EPC-1
Electro-Pneumatic Controller
Accepts 4-20 mA Signal
Accuracy to ±0.5% of Span

NEMA 4 Enclosure
is rugged, watertight and tamper resistant

Backlit LED Display
shows set point, process variable, process deviation from set point or calibrate high or low as selected by display mode switch

Response Speed Adjustment
sets the duration and frequency of air pulses controlling speed of response

Pneumatic Output
sends air to control valve up to maximum air input

AC Power Input
is 115/230 VAC, 50/60 Hz, switch selectable

Optional Remote Control and Remote Set Point Modules
can be mounted up to 1000 feet away

Display Mode Switch
selects set point, process variable, process deviation from set point or calibrate high or low for display

Set Point Adjustment
establishes process set point

Dead Band Adjustment
for hysteresis to balance system accuracy with valve wear

Pneumatic Input
uses standard plant air up to 100 psig maximum

Electrical Signal Input
is 4-20 mA or from RTD with optional signal conditioning card

Intrinsically Safe Option
Factory Mutual Approved for hazardous locations

Applications
- Process Control Systems
- HVAC Systems
- Water Purification Systems
- Vaporizers
- Metal Cleaning Systems
- Plating Systems
- Feed Water & Fuel System
- Pressure Control
- Controls in Boiler Rooms

ONE BOX REPLACES I/P TRANSDUCERS, POSITIONERS AND EXTERNAL POWER SUPPLIES
**EPC-1 ELECTRO-PNEUMATIC CONTROLLER**

- Simplified Installation eliminates need for Positioner, I/P, External Power Supply & Instrument Quality Air
- No Air Consumption at Steady State
- Air Output 0 to Maximum Supply Pressure
- Loss of Power Reset
- Accuracy to ±0.5% of Span
- Easy to Read Digital Display
- Internal Power Supply for Transmitter

**APPLICATION DATA**

- Control of E8, Kombat Series K, Intimidator Type J, Boss Type D, Doctor Type MD and other manufacturer's control valves
- Process Control Systems
- HVAC Systems
- Packaged Systems such as Water Purification, Vaporizers, Metal Cleaning, Plating, etc.
- Feed Water and Fuel System Controls in Boiler Rooms
- Ideal for Pressure Control

**APPLICABLE CODES**

- NEMA 4 Enclosure

**OPTIONS**

- TSC—Temperature Signal Conditioning Card (for RTD without transmitter)
- LCM-90—Local Control Module (where distance between valve & EPC exceeds 60°)
- EPC-RS—Remote Set Point Module
- Pressure Transmitter
- RTD Thermometer
- Differential Pressure Transmitter
- Thermowell

**MODELS**

EPC-1—Electro-Pneumatic Controller
EPC-H—EPC-1 for Actuators greater than 80 sq. in.
EPC-IS—Intrinsically Safe EPC-1

**Spence EPC SIMPLIFIES YOUR CONTROL SYSTEM**

Conventional Pneumatic Control System

Spence EPC-1 Electro-pneumatic Control System
EPC-1 ELECTRO-PNEUMATIC CONTROLLER SPECIFICATION

EPC-1 AND EPC/IS SERIES
Controllers shall be electro-pneumatic, accepting an input signal of 4 to 20 mA or RTD input and providing an output of 0-100 psig capable of modulating diaphragm or cylinder actuators without the use of valve positioners or I/P transducers. Controllers shall be capable of operating on 115/230 VAC, 50/60 Hz or 24 VDC supply and provided with a minimum 3/2 inch digital display indicating set point, process variable, deviation from set point and high/low calibration values.

Controllers shall be capable of direct or reverse action and provided with external AUTO/MANUAL switch. Controllers shall have no steady-state air consumption and be capable of accepting a 100 psig input without the use of regulators. Accuracy shall be ±0.5% of span, gain shall be adjustable, dead band shall be adjustable 0–5% of span and controllers shall be provided with an adjustable derivative function.

Enclosures shall be NEMA 1, 2, 3, 3S, 4, 4X, 12 and 13 rated and provided with a hinged cover. Controllers shall be CSA-Approved, FM-Approved for intrinsic safety.

Controllers shall be Spence Engineering or approved equivalent.

EPC/RCS-90 AND EPC/RCS-90/IS
A control module shall be provided to be mounted at or near the valve which will enable the controller to be mounted up to 1000 feet away and linked to the module by only electrical connections. Enclosure shall be NEMA 1, 2, 3, 3S, 4, 4X, 12 and 13 rated. The local control module shall be CSA-Approved, FM-Approved for intrinsic safety.

