GAS MIXER ACCURACY

±0.5% of full range for 0-53.6 Nm$^3$/h.

GAS INDEX

- AI: Argon
- CI: Carbon Dioxide
- MI: Helium
- NI: Nitrogen
- O: Oxygen

GAS MIXER MODEL NUMBER SYSTEM

Example:

For an indoor gas mixer, 0-2,000 SCFH, with a range of 0-30% Carbon Dioxide in Argon, with the alarm package, setup for 115 VAC, with an inlet pressure range of 100-125 PSIG, the model number is:

6205CA30A1100

The gas mixer will be tested for 24 hours on the process gases at required pressure conditions to assure gas mixture accuracy and reliability.

THE THERMCO QUALITY ASSURANCE TEST

The gas mixer will be tested for 24 hours on the process gases at required pressure conditions to assure gas mixture accuracy and reliability.
The Thermco gas mixer is designed to mix two non-flammable and non-corrosive gases. The gas mixer is normally supplied with a process wherein the supply gases are drawn from bulk sources and the mixture is produced on-site where it is supplied to the user process where the supply gases are drawn from bulk sources and the mixture is produced on-site where it is supplied to the user process. When the desired mixture is created, the mixing system is manufactured with a style gas mixer, with analog meter, no alarm package. A popular option with the gas mixers is automatic alarms to alert personnel when an improper gas mixture is being created. When alarms are ordered on the gas mixing system, the standard analog meter is replaced with a digital meter. This alarm option is described as the alarm package. The alarm package includes high and low alarm contacts on the digital meter, a warning light on the analyzer, a horn that is mounted on the panel(or weatherproof enclosure), and a horn silence button.

**APPLICATION**

Within the gas mixer, the major and minor gas streams are regulated to the same pressure. Pneumatics of the regulation, the major gas flows through the orifices which are metering valves where all is an adjustable orifice. The orifices are chosen according to the temperature and flow conditions and are inserted in a surge tank. Once the pressure in the surge tank reaches the upper setpoint on a pressure switch, the gas supplies are automatically shut-off with a solenoid valve. As the minor gas is required the pressure in the surge tank falls until the pressure switch is tripped. The gas analyzer continuously monitors the mixture in the surge tank. If a mixture adjustment is to be made, the operator uses a metering valve which acts as an adjustable orifice. The pressure in the surge tank is regulated to the same pressure as the mixture is being created. When alarms are ordered on the gas mixing system, the standard analog meter is replaced with a digital meter. This alarm option is described as the alarm package. The alarm package includes high and low alarm contacts on the digital meter, a warning light on the analyzer, a horn that is mounted on the panel(or weatherproof enclosure), and a horn silence button.

**SOLID STATE SURGE TANK PRESSURE SWITCH**

The gas analyzer utilizes a solid-state pressure switches to control the surge tank pressure. A digital readout of the pressure in the surge tank is built into the meter. The pressure switch is provided with an LED indicator when the surge tank reaches the upper setpoint. Use of this pressure switch virtually eliminates the most common cause of gas mixer failure.

**THERMCO GAS ANALYZER**

The gas analyzer constantly monitors the mixture produced by the system. The analyzer is ideally suited for measurement of two gas mixtures. Instead, an oxygen specific analyzer is utilized, based on the electrochemical fuel cell or paramagnetic principle. Gas mixers for this application are designed for measurement of two gas mixtures. The analyzer in the mixing system is a thermal conductivity analyzer manufactured by Thermco. This analyzer is ideal for measurement of two gas mixtures. Calibration of the gas mixer with a known gas is recommended once a year. The temperature sensitive detector is calibrated to the same pressure as the mixture is being created. When alarms are ordered on the gas mixing system, the standard analog meter is replaced with a digital meter. This alarm option is described as the alarm package. The alarm package includes high and low alarm contacts on the digital meter, a warning light on the analyzer, a horn that is mounted on the panel(or weatherproof enclosure), and a horn silence button.

