Digital Programmable Controllers

# **PC Series**



High Performance Multi-Functional Program Controller...at the lowest prices anywhere!



#### **Standard Features**

#### Structure

Unit available in standard DIN size (1/4 DIN) IP-54 protective construction.

#### **Programming Features**

Unit features large program storage capacity of 100 segments in 10 patterns.

#### **Programmable Alarms**

Units features as standard 3 Alarm outputs with optional 1 Alarm.

#### **True Multi-Input**

Unit features true multi-input capabilities:10 thermocouple types, 2 RTD type, 2 current inputs, and 1 voltage input.

#### **Control Action**

Unit features as standard full function third generation PID Autotune or ON/OFF servo output PID.

#### Heat/Cool Control Action (option)

There are 3 types of control output: Relay control output (DR), Non-Contact Voltage output (DS), DC Current output (DA).

#### **Approvals**

UL, cUL and CE Safety Approvals.

#### Warranty

All units manufactured to strict ISO standards and offer full 3 year manufacturers warranty.

#### **Program Pattern**

Settable maximum 10-step per pattern. When linking the pattern, the setting is possible up to 100-step.





### **General Specifications**

Input	Thermocouple K, J, R, S, B, E, T, N, PL-II C (W/Re5-26) External resistance: 100Ω or less RTD Pt100, 3-wire system (Allowable input wire resistance per wire: 10Ω or less)
	DC current 0 to 20mA DC, 4 to 20mA DC Input impedance: $50\Omega$ DC voltage 0 to 1V DC Input impedance: $1M\Omega$ or greater Allowable input voltage: $5V$ or less Allowable signal source resistance: $2k\Omega$ or less
	ScaleRefer to "Rated Scale"
	Resolution       • Thermocouple, RTD (without decimal point1°C (1°F)         • Thermocouple, RTD (with decimal point)0.1°C (0.1°F)         • DC current, DC voltage1
Accuracy (Setting • Indicating)	Within $\pm 0.2\%$ of each input span $\pm 1$ digit or $\pm 2^{\circ}$ C (4°F) whichever is greater However, R or S input 0 to 200°C (0 to 400°F): Within $\pm 4^{\circ}$ C (8°F) B input 0 to 300°C (0 to 600°F): Accuracy is not guaranteed. K, J, E and N input less than 0°C (32°F): Within $\pm 0.4\%$ of input span $\pm 1$ digit (The cold junctin compensating accuracy $\pm 1^{\circ}$ C 0 to 50°C)
Time Indication Accuracy	Within ±0.1% of setting time
Input Sampling Period	0.125 seconds
Control Output (OUT 1)	<ul> <li>Relay contact1a1b 3A 250V AC (resistive load), 250V AC 1A (inductive load cos Ø=0.4)</li> <li>Non-contact voltage12V DC Max. 40mA DC (Short-circuit protected)</li> <li>DC current4 to 20mA DC Load resistance: Max 550Ω</li> <li>Relay contact 1a x 2 250V AC 3A (Resisitive load), 250 V AC 1A (inductive load cos Ø=0.4) (for control motor, only PC-955)</li> </ul>
Control Action	Selectable by internal switch. • Fuzzy overshoot suppression PID (with auto-tuning function) • PID (with auto-tuning function) Proportional band (P): 0.0 to 999.9% (Setting the value to 0.0 causes the controller to act as an ON/OFF controller) ON/OFF action Hysteresis When applied thermocouple or RTD input, 0.1 to 100.0°C (°F) When applied DC input, 1 to 1000 (Decimal point place follows the selection) Integral time (I) 0 to 3600 seconds (OFF when set to 0) Derivative time (D) 0 to 1800 seconds (OFF when set to 0) Proportional cycle 1 to 120 seconds (not available when control output type is current) ARW
Alarm 1 (A1) Alarm 3 (A3) Alarm 4 (A4)	Setting accuracy:Within±0.2% of full scale ±1 digitControl action:ON/OFF actionOutput: Relay contact 3A 250V AC (Resistive load), Electric life: 100,000 times
Environment	Ambient temperature: -10 to 50°C Ambient humidity: 35 to 85%RH (non -condensing)
Mounting Method	Screw type mounting bracket
Setting Method	Sheet key input
Material • Color	Material: Flame resistant resin Color: Black - External Dimensions: 96 x 96 x 100 mm (W X H x D) - Weight: 500 g
Supply Voltage	100 to 240V AC 50/60Hz, 24V AC/DC 50/60 Hz Allowable voltage fluctuation: 85 to 264 V AC, 20 to 28 V AC/DC, Power consumption approximately 15VA
Attached Function	Setting value lock, Setting value limit, Sensor correction, Multi-range, Alarm action deleayed timer, Multi-function, Warm-up indication, Wait, Hold, Advance, Back advance, Repeat, Link, Time fast Change, Data clear, Patten number external selection, External operation, Power failure countermeasure, Fixed value control, Self-diagnosis, Sensor burnout alarm, PV start, Automatic cold junction temperature compensation





High Performance Temperature & Recording Instrumentation ...at the lowest prices anywhere!



