SOLO Basic Temperature Controllers

SLB4848 Series Overview

AutomationDirect's SOLO Basic is a single loop temperature controller that can control heating or cooling processes. Depending upon the particular model of controller, the available outputs include relay, voltage pulse or current. On select models there are two alarm outputs available with nine selectable alarm types. SOLO Basic controllers have a single control output that can be used for control of a heating or cooling application. Models with alarm outputs can also be configured to use one of the alarm outputs as a second control output allowing both heating and cooling control or two stage heating or two stage cooling control. There are three types of control modes: PID, ON/OFF and Manual. SOLO Basic can accept various types of thermocouple and RTDs.

Features

- Auto Tuning (AT) function with PID control
- 1/16 DIN panel size
- 2 line x 4 character 7-segment LCD display for Process Value (PV): Red color, and Set Point (SV): Green color
- Selectable display decimal point XXX.X or XXXX
- Selectable between °C and °F
- UL, CUL and CE agency approvals

Selection Guide

Part Number	Price	Input Voltage	Output #1	Alarm #1* / Output #2**	Alarm #2*
SLB4848-R0	$52.00	100 - 240 VAC	Relay - SPST	–	–
SLB4848-V0	$52.00	100 - 240 VAC	Voltage Pulse	–	–
SLB4848-C0	$52.00	100 - 240 VAC	Current	–	–
SLB4848-R2	$61.00	100 - 240 VAC	Relay - SPST	Relay - SPST	Relay - SPST
SLB4848-V2	$61.00	100 - 240 VAC	Voltage Pulse	Relay - SPST	Relay - SPST
SLB4848-C2	$61.00	100 - 240 VAC	Current	Relay - SPST	Relay - SPST

*Alarm #1 and Alarm #2 have a shared common
** Alarm #1 can be configured to function as Alarm #1 or as Control Output #2
Note: A mounting clip is included.

User Configurable Output Options

Control Output #1	*Alarm #1 / Output #2
Heating	Alarm #1
Cooling	**Heating
	**Cooling

* Note: Alarm #1 / Output #2 options are only available on models with alarm outputs.
**Heating and cooling options on Alarm #1 are only available in dual output modes. There are six configuration combinations. See manual for details.

SOLO Basic Temperature Controllers

Specifications	
Input Power Requirements	100 to 240 VAC 50 / 60 Hz
Operation Voltage Range	85 to 264 VAC
Power Consumption	5 VA Max
Control Mode	PID, ON/OFF or Manual
Input Accuracy	TC temperature indication accuracy: ±(0.3% of span + 1 digit) at 25°C ambient after 20 minutes warm up. Including NIST conformity, cold junction effect, A/D conversion errors and linearization conformity RTD temperature indication accuracy: ±(0.2% of span +1 digit)
Vibration Resistance	10 to 55 Hz, 10 m/s2 for 10 min, each in X, Y and Z directions
Display	2 line x 4 character, 7-segment LED display PV: 11mm red SV: 9.2 mm green
Shock Resistance	Max. 300 m/s2, 3 times in each 3 axes, 6 directions
Ambient Temperature Range	32°F to 122°F (0°C to 50°C)
Storage Temperature Range	-4°F to 149°F (-20°C to 65°C)
Altitude	2000m or less
Relative Humidity	35% to 80% (non-condensing)
IP Rating	IP66: Complete protection against dust and powerful water jets from all directions. (**inside suitable enclosure)
Agency Approvals	UL, CUL, CE (UL file number E311366)
Pollution Degree	Degree 2 - Normally, only non-conductive pollution occurs. Temporary conductivity caused by condensation is to be expected.
Input Types	
• Thermocouple*	K, J, T, E, N, R, S, B, L, U, TXK (Sampling Rate: 100 ms / per scan)
• Platinum RTD	3-wire Pt100, JPt100 (Sampling Rate: 100 ms / per scan)
• Copper, Nickel RTDs	Cu50, Ni120 (Sampling Rate: 100 ms / per scan)
Control Output Options	
• Relay (R)	SPST max. 5A @ 250 VAC resistive load
• Voltage Pulse (V)	DC 12V±15%, output current 40mA Max
• Current (C)	DC 4-20 mA output (sourcing) (Load resistance: Max 600Ω)
Alarm Output Option	(2) SPST relays with shared common, 3A @ 250VAC resistive load

*Note: Use only ungrounded thermocouples.
** No corrosive gases

Input Types

Thermocouple* Type and Temperature Range	
Input Temperature Sensor Type	Temperature Range
Thermocouple TXK type	-238 ~ 1472°F (-150 ~ 800°C)
Thermocouple U type	-328 ~ 932°F (-200 ~ 500°C)
Thermocouple L type	-328 ~ 1562°F (-200 ~ 850°C)
Thermocouple B type	212 ~ 3272°F (100 ~ 1800°C)
Thermocouple S type	32 ~ 3092°F (0 ~ 1700°C)
Thermocouple R type	32 ~ 3092°F (0 ~ 1700°C)
Thermocouple N type	-328 ~ 2372°F (-200 ~ 1300°C)
Thermocouple E type	32 ~ 1112°F (0 ~ 600°C)
Thermocouple T type	-328 ~ 752°F (-200 ~ 400°C)
Thermocouple J type	-148 ~ 2192°F (-100 ~ 1200°C)
Thermocouple K type	-328 ~ 2372°F (-200 ~ 1300°C)

RTD Type and Temperature Range	
Input Temperature Sensor Type	Temperature Range
Platinum (Pt100)	-328 ~ 1562°F (-200 ~ 850°C)
Platinum (JPt100)	-148 ~ 752°F (-100 ~ 400°C)
Copper (Cu50)	-58 ~ 302°F (-50 ~ 150°C)
Nickel (Ni120)	-112 ~ 572°F (-80 ~ 300°C)

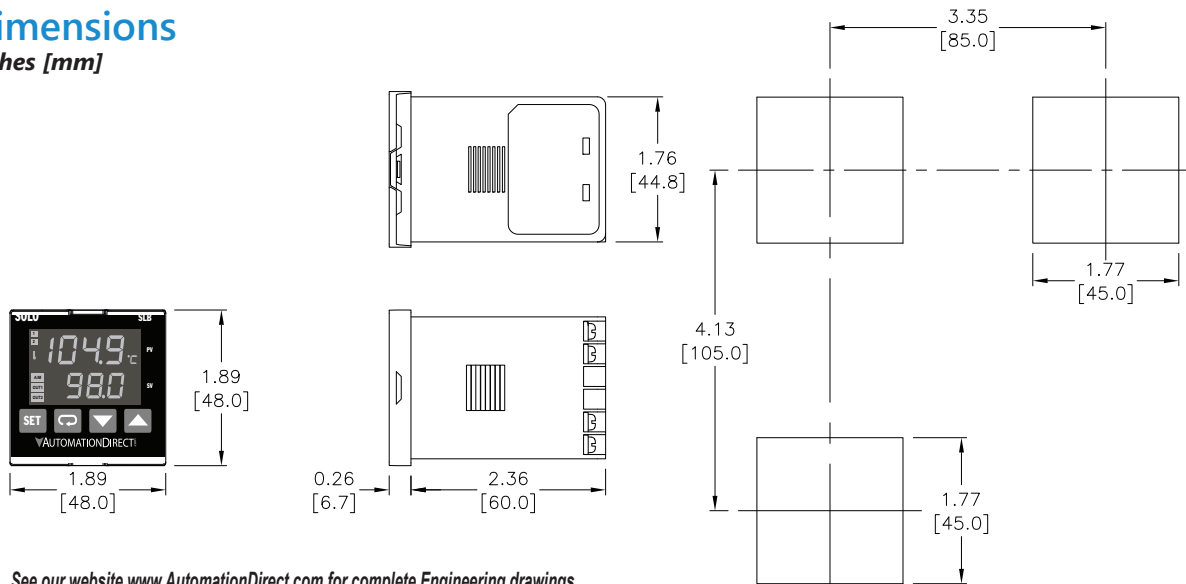*Note: Use only ungrounded thermocouples.

Scan or click the above QR code to be taken to the SOLO Basic Quick Start Guide

Scan or click the above QR code to be taken to the SOLO Basic Manual

Minimum Cutout and Spacing

3.35 [85.0]

1.77 [45.0]

4.13 [105.0]

1.77 [45.0]

Dimensions

inches [mm]

1.76 [44.8]

1.89 [48.0]

1.89 [48.0]

0.26 [6.7]

2.36 [60.0]

See our website www.AutomationDirect.com for complete Engineering drawings.
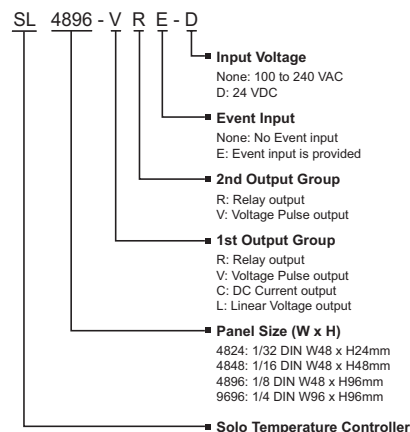
SOLO Standard Temperature Controllers

Overview

AutomationDirect's SOLO series includes single-loop dual-output temperature controllers that can control both heating and cooling simultaneously. There are four types of control modes: PID, ON/OFF, Ramp/Soak and Manual. Depending upon the model of controller, the available outputs include relay, voltage pulse, current, and linear voltage. There are up to three alarm outputs available. (The SL4824 series supports only one alarm output.) Select from seventeen alarm types in the initial setting mode. SOLO controllers can accept various types of thermocouple, RTD, or analog inputs. SOLO controllers have a built-in RS-485 interface using Modbus slave (ASCII or RTU) communication protocol.

