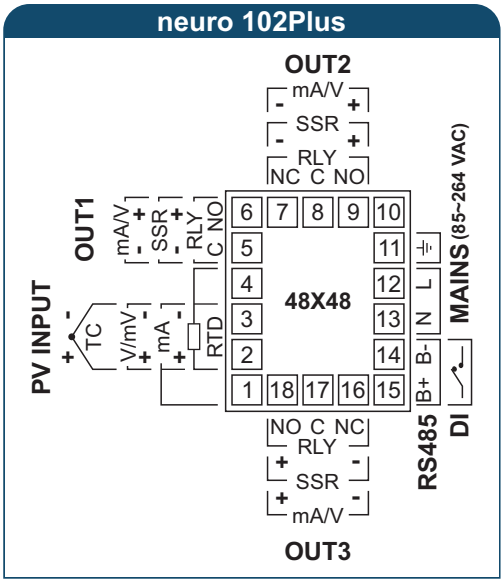
Type	Potential free Contact Closure
Functions	See table below

Option	Function
Ramp / Soak Profile	Remote Start of Profile A trigger on digital input starts Profile, provided it is enabled
Auxiliary Setpoint	Switching between Main & Auxiliary Contacts Closed: Auxiliary Setpoint is selected Contacts Open: Main Setpoint is selected
Remote Setpoint	Switching between Remote Setpoint & Control Setpoint Contacts Closed: Control Setpoint is selected Contacts Open: Remote Setpoint is selected, provided it is enabled

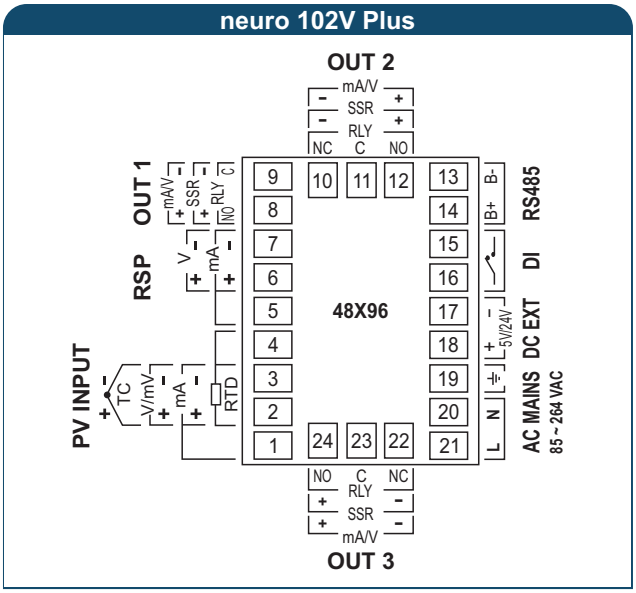
Outputs (Refer Table 2 : Output Option Selection & Function Assignments)	
Relay	Contact Type : Potential-free Change-over Contacts Contact Rating : 5A Resistive @ 120/240 Vac Contact Life : > 5,00,000 Operations at Rated Voltage / Current
SSR Drive	12 VDC @ 40 mA
DC Linear	Voltage : 0-5V, 0-10V (into 5KOhm Minimum) Current : 0-20mA, 4-20mA (into 550 Ohm Maximum)
Serial Communication	
Port	RS485, 2-wire, Half Duplex, Start-Stop Synchronized
Protocol	Modbus RTU
Baud Rate	Settable : 4800, 9600, 19200, 38400, 57600
Parity	Settable : None, Even, Odd
Max. Units per Loop	31
Max. Distance	1200 Metres
Power Supply	
Type	Switch Mode (SMPS)
Line Voltage	Standard : 85~264 VAC, 50/60Hz
Consumption	5VA Max
Physical	
Mounting	Plug-in with Panel Mounting Clamps
Dimensions / Panel Cutout	neuro102 Plus : 48 (H) X 48 (W) X 110 (D), mm / 45 (H) X 45 (W), mm neuro102V Plus : 96 (H) X 48 (W) X 100 (D), mm / 92 (H) X 45 (W), mm neuro102L Plus : 96 (H) X 96 (W) X 100 (D), mm / 92 (H) X 92 (W), mm
Terminals	Screw Type
Weight	225 gm, Appx.
Environmental	
Operating Ambient	0~55°C & 5~90%RH Non-condensing
Storage Temperature	-10 to +70 °C
Panel Sealing	IP65, NEMA 4X
EMC Standards	EN50081-2 & EN 50082-2 Generic Stds for Industrial Environment
Safety Standards	Meets EN61010, Installation Category 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.

