



TI-P830-01
CTLS Issue 2

SPC30 and SPC35 Single-Loop PID Process Controllers

Description

The SPC3x is a microprocessor-based temperature and process controller designed for industrial control applications.

It features a 50 ms sampling period, high-accuracy process indication, and universal input support for thermocouples, RTDs, and analogue signals.

The controller incorporates advanced PID control algorithms, high-resolution signal processing, and precise input measurement technology to deliver stable control performance, rapid response to process disturbances, and reliable operation across a wide range of temperature and process control applications



Options

Product code	Description
SPC30AEY2-FV1G7	SPC30, 1 x Current Output, 2 x Alarm Output, 100-240V AC
SPC30AEY2-FVMG7	SPC30, 1 x Current Output, 2 x Alarm Output, 100-240V AC, RS-485 Modbus
SPC35AEY2-FV1G7	SPC35, 1 x Current Output, 2 x Alarm Output, 100-240V AC
SPC35AEY2-FVMG7	SPC35, 1 x Current Output, 2 x Alarm Output, 100-240V AC, RS-485 Modbus

Key features and options

- Single-loop PID control for temperature and pressure applications
- Tier 2 positioning below GS-X, optimised for cost-sensitive installations
- Simple configuration for local setup and commissioning
- Fixed, application-focused configurations to reduce selection and specification risk
- Available Modbus variants for basic digital communication needs
- Compact, robust design suitable for industrial environments
- Global compliance alignment to support international deployment (EU and CN)

Features

Enhanced control performance which makes SPC3x suitable for a wide range of applications

Fast sampling speed of 50 ms (cf. SPC: 50 ms, SPC:500 ms)

Improved input indication accuracy For example: indication accuracy when measuring around 0.0 °C by using type K thermocouple of which measuring range 0.0 to 400.0 °C: ± 1.1 °C (cf. PXR: ± 3.1 °C)

Freely configurable control cycle (100 ms to 99 s)

Control method selectable among 7 types

(ON/OFF control, PID control, fuzzy PID control, self tuning control, PID2 control, 2-degrees-of-freedom PID control)

Any type of input can be accepted

Universal input is supported (thermocouple, RTD, voltage, current)

Easy-to-see clear display and user-friendly interface

Wide viewing angle, high luminance white LED backlit LCD

Large PV display (with character height of 18.1 mm which is the highest in the market)

Easy-to-distinguish parameter display with screen numbers

Easy-to-identify 11 segment alphanumeric display

Digit select key for easier value-setting (5 keys)

Most compact design in the market

Approximately 30% reduction in size compared to conventional models (58 mm depth behind panel)

A variety of functions extending the possibility of process controller

64 steps ramp/soak function

8 PID setting pallets, 8 SV pallets, zone PID facilitate frequent change of control conditions

RS-485 communication (optional) capable of cooperative operation, programless communication