Features

- 1/32 DIN, 1/16 DIN, 1/8 DIN, or 1/4 DIN panel size
- 2 line x 4 character 7-segment LED display for Process value (PV): Red color, and Set Point (SV): Green color
- PID control with Autotune (AT) function
- Accepts eleven types of thermocouples, two types of Pt100 RTD temperature sensors, and DC mA, mV, and Volt signals
- Selectable between°F and °C for thermocouple or RTD inputs.
- 0°C to 50 °C operating temperature range
- Up to three alarm groups, each with seventeen available alarm types.
- Four possible control output options depending on model; Relay, Voltage Pulse, Current, and Linear Voltage.
- Baud rates up to 38.4K bps.
- Thermocouple and Platinum RTD sample rates at 400 ms per scan

- Analog sample rate at 150 ms per scan
- 64 levels of Ramp / Soak control
- Two optional Event Inputs available in 1/8 DIN and 1/4 DIN sizes
- UL, CUL, and CE agency approvals

SOLO Controller Part Number Key

SL 4896 - V R E - D

Input Voltage
None: 100 to 240 VAC
D: 24 VDC

Event Input
None: No Event input
E: Event input is provided

2nd Output Group
R: Relay output
V: Voltage Pulse output

1st Output Group
R: Relay output
V: Voltage Pulse output
C: DC Current output
L: Linear Voltage output

Panel Size (W x H)
4824: 1/32 DIN W48 x H24mm
4848: 1/16 DIN W48 x H48mm
4896: 1/8 DIN W48 x H96mm
9696: 1/4 DIN W96 x H96mm

Solo Temperature Controller

Specifications	
Input Power Requirements	100 to 240 VAC 50 / 60 Hz or 24 VDC
Operation Voltage Range	AC: 85 VAC to 264 VAC or DC: 21.6 VDC to 26.4 VDC
Power Consumption	5 VA Max
Memory Protection	EEPROM 4K bit, number of writes 100,000
Control Mode	PID, ON/OFF, Ramp / Soak control or Manual
Input Accuracy	Less than ± 0.2% full scale (except thermocouple R, S, & B types) Max ± 3° (thermocouple R, S, & B types)
Vibration Resistance	10 to 55 Hz, 10 m/s2 for 10 min, each in X, Y and Z directions
Shock Resistance	Max. 300 m/s2, 3 times in each 3 axes, 6 directions
Ambient Temperature Range	32°F to 122°F (0°C to 50°C)
Storage Temperature Range	-4°F to 149°F (-20°C to 65°C)
Altitude	2000m or less
Relative Humidity	35% to 80% (non-condensing)
RS-485 Communication	Modbus slave ASCII / RTU protocol
Transmission Speed	2400, 4800, 9600, 19.2K, 38.4K bps
IP Rating	IP65: Complete protection against dust and low pressure spraying water from all directions. (inside suitable enclosure)
Agency Approvals	UL, CUL, CE (UL file number E311366)
Pollution Degree	Degree 2 - Normally, only non-conductive pollution occurs. Temporary conductivity caused by condensation is to be expected
Input Types	
• Thermocouple*	K, J, T, E, N, R, S, B, L, U, TXK (400 ms per scan)
• Platinum RTD	3-wire Pt100, JPt100 (400 ms per scan)
• Analog	0-50 mV, 0-5V, 0-10V, 0-20 mA, 4-20 mA (sinking) (150 ms per scan)**
Control Output Options	
• Relay (R)	SL4824: SPST max. resistive load 3A @ 250 VAC SL4848: SPST max. resistive load 5A @ 250 VAC SL4896, SL9696: SPDT max. resistive load 5A @ 250 VAC SL4824: SPST max. resistive load 3A @ 30 VDC SL4848: SPST max. resistive load 5A @ 30 VDC SL4896, SL9696: SPDT max. resistive load 5A @ 30 VDC
• Voltage Pulse (V)	DC 14V Max, output current 40mA Max
• Current (C)	DC 4-20 mA output (sourcing) (Load resistance: Max 600Ω)
• Linear Voltage (L)	DC 0-10V (Load resistance Min 1KΩ)

Note: Use only ungrounded thermocouples.
** Analog input impedance: 1.8MΩ

SOLO Standard Temperature Controller Selection Guide

SOLO Standard Temperature Controller Selection Guide										
Series		Part Number	Price	Dimensions	Display	Input Voltage	Control Output 1	Control Output 2	Event Inputs	Alarm Outputs	RS-485 Port
SL4824		SL4824-RR	$125.00	W - 48mm H - 24mm D - 103mm (1/32 DIN)	Two 4-digit PV: 7mm red SV: 6mm green	100 - 240 VAC	Relay - 3A, SPST	Relay - 3A, SPST	N/A	Control Output 2 can be used as Alarm 1	
		SL4824-VR	$125.00			100 - 240 VAC	Voltage Pulse				
		SL4824-CR	$125.00			100 - 240 VAC	Current				
		SL4824-LR	$125.00			100 - 240 VAC	Linear Voltage				
		SL4824-RR-D	$125.00			24 VDC	Relay - 3A, SPST				
		SL4824-VR-D	$125.00			24 VDC	Voltage Pulse				
		SL4824-CR-D	$125.00			24 VDC	Current				
SL4848		SL4848-RR	$140.00	W - 48mm H - 48mm D - 90mm (1/16 DIN)	Two 4-digit PV: 7mm red SV: 7mm green	100 - 240 VAC	Relay - 5A, SPST	Relay - 5A, SPST		Alarm 1 and Alarm 2 are 3A, SPST Relays with a shared common. Control Output 2 can be used as Alarm 3	Yes
		SL4848-VR	$140.00			100 - 240 VAC	Voltage Pulse				
		SL4848-CR	$140.00			100 - 240 VAC	Current				
		SL4848-LR	$140.00			100 - 240 VAC	Linear Voltage				
		SL4848-RR-D	$140.00			24 VDC	Relay - 5A, SPST				
		SL4848-VR-D	$140.00			24 VDC	Voltage Pulse				
		SL4848-CR-D	$140.00			24 VDC	Current				
		SL4848-VV	$140.00			100 - 240 VAC	Voltage Pulse	Voltage Pulse		Alarm 1 and Alarm 2 are 3A, SPST Relays with a shared common.	
		SL4848-CV	$140.00			100 - 240 VAC	Current				
		SL4848-LV	$140.00			100 - 240 VAC	Linear Voltage				
SL4896		SL4896-RRE	$152.00	W - 48mm H - 96mm D - 92mm (1/8 DIN)	Two 4-digit PV: 10mm red SV: 10mm green	100 - 240 VAC	Relay - 5A, SPDT	Relay - 5A, SPDT	Event 1 / Event 2	Alarm 1 and Alarm 2 are 3A, SPST Relays. Control Output 2 can be used as Alarm 3	
		SL4896-VRE	$152.00			100 - 240 VAC	Voltage Pulse				
		SL4896-CRE	$152.00			100 - 240 VAC	Current				
		SL4896-LRE	$152.00			100 - 240 VAC	Linear Voltage				
		SL4896-RRE-D	$152.00			24 VDC	Relay - 5A, SPDT				
SL9696		SL9696-RRE	$179.00	W - 96mm H - 96mm D - 95mm (1/4 DIN)	Two 4-digit PV: 20mm red SV: 13mm green	100 - 240 VAC	Relay - 5A, SPDT				
		SL9696-VRE	$179.00			100 - 240 VAC	Voltage Pulse				
		SL9696-CRE	$179.00			100 - 240 VAC	Current				
		SL9696-LRE	$179.00			100 - 240 VAC	Linear Voltage				
		SL9696-RRE-D	$179.00			24 VDC	Relay - 5A, SPDT				
		SL9696-VVE	$179.00			100 - 240 VAC	Voltage Pulse	Voltage Pulse		Alarm 1 and Alarm 2 are 3A, SPST Relays	
		SL9696-CVE	$179.00			100 - 240 VAC	Current				
		SL9696-LVE	$179.00			100 - 240 VAC	Linear Voltage				

Notes: EVENT1 input is a normally open contact input that controls the output(s) of the controller. All controller outputs are disabled when the contact is closed.

EVENT2 input is a normally open contact input that switches the control parameter group between two control parameter groups based on the state of EVENT2. If the contact is open, the primary control parameter group is used for all parameters and outputs. If the contact is closed, the secondary control parameter group is used for all parameters and outputs. Each temperature setting value has individual control parameters.

Click on the thumbnail or go to
https://www.automationdirect.com/VID-PS-0002 for a short
introductory video on the SOLO Temperature Controllers.

SOLO Standard Temperature Controller Selection Guide, continued

Available Input Types

All SOLO temperature controllers support these input types.

Thermocouple Type and Range*	
Input Temperature Sensor Type	**Temperature Range**
Thermocouple TXK type	-328 to 1472°F (-200 to 800°C)
Thermocouple U type	-328 to 932°F (-200 to 500°C)
Thermocouple L type	-328 to 1562°F (-200 to 850°C)
Thermocouple B type	212 to 3272°F (100 to 1800°C)
Thermocouple S type	32 to 3092°F (0 to 1700°C)
Thermocouple R type	32 to 3092°F (0 to 1700°C)
Thermocouple N type	-328 to 2372°F (-200 to 1300°C)
Thermocouple E type	32 to 1112°F (0 to 600°C)
Thermocouple T type	-328 to 752°F (-200 to 400°C)
Thermocouple J type	-148 to 2192°F (-100 to 1200°C)
Thermocouple K type	-328 to 2372°F (-200 to 1300°C)
Note: Use only ungrounded thermocouples.	

RTD Type and Range	
Input Temperature Sensor Type	**Temperature Range**
Platinum Resistance (Pt100)	-328 to 1112°F (-200 to 600°C)
Platinum Resistance (JPt100)	-4 to 752°F (-20 to 400°C)

Voltage Input Type and Input Range	
Voltage Input Type	**Engineering Range**
0~50mV Analog Input	-999 to 9999
0V~10V Analog Input	-999 to 9999
0V~5V Analog Input	-999 to 9999

Current Input Type and Range	
Current Input Type	**Engineering Range**
4~20mA Analog Input	-999 to 9999
0~20mA Analog Input	-999 to 9999

User Configurable Output Options	
Control Output 1	**Control Output 2**
Heating	(Alarm 1)
Cooling	(Alarm 1)
Heating	Cooling
Cooling	Heating

Mounting Clips			
Series	**Part Number**	**Pkg. Qty.**	**Price**
SL4824	SL-CLP-1	8	$12.00
SL4848			
SL4896	SL-CLP-2	20	$9.00
SL9696			

Process / Temperature Controllers

SOLO Standard Temperature Controllers - 1/32 DIN

SL4824 Series

Features

- 1/32 DIN panel size
- PID with Autotune
- Thermocouple, RTD, mA, mV and voltage inputs
- Output #1: Relay, Voltage Pulse, Current or Linear Voltage
- Output #2; Relay or Alarm Relay
- RS-485 communications port
- UL, CUL and CE approvals

Note: A set of mounting clips and a 249 Ω resistor are included.
Extra mounting clips are available (Part Number: SL-CLP-1, Qty: 20 per package)

Output Specifications

Part Number	Price	Input Voltage	Output #1	Output #2 / Alarm 1*
SL4824-RR	$125.00	110 - 240 VAC	Relay - SPST	Relay - SPST
SL4824-VR	$125.00	110 - 240 VAC	Voltage Pulse	Relay - SPST
SL4824-CR	$125.00	110 - 240 VAC	Current	Relay - SPST
SL4824-LR	$125.00	110 - 240 VAC	Linear Voltage	Relay - SPST
SL4824-RR-D	$125.00	24 VDC	Relay - SPST	Relay - SPST
SL4824-VR-D	$125.00	24 VDC	Voltage Pulse	Relay - SPST
SL4824-CR-D	$125.00	24 VDC	Current	Relay - SPST

Note: Inputs are sinking, outputs are sourcing.
*Output #2 can be configured as control output #2 or as Alarm 1 output
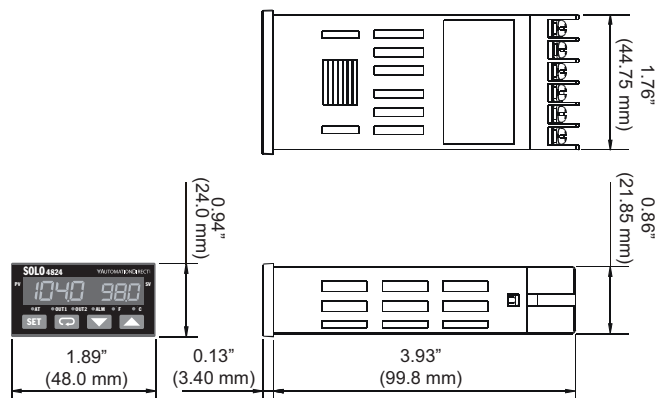
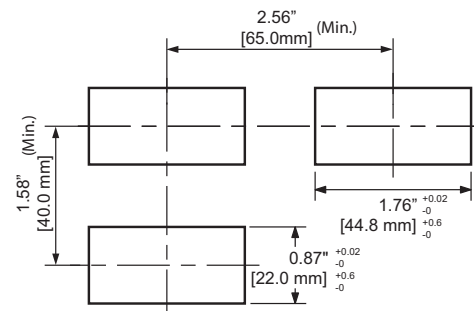*Scan or click the above QR code to be taken to the SL4824 Series Quick Start Guide*

Scan or click the above QR code to be taken to the SOLO Standard Series Manual

Dimensions

Minimum Cutout and Spacing

See our website www.AutomationDirect.com for complete Engineering drawings.

