

## SX90 Process Controller

### Description

The SX90 is a panel mounted 1/8th DIN controller, suitable for constant set point control of systems having fixed pre-programmed set points. The controller has universal inputs, and outputs using PID for close control of industrial processes. The SX90 controller is for use with the Spirax Sarco range of pneumatic and electric control valves and electrical and electropneumatic instruments.

### SX90 features:

- **Universal input** - Resistance thermometers, thermocouples, mA and mV.
- **Universal output** - VMD (valve motor drive), mA and voltage for continuous, relay and logic for switching control.
- **Auxiliary power supply** - For external transmitter requiring 24 Vdc.
- **Set point** - The SX90 can operate with local set point, remote set point, or a choice of 4 set points can be selected.
- **Ramps** - There are 2 independent ramps (ramp up and ramp down) for rate of change from one set point to another.
- **Remote set point** - For cascade control (master/slave) using 2 controllers working together, or to remotely control the set point.
- **Retransmission** - For retransmission of the process value, set value, or as second analogue output.
- **Event alarm** - 4 programmable relay outputs for deviation, band, and process alarms.
- **Quick codes** - 5-digit quick codes enable easy set-up and commissioning of the controllers
- **Serial communications** - For connecting via a serial port RS 485 (5 wire), up to 64 controllers into a supervisory system.
- **Auto/man** - The automatic to manual mode can be changed via the key board, or logic inputs.
- **Logic inputs** - 3 logic inputs to provide a variety of selectable functions.
- **Potentiometer Input** - For feedback of valve position.
- **Text messages** - Scrolling text messages can be configured to alert the user to process conditions.
- **Forced output** - Forced output level defined by instrument parameter and activated by a logic input or by writing to the parameter.



### Approvals

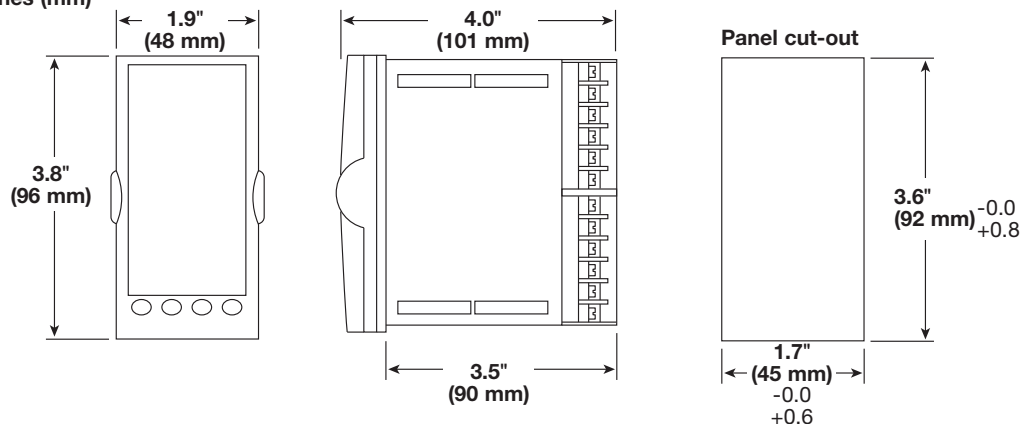
These controllers conform to the Council Directive 93/68/EEC and the regulations on the essential protection requirements in Electrical Apparatus EN 61010-1.90.

- **EMC emissions specification:** EN 61326-1: 1997 Class B (including amendments A1, A2 and A3).
- **EMC immunity specification:** EN 61326-1: 1997 Industrialallocations (including amendments A1, A2 and A3).

See the next two pages for SX90 Process Controller technical data

### Dimensions

(approximate) in inches (mm)



**How to order example:** 1 off Spirax Sarco SX90 process controller.

Local regulation may restrict the use of this product below the conditions quoted. Limiting conditions refer to standard connections only. In the interests of development and improvement of the product, we reserve the right to change the specification.

