

# Jupiter Scientific



## **Europa Dry Scrubber Installation and Operation Manual**

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## SECTION 1: INTRODUCTION

Congratulations on your purchase of the Jupiter Scientific Europa Dry Scrubbing System. The Jupiter Scientific Europa Dry Scrubbing System is a robust and simple exhaust gas treatment system. This manual will help you to install your system quickly and correctly and to operate your system safely.

The Jupiter Scientific Europa Dry Scrubbing System employs chemisorption to capture and treat hazardous gases so that they remain in the canister and do not pose a hazard to humans or the environment. It is a simple, “always on” solution through which all gases from the process must pass. As a result, even if the facility loses all power, the Europa System will continue to protect your workers.

Jupiter Scientific Incorporated manufactures the Europa System. Jupiter Scientific custom manufactures air pollution control systems in Fremont, California U.S.A. We can be reached at (888)-511-2479 or through [customerservice@jupitersci.com](mailto:customerservice@jupitersci.com). You can visit us on the internet at [www.jupitersci.com](http://www.jupitersci.com). Our mailing address is:

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## SECTION 2: EUROPA SYSTEM COMPONENTS

The following components shipped in the Europa System container. Please make sure that you have all of these components before proceeding. Please note that some of these items are already installed on the Europa Canister. For example, the blanks, clamps, and flanges are mounted on the canister inlet and outlet.

Item Number	Quantity	Photo	Description
1	1		Europa Scrubbing Canister
2	1		Europa Control Box
3	3		Magnetic Type T Thermocouple
4	1		Transducer
5	2		NW 160 Blank Flanges
6	8		Flange Clamps
7	4		Wheel Anchors
8	2		PTFE Tubing for Gas Sampling
9	2		NW 160 Centering Rings With Special Organic Resistant O-Rings



