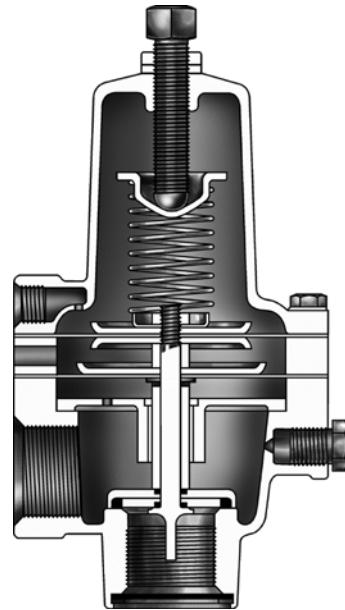


# Type 289RC Throttling Exhaust Booster



W7313



W7322

*Figure 1. Type 289 Throttling Exhaust Booster*

*Figure 2. Type 289 Throttling Exhaust Booster Sectional View*

## Introduction

The Type 289RC is a high-capacity, throttling exhaust booster designed to provide throttling “release control” (RC) control pressure to actuators, pneumatic devices, and related systems that require rapid response (i.e. surge valves or recycle valves on compressors). These exhaust boosters are normally used on control valve actuators to speed up the proportional operation of a control valve in response to sudden pressure changes from pneumatic output devices such as solenoid valves or pneumatic instruments. The one way throttling action offers superior control with exceptional stability.

## Features

- **Rapid Response**—By accurately matching the instrument and actuator performance with the bypass valve adjustment, the Type 289RC reduces overshoot and related problems while allowing very fast positioning response to system requirements.
- **High Volume**—The boosting system allows the Type 289RC to provide high flow rates with minimum pressure buildup.
- **Throttling Type Exhaust Booster**—The smooth, sensitive throttling action minimizes pressure surges caused by system fluctuations.

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## Specifications

### Body Size<sup>(1)</sup>

1 NPT

### Inlet and Outlet Connections

**Inlet:** Connect to the outlet via a bypass valve, adjustable from 0 to 0.3  $C_v$ . (Piping is normally configured by the customer.) See Figure 3.

**Signal:** 1/8 NPT (standard)

**Outlet Connection:** 1 NPT

### Maximum Pressure<sup>(1)</sup>

125 psig (8.6 bar)

### Input to Output Pressure Ratio

Fixed at 1 to 1

### Dead Band

**Static:** Bypass valve closed, less than 10% of the control pressure

**Dynamic:** Bypass valve open, variable from 0 to 10% of the control pressure

### Maximum Exhaust Flow Capacity

$C_v$  = 22. System capacity limited by the smallest restriction between the exhaust valve and pressure source

### Temperature Capabilities<sup>(1)</sup>

-20° to 180°F (-29° to 82°C)

### Approximate Weight

4 pounds (2 kg)

1. The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded.

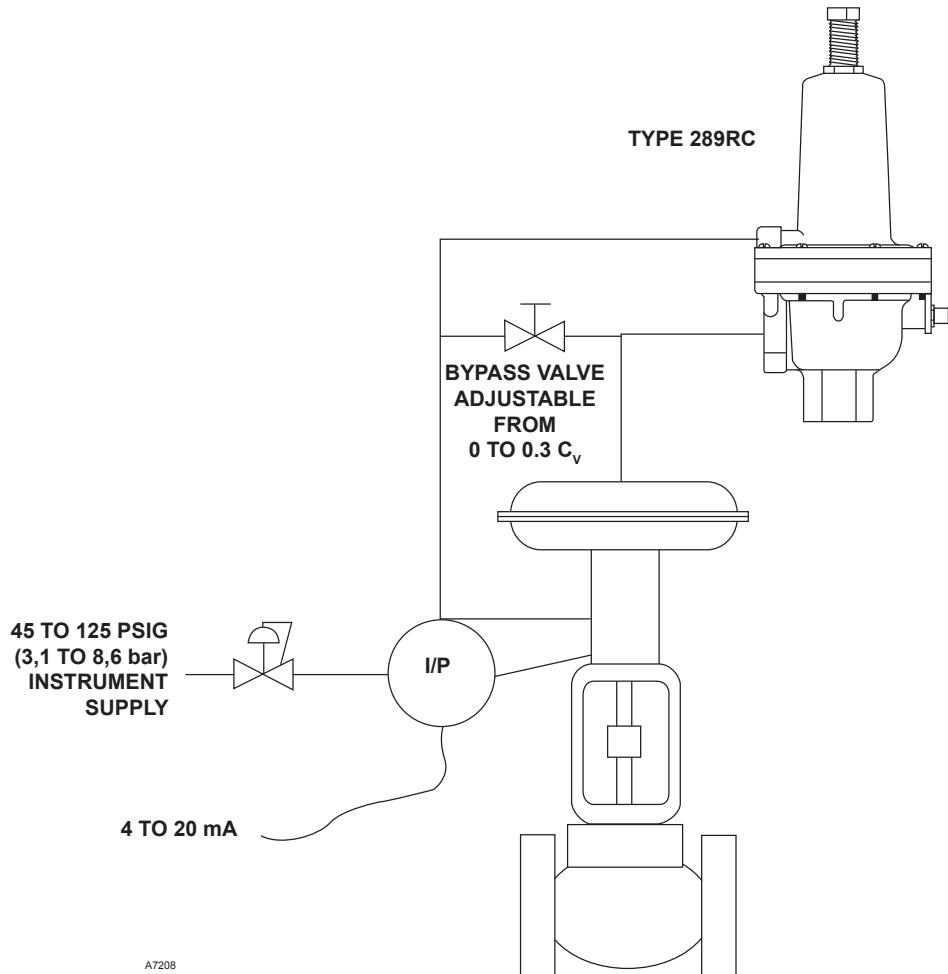
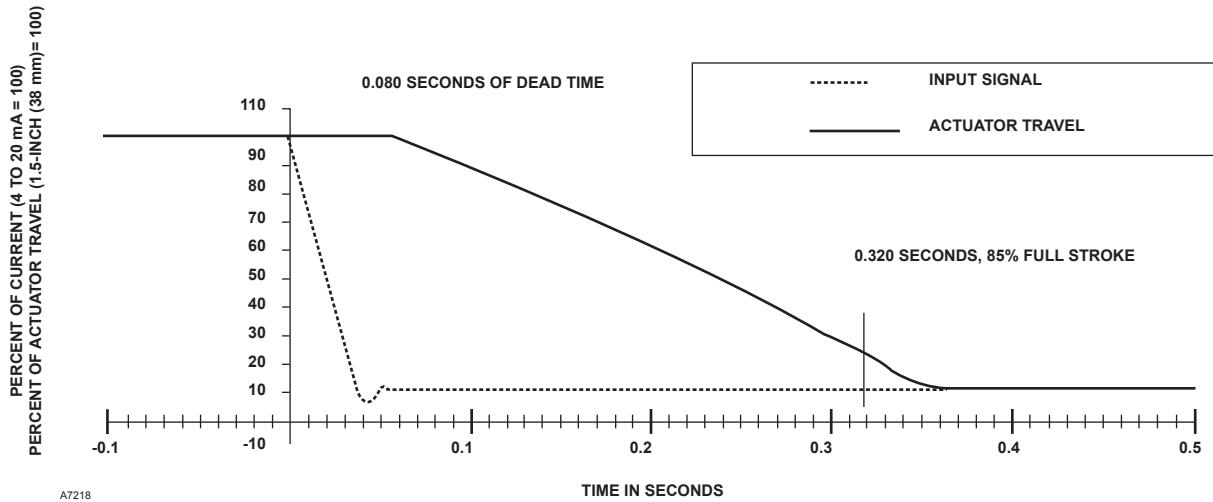