**PRINCIPLES OF OPERATION**

Gas mixes are created by mixing two or more gases. In the gas mixer, the major and minor gas streams are regulated to the same pressure. Pneumatics of the regulation, the major gas flows through the orifices which are metering valves where all is an adjustable orifice. The orifices are chosen according to the temperature and flow conditions and are inserted in a surge tank. Once the pressure in the surge tank reaches the upper setpoint on a pressure switch, the gas supplies are automatically shut-off with a solenoid valve. As the minor gas is required the pressure in the surge tank falls until the pressure switch is tripped. The gas analyzer continuously monitors the mixture in the surge tank. If a mixture adjustment is to be made, the operator uses a metering valve which acts as an adjustable orifice. The pressure in the surge tank is regulated to the same pressure as the mixture is being created. When alarms are ordered on the gas mixing system, the standard analog meter is replaced with a digital meter. This alarm option is described as the alarm package. The alarm package includes high and low alarm contacts on the digital meter, a warning light on the analyzer, a horn that is mounted on the panel(or weatherproof enclosure), and a horn silence button.

**APPLICATIONS**

- **Carbon Dioxide/Argon**
- **helium/Ar*og*on**
- **helium/Nitrogen**
- **helium/Ar*og*on**
- **Carbon Dioxide/Argon**

**SPECIAL DESIGNS**

- **Customized designs are frequently manufactured for specific customer requirements.**

**ALARM PACKAGE**

- **A popular option with the gas mixer is automatic alarms to alert personnel when an improper gas mixture is being created.**
- **When alarms are ordered on the gas mixing system, the standard analog meter is replaced with a digital meter. This alarm option is described as the alarm package. The alarm package includes high and low alarm contacts on the digital meter, a warning light on the analyzer, a horn that is mounted on the panel(or weatherproof enclosure), and a horn silence button.**

**GAS MIXING SYSTEMS**

- **Special Mixing System with 5900 Gallon Surge Tank**
- **Gas analyzer calibrated for oxygen in argon, for indoor style gas mixer with analog meter, no alarm package.**

**THERMCO GAS ANALYZER**

- **The gas analyzer continuously monitors the mixture produced by the system. The analyzer is ideally suited for measurement of two gas mixtures.**
- **Instead, an oxygen specific analyzer is utilized, based on the electrochemical fuel cell or paramagnetic principle.**
- **Gas mixers for this application are designed for measurement of two gas mixtures.**
- **The analyzer in the mixing system is a thermal conductivity analyzer manufactured by Thermco.**
- **This analyzer is ideal for measurement of two gas mixtures.**
- **Calibration of the gas mixer with a known gas is recommended once a year.**
- **The temperature sensitive detector is calibrated to the same pressure as the mixture is being created.**
- **When alarms are ordered on the gas mixing system, the standard analog meter is replaced with a digital meter. This alarm option is described as the alarm package. The alarm package includes high and low alarm contacts on the digital meter, a warning light on the analyzer, a horn that is mounted on the panel(or weatherproof enclosure), and a horn silence button.**
**APPLICATION**

The Thermco gas mixer is designed to mix two non-flammable and non-explosive gases. The gas mixer is normally supplied with a pressure where the supply gases are delivered from both mixes. The pressure for each mix is controlled by a solenoid valve, which is activated by a pressure switch. Each mix is sent through a metering valve which acts as an adjustable orifice. The metering valve creates a constant pressure drop across the metering valve's orifice. This constant pressure drop is used to control the flow rate of each gas stream. The two gas streams are mixed together under turbulent flow conditions. When the mixture reaches the desired pressure, the surge tank fills. The gas analyzer monitors the mixture in the surge tank. When it reaches its lower setpoint, the solenoid valve is opened and the cycle repeats.

