

EXA STAR Modulating E42, E52, E62 Valve Series

⚠ WARNING

Read these instructions carefully. Failure to follow them could result in a fire or explosion causing property damage, personal injury, or loss of life.

Service and/or installation must be performed by a trained, experienced service technician.

Disconnect power before installation to prevent electrical shock, equipment or control damage.

WHAT TO DO IF YOU SMELL GAS

1. Do not operate any appliance.
2. Do not touch any electrical switch; do not use any phone in your building.
3. Immediately evacuate the area and contact the gas supplier. Follow the gas supplier's instructions.
4. If you cannot reach the gas supplier, call the fire department.

⚠ WARNING

This control **must** be installed and operated **strictly** in accordance with the instructions of the OEM and with all applicable government codes and regulations, e.g. plumbing, mechanical, and electrical codes and practices. These instructions do not supersede OEM's installation or operating instructions.

DESCRIPTION

The E42, E52, and E62 Series valves are designed to have a linear relationship between the control signal and flow rate. The flow rate linearization is optimized over a 5:1 turndown* with the maximum flow rate determined at 1" w.c. pressure drop. See Sizing Chart (Table 1, page 2).

On atmospheric low-pressure applications, the E42, E52, E62 Series' more consistent gain allows the controller's entire control signal range to be utilized and tuning is simplified.

This is a vast improvement over control valves using ball, butterfly, and poppet valve designs. Their parabolic flow rate characteristic significantly reduces the effective control signal range of the controller and can make tuning difficult.

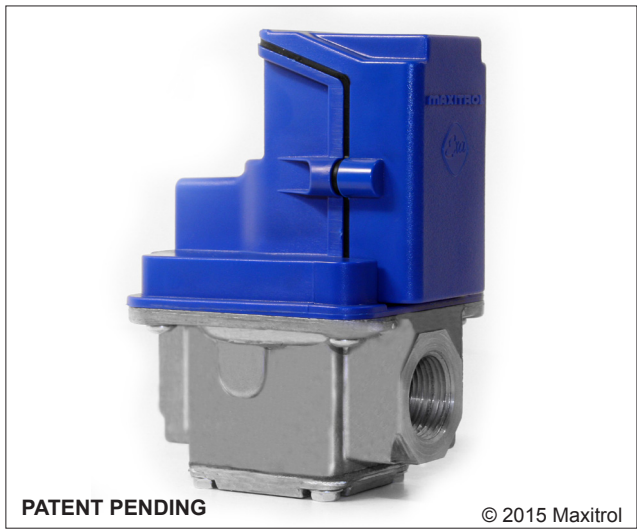
The EXA STAR modulating valve has a built-in digital controller that provides a seamless interface with a process controller.

The valve has two (2) buttons and a communication LED for the user interface. The buttons are for setting the valve for high and low fire settings (see Figure 4, page 4).

The valve has full open and full closed (not gas tight) mechanical limits. The user can program the settings that are within the valve's mechanical limits.

There are six (6) electrical connections on the EXA valve. Two (2) for power, two (2) for the control signal, and two (2) for position feedback (see Figure 2, page 2).

*For higher turndown ratios please consult Maxitrol Company.



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Figure 1: EXA STAR Modulating Valve Series

SPECIFICATIONS

Maximum Inlet Pressure: 5 psig

Power Requirements: 24 VAC/DC +/- 10% 50/60 hz
NOTE: The E42H, E52H, E62H use half-wave rectifiers. When using a single transformer for powering the E42H, E52H, E62H and devices with half-wave rectifiers, the common for each must be connected to the same leg of the transformer. Control signal devices with full-wave bridge rectifiers require a separate transformer. See "Power Supply Compatibility" bulletin.

Maximum Current Draw: 200 mA

Temperature Limits: -40° F to 150° F operating

Control Signal (user selectable): 0-10 VDC, 2-10 VDC, 0-20 mA, 4-20 mA; 100K Ohm Input Impedance

Mounting: Multipoise

Gases: Suitable for natural, manufactured, mixed gases, liquefied petroleum gases, and LP gas-air mixtures.

