

## Current - Pneumatic Transducers

### Models 443A and 445A

#### DESCRIPTION

The Model 443A and 445A Robertshaw Current - Pneumatic Transducers convert a DC current signal to a proportional pneumatic signal. Used with pneumatic devices, they permit the complete utilization of the speed of electronic transmission, reduce time-distance considerations, and broaden the scope of pneumatic instrumentation.

#### PRINCIPLE OF OPERATION

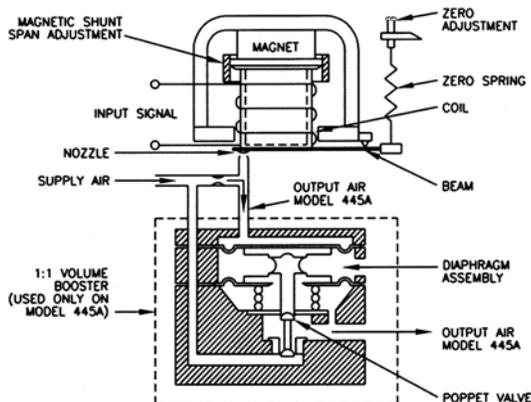
The 443A and 445A Current-Pneumatic Transducers can be connected for either direct or reverse action by reversing the DC current input wires and re-zeroing the device. In the direct action mode, increasing current increases the output air pressure where-as in the reverse-action mode, increasing input current decreases the output air pressure.

The coil, which is mounted on a beam, is suspended in the magnetic field of a permanent magnet. Current flow through the coil creates a force which moves the coil through the magnetic field varying the beam position with respect to the nozzle.

In direct action, an increase in input current to the coil moves the beam in the direction of the nozzle, allowing less air to bleed through it and thereby increasing output pressure. The beam moves until the force produced by the input current is equalized or rebalanced by the force produced by air pressure acting through the nozzle area against the beam.

Zero adjustment deflects the zero spring to vary the force balance on the beam to obtain the desired zero setting. Span is proportional to the flux density of the magnetic field surrounding the coil and is varied by the adjustment of the magnetic shunt.

With the pneumatic volume booster version (Model 445A), the output from the nozzle circuit is fed directly into the input chamber of a 1:1 (pressure ratio) force balance volume booster. On increasing pressure, the diaphragm assembly moves downward pushing the poppet valve off the supply seat. This allows the air to flow until the output pressure matches the input pressure. When the pressures are equal, the poppet valve reseats, closing off the supply pressure. The output pressure is then maintained at its new value.



MODEL 445A



MODEL 443A

#### FEATURES AND BENEFITS

- **External Zero Adjustment -**
- **Compatibility -**  
 With other electronic control instrumentation 1-5 ma DC, 4-20 ma DC, 10-50 ma DC and Voltage spans available.
- **Direct or Reverse Current Signal Action -**
- **Excellent Frequency Response -**  
 And dampening characteristics.
- **Compact Design -**
- **High Accuracy -**  
 Typical accuracy  $\pm 0.25\%$  ( $\pm 0.50\%$  guaranteed)  $\pm 0.25\%$  certified (Optional for 443A, 3-15 PSI Output Models only).
- **SR Certified FM Approved -**  
 See specifications.

**SPECIFICATIONS**

**Accuracy**

- Model 443A.....± 0.5% Max.
- Model 445A.....± 0.5% Max.

**Optional Accuracy** (Available only on Model 443A with 3 to 15 psig output):

- Model 443A.....High accuracy, ± 0.25% linearity  
(Includes sum of linearity, sensitivity, repeatability, and hysteresis errors)

**Air Consumption (Av.):**

- Model 443A.....6 SCFH
- Model 445A.....20 SCFH

**Maximum Delivery:**

- Model 443A.....8 SCFH
- Model 445A.....8 SCFM

**Weight:**

- Model 443A.....7 lbs.
- Model 445A.....9 lbs.

**Vibration (1G 10 to 80 Hz)**

- Model 443A.....Less than 1% shift
- Model 445A.....Less than 1% shift

**Shock: (10 ms.)**

- Model 443A.....No damage to 50G
- Model 445A.....No damage to 50G

**Ambient Temperature Effect**

- (40° to 140°F).....Less than 1% shift in zero and span for each 75°F change.

**APPROVALS**

Models 443A/445A-B(1, 2, or 3) and -A (High Accuracy) 4-20 ma DC units only, are  approved as Intrinsically Safe for Class I, Div. 1, Groups A, B, C & D when connected through a certified barrier in accordance with Robertshaw drawing 907GA695.

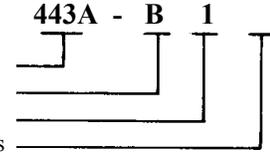
Models 443A/445A-(A, B, C, E & G) (1, 2 & 3) and -A (High Accuracy) are  approved for Explosionproof, Class I, Div. 1, Groups C & D and Class II, Div. 1, Groups E, F & G.

