



MODEL 8106 BULK GAS MIXER

0-2000 SCFH FLOW RATE



APPLICATION

The Thermco Model 8106 gas mixer is designed to mix two non-flammable and non-corrosive gases. The primary application for the Model 8106 is for shield gases for welding. The Model 8106 is supplied without a gas analyzer although it has been designed to easily accept a gas analyzer in the field if the user desires to add one at a later time.

The capacity of the Model 8106 is 0 to 2000 SCFH.

The Model 8106 comes standard with a weatherproof enclosure, so the gas mixer may be placed indoors or outdoors.

FEATURES

- Surge tank design allows infinite flow rate turn down from 2000 to 0 SCFH
- Gas mixer includes weatherproof lockable cabinet for indoor or outdoor installation
- Easily convertible to analyzer type system
- Option of pressure alarm system

EXAMPLES OF POSSIBLE MIXTURES

GAS MIXTURES

APPLICATIONS

Carbon Dioxide/Argon	}	Welding Shield Gas
Oxygen/Argon		
Helium/Argon		
Helium/Nitrogen	}	Leak Detection
Helium/Air		
Nitrogen/Argon		Lamp Filling

SPECIFICATIONS

Standard Ranges:

0-30% CO₂ in Argon
0-10% Oxygen in Argon
0-50% Helium in Argon
0-50% Nitrogen in Argon
0-50% Helium in Nitrogen
0-50% Helium in Air
custom ranges are available

Mixed Gas Flow Capacity:

Rated capacity of 0-2000 SCFH (0-53.6 Nm³/h) is at midrange setting. Less capacity is available below midrange setting and more capacity is available above midrange setting. Consult Thermco for details on available capacity. Midrange setting is the middle of the gas mixer adjustment range, i.e., a gas mixer with a range of 0-30% CO₂ in argon has a midrange setting of 15% CO₂ in argon.

Gas Mixing Accuracy:

±2% of full range over 60°F to 80°F (15°C to 27°C)
temperature range.
±4% of full range over 32°F to 104°F (0°C to 40°C)
temperature range.
±8% of full range of -10°F to 104°F (-23°C to 40°C)
temperature range.

Stated accuracy assumes that the input temperature of the gases are equal.

Gas mixer accuracies depend upon many variables, including gas mixer maintenance and environmental conditions around the gas mixer. These accuracies are presented as typical performance for these systems.

Ambient and Supply Gas Operating Temperatures:

Ambient and Process Gas -10°F to 104°F (-23°C to 40°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 gas mixer.

Gas Connections and Piping: 1 inch NPT female pipe for major, minor, and mixed gas connections. Piping and tubing are brass and copper materials.

Surge Tank: 30 gallon, carbon steel, ASME coded, and CRN registered; pressure relief valve provided.

Surge Tank Pressure Switch: Solid-state, rated 100,000,000 cycles.

Power Requirements: 115 VAC, 50/60 Hz, 1.0 ampere. Acceptable voltage range 104-126 VAC. Available on request, 220 VAC, 50/60 Hz, 0.5 ampere. Acceptable voltage range 204-240 VAC.

Weight: 245 lbs. (111 kg); crated 420 lbs. (191 kg).

Dimensions: 57" (145 cm) height, 43" (109 cm) width, 18" (46 cm) depth.

Enclosure: Carbon steel material, weatherproof, lockable.

CHANGING THE GAS MIXTURE

The gas mixer will be set at the factory to the midrange setting or a mixture that is requested by the buyer. The gas mixer may be changed by adjusting the mixture adjustment valve which is on the minor gas. A chart of turns open versus % mixture will be provided in the instruction manual to assist in mixture changes. For precise adjustment to new settings, it is recommended that the user use a portable gas analyzer, such as the Thermco Model 6800 or 6900.

PRINCIPLES OF OPERATION

The gases to be mixed are supplied from bulk storage systems, typically at pressures of 100 to 125 PSIG. Within the gas mixer, these gas streams are regulated to the same pressure. Downstream of the gas regulators, the major gas flows through a fixed orifice and the minor gas flows through a mixture adjustment valve. After passing through these devices, the two gas streams are combined and pass into a surge tank. Once the pressure in the surge tank reaches the upper setpoint on the pressure switch, the gas supplies are automatically shut off with a solenoid valve. As mixed gas is required, the pressure in the surge tank falls until it reaches the lower setpoint of the pressure switch. At this point the gas supplies are turned on and the cycle repeats.

The principle of the system is that under changing mixed gas flow rate only the cycling frequency changes. The pressure drop across the flow devices remain the same producing the consistent mixture.

OPTIONS

The Model 8106 is designed to accept the Thermco Model 7010 gas analyzer. A description of this analyzer is found on Thermco Specification Sheet 119. The Model 8106 will accept either the standard or alarm package type Model 7010.

The Model 8106 can also be used with the Thermco pressure alarm system. This is described on Thermco Specification Sheet 126. The Model 8106 may be initially ordered with the pressure alarm system, or this may be added in the field. The pressure alarm system is not suitable for outdoor installation.

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. For this reason, bulk gas supply systems (not portable liquid cylinders) should be used for the major gas, and in some circumstances, the minor gas. Please contact the Thermco sales engineer for guidance.

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.

Only use 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 two instruction manuals which include 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.