



## VARIABLE RATIO MINI-GAS MIXER

### MODELS 8500, 8505, 9775 — 0-750 SCFH FLOW RATE



Model 8500 shown  
with optional Pressure  
Alarm System

### APPLICATION

The variable ratio mini-gas mixers are designed to create welding shield gas. There are three configurations: The Model 8500 has a range of 0-50% carbon dioxide in argon, the Model 8505 has a range of 0-10% oxygen in argon, and the Model 9775 has a range of 0-50% helium in argon. Pure gases are supplied, often in liquid cylinders, to the mini-gas mixer where they are mixed in a proportion selected by the user. The mixed gas is then distributed to the welding machines through a pipeline system. The mixture going to the welding machines will remain constant, regardless of the flowrate. The flow capacity of the Model 8500 and Model 8505 is 750 SCFH. The flow capacity of the Model 9775 is 350 SCFH. These mini-gas mixers can provide their maximum flowrate at 50 PSIG output pressure, unlike some gas mixers which have a lower capacity at their full outlet pressure.

### FEATURES

- All models are variable simply by turning a single dial.
- Surge tank design allows infinite flow rate turn down from 750 to 0 SCFH while maintaining a precise mix.
- All solid-state pressure switch which controls surge tank pressure is rated at 100 million cycles. This switch also provides a digital readout of the surge tank pressure, which can be observed through the front window.
- Diagnostics – a light on the solid-state pressure switch illuminates when the surge tank is filling.
- Optional pressure alarm system available.

## SPECIFICATIONS

Model	Range
8500	0-50% carbon dioxide in argon
8505	0-10% oxygen in argon
9775	0-50% helium in argon

### Mixed Gas Flow Capacity:

Model 8500, 0-750 SCFH (0-20.1 Nm<sup>3</sup>/h)

Model 8505, 0-750 SCFH (0-20.1 Nm<sup>3</sup>/h)

Model 9775, 0-350 SCFH (0-9.4 Nm<sup>3</sup>/h)

Note: This is the mixed gas capacity at the mid-range setting. The capacity may be more or less depending on the mixture setting. Consult Thermco for details.

### Accuracy Under

**Typical Conditions:** ±1.5% carbon dioxide Model 8500  
±0.3% oxygen Model 8505  
±1.5% helium Model 9775

(Example: For 25% carbon dioxide in argon mixture, the mix will be ±1.5% carbon dioxide; therefore, the mixture will be within the limits of 23.5% to 26.5% carbon dioxide.)

### Ambient and Supply Gas

**Operating Temperatures:** 32°F (0°C) to 104°F (40°C).

**Supply Gas Pressure:** 100-125 PSIG (6.9-8.6 barg)

**Mixed Gas Outlet Pressure:** 10-50 PSIG (0.7-3.4 barg).  
Regulator provided by Thermco in mixer for mixed gas pressure adjustment.

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

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

**Surge Tank Pressure Switch:** Solid-state sensing and output, rated 100,000,000 cycles.

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

**Weight:** Net 65 lbs. (29.5 kg); Packed 78 lbs. (35.4 kg).

**Dimensions:** 27.50" (70 cm) height, 19.1" (49 cm) width, 10.25" (26 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. The minor gas flows through a metering valve, precisely calibrated to the mixed gas proportion which is created when the valve is adjusted. 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.

## 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 horn silence button on the inner door.

## SOLID-STATE SURGE TANK PRESSURE SWITCH



The mini-gas mixer utilizes a solid-state pressure switch to control the surge tank pressure. A digital readout of the pressure is built into the switch. Both the sensing element and electrical switch are solid-state. An LED indicator shows when the surge tank is filling. Use of this pressure switch virtually eliminates the most common cause of gas mixer failure.

## REQUIRED SUPPLY PRESSURE

The user must provide a supply of gases that will maintain a minimum of 100 PSIG (standard unit) at the maximum gas mixer flowrate. The gas mixer will require its maximum flowrate when the gas mixer is filling its surge tank. For example, a Model 8500 mixing 25% carbon dioxide, 75% argon has a maximum flowrate of 750 SCFH. This would calculate to 187.5 SCFH of carbon dioxide and 562.5 SCFH of argon. This is the minimum flowrate the carbon dioxide and argon sources must be capable of supplying for proper mixer operation.

Gas mixers will be made for input pressures of 100-125 PSIG and mixed gas output pressures of 10-50 PSIG unless ordered otherwise. Gas mixers may 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 is 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.