EPC/RS MODULE
The remote set point module shall consist of a 1/4 DIN, NEMA 1 panel mount enclosure designed to be mounted up to 1000 feet away from the controller. Enclosure shall be provided with a clear, hinged cover equipped with a lock and two keys. Modules shall be provided with all necessary panel mount hardware and plug-in terminal connector. Modules shall have a minimum 3/2 inch digit backlit LCD display with 1/2 inch high characters. Display shall indicate high-low transmitter calibration values, process values, deviation from set point and process set point. Module shall allow calibration adjustment and manual change of controller set point. Module shall be powered by 24 VDC from the controller and require no external power supply.

SET POINT RAMP GENERATOR
Controller shall be capable of providing automatic ramp-up and/or ramp-down to or from final process set point incrementally in 4,096 discrete steps. Ramp time shall be adjustable from a minimum of one second to a maximum or 166 hours and shall be selected via digital switches on the front panel. Timer on/off, start/stop/pause/resume, ramp-up/ramp-down and reset functions shall be capable of remote control with a PLC or DCC interface using a zero signal (shunt to ground contact closure).

RATINGS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Supply Voltage</td>
<td>115 Volts 50/60 Hz</td>
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<tr>
<td></td>
<td>230 Volts 50/60 Hz</td>
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<tr>
<td></td>
<td>24 Volts DC</td>
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<tr>
<td>Operating Voltage Range</td>
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<tr>
<td>Power Consumption</td>
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<td>0.7 Watts (steady state)</td>
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<td>Input</td>
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<td>Air Supply</td>
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<td>Output</td>
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<tr>
<td>Air Consumption</td>
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<tr>
<td>Accuracy</td>
<td>±0.5% Span</td>
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<tr>
<td>Response Speed Range</td>
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<td></td>
<td>High = 12</td>
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<td>Dead Band</td>
<td>Adjustable, 0 to 5% Span</td>
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<tr>
<td>Input Resistance</td>
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<tr>
<td>Pneumatic Fittings</td>
<td>1/8” FNPT</td>
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<td>Air Delivery</td>
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<tr>
<td></td>
<td>0.55 scfm at 60 psi</td>
</tr>
<tr>
<td></td>
<td>0.63 scfm at 90 psi</td>
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<tr>
<td>Weight</td>
<td>9 lbs (4.1 kg)</td>
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</table>

*Noryl is a registered trademark of General Electric.
**EPC-1 Electro-pneumatic Controller**

**Options**

**EPC/IS Intrinsically Safe**
The Spence EPC/IS is an intrinsically safe, single loop electro-pneumatic controller when installed with barriers. It is Factory Mutual approved for:

- Class I, II, III Division 1, applicable Groups C, D, E, F and G
- Nonincendive for Class I, Division II, Groups C and D
- Suitable for Class II and III, Division 2, Groups F and G hazardous locations

**EPC/RS Remote Set Point Module**
The Spence EPC/RS is a 1/4 DIN, panel mounted module in a NEMA 1 enclosure, designed to provide remote monitoring and control of the EPC-1 Series Controllers up to 1000 feet away. Included are:

- 31/2" digit, backlit LCD display indicating:
  - PMC-1 low and high calibration values
  - Process value (temperature, pressure, etc.)
  - Process deviation from set point
  - Process set point
- Mode select button and LED indicators
- Remote set point button
- Hi-Lo calibration adjustments

**EPC/RCS-90 & RCS-90/IS Local Control Module**
The Spence EPC/RCS-90 is a small enclosure housing a terminal strip and the loading/unloading solenoid valves which are normally inside the EPC-1 Series Controller. Designed to mount on the wall or directly on the control valve, the RCS-90 minimizes the air signal line length and requires only electrical connections to the EPC-1 up to 1000 feet away. Available with hi-cycle standard or FM approved (same as EPC/IS) intrinsically safe solenoid valves for applications including:

- Where EPC-1 air output line to the control valve exceeds 60 feet
- When system response speed needs to be increased
- Where valve location requires intrinsically safe equipment
- Ambient temperatures near valve exceed EPC-1 rating but are within RCS-90's –20 to 175°F (–29 to 79°C) temperature rating
- When EPC-1 is installed for remote valve operation
- To operate double acting cylinder actuators

**Set Point Ramp Generator**
The Spence EPC-1 Set Point Ramp Generator module is a factory mounted module which provides automatic ramp-up or ramp-down to or from final process set point. The ramp time is adjustable from one second to 166 hours. Ramp time is selected by digital switches on it's front panel which replaces the EPC-1's lower panel. Remote controllable functions include timer on/off, start/pause/resume, ramp-up/ramp-down and reset. Applications include:

- Steam Distribution Systems for automatic, gradual warm-up to prevent boiler overloads, allow traps to remove high startup condensate loads and to eliminate water hammer, “banging” and resulting mechanical damage
- Food, Pharmaceutical and Process Industries in single loop process control systems