



**INSTRUMENT CORPORATION**

**GENERAL PURPOSE MINI-GAS MIXER**  
MODELS 8510, 8515 — 0-750 SCFH FLOW RATE



Model 8510 shown  
with optional Pressure  
Alarm System

**APPLICATION**

The general purpose mini-gas mixer is designed to create a constant proportion of virtually any two nonflammable, noncorrosive gases. The Model 8510 is used for mixing inert gases, and the Model 8515 is used for mixing when one gas is oxygen.

Common applications include shield gas for welding, leak detection mixtures, cover gas for molten metals and lamp filling mixtures.

Because the gas mixer uses a surge tank design, this type of system is ideal for applications that require maintaining a precise proportion from full mixed gas flow down to zero flow.

**FEATURES**

- Surge tank design allows infinite flow rate turn down from 750 to 0 SCFH.
- Gas mixture is set at the factory to the user specified setting. The mixture may be changed by the user to a new mixture.
- Option of pressure alarm system.

**EXAMPLES OF POSSIBLE MIXTURES**

**GAS MIXTURES**

**APPLICATIONS**

Carbon Dioxide/Argon ————  
Oxygen/Argon ————  
Helium/Argon ————

Welding Shield Gas

Helium/Nitrogen ————  
Helium/Air ————

Leak Detection

Nitrogen/Argon ————

Lamp Filling

SF<sub>6</sub>/Carbon Dioxide ————

Cover Gas for Molten Metal

## SPECIFICATIONS

### Models:

8510: Mixing 2 inert gases.  
8515: Mixing 1 inert gas and oxygen.

### Mixed Gas Flow Capacity:

0-750 SCFH (0-20.1 Nm<sup>3</sup>/h) mixed gas for both models.

### Gas Mixing Accuracy:

±5% of the minor component for minor components larger than 7.0%;  
±0.35% of the minor component absolute for components from 1.0 to 7.0%. For components less than 1.0%, consult the factory.

Example: For 25% CO<sub>2</sub> in Ar mixture, the accuracy is 25 x 0.05=±1.25% CO<sub>2</sub>; therefore, the mixture will be within the limits of 23.75% to 26.25% CO<sub>2</sub>. For a mixture of 2.0% O<sub>2</sub> in Ar, the accuracy is ±0.35% O<sub>2</sub>; the mixture will be within the limits of 1.65% to 2.35% O<sub>2</sub>.

Accuracies assume that the gases entering the gas mixer are at equal temperatures and the supply gases and the gas mixer environment are in the range of 50-90°F (10-32°C). Accuracy outside these temperature limits will vary; consult the factory for details.

### Ambient and Supply Gas Operating Temperatures:

32°F to 100°F (0°C to 38°C).

**Supply Gas Pressure:** 100-125 PSIG (6.8-8.6 barg) for major and minor gases. Input pressures do not have to be equal.

**Mixed Gas Outlet Pressure:** 10-50 PSIG (0.7-3.4 barg).

Adjustable regulator provided by Thermco in the gas mixer.

**Gas Connections and Piping:** 1/2 inch NPT female pipe for major, minor, and mixed gas connections.

**Surge Tank:** 5 gallon, carbon steel, ASME coded, and CRN registered; pressure relief valve provided.

**Power Requirements:** 115 VAC, 50/60 Hz., 0.5 ampere. Acceptable voltage range 104-126 VAC. Available on request, 220 VAC, 50/60 Hz., 0.25 ampere. Acceptable voltage range 204-240 VAC.

**Weight:** Both models, 58 lbs. (26.3 kg); packed 68 lbs. (30.8 kg).

**Dimensions:** 27.75" (70.5 cm) height, 18.75" (47.6 cm) width, 10.4" (26.4 cm) depth.

**Enclosure:** Steel material, with door gasket for protection from dust. The door is provided with a lock. This enclosure is not designed for outdoor installation.

**Mounting:** Wall or bench indoors.

## PRINCIPLES OF OPERATION

The Thermco gas mixer operates on the concept of a controlled pressure drop across flow restrictions of known performance, regardless of downstream mixed gas demand. The major gas flows through a fixed orifice and the minor gas flows through a metering valve. During periods of high mixed gas flow, there is continuous flow through the flow restrictions and the pressure drop is relatively large and easily controlled. During periods of low mixed gas flow, the flow through the flow restrictions becomes intermittent due to the action of the surge tank/solenoid valve/pressure switch combination. The result is that under changing mixed gas flows only the cycling frequency changes; the pressure drop across the flow restrictors remain the same producing the consistent mixture.

## CHANGING THE MIXTURE

The gas mixer will be set at the factory to the mixture specified by the buyer. The gas mixer may be changed by adjusting the mixture adjustment valve which is on the minor gas. A gas analyzer, such as the Thermco Model 6801 or 6900, should be used to assist in setting the new mixture.

## OPTIONAL PRESSURE ALARM SYSTEM

A pressure alarm system is available to alert personnel in the event of low input gas pressure. When one of the input gas pressures falls too low to create an accurate mixture, a light specific to the low pressure gas is illuminated on the front door, and a horn on the enclosure sounds. The operator can silence the horn with a silence button on the front door. This alarm will help prevent the creation of an improper mixture if one gas source is exhausted, or low input pressure is caused by some other reason.

## NOTICE CONCERNING SUPPLY SYSTEMS

Because these gas mixers operate by intermittently filling a surge tank in the gas mixer, the gas mixer will demand the supply gases at full gas mixer capacity for some period of time, even if the mixed gas demand is small.

Gas mixers will be made for input pressures of 100-125 PSIG and mixed gas outlet pressures of 10-50 PSIG unless ordered otherwise. Gas mixers can be made to special pressure conditions; consult Thermco for details. There is an extra charge for manufacturing to special pressure conditions.

## WARNING

Improper use of this product can cause death, serious injury, or property damage. Personnel dealing with this equipment should read and understand warning labels and instruction manuals provided by Thermco. Only personnel familiar with industrial gases should attempt to install or service this equipment. Gases from high pressure cylinders must be reduced to the specified pressure before entering the gas mixing system to prevent the possibility of equipment damage and personal injury.

Use only oxygen in gas mixers specifically designed for oxygen service. Gas mixers not designed for oxygen service cannot be converted to oxygen service.

Flammable or corrosive gases should not enter these gas mixing systems.

## DOCUMENTATION

Each gas mixer is supplied with one instruction manual which includes complete wiring and flow diagrams. A complete data sheet prepared for each gas mixer specifying major parts of the gas mixer, operating pressure settings and recommended spare parts. A copy of the instruction manual is kept on file at Thermco, and engineering assistance is provided if required. Thermco has been providing service on gas mixers since 1964.

## ORDERING INFORMATION

Thermco gas mixers are available through many local industrial gas suppliers. Thermco gas mixers may also be ordered directly from the factory. It is specially important to order the correct pressure conditions for the application. If there are questions, please contact the Thermco sales engineer.