Figure 3. Typical Type 289RC Throttling Exhaust Booster and Control Valve Installation



(USING A TYPE 546 I/P TRANSDUCER WITH 4 TO 20 mA INPUT SIGNAL, 6 TO 30 PSIG (0,41 TO 2,1 bar) OUTPUT, AND 35 PSIG (2,4 bar) SUPPLY PRESSURE; A TYPE 657 OR 645 VALVE ACTUATOR WITH 10 TO 26 PSIG (0,69 TO 1,8 bar) SETTING AND 0 TO 1.5-INCHES (0 TO 38 mm) OF TRAVEL; AND A TYPE 289RC EXHAUST BOOSTER WITH A BYPASS VALVE.)

**Figure 4. Typical Response Curve for Type 657 size 45 Actuator with Type 289RC Throttling Exhaust Booster**

## Installation

The instrument connection must be made to the spring case, 1/8 NPT fitting. The actuator is connected to the 1 NPT side port. The inlet and outlet must be connected via an adjustable bypass valve. Flow through the exhaust valve must be as indicated by the flow direction arrow on the body. See Figure 3.

## Principal of Operation

The Type 289RC 1 NPT output port is connected directly to a spring return actuator and the 1/8 NPT inlet port is connected to the controlling instrument (I/P transducer, positioner, controller, etc.). The inlet and outlet chambers connected through a needle valve. The needle valve is adjusted on the control valve system to account for differences in various instrument and actuator performance characteristics.

Once this adjustment has been accomplished the control valve action is described as follows: As the output pressure of the instrument increases the actuator moves the valve normally since the exhaust

booster cannot be actuated in this manner. When the output pressure of the instrument decreases the actuator will move the valve normally until the rate of change of the output pressure exceeds the capacity limit of the needle valve. When this occurs, the pressure drop in the Type 289RC causes the booster exhaust valve to open and quickly drop the pressure in the actuator. Because of the throttling action of the Type 289RC, the booster exhaust valve closes as the pressure difference between the instrument and actuator decreases and the control valve system resumes normal operation.

## Ordering Information

Refer to the Specifications section on page 2. Carefully review the description below each specification to be sure exhaust booster meets the needs of the application. Specify the product type number to your local Sales Office.

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## Industrial Regulators

### Emerson Process Management Regulator Technologies, Inc.

USA - Headquarters  
McKinney, Texas 75069-1872 USA  
Tel: 1-800-558-5853  
Outside U.S. 1-972-548-3574

Asia-Pacific  
Shanghai, China 201206  
Tel: +86 21 2892 9000

Europe  
Bologna, Italy 40013  
Tel: +39 051 4190611

Middle East and Africa  
Dubai, United Arab Emirates  
Tel: +971 4811 8100

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## Natural Gas Technologies

### Emerson Process Management Regulator Technologies, Inc.

USA - Headquarters  
McKinney, Texas 75069-1872 USA  
Tel: 1-800-558-5853  
Outside U.S. 1-972-548-3574

Asia-Pacific  
Singapore, Singapore 128461  
Tel: +65 6777 8211

Europe  
Bologna, Italy 40013  
Tel: +39 051 4190611  
Gallardon, France 28320  
Tel: +33 (0)2 37 33 47 00

## TESCOM

### Emerson Process Management Tescom Corporation

USA - Headquarters  
Elk River, Minnesota 55330-2445 USA  
Tel: 1-763-241-3238

Europe  
Selmsdorf, Germany 23923  
Tel: +49 (0) 38823 31 0



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