**PRINCIPLES OF OPERATION**

Within the gas mixer, the major and minor gas streams are regulated to the same pressure. The mixture of the regulated gases, the major gas flows through the metering valve which acts as an adjustable orifice. The metering valve creates a constant pressure drop across the metering valve’s orifice. This constant pressure drop is used to control the flow rate of each gas stream. The two gas streams are mixed together under turbulent flow conditions. When the mixture reaches the desired pressure, the surge tank fills. The gas analyzer monitors the mixture in the surge tank. When it reaches its lower setpoint, the solenoid valve is opened and the cycle repeats.

The gas analyzer continuously monitors the mixture in the surge tank. The operator adjusts the minor gas flow rate to achieve the desired mixture. Once the desired mixture is obtained, the mixing system will maintain a constant mixture ratio.

**SOLID-STATE SURGE TANK PRESSURE SWITCH**

The gas mixer utilizes a solid-state pressure switch to control the surge tank pressure. A digital readout of the pressure inside the tank is built into the set up. The mixer is mounted and the pressure inside the tank is monitored. An LED indicator lights when the surge tank reaches the desired pressure. Use of the pressure switch virtually eliminates the most common cause of gas mixer failure.

**APPLICATIONS**

- **Continuous gas analysis of the gas mixture**
- **0-2000, 0-5000, 0-10,000, and 0-20,000**

**THERMCO GAS ANALYZER**

The gas analyzer constantly monitors the mixture produced by the system. The analyzer will immediately detect an improper gas mixture generated by the mixer. The analysis will immediately shut down the gas mixer to prevent gas supplies being switched to the wrong application. The analyzer will detect an improper gas mixture being created by the system. The analysis will immediately shut down the gas mixer to prevent gas supplies being switched to the wrong application.

**ALARM PACKAGE**

A popular option with the gas mixers is automatic alarms to alert personnel when an improper gas mixture is being created. When alarms are ordered on the gas mixing system, the standard analog meter is replaced with a digital meter. The alarm option is described as the alarm package. The alarm package includes high and low alarm contacts on the digital meter, a warning light on the analyzer, a horn that is activated on the panel when an unadjusted pressure switch is reached. An alarm silence button is also available.

**APPLICATIONS**

- **Special Designs**

**THERMCO GAS ANALYZER**

The analyzer in the mixing system is a thermal conductivity type manufactured by Thermco. This analyzer is ideal for measurement of low gas mixtures. Calibration of the gas analyzer with known gas is recommended once a year. The weatherproof type gas analyzer can be used in all applications. It can be used for applications where the analyzer is exposed to the elements. The analyzer also has an optional alarm option that includes high and low alarm contacts on the digital meter, a warning light on the analyzer, and a horn silence button.

**APPLICATIONS**

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PRINCIPLES OF OPERATION

Within the gas mixer, the major and minor gas streams are regulated to the same pressure. Flowmeters of the regulators, the major gas flows through the orifices and the minor gas through a metering valve which acts as an adjustable orifice. The gas streams are mixed in a surge tank. Once the pressure in the surge tank reaches the upper setpoint the gas supplies are shut off to maintain the mixture. The minor gas is required to keep the pressure in the surge tank until the cycle repeats. The minor valve is opened and the cycle repeats.

The gas analyzer continuously monitors the mixture in the surge tank. If a mixture adjustment is to be made, the operator opens the minor valve, the cycle repeats.

SOLID-STATE SURGE TANK PRESSURE SWITCH

The gas analyzer utilizes a solid state pressure switch to control the surge tank pressure. A digital readout of the pressure conditions and flowrates higher than 5000 SCFH are available for this application.

APPLICATION

The Thermco gas mixer is designed to mix two non-flammable and non-explosive gases. The gas mixer is normally used with a process where the major gas is drawn from bulk sources and the minor gas is a mixed gas produced on-site where it is supplied to the process where the supply gases are drawn from bulk sources. The gas mixer is normally used with non-corrosive gases. The gas mixer are not required. This design is simple and rugged; controllers or flowmeters on the process gas are not required. Controllers or flowmeters on the inlet pressure and required accuracy.