SOLO Standard Temperature Controllers - 1/16 DIN

SL4848 Series

Features

- 1/16 DIN panel size
- PID with Autotune
- Thermocouple, RTD, mA, mV and voltage inputs
- Output #1: Relay, Voltage Pulse, Current or Linear Voltage
- Output #2: Relay or Voltage Pulse for control or Alarm output
- RS-485 communications port
- UL, CUL and CE approvals

Note: A set of mounting clips and a 249 Ω resistor are included.
Extra mounting clips are available (Part Number: SL-CLP-2, Qty: 20 per package)

Output Specifications

Part Number	Price	Input Voltage	Output #1	Output #2 / Alarm #3*	Alarm #1**	Alarm #2**
SL4848-RR	$140.00	110 - 240 VAC	Relay - SPST	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-VR	$140.00	110 - 240 VAC	Voltage Pulse	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-CR	$140.00	110 - 240 VAC	Current	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-LR	$140.00	110 - 240 VAC	Linear Voltage	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-RR-D	$140.00	24 VDC	Relay - SPST	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-VR-D	$140.00	24 VDC	Voltage Pulse	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-CR-D	$140.00	24 VDC	Current	Relay - SPST	Relay - SPST	Relay - SPST
SL4848-VV	$140.00	110 - 240 VAC	Voltage Pulse	Voltage Pulse	Relay - SPST	Relay - SPST
SL4848-CV	$140.00	110 - 240 VAC	Current	Voltage Pulse	Relay - SPST	Relay - SPST
SL4848-LV	$140.00	110 - 240 VAC	Linear Voltage	Voltage Pulse	Relay - SPST	Relay - SPST

Note: Inputs are sinking, outputs are sourcing.
*Output #2 can be configured as control output #2 or as Alarm #3
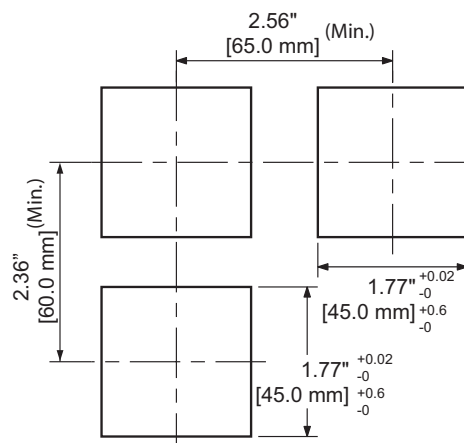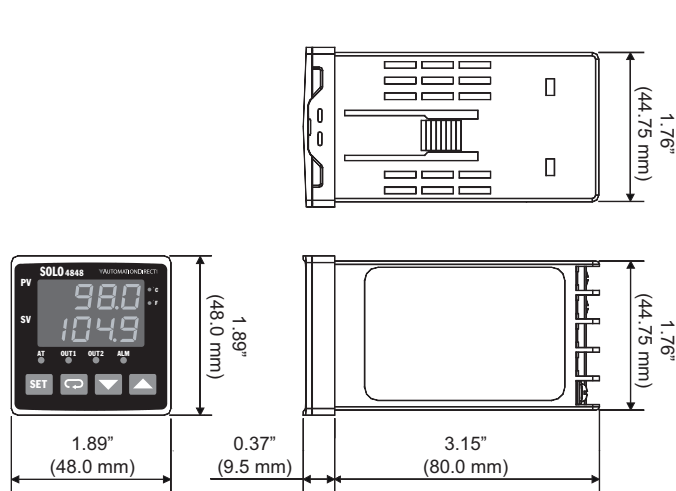*** Alarm #1 and Alarm #2 have a shared common*

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Dimensions

Minimum Cutout and Spacing

2.56" [65.0 mm] (Min.)

2.36" [60.0 mm] (Min.)

1.77" +0.02 -0 [45.0 mm] +0.6 -0

1.77" +0.02 -0 [45.0 mm] +0.6 -0

1.76" (44.75 mm)

1.89" (48.0 mm)

1.76" (44.75 mm)

1.89" (48.0 mm)

0.37" (9.5 mm)

3.15" (80.0 mm)

See our website www.AutomationDirect.com for complete Engineering drawings.

SOLO Standard Temperature Controllers - 1/8 DIN

SL4896 Series

Features

- 1/8 DIN panel size
- PID with Autotune
- Thermocouple, RTD, mA, mV and voltage inputs
- 2 event inputs
- Output #1: Relay, Voltage Pulse, Current or Linear Voltage
- Output #2: Relay or Alarm Relay
- RS-485 communications port
- UL, CUL and CE approvals

Note: A set of mounting clips and a 249 Ω resistor are included.
Extra mounting clips are available (Part Number: SL-CLP-2, Qty: 20 per package)

Output Specifications

Part Number	Price	Input Voltage	Output #1	Output #2 / Alarm #3*	Alarm #1	Alarm #2
SL4896-RRE	$152.00	110 - 240 VAC	Relay - SPDT	Relay - SPDT	Relay - SPST	Relay - SPST
SL4896-VRE	$152.00	110 - 240 VAC	Voltage Pulse	Relay - SPDT	Relay - SPST	Relay - SPST
SL4896-CRE	$152.00	110 - 240 VAC	Current	Relay - SPDT	Relay - SPST	Relay - SPST
SL4896-LRE	$152.00	110 - 240 VAC	Linear Voltage	Relay - SPDT	Relay - SPST	Relay - SPST
SL4896-RRE-D	$152.00	24 VDC	Relay - SPDT	Relay - SPDT	Relay - SPST	Relay - SPST

Note: Inputs are sinking, outputs are sourcing.
*Output #2 can be configured as control output #2 or as Alarm #3

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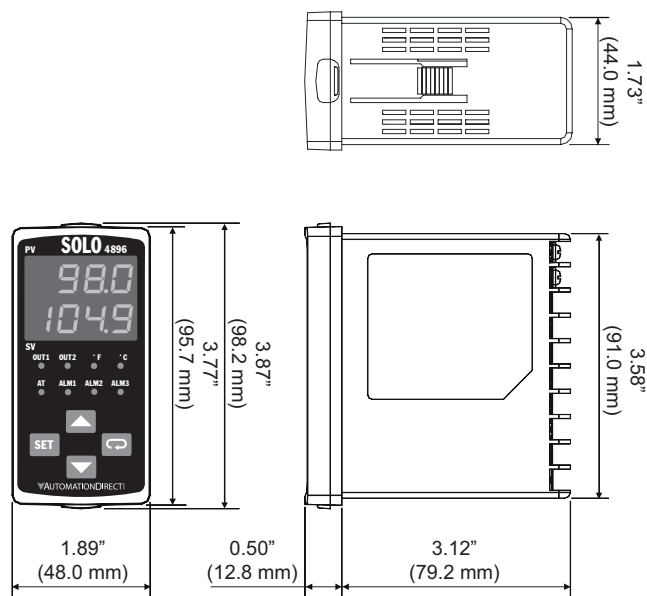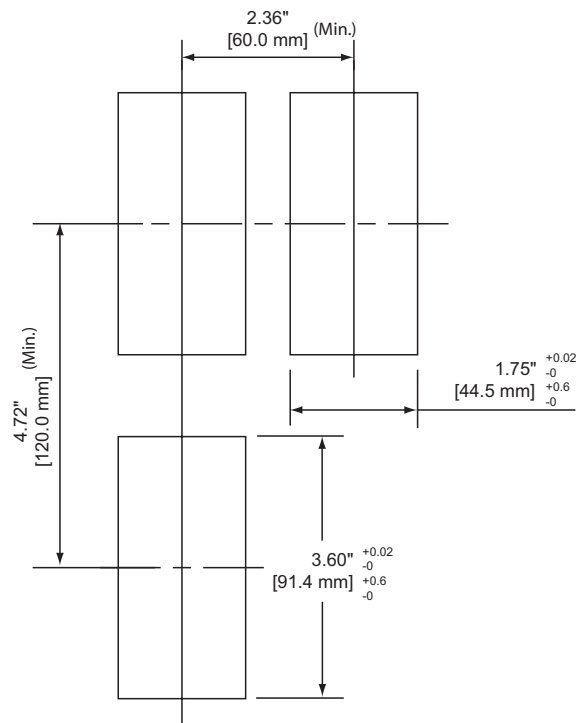*Scan or click the above QR code to be taken to the SOLO Standard Series Manual*

Dimensions

Minimum Cutout and Spacing

2.36" [60.0 mm] (Min.)

4.72" [120.0 mm] (Min.)

1.75" [44.5 mm] +0.02 -0 / +0.6 -0

3.60" [91.4 mm] +0.02 -0 / +0.6 -0

1.73" (44.0 mm)

3.87" (98.2 mm)
3.77" (95.7 mm)

3.58" (91.0 mm)

1.89" (48.0 mm)

0.50" (12.8 mm)

3.12" (79.2 mm)

See our website www.AutomationDirect.com for complete Engineering drawings.

