Mustang® P53® Sample Conditioning System
Installation, Operation & Maintenance
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SAFETY WARNINGS

Failure to abide by any of the safety warnings could result in serious injury or death.

• Standard for Safety Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements (CAN/CSA C22.2 No. 61010-1, 07/01/2004, Ed. 2).
• Standard for Safety Explosion-Proof and Dust-Ignition Proof Electrical Equipment for Use in Hazardous (Classified) Locations (ANSI/UL 1203, 1028/09, Ed. 4).
• Explosion-Proof Enclosures for Use in Class 1 Hazardous Locations Industrial: Industrial Products (CSA C22.2 No. 30-M1986, (G.I. No. 2, 11/1988)).
• Electrical power must be “OFF” before and during installation and maintenance or personal injury may result. Follow site requirements for Safety Precaution Rules.
• Do not exceed any equipment pressure, or electrical ratings.
• To reduce the risk of fire or explosion, do not install where the marked operating temperature exceeds the ignition temperature of the hazardous atmosphere(s).
• Heated regulator surface temperature will approach temperature limit specified in technical specifications.
• Select a mounting location so that the system will not be subjected to impact or other damaging effects.
• The hazard location information specifying class and group listing of each system is marked on the nameplate.
• Properly ground all equipment to prevent static electric generation.
The Mustang® P53® Sample Conditioning System is an integral component to provide an Analytically Accurate® solution for natural gas sampling applications. The P53 Sample Conditioning System solves the problem of hydrocarbon liquid condensation from Joule-Thomson cooling in natural gas analysis systems. High pressure natural gas samples are transported at a temperature well above the expected hydrocarbon dew point, which is maintained throughout the pressure reduction process, delivering a representative sample to the analyzers.

**APPLICATION**

The Mustang P53 Sample Conditioning System is available with either the Mustang® Heated Regulator or Mustang® Joule-Thomson Heated Regulator, used in combination with a heated liquid membrane separator and is designed for use with integrally controlled, remote Mustang Pony® Heated Probe Enclosure products.

**FEATURES**

- Patented technology utilizing existing power supplied by electric heat trace tube bundle
- Remote or Direct Mount
- Rated for Class 1, Division 1, Group D locations
- Multiple streams in and out
- Digital Controller
- Steel latching closures
- Glass Fiber Reinforced Polyester (GRP) or Stainless Steel (SS) Enclosure
- NEMA 4X Enclosure
- Low Pressure Pump System (available for systems such as flares, ducts and vapor recovery)

**BENEFITS**

- Requires no external power or natural gas for proper operation
- Conforms to the API Manual of Petroleum Measurement Standards chapter 14.1
**TECHNICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Wetted Parts</th>
<th>316 SS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contained Gas Volume</td>
<td>0.51 cu. in.</td>
</tr>
<tr>
<td>Maintains Sample Gas</td>
<td>Standard set point at 120ºF (49ºC) Adjustable from 60ºF to 400ºF (16ºC to 204ºC)</td>
</tr>
<tr>
<td>Regulator</td>
<td>MHR® Single-Stage Regulator</td>
</tr>
<tr>
<td></td>
<td>MJTHR® Multi-Stage Regulator</td>
</tr>
<tr>
<td>Input Supply Voltage Options</td>
<td>120 VAC, 375 Watts, 50/60 Hz, ± 10%</td>
</tr>
<tr>
<td></td>
<td>240 VAC, 375 Watts, 50/60 Hz, ± 10%</td>
</tr>
<tr>
<td></td>
<td>24 VDC, 205 Watts</td>
</tr>
<tr>
<td>Maximum Allowable Operating Pressure</td>
<td>2000 psig @ 60ºF (138 BAR at 16ºC) (Standard Design - Liquid membrane separator upstream of MHR Single Stage Regulator)</td>
</tr>
<tr>
<td></td>
<td>3750 psig @ 60ºF (259 BAR at 16ºC) (Liquid membrane separator downstream of MHR Single-Stage Regulator)</td>
</tr>
<tr>
<td></td>
<td>6000 psig @ 60ºF (414 BAR at 16ºC) (Liquid membrane separator downstream of MJTHR Multi-Stage Regulator)</td>
</tr>
<tr>
<td>PID Temperature Controller Options</td>
<td>OI Oven Industries Controller</td>
</tr>
<tr>
<td></td>
<td>W Watlow® Controller</td>
</tr>
<tr>
<td>Cabinet Construction Options</td>
<td>GRP Glass Fiber Reinforced Polyester</td>
</tr>
<tr>
<td></td>
<td>SS Stainless Steel</td>
</tr>
<tr>
<td>Optional Diaphragm Pump (for low pressure systems)</td>
<td>250ºF Teflon® Seals</td>
</tr>
<tr>
<td></td>
<td>400ºF Teflon®/EPDM Seals</td>
</tr>
</tbody>
</table>
Mustang® P53® Sample Conditioning System
Oven Industries Controller Model