Technical specifications

Power supply	100 V (-15%) to 240 V (+10%) AC, 50/60 Hz
Power consumption	13 VA maximum (100 to 240 V AC), 8 VA maximum (24 V DC/AC)
Insulation resistance	20 MΩ or more (at 500 V DC)
Withstand voltage	Power source ↔ all terminals: 1500 V AC for 1 min Relay contact output ↔ all terminals: 1500 V AC for 1 min Between others 500 V AC for 1 min
Inputs	
Number of inputs	1 (Rear terminals - Process value input/Universal input)
Input setting	Programmable scale
Input signal, range and type	Universal input: thermocouple, RTD, voltage, current - see IM-P830-02, Table 1
Indication accuracy (at Ta = 23 °C)	Thermocouple input: either $\pm 1\text{ °C} \pm 1\text{ digit}$ or $\pm 0.3\% \pm 1\text{ digit}$ of indicated value, whichever is larger, except
	Thermocouple B: 0 to 400 °C: no accuracy assurance Thermocouple R: 0 to 500 °C: $\pm 3\text{ °C} \pm 1\text{ digit}$ Thermocouples K, T, E, U, or N: -200 to -100 °C: $\pm 2\text{ °C} \pm 1\text{ digit}$
	RTD input: $\pm 0.8\text{ °C} \pm 1\text{ digit}$ or $\pm 0.2\% \pm 1\text{ digit}$ of indicated value, whichever is larger
	mV input, voltage input, current input: $\pm 0.3\%FS \pm 1\text{ digit}$
Temperature effect on sensitivity	$\pm 0.3\%FS/10\text{ °C}$
Indication resolution	see IM-P830-02, Table 1
Input sampling rate	50 ms
Input impedance	Thermocouple, mV input: 1 MΩ or more Current input: 150 Ω or less (built-in diode) Voltage input: About 1 MΩ
Variation by signal source resistance	Thermocouple, mV input: $\pm 0.3\%FS \pm 1\text{ digit}$ per 100 Ω Voltage input: $\pm 0.3\%FS \pm 1\text{ digit}$ per 500 Ω
Allowable wiring resistance	RTD: 10 Ω or less (per wire)
Allowable input voltage	DC voltage input: within $\pm 35V$ Current input: within $\pm 25\text{ mA}$ Thermocouple, RTD, mV input: within $\pm 5\text{ V}$
Noise reduction ratio	Normal mode: 40 dB (50/60 Hz) Common mode: 120 dB (50/60 Hz) Between input and power supply: $\pm 1\text{ °C}$, at 220 V AC, 50/60 Hz
Input correction	(a) User adjustment: $\pm 50\%FS$ for each of zero and span point (b) Process value shift: $\pm 10\%FS$ (c) Input filter: 0.0 to 120.0 s (filter OFF if set at 0.0) (d) Square root extraction: -0.1 to 105% (OFF if set to -0.1%)
Overrange, underrange	Beyond range of -5 to 105% (accuracy not guaranteed between -5 and 0, and between 100 and 105%FS) *Pt (-200 to 850 °C) input: out of the range between -2 to 105% 0 to 10 V DC input: out of the range between -2 to 105% Thermocouple E input: out of the range between -5 to 102%
Output	
Number of outputs	1 (Rear terminals - Current Output)
Output Type	Current output (0 to 20 mA DC/4 to 20 mA DC) • Accuracy: $\pm 5\%FS$ • Load resistance: 500 Ω MAX.

Specifications continued on next page

Technical specifications (continued)

Alarm Output	
Number of alarm outputs	1 (Rear terminals - Alarm output 2 points)
Alarm Output specifications	Relay contact output Contact structure: SPST (single pole single throw) Contact capacity: 250 V AC/30 V DC, 1 A (resistive load) Minimum ON/OFF current: 10 mA (5 V DC) Mechanical life: 20 million operations MIN. (100 operations/min) Electrical life: 100,000 operations MIN. (rated load)
Output functions	Alarm output (see "Alarm function"), main unit control mode output, program status output, control output 1 and 2, etc.
Output cycle	100 ms
Display unit	
Type	LCD (with backlight)
Indication contents	Process value indication: 11-segment, 4-digit [white] Setpoint indication: 11-segment, 4-digit [green] Screen No. indication: 7-segment, 4-digit [orange] Indication status: 42 indicator lamps
Luminance setting	Possible (4 steps)
Button Type	Sheet type keys (with emboss)
Number of keys	5
Control functions - types	
ON/OFF control	PID control: - Dual control (heating/cooling) - PID parameters determination: Auto tuning Fuzzy PID control - Dual control (heating/cooling) - PID parameters determination: Auto tuning
Self tuning control	PID2 control - Dual control (heating/cooling) - PID parameters determination: Auto tuning 2-degrees-of-freedom PID - PID parameters determination: Auto tuning Position proportional PID (servo) control with position feedback - Full stroke time: 30 seconds MIN.
Control functions - parameters	
	- Proportional band (P): 0.1 to 999.9% - Integral time (I): 0 to 3200 s Integral time control invalidated when I = 0. - Differential time (D): 0.0 to 999.9 s Differential time control invalidated when D = 0. - Control cycle: 100 to 900 ms (in 100 ms), 1 to 99 s (in seconds) - Anti-reset windup: 0 to 100% of measurement range - Hysteresis band: 50% of measurement range (at 2-position control only) - Number of SV and PID combinations: 8 combinations. Changed by any of parameter setting, digital input, communication, user function keying, zone change.