SOLO Standard Temperature Controllers - 1/4 DIN
SL9696 Series

Features

- 1/4 DIN panel size
- PID with Autotune
- Thermocouple, RTD, mA, mV and voltage inputs.
- 2 event inputs
- Output #1: Relay, Voltage Pulse, Current or Linear Voltage
- Output #2: Relay or Voltage Pulse for control or Alarm output
- RS-485 communications port
- UL, CUL and CE approvals

Note: A set of mounting clips and a 249 Ω resistor are included.
Extra mounting clips are available (Part Number: SL-CLP-2, Qty: 20 per package)

Output Specifications

Part Number	Price	Input Voltage	Output #1	Output #2 / Alarm #3*	Alarm #1	Alarm #2
SL9696-RRE	$179.00	100 - 240 VAC	Relay - SPDT	Relay - SPDT	Relay - SPST	Relay - SPST
SL9696-VRE	$179.00	100 - 240 VAC	Voltage Pulse	Relay - SPDT	Relay - SPST	Relay - SPST
SL9696-CRE	$179.00	100 - 240 VAC	Current	Relay - SPDT	Relay - SPST	Relay - SPST
SL9696-LRE	$179.00	100 - 240 VAC	Linear Voltage	Relay - SPDT	Relay - SPST	Relay - SPST
SL9696-RRE-D	$179.00	24 VDC	Relay - SPDT	Relay - SPDT	Relay - SPST	Relay - SPST
SL9696-VVE	$179.00	100 - 240 VAC	Voltage Pulse	Voltage Pulse	Relay - SPST	Relay - SPST
SL9696-CVE	$179.00	100 - 240 VAC	Current	Voltage Pulse	Relay - SPST	Relay - SPST
SL9696-LVE	$179.00	100 - 240 VAC	Linear Voltage	Voltage Pulse	Relay - SPST	Relay - SPST

Note: Inputs are sinking, outputs are sourcing.
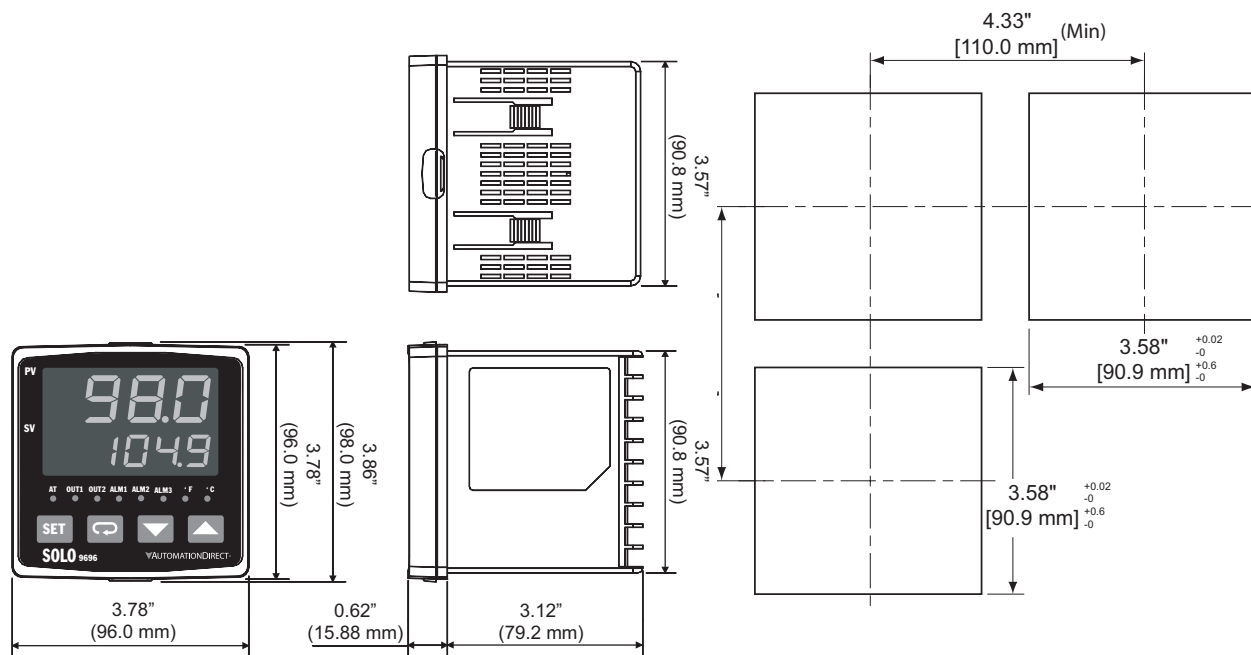**Output #2 can be configured as control output #2 or as Alarm #3*

Scan or click the above QR code to be taken to the SL9696 Series Quick Start Guide

Scan or click the above QR code to be taken to the SOLO Standard Series Manual

Dimensions

Minimum Cutout and Spacing

4.33" (Min) [110.0 mm]

3.57" (90.8 mm)

3.58" [90.9 mm] +0.02 -0 / +0.6 -0

3.58" [90.9 mm] +0.02 -0 / +0.6 -0

3.57" (90.8 mm)

3.86" (98.0 mm)

3.78" (96.0 mm)

3.78" (96.0 mm)

0.62" (15.88 mm)

3.12" (79.2 mm)

See our website www.AutomationDirect.com for complete Engineering drawings.

SOLO - SLM Series Modular Temperature Controllers

SLM1-C Model Shown

SLM2-V Model Shown

SLM Series Overview

AutomationDirect's SOLO Modular single loop temperature controllers provide the means to assemble a compact, modular multi-loop temperature control system. Starting with a SOLO single loop temperature controller main module, up to seven additional SOLO single loop temperature controller extension modules can be easily connected to the main controller using the built-in extension ports for shared power and network communications.

All SOLO Modular temperature controller modules accept an input from numerous types of thermocouples or RTDs, as well as linear analog current, voltage or mV signals from temperature transmitters and provides two separate outputs. Depending on the controller model, available output types for Output 1 include either relay, voltage pulse, linear voltage, or linear current. Output 2 is a relay output. Configuring both outputs for control allows for both heating and cooling control or two stage heating control or two stage cooling control. Optionally one output can be configured for control of either a heating or cooling application and the other output an alarm or both outputs can be set to alarm independently. If the controller is equipped with either the linear voltage or linear current output, Output 1 can be configured for process variable retransmission. These versatile controllers can be configured to operate with PID with Auto Tuning, On/Off, Ramp/Soak, or Manual control modes, and twelve different alarm modes are available. SOLO Modular controllers mount on 35mm DIN rail, have removable terminal blocks, and are 24 VDC powered.

Configuration of SOLO Modular controllers is accomplished using free SL-SOFT SOLO configuration and monitoring software downloadable from AutomationDirect.com, or RS-485 digital communication using the Modbus protocol.

Features

- Easy to assemble DIN rail mounted compact modular multi-loop temperature control system
- Add up to seven SOLO extension controllers to each SOLO main controller for a total of eight temperature control loops
- Heating and/or Cooling applications with PID with Auto Tuning, On/Off, Ramp/Soak, or Manual control modes
- Thermocouple, RTD, mA, mV, or voltage inputs
- Output 1: Relay, Voltage Pulse, Linear Voltage, or Linear Current, depending on model (Control, Alarm, or Process Variable Retransmission for linear current or linear voltage modules)
- Output 2: Relay (Control or Alarm)
- RS-485 Modbus communication
- Configuration using free SL-SOFT configuration and monitoring software downloadable from AutomationDirect.com

SOLO - SLM Series Modular Temperature Controllers

Model	Module Type	Inputs	Output 1	Output 2	Operating Voltage	Communication	Weight (lbs)	Price
SLM1-C	Main	Current, voltage, thermocouple or RTD	4-20mA	3A SPST relay	24VDC	RS-485	0.27	$87.00
SLM1-L			0-10VDC				0.27	$87.00
SLM1-R			3A SPST relay				0.27	$87.00
SLM1-V			12 VDC pulse				0.27	$87.00
SLM2-C	Extension		4-20mA				0.27	$87.00
SLM2-L			0-10VDC				0.27	$87.00
SLM2-R			3A SPST relay				0.27	$87.00
SLM2-V			12 VDC pulse				0.27	$87.00

Insert

Scan or click the above QR code to be taken to the SLM Series Installation Instructions and User Guide

Manual

Scan or click the above QR code to be taken to the SLM Series User Manual

SOLO - SLM Series Modular Temperature Controllers

Specifications	
Operating Voltage	21.6 to 26.4 VDC
Power Consumption	Rated 24 VDC, Max. 24 W combined, 3W + 3W x number of SLM2 controllers (Max. 7)
Input Sensors	Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK Platinum RTD: Pt100, JPt100 Linear DC input: 0 ~ 5V, 0 ~ 10V, 0 ~ 20mA, 4 ~ 20mA, 0 ~ 50mV
Input Accuracy	Thermocouples: ±0.3% full scale RTD: ±0.2% full scale Analog input: ±0.3% full scale ± 1 digit
Sampling Rate	Analog input: 0.15 sec. Thermocouple or platinum RTD: 0.4 sec.
Control Method	PID, ON/OFF, Ramp / Soak control or Manual
Output Types	Relay: SPST, Max. load 250VAC, 3A resistive load Voltage pulse: 12VDC, Max. output current: 40mA Current: DC 4 ~ 20mA (Load resistance: < 500Ω) Analog voltage: 0 ~ 10V (Load resistance: > 1,000Ω)
Output Function	Control output, alarm output, retransmission output Retransmission output is available only when output 1 is linear voltage or current output.
Alarm	12 alarm modes
Communication	RS-485 communication, 2,400 bps ~ 38,400 bps
Communication Protocol	Modbus protocol, ASCII/RTU format
Vibration Resistance	10 ~ 55Hz, 10m/s^2 for 10mins, each in X, Y and Z direction
Shock Resistance	Max. 300m/s^2, 3 times in each 3 axes, 6 directions
Ambient Temperature	0 to 50°C (32 to 122°F)
Storage Temperature	-20 to +65°C (-4 to 149°F)
Altitude	2,000m or less
Ambient Humidity	35% ~ 85% RH (non-condensing)
Pollution Degree	2

Available Input Types

SOLO Modular temperature controllers support these input types.

Thermocouple Type and Range*	
Input Temperature Sensor Type	**Temperature Range**
Thermocouple TXK type	-328 to 1472°F (-200 to 800°C)
Thermocouple U type	-328 to 932°F (-200 to 500°C)
Thermocouple L type	-328 to 1562°F (-200 to 850°C)
Thermocouple B type	212 to 3272°F (100 to 1800°C)
Thermocouple S type	32 to 3092°F (0 to 1700°C)
Thermocouple R type	32 to 3092°F (0 to 1700°C)
Thermocouple N type	-328 to 2372°F (-200 to 1300°C)
Thermocouple E type	32 to 1112°F (0 to 600°C)
Thermocouple T type	-328 to 752°F (-200 to 400°C)
Thermocouple J type	-148 to 2192°F (-100 to 1200°C)
Thermocouple K type	-328 to 2372°F (-200 to 1300°C)
Note: Use only ungrounded thermocouples.	

| RTD Type and Range	
Input Temperature Sensor Type	**Temperature Range**
Platinum Resistance (Pt100)	-328 to 1112°F (-200 to 600°C)
Platinum Resistance (JPt100)	-4 to 752°F (-20 to 400°C)
Note: Default setting: Pt100 input.	

Voltage Input Type and Input Range	
Voltage Input Type	**Engineering Range**
0~50mV Analog Input	-999 to 9999
0V~10V Analog Input	-999 to 9999
0V~5V Analog Input	-999 to 9999

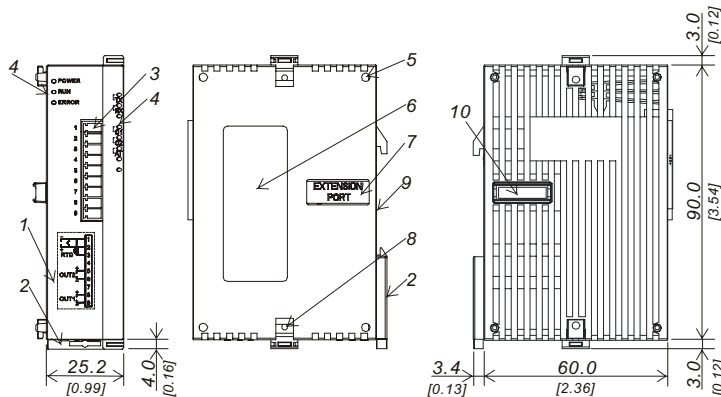| Current Input Type and Range*	
Current Input Type	**Engineering Range**
4~20mA Analog Input	-999 to 9999
0~20mA Analog Input	-999 to 9999
* Install the supplied 249 ohm resistor between terminal #1 and #2 for linear current inputs.	