**ORDERING INFORMATION**

\*STANDARD MODELS **443A-B1 or 445A-B1**

OPTIONAL MODELS

Select from tables. (Allow additional 2 weeks delivery time.)



Key Model Number

Table 1 - Input Current

Table 2 - Output Pressure

Table 3 - Optional Selections

**KEY MODEL NUMBER**

Model No.	Description
*443A	I-P Transducer, delivers 0.135 SCFM output air
*445A	I-P Transducer, delivers 8.0 SCFM output air

NOTE: Place ( - ) between Model No. and Table 1.

**TABLE 1 – INPUT SIGNAL**

Designation	Description
A	1-5 ma DC, 2100 ohms.
*B	4-20 ma DC, 135 ohms.
C	10-50 ma DC, 26 ohms.
E	Voltage input 8 VDC span, temperature compensated (R = 800 ohms, I = 10 ma Span)
F	Voltage input 10 VDC span, temperature compensated (R = 1,000 ohms, I = 10 ma Span)

**TABLE 2 - OUTPUT PRESSURE**

Designation	Description
*1	3 to 15 psig output (20 psi air supply)
2	3 to 27 psig output (32 psi air supply)
3	6 to 30 psig output (35 psi air supply)

**TABLE 3 - OPTIONAL SELECTIONS (443A ONLY)**

Designation	Description
omit	None
† A	High Accuracy, ± 0.25% linearity.

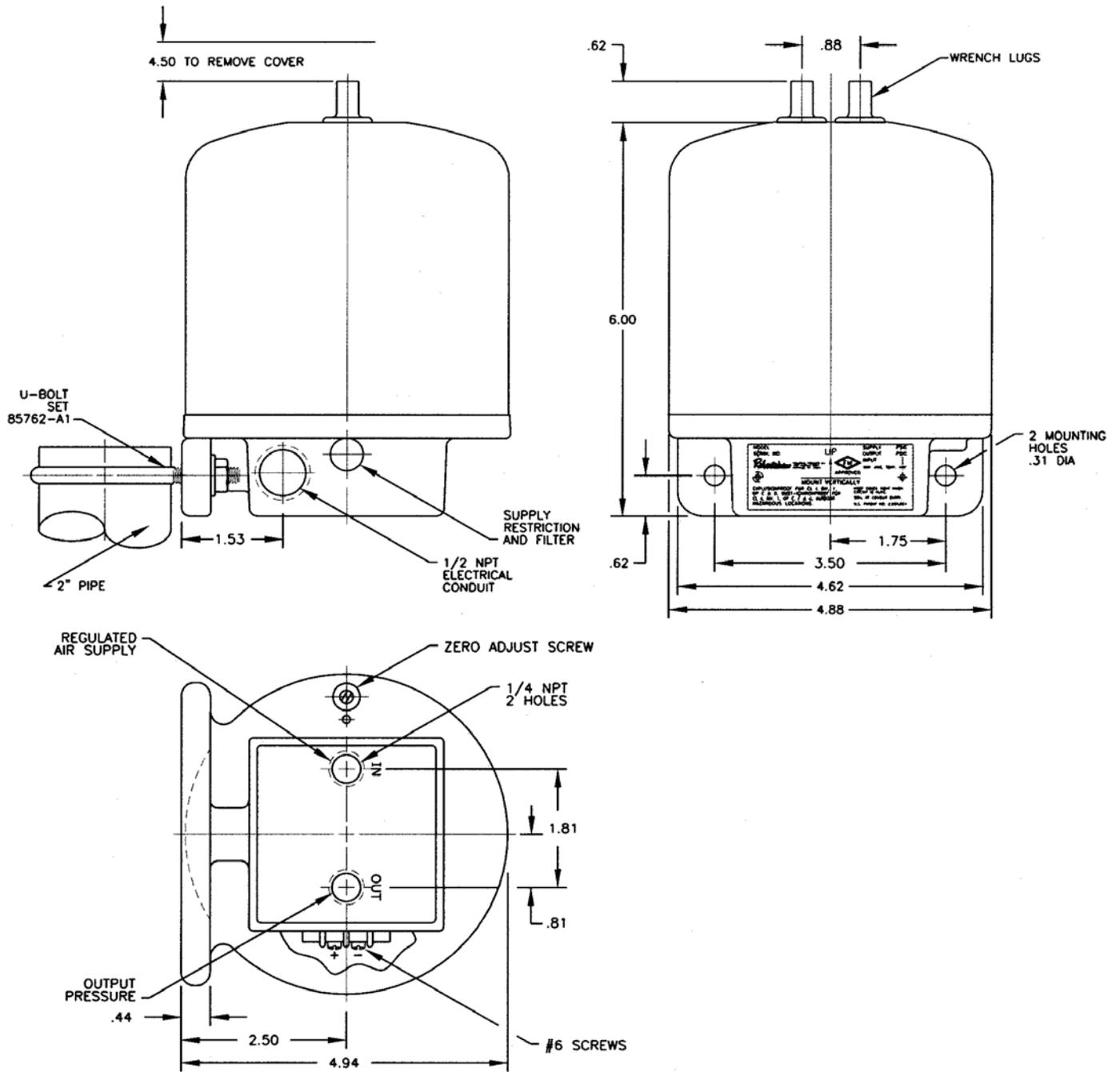
†Available on 3 to 15 psig output only.