Specifications continued on next page

Technical specifications (continued)

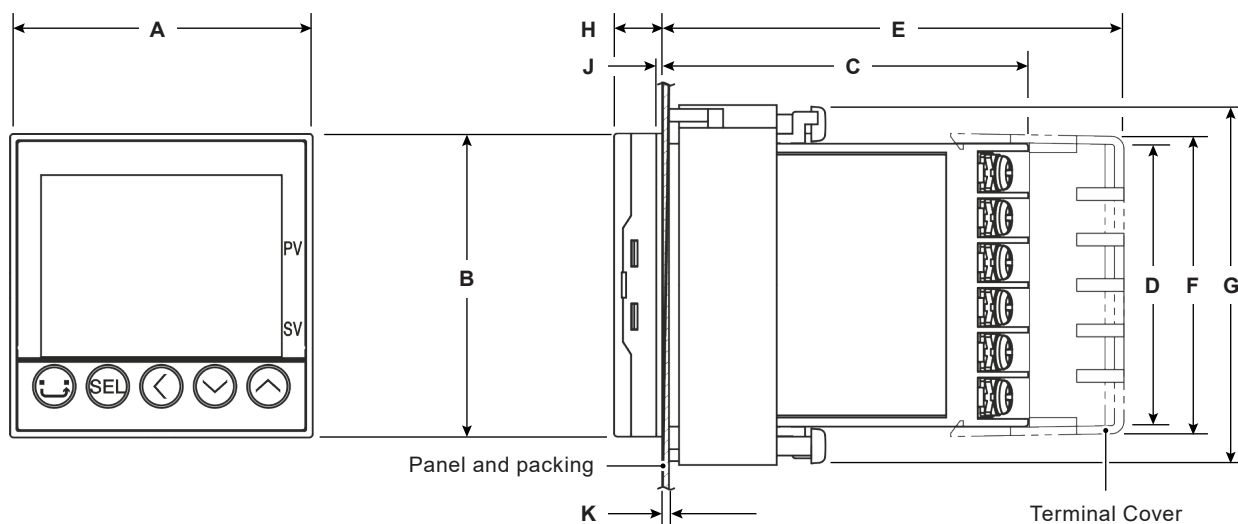
Control functions - mode	
Mode type	Auto, Manual, Remote *During 2-position control in Manual mode, 2-position manual operation with MV = 100% or 0% is operated.
Mode switching	- Auto↔Manual: Balanceless·bumpless - Auto/Manual → Remote: Balance·bumpless - Auto/Manual ← Remote: Balance·bumpless
Alarm function	
Number of alarm setting points	Up to 5 points (according to the number of DOs)
Alarm type	Process value (upper limit/lower limit, absolute/deviation, range), main unit error, etc. (non-excitation, delay, latch, timer function option provided)
Communication function - RS485 (optional)	
Number of points	1 (Rear terminals - Option (RS-485 interface))
Physical specifications and Protocol	EIA-485, Modbus-RTU
Communication method	Half duplex bit serial, Asynchronous communication
Code type	Data length: 8 data bits. Parity: Odd, even, none.
Communication rate	9600 bps, 19200 bps, 38.4 kbps, 115.2 kbps
Connection status	Up to 32 units connectable including multidrop master function.
Communication distance	Up to 500 m (total connect extension)
Additional functions	- Cooperative operation The function in which several process controllers (as slave devices) can be operated by a master process controller. - Programless communication The function in which a process controller can communicate with a PLC without program. Supported PLCs: Mitsubishi PLC Q series Siemens PLC S7 series
Environmental	
Data backup at power failure	Memory protection: Protect by non-volatile memory
Self-diagnosis	Method: Program error supervision by watchdog timer
Operating ambient temperature	-10 to 50 °C
Storage temperature	-20 to 60 °C
Operating/storage ambient humidity	90%RH MAX. (no condensing)
Warm-up time	30 min MIN
Vibration	During transportation 9.8 m/s ² (1G) or less
Impact	During transportation: 294 m/s ² (30G) or less
Mounting method	Panel mount
External terminals	Screw terminals, M3.
Case material	- ABS, PPO - Non-combustibility grade: UL94V-0 equivalent - Color: Black

Specifications continued on next page

Technical specifications (continued)

Protection structure	- Panel front side: IP66, NEMA-4X equivalent (When the panel is mounted using our genuine packing. Not water-proof if mounted closely together.) - Body: IP20 equivalent (slits on top and bottom) - Terminals: IP10 equivalent, when supplied terminal cover is used.
User customize function - Program (ramp/soak) function	
Number of program steps	64 steps x 1 pattern, 32 steps x 2 pattern, 16 steps x 4 pattern 8 steps x 8 pattern (1 step = 2 segments)
Control option	Operation control by digital input Status output by digital output
Basic functions	(1) Segment time can be set in "Hour, Minutes" or "Minutes, Seconds" (2) Guarantee soak (3) Repeat action (4) PV start (5) Delay start (6) Power restoring function
Memory backup	EEPROM
Operating days alarm	Displays the operating days and activates alarm output (optional) when it exceeds the setpoint. This function is useful for preventive maintenance because it let you know the appropriate time for maintenance work.
Certification	LVD (2014/35/EU, Low Voltage Directive) EN 61010-1:2010+A1:2019 EMC (2014/30/EU, Electromagnetic Compatibility) EN 61326-1:2013