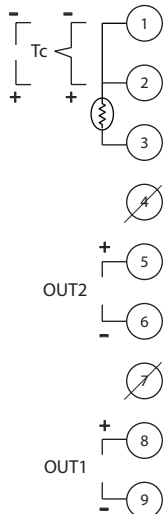# SOLO - SLM Series Modular Temperature Controllers
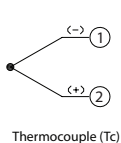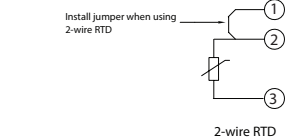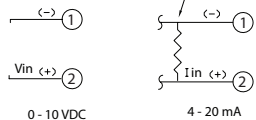
Dimensions

mm [inches]
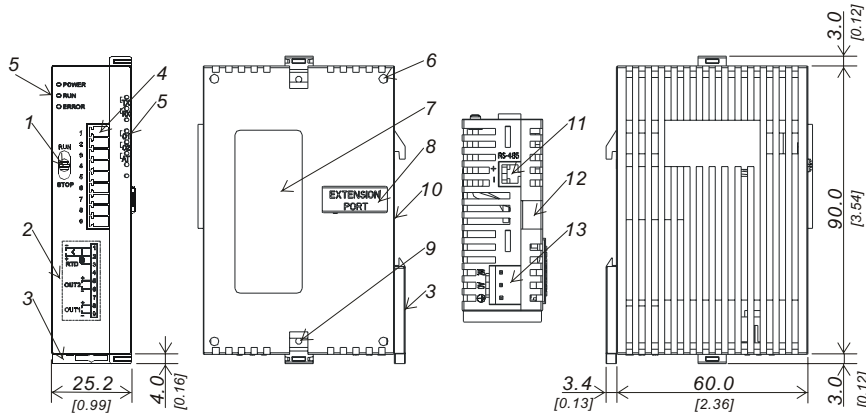
SLM1

SLM2

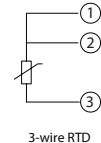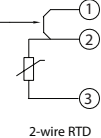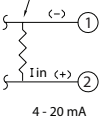| Feature	SLM1	SLM2
1	RUN/STOP switch	Wiring and Model name
2	Wiring and Model name	DIN rail clip
3	DIN rail clip	I/O terminals
4	I/O terminals	LED indicators
5	LED indicators	Mounting hole
6	Mounting hole	Specification label
7	Specification label	Extension port
8	Extension port	Extension clip
9	Extension clip	DIN rail
10	DIN rail	Extension port
11	RS-485 communication port	N/A
12	Extension clip	N/A
13	DC power input	N/A

Wiring

Input and Outputs (SLM1 & SLM2 Front Terminals)

Sensor Input

For 4-20 mA sensor input install supplied 249Ω resistor.

0 - 10 VDC

4 - 20 mA

Install jumper when using 2-wire RTD

2-wire RTD

Thermocouple (Tc)

3-wire RTD

Power Input (SLM1 Bottom Terminals)

DC 21.6 to 26.4
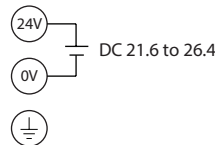
RS-485 (SLM1 Bottom Terminals)

prosense® PPC5 Advanced Process Controller

PPC5 Series

Overview:

Made exclusively for AutomationDirect by Yokogawa, the ProSense PPC5 series of Advanced Process Controllers is loaded with the features, functionality, and powerful performance to handle temperature, pressure, level, flow, and other process variable control applications. These controllers accept inputs directly from thermocouples or RTD's and analog signals from most any type of process variable sensor/transmitter. Models are available with an additional analog input for remote setpoint and up to 4 contact inputs that can be selected to perform up to 17 different functions. The control output is user selected to be a relay, voltage pulse, or linear current output. Also included is an analog retransmission output that is selectable to represent the PV, SP, target SP, remote SP, or output signal. When not used for retransmission, this output can be used as a loop power supply to power sensor/transmitters. Three alarm contact outputs can be configured for 30 alarm types and 10 alarm functions. The PPC5 series can be ordered without any communications, with RS-485 Modbus ASCII/RTU communications, or with Ethernet+RS-485 gateway Modbus TCP/IP communications. The controllers can be configured using the keypad and large 5-digit multicolor display or using free downloadable software.

Features:

- **Process variable input:** thermocouple (14 types), RTD (2 types), analog mA, mV, V (8 ranges)
- **Remote setpoint analog input:** V (5 ranges) PPC5-11xx models only
- **Control period:** 50ms, 100ms, or 200ms selectable
- **Contact inputs:** 3 (PPC5-10xx), 4 (PPC5-11xx), 17 selectable functions
- **Control output:** selectable relay, voltage pulse, or linear current
- **Retransmission output:** mA selectable for PV, SP, target SP, remote SP, or output
- **Transmitter loop power supply:** 15V available when not using retransmission output
- **Alarm outputs:** 3 alarm contacts, selectable 30 alarm types and 10 alarm functions
- **Communications:** Models without communications, RS-485, Modbus slave ASCII / RTU, Coordinated communication, or Ethernet+RS-485 gateway, Modbus TCP/IP
- **Configuration:** Keypad or free downloadable software
- **User Function Keys:** 3 on the keypad, 22 selectable functions
- **Display:** Large 5-digit LCD, PV line-white/red (color changing), Data line-orange, 2 selectable bar graphs orange and white
- **Agency Compliance & Certifications:** UL Recognized, CSA, CE
- **Warranty:** 3 years

Control Modes

All Models
- Single-loop control
- Loop control with PV-hold function

Models with Auxiliary Analog Input
- Cascade primary-loop control
- Cascade secondary-loop control
- Cascade control (single controller)
- Loop control for backup
- Loop control with PV switching
- Loop control with PV auto-selector

Control Types
- PID Control (8 parameter groups)
- ON/OFF Control (1 point of hysteresis)
- ON/OFF Control (2 points of hysteresis)
- Sample PI control
- Batch PID control
- Manual control

Alarm Types
- PV (measured value) high/low limit alarm
- Deviation high/low limit alarm
- Deviation high and low limits alarm
- Deviation within high and low limits alarm
- Analog input PV high/low limit alarm
- Analog input REMOTE SP high/low limit alarm
- PV rate-of-change alarm
- SP (setpoint) high/low limit alarm
- Target SP high/low limit alarm
- Target SP deviation high/low limit alarm
- Target SP deviation high and low limits alarm
- Target SP deviation within high and low limits alarm
- Control output high/low limit alarm
- Self-diagnosis alarm
- FAIL

Alarm Functions
- Hysteresis
- Stand-by
- Latch (4 types)
- Release of Alarm Latch
- Delay Timer
- Energized/De-energized
- PV Velocity

prosense® PPC5 Advanced Process Controller

Contact Input Functions

- AUTO/MANUAL switching
- REMOTE/LOCAL switching
- STOP/START switching
- Switching to CASCADE
- Switching to AUTO
- Switching to MANUAL
- Switching to REMOTE
- Switching to LOCAL
- AUTO-TUNING START/STOP switching
- OUTPUT TRACKING switching
- Two-input switching
- PV Hold
- LCD backlight ON/OFF switching
- Message interrupt displays 1 through 4
- SP number specification
- PID number specification
- Manual preset output number specification

User Function Key Functions

- Off
- AUTO/MANUAL switch
- CASCADE/AUTO/MAN switch
- REMOTE/LOCAL switch
- Loop-2 REMOTE/LOCAL switch
- STOP/RUN switch
- Switch to CASCADE
- Switch to AUTO
- Switch to MANUAL
- Switch to REMOTE
- Switch to LOCAL
- Switch to Loop-2 REMOTE
- Switch to Loop-2 LOCAL
- Switch to STOP
- Switch to RUN
- Auto-tuning switch
- LCD brightness UP
- LCD brightness DOWN
- Adjust LCD brightness
- LCD Backlight ON/OFF switch
- Latch release
- PID Tuning switch

Other Available Functions

- Selectable action on PV burnout detection
- Internal or external thermocouple reference junction compensation
- Analog input square root extraction
- Input and output 10 segment linearization
- Auto-selector between larger, smaller, average, or difference of two PV inputs
- Switch between PV inputs based on low/high limit or percentage values or contact input
- Switch between PID groups based on setpoint, target setpoint, PV, deviation, or contact input
- Overshoot suppression "Super" function

- Hunting suppression "Super2" function
- Integral action suppression (anti-reset wind-up)
- Output velocity limiter
- Output tight shut function
- Non-linear PID control
- Auto-tuning speed adjustment
- Selectable SP ramp rate
- SP tracking of PV or remote SP functions
- Selectable restart mode and timer
- Split Computation Output

PPC5 Advanced Process Controller Selection						
Model	Description	Retransmission Output	Auxiliary Analog Input	Communications	Weight (lbs)	Price
PPC5-1000	ProSense advanced process controller, 1/4 DIN, 2-line alpha-numeric LCD, bar graph LCD, current, voltage, RTD, thermocouple, discrete input, current, voltage pulse, relay output, 100-240 VAC operating voltage.	Yes	No	No	1.15	$426.00
PPC5-1001				RS-485	1.19	$504.00
PPC5-1002				Ethernet	1.21	$543.00
PPC5-1100			Yes	No	1.19	$497.00
PPC5-1101				RS-485	1.23	$576.00
PPC5-1102				Ethernet	1.25	$616.00