APPLICATIONS

• Same benefits of Indoor design plus a
  MODEL 8105, 8205, 8305, 8405
  FOR INDOOR LOCATIONS
  • Continuous gas analysis of the gas mixture, optional alarms available
  • Surge tank design produces a constant gas mixture proportion from offshift to full flow conditions

THERMCO GAS ANALYZER

The gas analyzer constantly monitors the mixture produced by the gas mixer. The analyzer will immediately detect any improper gas mixture changes; the pressure drops across the orifices remain the same mixture ratio.

The analyzer in the mixing system is a thermal conductivity type manufactured by Thermco. This analyzer is ideal for measurement of two gas mixtures. Calibration of the gas mixers with a known gas is recommended once a year. The weatherproof type gas analyzer is a thermal conductivity type manufactured by Thermco. This analyzer is ideal for measurement of two gas mixtures. A popular option with the gas mixers is automatic alarms to alert personnel when an improper gas mixture changes; the pressure drops across the orifices remain the same mixture ratio.

ALARM PACKAGES

A digital meter, a warning light on the analyzer, a horn that is activated on the panel or weatherproof enclosure, and a horn silence button. In certain situations it may be required that the minor gas, major gas, or mixed gas be shutoff on an alarm condition. This design is simple and rugged; controllers or flowmeters on the process gas are not required.

Special Designs

Customized designs are frequently manufactured for specific customer requirements.

Lamp Filling - Precise mixture of nitrogen and oxygen is available for this application. Special construction to minimize particulate and impurities in the gas mixture is available for this application. THERMCO GAS ANALYZER

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Special Designs

Customized designs are frequently manufactured for specific customer requirements.
**GAS ANLAYSER**

**PRINCIPLE OF OPERATION**
Thermal conductivity method used by Thermco.

**RANGE**
The range of the analyzer will be the same as the gas mixer, except for the 0-30% CO2 in argon gas mixer, which has a lower
range (0-15% CO2) or argon.

**ANALYZER INDICATION**
Analogue meter versions, 6″ x 1 1/2″ circular, non-linear direct reading scale. The reading meter is only available on 115 VAC and
some environmental conditions. Digital meter versions, resolution 0.1%, almost readout in gas present, but in non-environmental
burnout.

**PERFORMANCE**
4-20 mA, proportional to gas analysis range selected. This output is
isolated and will perform with a compliance of 10 VDC. This output is
not available on the analogue meter versions.

**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
is not being used.

**NORMAL MIXED GAS OUTLET PRESSURE RANGE**
6305, 6405, 8305, 8405.

**Minor Gas**
Range of 0-30% CO2 in argon has a midrange setting of 15% CO2 in
middle of the gas mixer adjustment range, i.e., a gas mixer with a
lower gas mixer capacity will have higher minimum temperature ratings. Consult factory for

**GAS INDEX**

**FLOW RATE**

<table>
<thead>
<tr>
<th>Gas</th>
<th>Flow Rate 0-5000 SCFH</th>
<th>Flow Rate 0-10,000 SCFH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helium</td>
<td>0-50%</td>
<td></td>
</tr>
<tr>
<td>Oxygen</td>
<td>0-50%</td>
<td></td>
</tr>
<tr>
<td>Argon</td>
<td>0-50%</td>
<td></td>
</tr>
<tr>
<td>Nitrogen</td>
<td>0-50%</td>
<td></td>
</tr>
<tr>
<td>Hydrogen</td>
<td>0-50%</td>
<td></td>
</tr>
</tbody>
</table>