**ACCESSORY ITEMS**

Part No.	Description
85762-A 1	U-bolt for mounting on 2" pipe.

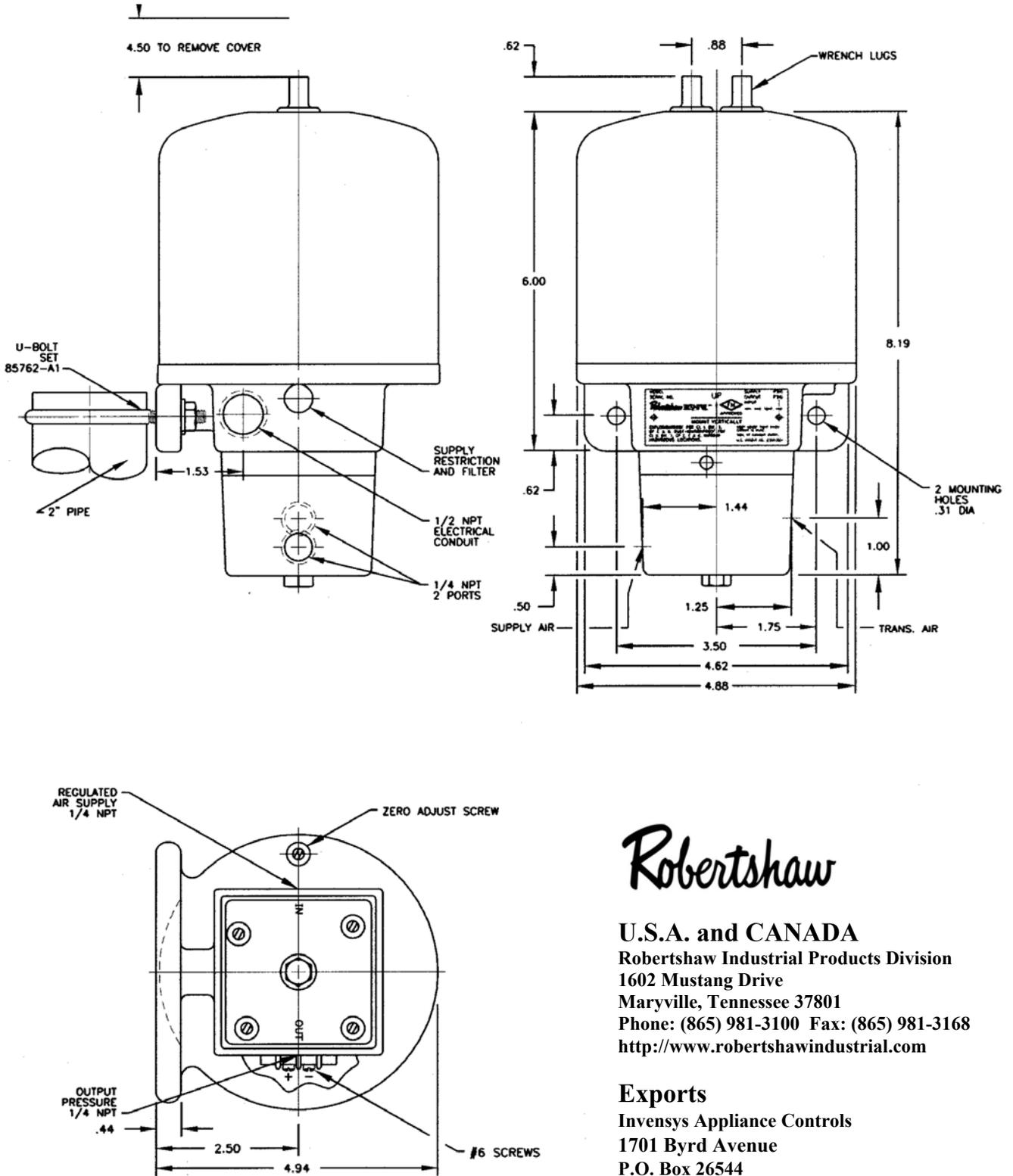
# DIMENSIONAL DATA

Model 443A



# DIMENSIONAL DATA

Model 445A



# Robertshaw

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