Process / Temperature Controllers

prosense® PPC5 Advanced Process Controller

PPC5 Technical Specifications	
Input Power Requirements	100-240 VAC (+10%/-15%), 50/60 Hz
Power Consumption	18 VA
Isolation	Between primary terminals and secondary terminals: 2300VAC for 1 minute (UL, CSA) Between primary terminals and secondary terminals: 3000VAC for 1 minute (CE) Between primary terminals: 1500VAC for 1 minute (Power and relay output terminals) Between secondary terminals: 500VAC for 1 minute (Analog I/O signal terminals, contact input terminals, communication terminals and functional grounding terminals)
Insulation	Between power supply terminals and grounding terminal 20MΩ or more at 500VDC
Control Types	PID (Reverse and Direct acting), ON/OFF (1 or 2 point hysterisis), Sample PI control, and Batch PID
Continuous Vibration	At 5 to 9 Hz: Half amplitude of 1.5 mm or less, 1oct/min for 90 minutes each in the three axis directions At 9 to 150 Hz: 4.9 m/s² or less, 1oct/min for 90 minutes each in the three axis directions
Shock	98 m/s² or less, 11 ms
Shock-period Vibration	14.7 m/s², 15 seconds or less
Magnetic Field	400 A/m or less
Ambient Temperature Range	-10 to 50°C (side-by-side mounting: -10 to 40 °C)
Ambient Humidity	20 to 90% RH (no condensation allowed)
Storage Temperature	-25 to 70ºC
Storage Temperature Change	20ºC/h or less
Storage Humidity	5 to 95% RH (no condensation allowed)
Altitude	2000m or less above sea level
Startup Time	10 seconds or less
Warm-up Time	30 minutes or more after power on
Ambient Temperature Effect	Voltage or TC input: ±1 µV/ºC or ±0.01% of F.S./ºC, whichever is larger Current input: ±0.01% of F.S./ºC RTD input: ±0.05ºC/ºC (ambient temperature) or less Analog output: ±0.02% of F.S./ºC or less
Power Supply Voltage Effect	Analog input: ±0.05% of F.S. or less (Within rated voltage range) Analog output: ±0.05% of F.S. or less (Within rated voltage range)
Configuration Cable and IR Adapter (PPC5-CBL1)	USB to maintenance port cable (PPC5 powered through cable) or IR front panel adapter (Powered PPC5) for installed unit (Compatabile with all models including PPC5-1x00 without communication) Rated USB input voltage: 4.75 to 5.25 VDC at 100mA DC (including the cable) Dust- and drip-proof: IP3x
RS-485 Communication (PPC5-1x01 Models)	RS-485 (PPC-1x01 models) Modbus (ASCII/RTU) and coordinated control 4-wire type half-duplex or 2-wire type half-duplex, asynchronous operation, non-procedural Max nodes: 31 Max communication distance: 1200m Baud rate: 600, 1200, 2400, 4800, 9600, 19200, 38400 bps
Ethernet Communication (PPC5-1x02 Models)	Ethernet (PPC-1x02 models) Modbus/TCP w/ RS-485 serial gateway RJ45 (10BASE-T/100BASE-TX) Maximum connections: 2 Max communication distance: 100m Default port #: 502 (Selectable range 1024 to 65535) Serial gateway: RS-485 2-wire half-duplex, Modbus/RTU (9600, 19200, or 38400 bps)
IP Rating	IP66 (Front panel when installed)
Agency Compliance & Certifications	UL Recognized (file # E311366), CSA (file # 600893), CE
Installation Category	II
Measurement Category	I (CAT I) (UL, CSA), O (Other) (CE)
Pollution Degree	Degree 2

prosense® PPC5 Advanced Process Controller

PPC5 Technical Specifications			
Input			
PV (Universal Input)			
Number of Inputs	1		

Input Type		Instrument Range		Accuracy
		ºC	**ºF**	
Thermocouple	K	-270.0 to 1370.0ºC	-450.0 to 2500.0ºF	±0.1% of instrument range ±1 digit for 0°C or more ±0.2% of instrument range ±1 digit for less than 0°C ±2% of instrument range ±1 digit for less than -200.0°C of thermocouple K ±1% of instrument range ±1 digit for less than -200.0°C of thermocouple T
		-270.0 to 1000.0ºC	-450.0 to 2300.0ºF	
		-200.0 to 500.0ºC	-200.0 to 1000.0ºF	
	J	-200.0 to 1200.0ºC	-300.0 to 2300.0ºF	
	T	-270.0 to 400.0ºC	-450.0 to 750.0ºF	
		0.0 to 400.0ºC	-200.0 to 750.0ºF	
	B	0.0 to 1800.0ºC	32 to 3300ºF	±0.15% of instrument range ±1 digit for 400°C or more ±5% of instrument range ±1 digit for less than 400°C
	S	0.0 to 1700.0ºC	32 to 3100ºF	±0.15% of instrument range ±1 digit
	R	0.0 to 1700.0ºC	32 to 3100ºF	
	N	-200.0 to 1300.0ºC	-300.0 to 2400.0ºF	±0.1% of instrument range ±1 digit ±0.25% of instrument range ±1 digit for less than 0°C
	E	-270.0 to 1000.0ºC	-450.0 to 1800.0ºF	±0.1% of instrument range ±1 digit for 0°C or more ±0.2% of instrument range ±1 digit for less than 0°C ±1.5% of instrument range ±1 digit for less than -200.0°C of thermocouple E.
	L	-200.0 to 900.0ºC	-300.0 to 1600.0ºF	
	U	-200.0 to 400.0ºC	-300.0 to 750.0ºF	
		0.0 to 400.0ºC	-200.0 to 1000.0ºF	
	W	0.0 to 2300.0ºC	32 to 4200ºF	±0.2% of instrument range ±1 digit (Note 2)
	Platinel 2	0.0 to 1390.0ºC	32.0 to 2500.0ºF	±0.1% of instrument range ±1 digit
	PR20-40	0.0 to 1900.0ºC	32 to 3400ºF	±0.5% of instrument range ±1 digit for 800°C or more Accuracy is not guaranteed for less than 800°C
	W97Re3-W75Re25	0.0 to 2000.0ºC	32 to 3600ºF	±0.2% of instrument range ±1 digit
RTD	JPt100	-200.0 to 500.0ºC	-300.0 to 1000.0ºF	±0.1% of instrument range ±1 digit (Note 1)
		-150.00 to 150.00ºC	-200.0 to 300.0ºF	±0.1% of instrument range ±1 digit
	Pt100	-200.0 to 850.0ºC	-300.0 to 1560.0ºF	±0.1% of instrument range ±1 digit (Note 1)
		-200.0 to 500.0ºC	-300.0 to 1000.0ºF	
		-150.00 to 150.00ºC	-200.0 to 300.0ºF	±0.1% of instrument range ±1 digit
Standard Signal		0.400 to 2.000 V		±0.1% of instrument range ±1 digit
		1.000 to 5.000 V		
		4.00 to 20.00 mA		
DC Voltage/Current		0.000 to 2.000 V		
		0.00 to 10.00 V		
		0.00 to 20.00 mA		
		-10.00 to 20.00 mV		
		0.0 to 100.0 mV		

The accuracy is that in the standard operating conditions: 23±2°C, 55±10%RH, and power frequency at 50/60 Hz.
Note 1: ±0.3°C ±1 digit in the range between 0 and 100°C, ±0.5°C ±1 digit in the range between -100 and 200°C.
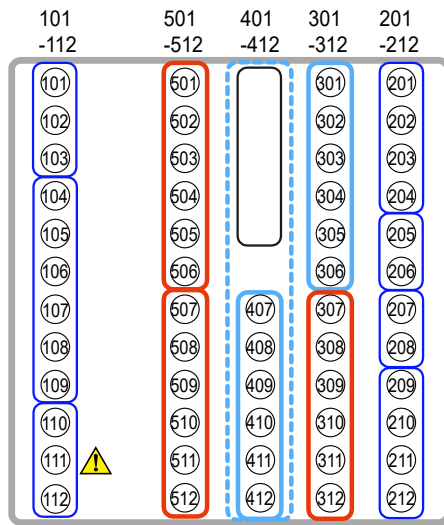*Note 2: W: W-5% Re/W-26% Re(Hoskins Mfg.Co.). ASTM E988*
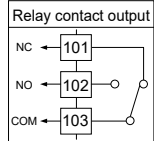
prosense® PPC5 Advanced Process Controller

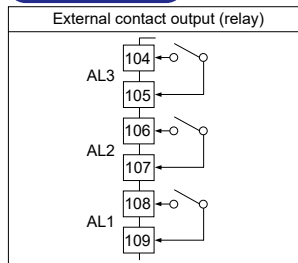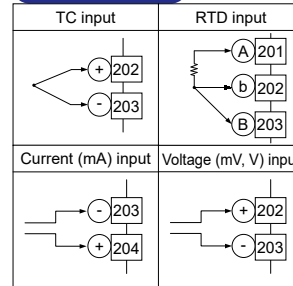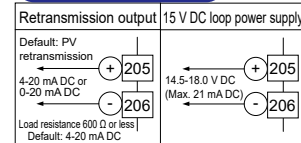| PPC5 Technical Specifications		
Remote Auxiliary Analog Input (RSP) (PPC5-11xx models)		
Number of Inputs	1	
Input Type	**Instrument Range**	**Accuracy**
Standard Signal	0.400 to 2.000 V	±0.2% of instrument range ±1 digit
	1.000 to 5.000 V	±0.1% of instrument range ±1 digit
DC Voltage	0.000 to 2.000 V	±0.2% of instrument range ±1 digit
	0.00 to 10.00 V	±0.1% of instrument range ±1 digit
DC Voltage for High-Input Impedance	0.000 to 1.250 V	±0.1% of instrument range ±1 digit
Digital Inputs		
Number of Inputs	3 (PPC5-10xx) or 4 (PPC5-11xx)	
Type	Dry contact or NPN transistor input	
Contact Rating	12VDC, 10mA or more (Use a contact with a minimum on-current of 1mA or less)	
ON/OFF Detection	Dry contact input: Contact resistance of 1kΩ or less is determined as "ON" and contact resistance of 50kΩ or more as "OFF. NPN Transistor input: Input voltage of 2V or less is determined as "ON" and leakage current must not exceed 100µA when "OFF".	
Minimum Detection Hold Time	Control period +50 ms	
Output		
Analog Control Output		
Number of Outputs	1 (Current or Pulsed Voltage)	
Current Output	4 to 20 mA DC or 0 to 20 mA DC/load resistance of 600Ω or less	
Current Accuracy	±0.1% of span (±5% of span for 1mA or less) in the standard operating conditions: 23±2°C, 55±10%RH and power frequency at 50/60 Hz	
Voltage Pulse Output	Time proportional output (On-voltage: 12V or more/load resistance of 600Ω or more / Off-voltage: 0.1 V DC or less)	
Voltage Pulse Resolution	10ms or 0.1% of output, whichever is larger	
Relay Control Output		
Number of Outputs	1	
Contact Type	SPDT (Form C)	
Contact Rating	250VAC, 3A max., 10mA min. or 30VDC, 3A max., 10mA min. (resistance load)	
Relay Alarm Ouput		
Number of Outputs	3	
Contact Type	SPST N.O. (Form A), (Independent commons)	
Contact Rating	240VAC, 1A max., 1mA min. or 30VDC, 1A max., 1mA min. (resistance load)	
Retransmission Output		
Number of Outputs	1 (Or output can be substituted for 15VDC Loop Power Supply)	
Current Output	4 to 20 mA DC or 0 to 20 mA DC/ load resistance of 600Ω or less	
Current Accuracy	±0.1% of span (±5% of span for 1 mA or less) in the standard operating conditions: 23±2°C, 55±10%RH and power frequency at 50/60 Hz (Output accuracy only not combined input to output)	
Loop Power Supply	14.5 to 18.0 VDC	
Supply Current	Approximately 21mA maximum (Short-circuit current limiting circuit)	

prosense® PPC5 Advanced Process Controller

Wiring

```
101     501     401     301     201
-112    -512    -412    -312    -212

101     501     401     301     201
102     502             302     202
103     503             303     203
104     504             304     204
105     505             305     205
106     506             306     206
107     507     407     307     207
108     508     408     308     208
109     509     409     309     209
110     510     410     310     210
111     511     411     311     211
112     512     412     312     212
```

Ethernet communication (with gateway function)   ETHR

10BASE-T/100BASE-TX
RJ45 connector

Upper side LED (baud rate)	
Color	Amber
Lit	100M bps
Unlit	10M bps

Lower side LED (link activity)	
Color	Green
Lit	Linked
Blink	Active
Unlit	Link failure