Shinko is an ISO 9001 facility



Distributed By:

Program		
Number of Patterns	10 (can be linked)	
Number of Steps	100 (10 Steps/Pattern)	
Number of Repeats	0 to 9999 times	
Program Time Range	0 to 99 hours 59 minutes/step, or 0 to 99 minutes 59 seonds/step	
Time Setting Accuracy	Within ±0.1% of setting time	
Watt Value	±(0 to 100)°C (°F) (no wait action when set to 0), however, In case of with decimal point: ±(0.0 to 100.0) In case of DC input: ±(0 to 1000) (Decimal point place follows the selection.)	

## Options

Alarm 2 (A2)	When this option is added, 1 alarm point is added (only PC-935 type) Alarm action type, Setting range and Relay contact type are the same as those of Alarm 1 (A1). See Alarm 1 (A1) section.
Control Output (OUT2) (Heating/Cooling Control) (DR, DS, DA)	If this option is applied, control output 2 is added and enables Heating/Cooling control (only PC-935 type). There are 3 types of control output i.e. Relay contact output (DR), Non-contact voltage output (DS), DC current output (DA) and non-contact relay output. Must be designated when ordering. Control action (Heating Side): the same as control output (OUT1) Control action (Cooling side): Proportional band (p) – 0.0 to 10.0 times of the control output (OUT1) proportional band (ON/OFF action when set ot 0.0) Integral time (1) the same as the integral time setting value of the control output (OUT 1) Derivative time (D) the same as the derivative time setting value of the control output (OUT 1) Overlap cycle Thermocouple and RTD: -100.0 to 100.0°C (°F) Dead band DC current and DC voltage: -1000 to 1000 (Decimal point place follows the selection.) Hysteresis 0.1 to 100.0°C (°F) Control output • Relay contact (DR) :3A 250 VAC (Resistive load), 1A 250 VAC (Inductive load $\emptyset$ =0.4), Electric life: 100,000 times • Non-contact voltage (DS) :12-14V DC Max. 40mA (short-circuit protected) • DC current (DA) :4 to 20mA DC Load resistance: Max. 550kΩ Cooling action mode (This must be selected) • Air cooling (Linear characteristic) • Oil cooling (1.5 <sup>th</sup> Power of the linear characteristic)
Serial Communication (C5, C)	Each setting status change, setting value reading and setting etc., of PC-900 can be operated from the external computer. (If option C5 and RS-232C (C) is added, external operation function is not available. The option SVTC and external operation function cannot be applied together.) Communication interface Based on EIA, RS-485 Data transfer rate (2400,4800,9600, 19200bps) Selectable by key operation. Communication protocol Based on Shinko standard protocol of Modbus. Number of connectable units A maximum of 31 units per host computer.
Setting Value Digital Transmission (SVTC)	Setting value digital transmission (master)         If Setting value digital transmission (master) is selected during Communication protocol selection, SV of PC-900 can be transmitted digitally to the controllers such as JC□-33A series (slave) with communication function (option C5).         Example of Setting value digital transmission         (A maximum of 31 units of controller with communication function (option C5) can be connected.)         PC-900, SVTC       JCR-33A, C5       JCR-33A, C5         Image: transmission       Image: transmission function (option C5) can be connected.)         PC-900, SVTC       JCR-33A, C5       JCR-33A, C5         Image: transmission function function (option C5) can be connected.)       Image: transmission function (option C5) can be connected.)         PC-900, SVTC       JCR-33A, C5       JCR-33A, C5         Image: transmission function function (option C5) can be connected.)       Image: transmission function (option C5) can be connected.)         PC-900, SVTC       JCR-33A, C5       JCR-33A, C5         Image: transmission function function function (option C5) can be connected.)       Image: transmission function functio

received from the PC-935/PCD-13A/PCD-33A (master) with Setting value digital transmission (option SVTC).

Retransmission (TA or TV)	Any one of transmissions, Process variable, Main setting value or Main output manipulating value, is output in current or voltage, converting the value to analog signal every 0.125 seconds.Transmitting parameter : PV, SV, MV (Selectable by key)Resolution: 1/10000Current (TA): 4 to 20mA DC ( load resistance, maximum 500kΩ)Voltage (TV): o to 1V DC (load resistance, maximum 100kΩ)Output accuracy: Within ±0.3% of full scale
Time Signal Output (TS)	Time signal block number (Block number that the OFF time and ON time of the signal were set) can be set to each step Maximum 8 channels per step can be outputed. Output : Open collector, Capacity 24V DC maximum 50mA
Loop Break Alarm Output (LA)	It detects the breaking status on the loops such as heater burnout, sensors burnout or the operation end trouble. When Loop break alarm (LA) and Alarm 2 output (A2) are applied together, the output terminal is common. Loop break alarm output (LA) is not available with a combination of Heating/Cooling control output (DR, DS or DA). In case of PC-955 type, relay contact is not available. (however, the LA indicator lights.) Output :Relay contact 3A 250V DC (resistance load)

#### **Terminal Wiring**



#### Panel Cutout





# All units feature a full 3 year warranty and lifetime technical support!