Back Panel Terminations

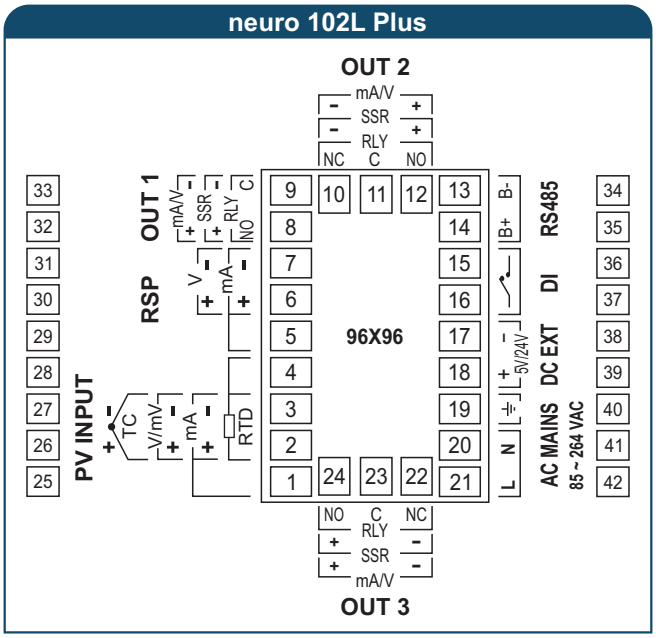
neuro 102Plus



neuro 102V Plus



neuro 102L Plus



Tables

Table 1 : Temperature Ranges for Thermocouples & RTD

Input Type	Range (Min. to Max.)
Type J Thermocouple (Fe-K)	0 to +960°C / +32 to +1760°F
Type K Thermocouple (Cr-Al)	-200 to +1376°C / -328 to +2508°F
Type T Thermocouple (Cu-Con)	-200 to +387°C / -328 to +728°F
Type R Thermocouple (Pt/Pt-Rh13%)	0 to +1771°C / +32 to +3219°F
Type S Thermocouple (Pt/Pt-Rh10%)	0 to +1768°C / +32 to +3214°F
Type B Thermocouple	0 to +1826°C / +32 to +3218°F
Type N Thermocouple	0 to +1314°C / +32 to +2397°F
3-wire, RTD Pt100	-199 to +600°C / -328 to +1112°F

Table 2 : Output Option Selection & Function Assignments

	Available Options (Specify while Ordering)	Function Assignments (User Programable)
Output 1	Universal, User Selectable through Jumper Settings **Relay** : 5A / 230 VAC, 5A / 30 VDC, Resistive Load **DC Pulses** : 12 VDC @ 40 mA (for SSR) **DC Linear** : 0/4 - 20 mA into 550Ω Max., Standard 0 - 5/10 VDC into 5KΩ Min., Optional ***(Isolated from Power, Inputs & Outputs)**	✓ Main Control Output
Output 2 **(Non-Isolated)** (Optional, For Alarm or Bi-Directional Control)	User Selectable through Jumper Settings **Relay** : 5A / 230 VAC, 5A / 30 VDC, Resistive Load **DC Pulses** : 12 VDC @ 40 mA (for SSR) **Or** **DC Linear** : 0/4 - 20 mA into 550Ω Max., Standard 0 - 5/10 VDC into 5KΩ Min., Optional **(Non - Isolated)**	✓ Cool Control Output ✓ Alarm-1 Output ✓ End of Profile Output
Output 3 **(Non-Isolated)** (Optional, For Alarm or Retransmission)	User Selectable through Jumper Settings **Relay** : 5A / 230 VAC, 5A / 30 VDC, Resistive Load **DC Pulses** : 12 VDC @ 40 mA (for SSR) **Or** **DC Linear** : 0/4 - 20 mA into 550Ω Max., Standard 0 - 5/10 VDC into 5KΩ Min., Optional **(Non - Isolated)**	✓ Alarm-2 Output ✓ End of Profile Output ✓ Retransmission Output

* **Output 1 Isolation is available in models neuro102V Plus & neuro102L Plus only**

Ordering Code

Input	
TC	Thermocouple
PT	RTD Pt100
LV	Linear Voltage
LC	Linear Current

–

Output 1	
CX	Refer Note-1
VX	Refer Note-2
2C	SSR
2V	SSR
3V	0-5/10 V
4C	0/4-20 mA

–

Output 2	
0	None
1	Relay**
2	SSR**
3	0-5/10 V
4	0/4-20 mA

–

Output 3	
0	None
1	Relay**
2	SSR**
3	0-5/10 V
4	0/4-20 mA

–

Power Supply	
0	85~264 VAC

–

Serial Port	
0	None
1	RS485

–

Excitation Voltage	
0	24 VDC
1	5 VDC

–

Options	
N	None
P	Ramp/Soak Profile
A	Auxiliary SP*
R	Remote SP*

Note 1
The character **C** specifies output option as “Relay, SSR & 0/4-20 mA”. The character **X** can be specified as 1, 2 or 4 for the factory jumper setting to Relay, SSR or 0/4-20 mA, respectively.

Note 2
The character **V** specifies output option as “Relay, SSR & 0-5/10 V”. The character **X** can be specified as 1, 2 or 3 for the factory jumper setting to Relay, SSR or 0-5/10 V, respectively.

Example Code **TC - C4 - 1 - 4 - 0 - A**
Thermocouple Input, Output-1 0/4-20 mA, Output-2 Relay, Output-3 0/4-20 mA (Retransmission), 85~264 VAC Supply, Auxiliary Setpoint

* Available in models neuro102V Plus & neuro102L Plus only

** Relay and SSR selection is jumper settable by user. The ordering code only implies the factory settings at the time of dispatch if Relay/SSR output option is ordered .

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