Dimensions/panel cut-out/weight - SPC30



Dimensions (approximate) in mm (inches)

A	48 (1.89)
B	48 (1.89)
C	58 (2.30)
D	44.8 (1.76)
E (including terminal cover)	73.2 (2.88)
F (terminal cover)	48 (1.89)
G	57 (2.24)
H	7.7 (0.30)
J	1.0 (0.04)
K (panel thickness)	1 < t < 8

Panel cut out

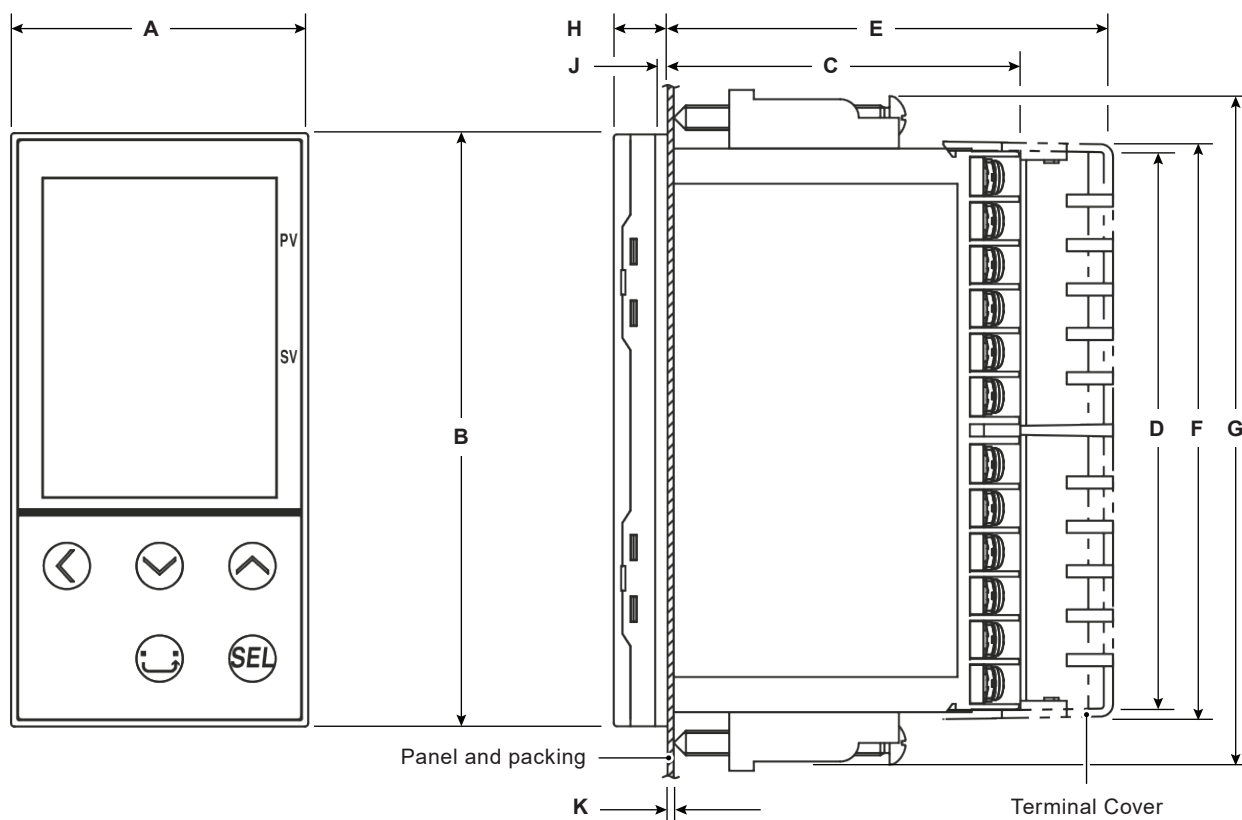
45 mm (-0.0, +0.5)
x
45 mm (-0.0, +0.5)
1.77" (-0.0, +0.02)
x
1.77" (-0.0, +0.02)