RS-485

RSB(+) 407
RSA(-) 408
SG 409
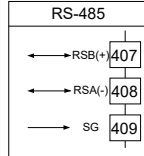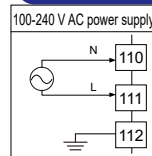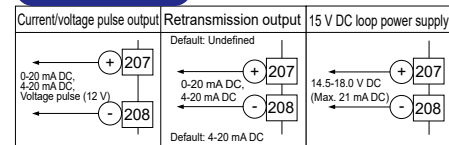
Aux. analog input / Contact input   RSP

External contact input

No-voltage contact
303 COM
304 DI16

Transistor contact
303 COM
304 DI16 +5V

Remote input

Specify within a range of 1-5 V DC, 0-2 V DC, 0-10 V DC.
+ 305
- 306

Control output   OUT

Relay contact output

NC 101
NO 102
COM 103

Contact output   ALM

External contact output (relay)

AL3 104 / 105
AL2 106 / 107
AL1 108 / 109

Power supply

100-240 V AC power supply

N 110
L 111
112

RS-485 communication

RS-485   RS485

SDB(+) 407
SDA(-) 408
SG 409
RDB(+) 410
RDA(-) 411

PV input   PV

TC input	RTD input
+ 202 / - 203	A 201 / b 202 / B 203

Current (mA) input	Voltage (mV, V) input
- 203 / + 204	+ 202 / - 203

Retransmission output   RET

Retransmission output	15 V DC loop power supply
Default: PV retransmission	
4-20 mA DC or 0-20 mA DC	14.5-18.0 V DC (Max. 21 mA DC)
+ 205 / - 206	+ 205 / - 206
Load resistance 600 Ω or less Default: 4-20 mA DC	

Control output   OUT

Current/voltage pulse output	Retransmission output	15 V DC loop power supply
	Default: Undefined	
0-20 mA DC, 4-20 mA DC, Voltage pulse (12 V)	0-20 mA DC, 4-20 mA DC	14.5-18.0 V DC (Max. 21 mA DC)
+ 207 / - 208	+ 207 / - 208	+ 207 / - 208
	Default: 4-20 mA DC	

Contact input   DI

External contact input

No-voltage contact
209 DI3
210 DI2
211 DI1
212 COM

Transistor contact
209 DI3 +5V
210 DI2 +5V
211 DI1 +5V
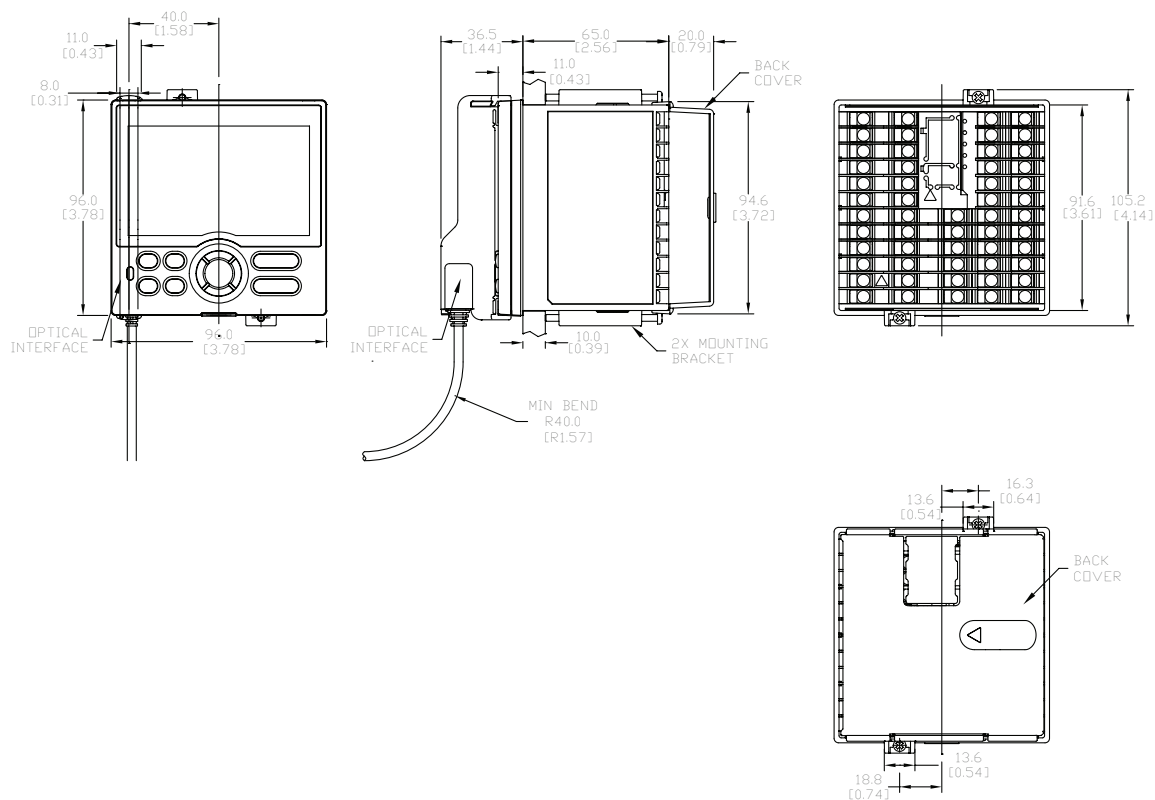212 COM

pros**ense**®
• PPC5 Advanced Process Controller

Dimensions

mm [inches]

See our website www.AutomationDirect.com for complete Engineering drawings.

Insert

Scan or click the above QR code to be taken to the PPC5 Series Installation Instructions and User Guide

Manual

Scan or click the above QR code to be taken to the PPC5 Series User Manual

prosense® PPC5 Advanced Process Controller Accessories

The ProSense PPC5-CBL1 is required to configure a PPC5-1x00 advanced process controller without RS-485 or Ethernet communications via a computer running the Parameter Setting Software (free download from www.automationdirect.com).
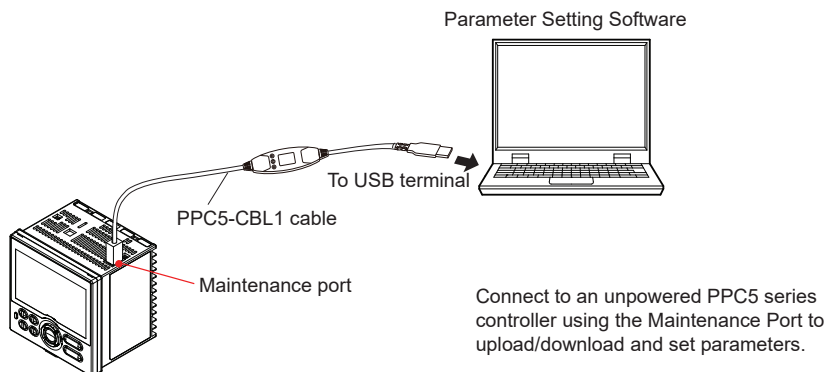
PPC5 series controller models with RS-485 (PPC5-1x01) or Ethernet (PPC5-1x02) communications can be configured using the PPC5-CBL1 or via the controller's communication RS-485 terminals or Ethernet port.

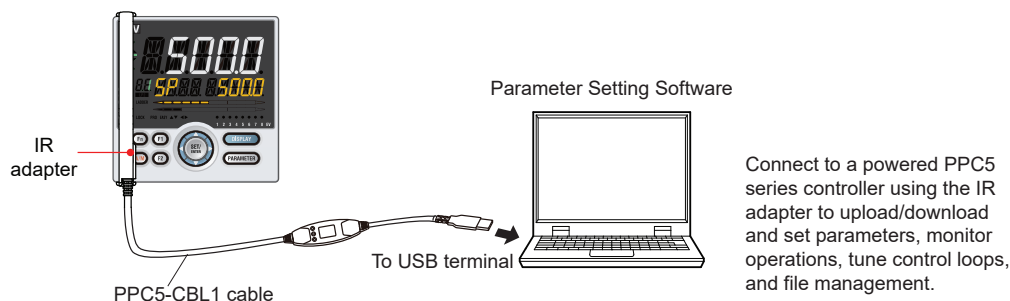All PPC5 series controllers can be configured using the controller's keypad and display.

PPC5 Advanced Process Controller Accessories

Model	Description	Weight (lbs)	Price
PPC5-CBL1	ProSense configuration cable, USB to micro-USB and IR adapter. For use with all PPC5 Series advanced process controllers.	0.60	$231.00
USB-485M	USB to RS-485 adapter. For use with PPC5-1x01 advanced process controllers.	0.40	$69.00

Parameter Setting Software available for free download from www.automationdirect.com

Parameter Setting Software

To USB terminal

PPC5-CBL1 cable

Maintenance port

Connect to an unpowered PPC5 series controller using the Maintenance Port to upload/download and set parameters.

When using the maintenance port, power is provided from the USB port. Do not supply power to the controller through the terminals until disconnected from the maintenance port.

IR adapter

Parameter Setting Software

To USB terminal

PPC5-CBL1 cable

Connect to a powered PPC5 series controller using the IR adapter to upload/download and set parameters, monitor operations, tune control loops, and file management.

The IR adapter does not power the controller. When using the IR adapter power must be supplied to the controller.

SOLO® Basic Temperature Controllers

$55.00
1/16 DIN with Alarms

$47.00
1/16 DIN without Alarms

Choose from 6 models

SOLO Basic Series Controllers

The economical SOLO Basic series of temperature process controllers offer a cost effective solution for users requiring a simple temperature control system without having to pay for unnecessary features. This single loop temperature controller can control a heating or cooling process using relay, voltage pulse or 4 to 20 mA current outputs. Models with two alarm outputs can be configured to use one of the alarm outputs as a second control output allowing both heating and cooling control or two stage heating or cooling.
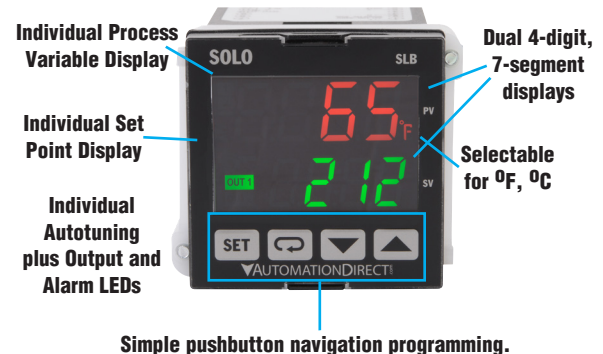
SOLO Basic series support three control modes: PID, ON/OFF, and Manual.