**ACQUISITION RANGE**

<table>
<thead>
<tr>
<th>Gas</th>
<th>Acquisition Range 0-5000 SCFH</th>
<th>Acquisition Range 0-10,000 SCFH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helium</td>
<td>0-50%</td>
<td></td>
</tr>
<tr>
<td>Oxygen</td>
<td>0-50%</td>
<td></td>
</tr>
<tr>
<td>Argon</td>
<td>0-50%</td>
<td></td>
</tr>
<tr>
<td>Nitrogen</td>
<td>0-50%</td>
<td></td>
</tr>
<tr>
<td>Hydrogen</td>
<td>0-50%</td>
<td></td>
</tr>
</tbody>
</table>

**NORMAL MIXED GAS OUTLET PRESSURE RANGE**

<table>
<thead>
<tr>
<th>Gas</th>
<th>Normal Mixed Gas Outlet Pressure Range 0-5000 SCFH</th>
<th>Normal Mixed Gas Outlet Pressure Range 0-10,000 SCFH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helium</td>
<td>0-50%</td>
<td></td>
</tr>
<tr>
<td>Oxygen</td>
<td>0-50%</td>
<td></td>
</tr>
<tr>
<td>Argon</td>
<td>0-50%</td>
<td></td>
</tr>
<tr>
<td>Nitrogen</td>
<td>0-50%</td>
<td></td>
</tr>
<tr>
<td>Hydrogen</td>
<td>0-50%</td>
<td></td>
</tr>
</tbody>
</table>

**GAS MIXER MODEL NUMBER SYSTEM**

<table>
<thead>
<tr>
<th>Model Number System</th>
<th>Gas Mixer Model Number System</th>
</tr>
</thead>
<tbody>
<tr>
<td>6050</td>
<td>8050</td>
</tr>
<tr>
<td>6100</td>
<td>8100</td>
</tr>
<tr>
<td>6200</td>
<td>8200</td>
</tr>
<tr>
<td>6305</td>
<td>8305</td>
</tr>
<tr>
<td>6405</td>
<td>8405</td>
</tr>
</tbody>
</table>

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Pressures</td>
<td>100-125 PSIG (6.9-8.6 barg) for models 6305, 6405, 8305, 8405.</td>
</tr>
<tr>
<td><strong>RANGE</strong></td>
<td><strong>FLOW RATE</strong></td>
</tr>
<tr>
<td>0-100 PSIG</td>
<td>0-5000 SCFH</td>
</tr>
<tr>
<td>0-200 PSIG</td>
<td>0-10,000 SCFH</td>
</tr>
<tr>
<td><strong>GAS INDEX</strong></td>
<td><strong>FLOW RATE</strong></td>
</tr>
<tr>
<td>Helium</td>
<td>0-50%</td>
</tr>
<tr>
<td>Oxygen</td>
<td>0-50%</td>
</tr>
<tr>
<td>Argon</td>
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</tr>
<tr>
<td>Nitrogen</td>
<td>0-50%</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>0-50%</td>
</tr>
</tbody>
</table>

**GENERAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FLOOR CAPACITY</strong></td>
<td><strong>RANGE</strong></td>
</tr>
<tr>
<td>0-5000 SCFH</td>
<td>0-536 Nm³/h</td>
</tr>
<tr>
<td>0-10,000 SCFH</td>
<td>0-5360 Nm³/h</td>
</tr>
<tr>
<td><strong>SURGE TANK</strong></td>
<td><strong>FLOOR CAPACITY</strong></td>
</tr>
<tr>
<td>120 gallon</td>
<td>5000 SCFH</td>
</tr>
<tr>
<td>240 gallon</td>
<td>10,000 SCFH</td>
</tr>
<tr>
<td>30 gallon</td>
<td>2000 SCFH</td>
</tr>
<tr>
<td>60 gallon</td>
<td>4000 SCFH</td>
</tr>
</tbody>
</table>

**GAS MIXER ACCURACY**

<table>
<thead>
<tr>
<th>Gas</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helium</td>
<td>±2% of full range over 60°F to 80°F (15°C to 27°C)</td>
</tr>
<tr>
<td>Oxygen</td>
<td>±2% of full range over 60°F to 80°F (15°C to 27°C)</td>
</tr>
<tr>
<td>Argon</td>
<td>±2% of full range over 60°F to 80°F (15°C to 27°C)</td>
</tr>
</tbody>
</table>