- Certifications:**
- EMC (EN 61000:2001)
 - Immunity (EN 61000-6-2:2001)
 - Emissions (EN 61000-6-4:2001)
 - UL Recognized
 - CE

Enclosure: IP40

Electrical Connection: UL310

- Sizes:** E42: 3/8", 1/2" NPT or Rp ISO 7-1
 E52: 1/2", 3/4" NPT or Rp ISO 7-1
 E62: 3/4", 1" NPT or Rp ISO 7-1

SPECIFICATIONS CONTINUED

Sizing

Valve sizing and selection is based on the typical 1.0" w.c. pressure drop allowance at maximum flow rate. Using the Sizing Chart (Table 1, page 1), find the closest flow rate which meets or exceeds the appliance's maximum modulated flow rate.

Table 1: Sizing Chart

Flow Capacity @ 1" w.c. Pressure Drop		
Model	Nat Gas	LP
E42.22	60K	100K
E42.26	100K	175K
E52.22	175K	250K
E52.24	250K	400K
E52.28	400K	600K
E62.22	400K	600K
E62.26	600K	

Control Signal

The control signal indicates a position within the valve's programmed range of modulation.

NOTE: Control signal is polarity sensitive. Connect control signal positive (+) to terminal 1 and control signal return (-) to terminal 2 (see Table 2).

The control signal is "scaled" between the high and low fire setting of the valve. The minimum control signal will correspond to the programmed low fire setting, and the maximum control signal will correspond to the programmed high fire setting.

Table 2: Connection Table

Connection Table			
Terminal 1	Terminal 2	Terminal 3	Terminal 4
Signal (+)	Signal (-)	Power (+)	Power (-)

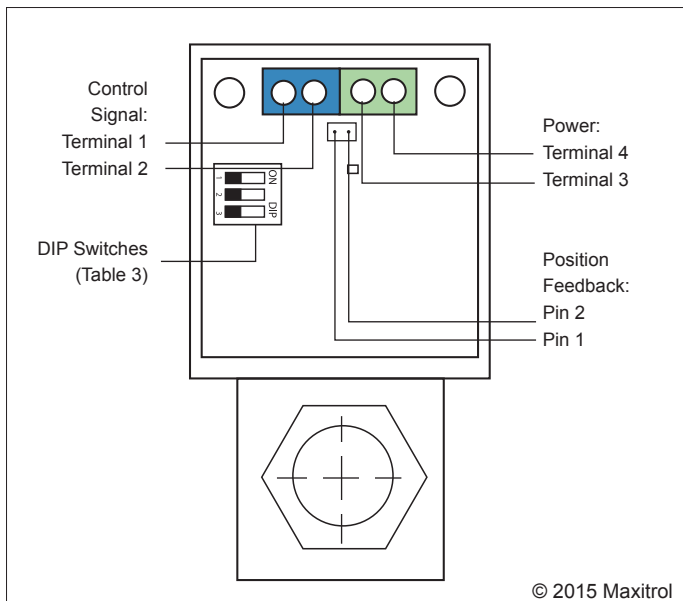


Figure 2: EXA STAR Modulating Valve Series Connections

DIP Switches

A three (3) position DIP switch is located on the PCB (see Figure 2). Change the signal type and offset by changing the position of DIP switches. (For DIP switch position and corresponding current/voltage ranges, see Table 3).

Table 3: Dip Switch Position Table

DIP Switch Position Table			
Control Signal	SW1 Signal	SW2 Offset	SW3 Characteristic
0-10 V	OFF	OFF	OFF
2-10 V	OFF	ON	OFF
0-20 mA	ON	OFF	OFF
4-20 mA	ON	ON	OFF

POSITION FEEDBACK OUTPUT SPECIFICATION

The PWM output will give a feedback to correspond with the current valve position between the programmed minimum and maximum positions. The duty cycle range is always scaled from the programmed minimum to the programmed maximum position.

- Frequency:** 200 Hz \pm 1 Hz
- Resolution:** 9-bit (0.29% duty cycle)
- Duty Cycle:** 3% @ programmed minimum position
97% @ programmed maximum position
- Output Impedance:** 3.2 k Ω \pm 0.1 k Ω
- Output High Voltage:** 5.0 V nominal
5.25 V maximum

NOTE: Output high level varies with the load current at the PWM output.

- Output Low Voltage:** 0.0 V + 0.01 V
Pin 1: (-) negative polarity
Pin 2: (+) positive polarity
(see Figure 2)

- Connection:** TYCO MTA-100 or EQ.
(REF. 3-640442)

EXA STAR Modulating Valve Series

DIMENSIONS

NOTE: Dimensions are to be used only as an aid in designing clearance for the valve. Actual production dimensions may vary somewhat from those shown (see Table 4 and Figure 3).