Weight

100 g (3.53 oz)

Dimensions/panel cut-out/weights for the SPC35 are on the next page

Dimensions/panel cut-out/weight - SPC35



Dimensions (approximate) in mm (inches)

A	48 (1.89)
B	96 (3.78)
C	57 (2.24)
D	91.4 (3.60)
E (including terminal cover)	72.2 (2.84)
F (terminal cover)	93.7 (3.69)
G	110.4 (4.35)
H	8.7 (0.34)
J	2 (0.08)
K (panel thickness)	1 < t < 8

Panel cut out

92 mm (-0.0, +0.5)
x
45 mm (-0.0, +0.5)
3.62" (-0.0 +0.02)
x
1.77" (-0.0 +0.02)

Weight

170 g (5.99 oz)

Isolation specifications

SPC30

Power source	Internal circuit
	Process value input
	Control output 1 (current)
Alarm output 1 to 2 (relay contact, shared common)	Communication (RS-485)

SPC35

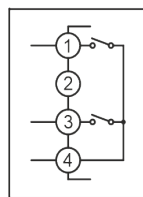
Power source	Internal circuit
	Process value input
	Control output 1 (current)
Alarm output 1 to 2 (relay contact, shared common)	Communication (RS-485)

- Basic insulation
- Functional insulation
- No Insulation

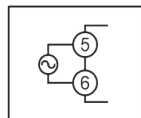
Terminal specifications

Rear terminals SPC30

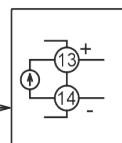
Alarm Output 2 points



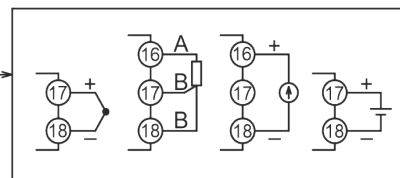
Power Supply



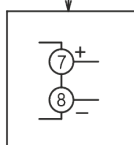
Current Output



Process value input/Universal input

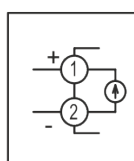


Option (RS-485 interface)

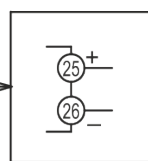


Rear terminals SPC35

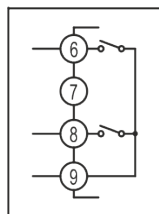
Current Output



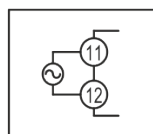
Option (RS-485 interface)



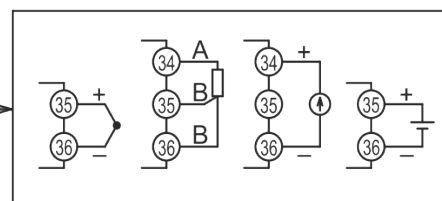
Alarm Output 2 points



Power Supply



Process value input/Universal input



Order Codes SPC3x

				Example
SPC3		Single-Loop PID Process Controller		SPC3
5	Size	0	= 48 x 48 mm	0
		5	= 48 x 96 mm	
6	-	A	= Not used	A
7	Control Output	E	= Current Output	E
8	Control Output	Y	= None	Y
9	Revision Code	2	= 2	2
10	Alarm Output	F	= 2 Points	F
11	Power Supply	V	= 100 to 240 V AC, English	V
12	Communications	1	= None	1
		M	= RS-485 Communication	
13	-	G	= Not used	G
14	-	7	= Not used	7

SPC30 - without ModBus RS485

	5	6	7	8	9		10	11	12	13	14
SPC3	0	A	E	Y	2	-	F	V	1	G	7

SPC35 - with ModBus RS485

	5	6	7	8	9		10	11	12	13	14
SPC3	5	A	E	Y	2	-	F	V	M	G	7

How to order

Examples

SPC30AEY2-FV1G7

1 off Spirax Sarco SPC30 Single-Loop PID Process Controller with 1 x Current Output, 2 x Alarm Output, 100-240V AC

SPC35AEY2-FVMG7

1 off Spirax Sarco SPC30 Single-Loop PID Process Controller with 1 x Current Output, 2 x Alarm Output, 100-240V AC, RS-485 Modbus

Spare parts and accessories

The controllers contain no user servicable parts.