PRODUCT DIMENSIONS & PARTS

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Insulated Enclosure</td>
</tr>
<tr>
<td>2</td>
<td>Self-Limiting Block Heater</td>
</tr>
<tr>
<td>3</td>
<td>System Temperature Limiter</td>
</tr>
<tr>
<td>4</td>
<td>Temperature Controller</td>
</tr>
<tr>
<td>5</td>
<td>Single or Multi-Stage Heated Regulator</td>
</tr>
<tr>
<td>6</td>
<td>Liquid Membrane Separator</td>
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Mustang® P53® Sample Conditioning System
Watlow® Controller Model

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</table>
Weight 90lbs.
INSTALLATION INSTRUCTIONS

NOMENCLATURE

- MAOP—Maximum Allowable Operating Pressure
- LNG—Liquid Natural Gas
- BTU—British Thermal Unit

TOOLS REQUIRED

- Standard Hand Tools
- Utility Knife

INSTALLATION

1. Mount the P53® Sample Conditioning System assembly in accordance with previous cautions and warnings.
2. Perform the electrical hook up with de-energized conductors.
3. Verify the unit that you are hooking up to matches voltage wise with the power supply that you are connecting. Damage to the unit can occur if the wrong source power is applied.
4. A seal fitting is required for the power input connection to the controller enclosure to maintain its electrical hazard classification rating.
5. Prior to connecting the heat trace bundle tube to the system, the polarity must be checked on the heat trace bundle tube leads. Check each lead to ground using proper equipment. The load (hot) lead must be determined for proper electrical connection. Failure to do so, may cause system to short out.
6. For 120 volt single phase input power: Connect the “hot” wire to wiring terminal #1. Connect the “Neutral” wire to wiring terminal #2. Connect the earthing (ground) wire to the green screw in the bottom of the enclosure.
7. For 240 volt single phase input power: Connect one “hot” wire to wiring terminal #1. Connect the second “hot” wire to wiring terminal #2. Connect the earthing (ground) wire to the green screw in the bottom of the enclosure.
8. For 24 VDC input power: Connect the positive wire to wiring terminal #1. Connect the negative wire to wiring terminal #2. Connect the earthing (ground) wire to the green screw in the bottom of the enclosure.
9. A seal fitting is required between the controller enclosure and the Mustang® Heated Regulator heater block.
10. Externally connect earthing (grounding) conductors from assembly to equipment ground connections.
11. Connections from the controller to the heater block are pre-wired from the factory. If replacement or troubleshooting is required, refer to the electrical schematic supplied with the unit.

ADJUST THE TEMPERATURE SET POINT

The temperature controller comes from the factory set to 120°F unless otherwise specified. If a different temperature is required, refer to the temperature controller operation manual for the complete setup and adjustment procedures.

SET REGULATOR PRESSURE

Apply input pressure and adjust the regulator adjustment screw until the desired output pressure is attained. The nut on the adjustment screw may be used to secure the adjustment screw at its set point.
PROBE INSTALLATION

Probe installation is the same with the P53® Sample Conditioning System or the Mustang® Sample Conditioning System (MSCS®). With the P53 Sample Conditioning System, the probe is housed within the P53 insulated enclosure. With the MSCS, the probe is housed within the Pony® Heated Probe Enclosure.

HEAT TRACE CONNECTION

Refer to the Mustang Sampling Heat Trace Stripping Preparation Guide.
**OPERATION INSTRUCTIONS**

1. Close the cover on the controller enclosure.
2. Allow a few minutes for the system temperature to stabilize.
3. Verify that sample stream supply is shut off.
4. Turn on the electrical supply to the controller.
5. Set the regulator temperature set point to the recommended temperature.
6. Slowly turn in the sample fluid flow to full open to the regulator.
7. Adjust the regulator adjusting screw to obtain the desired output pressure.
8. Once sample is being regulated, monitor the regulator temperature to verify that the controller is maintaining the set point temperature.
9. Verify the pressure and flow to the remote gas chromatograph or analyzer.
10. Once the flow is correctly established to the analyzer or gas chromatograph, document the flow value. Do not adjust the flow value unless a calibration check is made on the analyzer.
11. Do not leave power on for extended periods of time without flow through the unit.

**MAINTENANCE INSTRUCTIONS**

1. Once system is operational, no routine maintenance is required.
2. Monitoring of flow and temperature values is recommended at least annually.
About Mustang Sampling
Mustang Sampling, LLC is the innovator of Analytically Accurate® solutions within sample conditioning systems. We provide custom solutions of products and services globally to the Natural Gas, Natural Gas Liquids (NGL), and Liquefied Natural Gas (LNG) industries. Mustang Sampling continues to pioneer integrated control systems, allowing our customers to maintain phase stability from sample extraction at the source through sample analysis. Our products are continuously improved and subjected to the highest quality standards which provides our customers with the best sample conditioning solutions.