Table 4: Dimensions

Model	Swing Radius (SR)	Dimensions inches (millimeters)					
		A	B	C	D	E	F
E42	4.0 (102)	4.8 (122)	1.0 (26)	2.1 (54)	3.7 (94)	2.4 (61)	2.4 (61)
E52	4.3 (110)	5.5 (140)	1.3 (34)	3.4 (87)	3.7 (94)	3.3 (84)	2.4 (61)
E62	4.6 (117)	6.0 (153)	1.5 (39)	4.1 (105)	4.1 (105)	3.9 (100)	2.4 (61)

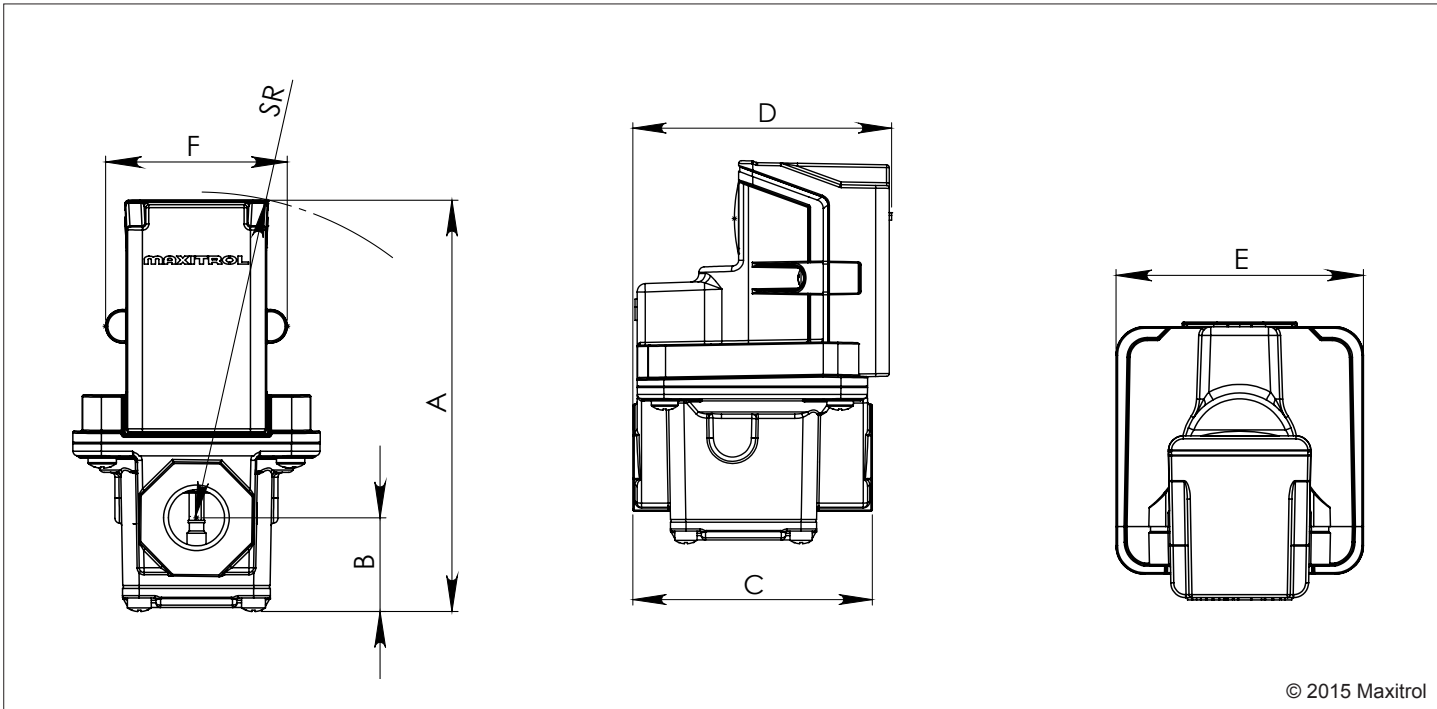


Figure 3: EXA STAR Modulating Valve Series Dimensions

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EXA STAR Modulating Valve Series