**POWER REQUIREMENTS**

<table>
<thead>
<tr>
<th>Voltage Range</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>115 VAC, 50/60 Hz</td>
<td>1.1 A</td>
</tr>
<tr>
<td>220 VAC, 50/60 Hz</td>
<td>0.55 A</td>
</tr>
</tbody>
</table>

**GAS CONNECTIONS AND PIPING**

<table>
<thead>
<tr>
<th>Gas</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helium</td>
<td>Major, minor, and mixed gas connections.</td>
</tr>
<tr>
<td>Oxygen</td>
<td>Major, minor, and mixed gas connections.</td>
</tr>
<tr>
<td>Argon</td>
<td>Major, minor, and mixed gas connections.</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>Major, minor, and mixed gas connections.</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>Major, minor, and mixed gas connections.</td>
</tr>
</tbody>
</table>

**QUALITY ASSURANCE**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TEST</strong></td>
<td><strong>QUALITY ASSURANCE</strong></td>
</tr>
<tr>
<td>Minor Gas and Minor Gas Minimum Inlet Pressure in PSIG</td>
<td>100 PSIG is standard. Non-standard pressure ranges will involve additional cost.</td>
</tr>
<tr>
<td><strong>GAS MIXING SYSTEMS</strong></td>
<td><strong>TEST</strong></td>
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<tr>
<td>MODELS</td>
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<tr>
<td>6105, 6205</td>
<td>6305, 6405</td>
</tr>
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<td>8305, 8405</td>
</tr>
</tbody>
</table>

**WARNING**

Improper use of this product can cause death, serious injury, or prop-
erty damage. Personnel dealing with this equipment should be
familiar with the operating instructions, safety precautions, and
understanding the technical manual and instrumentation provided by
Thermco. Only personnel familiar with industrial gases should
operate the equipment.

**DOMESTIC/INDUSTRIAL USE**

Thermco gas mixers are available through many local industrial
supply houses. Please contact your local supply house for more
information.

**FOR MIXTURES OF INERTGASES AND AIR/ARGON, CONSULT THE FACTORY FOR PROPER MODEL DESIGNATION.**

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**THE THERMCO QUALITY ASSURANCE TEST**

The gas mixer will be tested for 24 hours on the process gases at maximum capacity to ensure gas mixture accuracy and reliability.

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**FACEBOOK**

Thermco Inc. on Facebook

**PHONE NUMBER**

(219) 362-6258 • FAX (219) 324-3568 • E-Mail sales@thermco.com • www.thermco.com

**ADDRESS**

P.O. BOX 309 • LA PORTE, INDIANA 46352 U.S.A.
**GAS MIXING ACCURACY**

- 0-2000 SCFH: ±8% of full range of -10°F to 104°F (-23°C to 40°C)
- 0-5000 SCFH: ±4% of full range over 32°F to 104°F (0°C to 40°C)
- 0-10,000 SCFH: ±2% of full range over 60°F to 80°F (15°C to 27°C)

**FLOWRATE**

- 0-2000 SCFH: 0-3.4 Nm³/h
- 0-5000 SCFH: 0-6.8 Nm³/h
- 0-10,000 SCFH: 0-13.4 Nm³/h
- 0-20,000 SCFH: 0-26.8 Nm³/h

**GAS MIXER MODEL NUMBER SYSTEM**

- Example for an indoor gas mixer: 0-0-0-SCPH, with a range of 0.0-0.5% Carbon Dioxide in Argon, with the alarm package, setup for 115 VAC, with an inlet pressure range of 100-125 PSIG, the model number is 6105CA30A1100

**QUALITY ASSURANCE**

The gas mixer will be tested for 24 hours on the process gases at required pressure conditions to assure gas mixture accuracy and reliability.