With the SOLO® Basic series, you get:
- **Auto Tuning (AT) function with PID control**
- **1/16 DIN panel size**
- **Single loop heating and/or cooling control at an unbelievable low price**
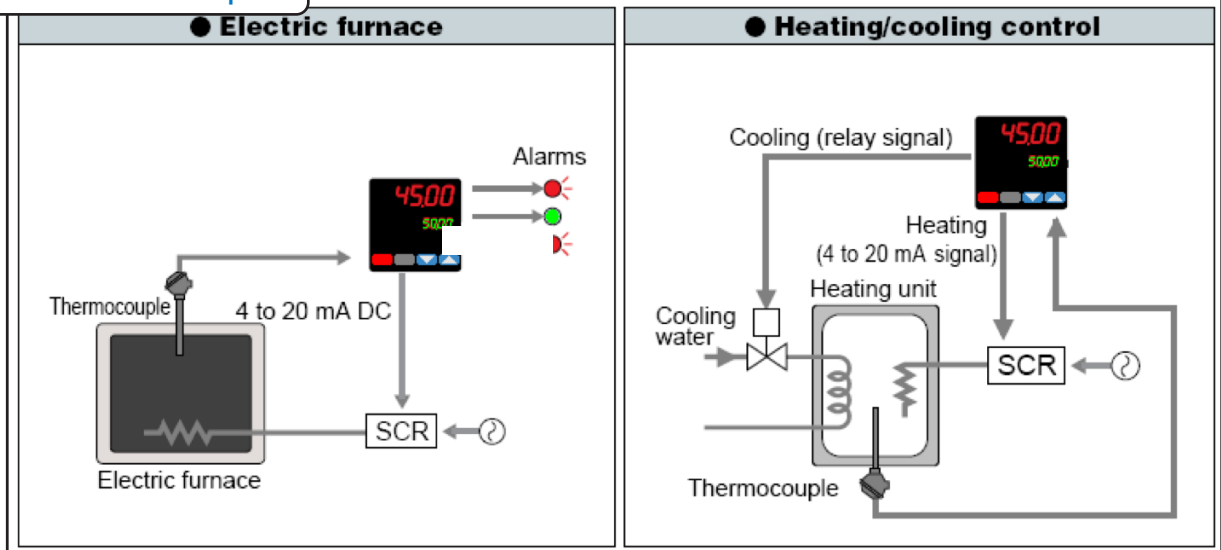- **Includes free award-winning technical support**

Thermocouple and RTD inputs

All SOLO Basic series controllers support 15 temperature input types, and with a few simple steps from the industry's best installation documentation, and your process will be up and running in no time.

Individual Process Variable Display

Dual 4-digit, 7-segment displays

Individual Set Point Display

Selectable for °F, °C

Individual Autotuning plus Output and Alarm LEDs

Simple pushbutton navigation programming.

Application Examples

● **Electric furnace**

Alarms

Thermocouple   4 to 20 mA DC

Electric furnace

SCR

● **Heating/cooling control**

Cooling (relay signal)

Heating (4 to 20 mA signal)

Heating unit

Cooling water

SCR

Thermocouple

SOLO® Standard Process and Temperature Controllers

$114.00
1/32 DIN

$127.00
1/16 DIN

$138.00
1/8 DIN

$163.00
1/4 DIN

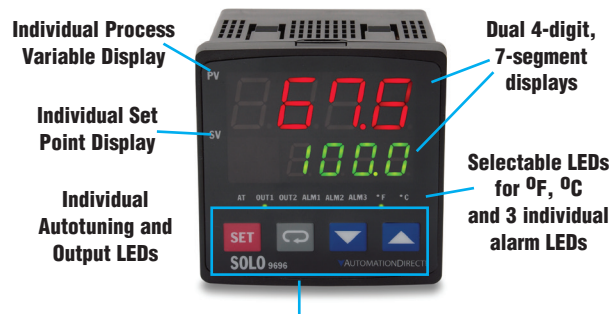## Choose from 30 models

SOLO Standard Series Controllers

The powerful SOLO® Standard series of temperature process controllers take a signal from a temperature device, such as a thermocouple or RTD, or from a pressure/ flow/ level sensor, and maintain a setpoint using an output signal (relay, voltage pulse, current, or linear voltage depending on model). SOLO Standard series support four control modes: PID, ON/OFF, Ramp/Soak and Manual.

With the SOLO® Standard series, you get:

• **Precise control**
• **Flexible connectivity**
• **The right size to fit your application**
• **An unbeatable price that includes free award-winning technical support**
• **AC powered or 24VDC models**

Universal inputs

All SOLO Standard series controllers support 13 temperature input types and 5 analog input types, and with a few simple steps from the industry's best installation documentation, and your process will be up and running in no time.

Individual Process Variable Display

Individual Set Point Display

Individual Autotuning and Output LEDs

Dual 4-digit, 7-segment displays

Selectable LEDs for °F, °C and 3 individual alarm LEDs

Simple pushbutton navigation programming, or download the FREE software from our Website for programming and monitoring the SOLO controllers.

Select the SOLO® standard controller that best fits your application

SOLO brand controllers offer you outstanding features at unbeatable prices:

• 4 standard DIN sizes with a dual 4-digit, 7-segment displays for Process Variable and Setpoint
• Dual output control for heating and cooling
• Built-in PID with Autotuning (AT) function for fast and easy startups

• Universal inputs, including T/C, RTD, and DC voltage, are standard on all controllers, mA and mV are standard on all SL models
• Flexible control modes to fit your process include PID, On/Off and Manual for all controllers and Ramp/Soak for SL models
• IP65 environmental rating (when mounted in appropriate enclosures)

| Features	1/32 DIN SL4824	1/16 DIN SL4848	1/8 DIN SL4896	1/4 DIN SL9696
Display of PV & SP	Yes	Yes	Yes	Yes
RS-485, MODBUS RTU/ASCII	Yes	Yes	Yes	Yes
Two Separate Event Inputs	No	No	Yes	Yes
Dual Outputs for Heating & Cooling Loops	Yes	Yes	Yes	Yes
Available Alarms Groups	1	3	3	3
Auto Tuning Capability	Yes	Yes	Yes	Yes
Universal Inputs (T/C, RTD, mV & mA)	Yes	Yes	Yes	Yes
	go to page P5-10	go to page PS-11	go to page PS-12	go to page PS-13

Modular Temperature Controllers

SOLO® Modular Temperature Controllers

SOLO modular temperature controllers consist of one control module and up to seven expansion modules to support up to eight independent control loops. Each module accepts thermocouple, RTD, mA, mV, or voltage inputs and provide two outputs for alarming or PID, On/Off, Ramp/Soak, or manual control modes.

$79.00
SLM1-C

Features

- Compact modular multi-loop temperature control system
- Up to eight temperature control loops
- PID, On/Off, Ramp/Soak, or manual control modes
- Process variable retransmission on current or voltage models
- 24 VDC operating voltage
- Voltage, current, voltage pulse, or relay outputs (depending on model)
- 12 alarm modes
- Additional relay output on all models
- Modbus ASCII/RTU communication via RS-485
- Free downloadable SL-SOFT configuration and monitoring software
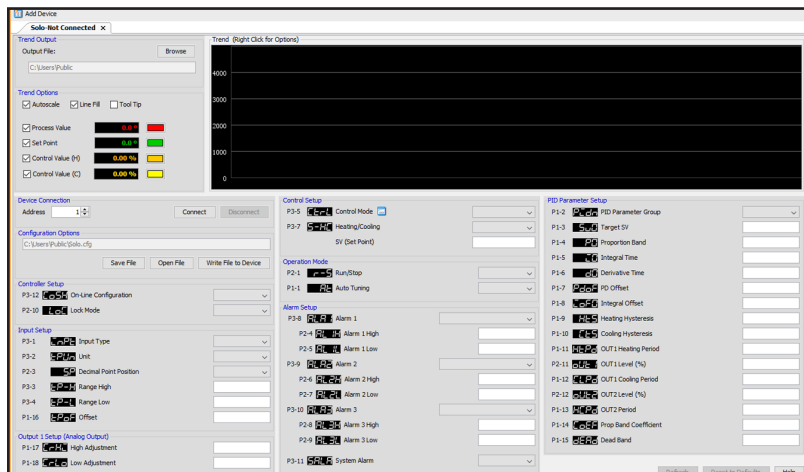

R S - 4 8 5
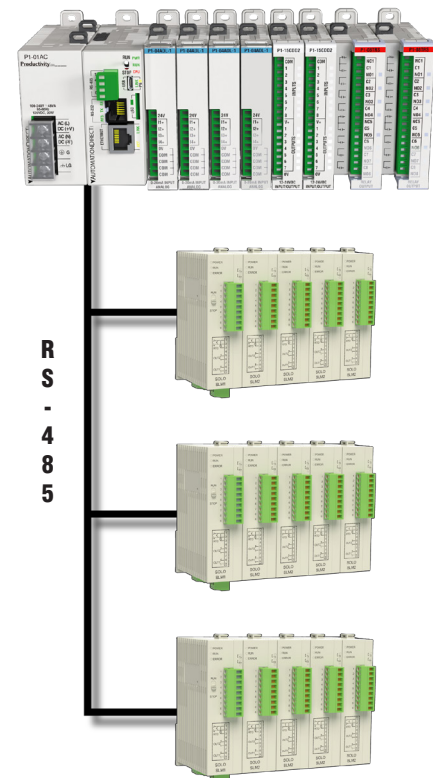
Use a PLC, HMI, or PC to collect data from the controllers and then have your program trigger events based on the values

Simple Configuration and Control

FREE configuration and monitoring software

That's right, FREE! Configuration and monitoring software (SL-SOFT, Version 3.0 downloadable from our Web site) allows you to configure each controller with ease and gives you data analysis capabilities for up to 16 units simultaneously.

FREE software that's easy-to-use and intuitive, with a GUI that make setting up the SOLO series of temperature controllers a breeze. (Download at http://support.automationdirect.com/downloads.html)

Process control setup made easy

All units support RS-485 serial communications (up to 38.4K bps), which allows you to use the free configuration software [SL-SOFT] to configure and monitor multiple SOLO controllers using Modbus RTU or Modbus ASCII protocols. For even simpler setup, the controller can be configured manually with the user-friendly keypad on each unit.

Collect and act on data

Using RS-485 communications, the SL-SOFT utility provides the ability to monitor and log historical data, using the built-in trending graph, from up to 16 devices and save it to a file.

Connect to other hardware

The RS-485 communications of the SOLO Temperature Controller can also provide connection to any HMI, PC or PLC supporting industry-standard Modbus RTU or Modbus ASCII protocol. This allows you to collect, monitor and have your application react to data being read from the SOLO controllers.

PLC Connection
Use a PLC to collect data from the controllers and then have your program trigger events based on the values
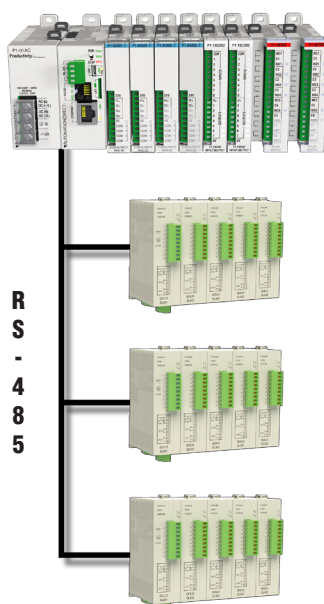
HMI Connection
Use an operator interface to collect data and monitor your process.

PC Connection
Use a PC to configure and monitor your SOLO controllers with SL-SOFT. Use the trending graph to monitor and log historical data.