TI-P323-30-US-US 12.13

# SX90 Process Controller

## Technical data

### General details

Mounting arrangement	Panel mounted 1/8 DIN
Power supply	85 to 265 Vac, 9 W maximum
Electrical connections	Screw connection terminal block
Panel sealing	IP65 – plug in from front panel, NEMA 4X
Operating temperature/humidity	0 to 55°C, 5 to 85% RH
Atmospheres	Not suitable for use in explosive or corrosive atmospheres
Electromagnetic compatibility (EMC)	EN 61326
Electrical safety BS EN 61010	Installation Category II
Weight	0.8 lb (350 g)
Approvals	CE

### Process variable inputs

Calibration accuracy	< ±0.25% reading ±1 LSD
Resolution	< 0.5 µV with 1.6 sec filter
Input filter	Off to 59.9 seconds
RTD	3 wire Pt100 DIN 43760
Bulb current	0.2 mA
Universal linear mA	4 - 20 mA, 0 - 20 mA, using external shunt resistor 2.49 Ω
Linear input range	-10 to 80 mV
Thermocouples	K, J, N, R, S, B, L, T, C, custom
Sampling rate	4 Hz (250 ms)
Cold junction accuracy	<±1°C at 25°C ambient
Accuracy linear mA	< 0.1% reading
Input impedance	100 MΩ
Number of set points	3 plus remote set point
User calibration	2 point gain and offset

### Transmitter power supply

Isolation	300 Vac double isolated
Output voltage	18 V ±15%
Current	30 mA maximum
Load regulation	< 1 V over 25 mA

### Control action

Proportional band	1 - 9999 Engineering units or 0.01 to 300 %age or 0.1 - 3000
Integral time	Off - 9999
Derivative time	Off - 9999
Error band	One shot tune, or natural frequency tune. The controller will automatically select the best method according to the process conditions.
Auto tuning	Hysteresis from 0.01 to 300.0 or 0.1 to 3000 Engineering units
On-Off control	1 - 9999 Engineering units or 0.01 to 300 %age or 0.1 - 3000
Cut back	To minimise overshoot on critical processes.
Auto / manual modes	Selectable from keyboard.

### Relays

Isolation	300 Vac double insulated
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### Logic inputs (x2)

Contact closure	Open > 1200R, Closed < 300R
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### Comms

Isolation	300 Vac double isolation
Hardware	EIA 485 5 wire (EIA 422 compatible)
Protocol	Modbus RTU slave

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## Remote set point input

Isolation	300 Vac double isolation
Calibration accuracy	< $\pm 0.25\%$ reading $\pm 1$ LSD
Sampling rate	4 Hz (250 ms)
Resolution	>14 bits – 0.5 mV for 0 – 10 V input, 2 $\mu$ A for 4 – 20 mA
Input impedance	> 222 K $\Omega$ (Volts) 2.49 $\Omega$ (Current)
Linear input range	0 – 10 V, 0 – 20 mA
Input filter	Off to 59.9 seconds
Zero offset	User adjustable over full range
User calibration	2 point gain and offset

## Pot input

Pot resistance range	100 - 10 k $\Omega$
Excitation voltage	0.46 to 0.54 V
Resolution	0.006% of Span (>14Bits)
Sample rate	1 Hz
Short circuit pot detection	< 25 $\Omega$
Open circuit pot detection	> 2 M $\Omega$
Open circuit wiper detection	> 5 M $\Omega$
Contact rating	Maximum 2A @ 264 Vac resistive <b>Note:</b> Maximum 2A per terminal limit applies where relays have common terminals. (2 amps maximum for terminal AB)