CONNECTIONS

- Step 1: Remove two (2) screws holding cover.
- Step 2: Switch power and control signal to OFF position.
- Step 3: Connect 24V (AC/DC) power source to terminals 3 and 4. Note polarity when using a DC power source or if one leg of an AC transformer secondary is externally grounded or is sharing power with another half-wave device (see Figure 2, page 2).
- Step 4: Set DIP switches to match available control signal (see Table 3, page 2).
- Step 5: Connect control signal to terminals 1 and 2. Observe polarity.
NOTE: The return, or signal ground, must be connected to terminal 2 (see Figure 2, page 2).
- Step 6: Switch power and control signal to ON position.
- Step 7: Set valve (see “Valve Setting” section below).
- Step 8: Replace cover.

VALVE SETTING

The EXA STAR modulating valve series has two (2) buttons and a communication LED for the user interface. The buttons are used to set the valve for high and low fire settings (see Figure 4).

1. High Fire Setting (LED will be solid red)
2. Low Fire Setting (LED will be blinking red)
3. Operating Mode (LED will be OFF)

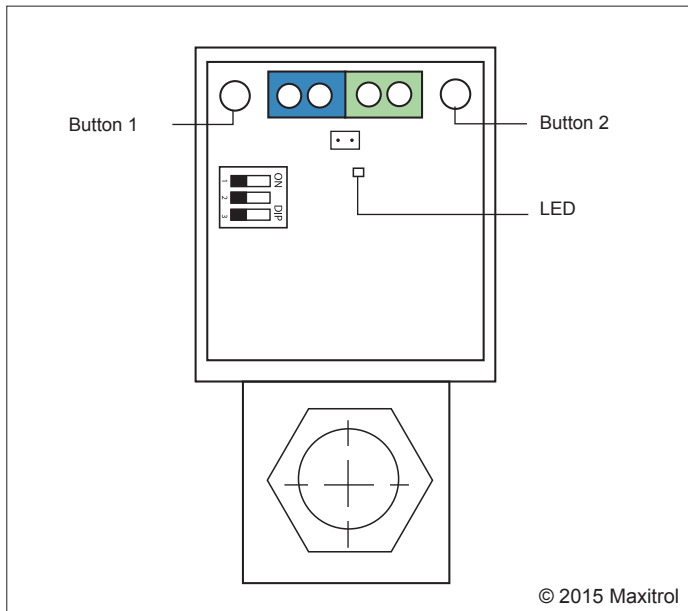


Figure 4: EXA STAR Modulating Valve Series Adjustment Controls

HIGH FIRE SETTING - BUTTON #1

To enter the high fire setting mode, press and hold Button #1 until the LED lights solid red. Release. The valve is now in the high fire setting mode. Buttons #1 and #2 are used to set desired high fire setting.

To increase gas flow slowly, press button #1. Each button press will increase gas flow by the minimum available step size. To increase gas flow rapidly, hold button #1. Holding the button down allows the valve to auto step and eliminates the need to repeatedly press the button.

To decrease gas flow slowly, press button #2. Each button press will decrease gas flow by the minimum available step size. To decrease gas flow rapidly, hold button #2. Holding the button down allows the valve to auto step and eliminates the need to repeatedly press the button.

To save the high fire setting, simultaneously hold Buttons #1 and #2 until the LED turns OFF.

NOTE: Controls left in any setting mode will default to the current settings and return to normal operating mode after 5 minutes of inactivity.

LOW FIRE SETTING - BUTTON #2

To enter into the low fire setting mode, press and hold Button #2 until the LED light blinks red. Release. The valve is now in the low fire setting mode. Buttons #1 and #2 are used to set the desired low fire setting.

To decrease gas flow slowly, press button #2. Each button press will decrease gas flow by the minimum available step size. To decrease gas flow rapidly, hold button #2. Holding the button down allows the valve to auto step and eliminates the need to repeatedly press the button.

To increase gas flow slowly, press button #1. Each button press will increase gas flow by the minimum available step size. To increase gas flow rapidly, hold button #1. Holding the button down allows the valve to auto step and eliminates the need to repeatedly press the button.

To save the low fire setting, simultaneously hold Buttons #1 and #2 until the blinking LED turns OFF.

NOTE: Controls left in any setting mode will default to the current settings and return to normal operating mode after 5 minutes of inactivity.

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