## Outputs

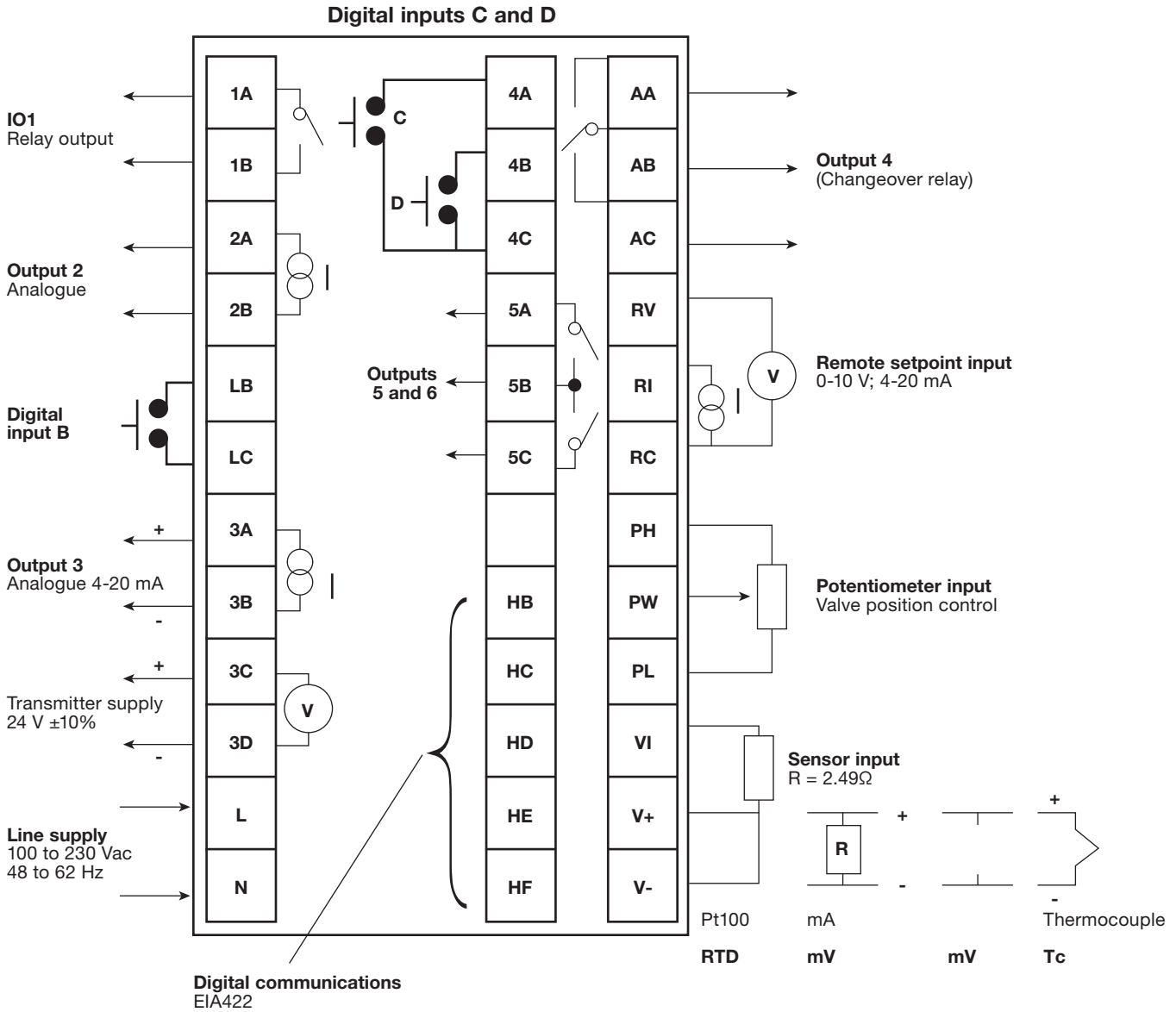
Output 1	SPST N/O contact
Output 2	0 – 20 mA, 4 – 20 mA, 300 Vac double insulated, 13.5 bits resolution (<550 $\Omega$ )
Output 3	0 – 20 mA, 4 – 20 mA, 300 Vac double insulated, 13.5 bits resolution (<550 $\Omega$ )
Output 4	Changeover relay contacts
Outputs 5 and 6 (VMD)	2 SPST interlocked N/O relays
Input filter	Off to 59.9 seconds
Zero offset	User adjustable over full range
User calibration	2 point gain and offset
Open circuit wiper detection	> 5 M $\Omega$

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## Wiring diagrams

**Warning:** Safe operation of this product can only be guaranteed if it is properly installed, commissioned, used and maintained by qualified personnel as stated in the IMI supplied with the unit. It is the duty of the Company Safety Officer to ensure that the product specific data and Safety information within the supplied IMI has been fully understood and complied with.

## Terminal diagram



# SX90 Process Controller

Wiring diagram for connecting the 4-20 mA transmitter