### SECTION 3: INSTALLING THE EUROPA CONTROL BOX

1. Familiarize yourself with the Europa Control Box in the following photographs

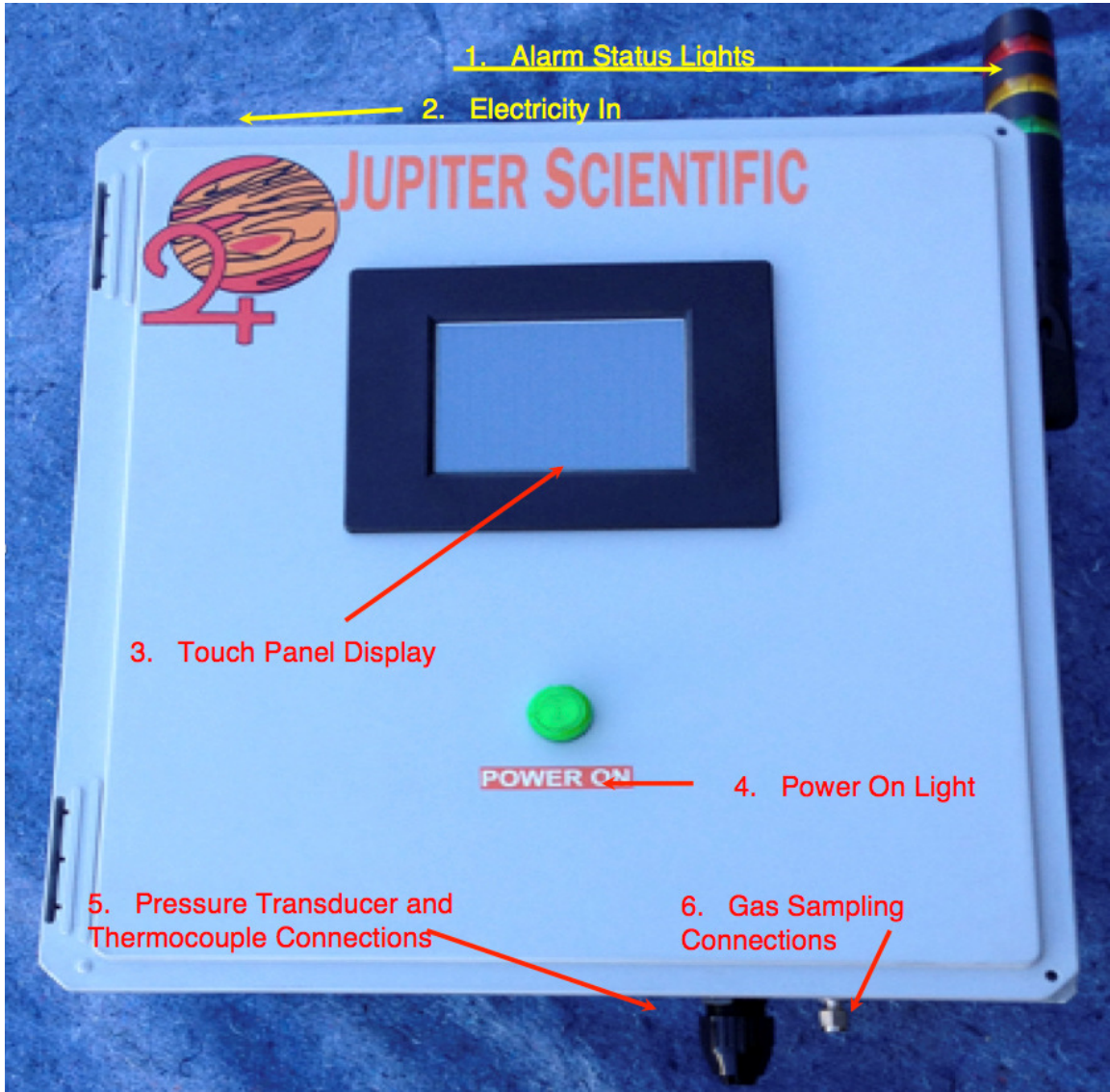


Figure 1: Europa Control Box Exterior Components

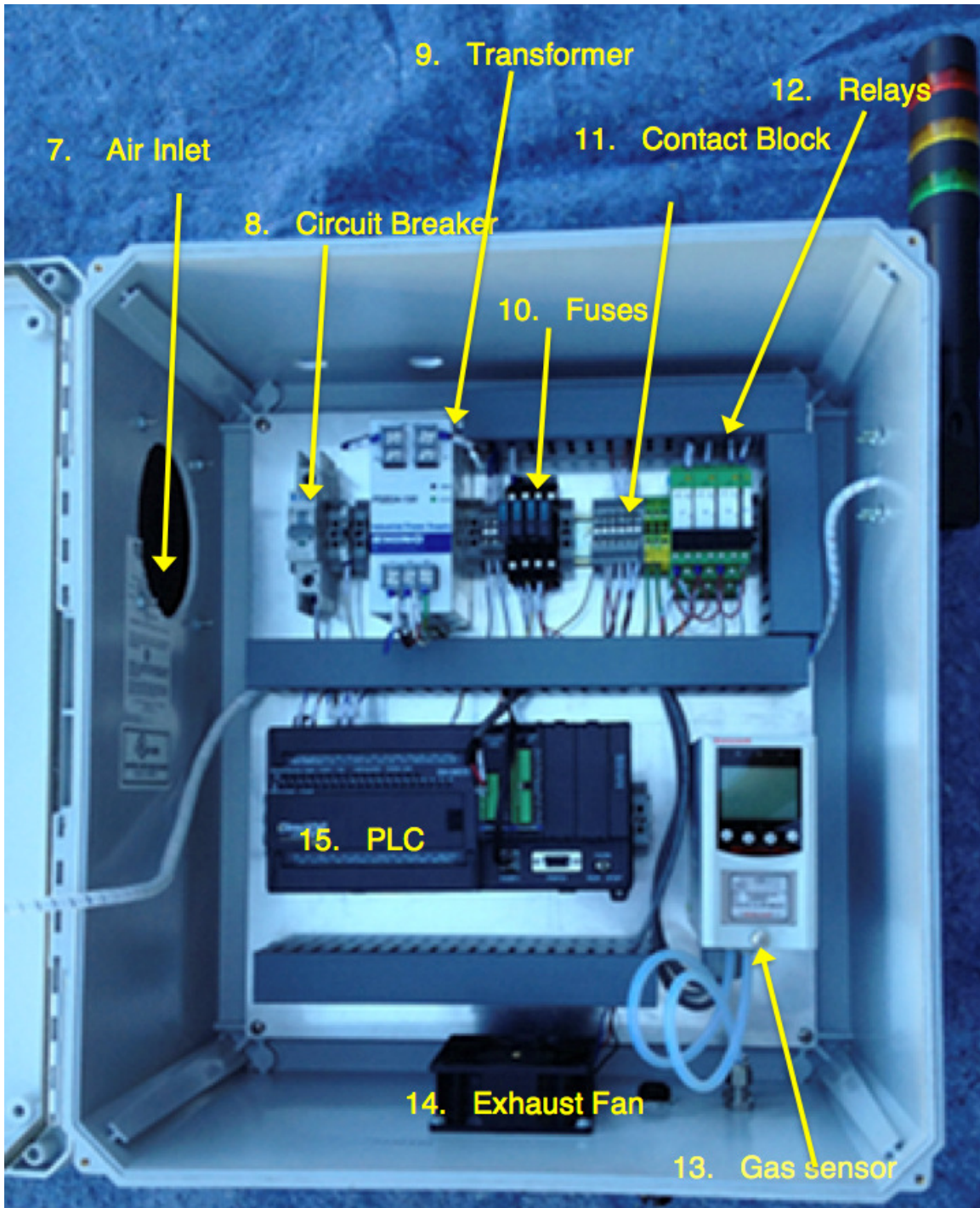


Figure 2: Inside View of Europa Components



### SECTION 3: INSTALLING THE EUROPA CONTROL BOX

**Translation Chart for Europa Control Box**

Number	English Name	Chinese Name
1	Alarm Status Lights	
2	Electricity In	
3	Touch Panel Display	
4	Power On Light	
5	Pressure Transducer and Thermocouple Connections	
6	Das Sampling Connections	
7	Air Inlet	
8	Circuit Breaker	
9	Transformer	
10	Fuses	
11	Contact Block	
12	Relays	
13	Gas Sensor	
14	Exhaust Fan	
15	PLC	

2. Mount the Europa Control System to the Wall 3 meters or less from the Europa canister Location.
3. Connect electricity to the Europa Control Box circuit breaker (8), Run electrical wire with conduit to entrance (2).
4. Make connections to Europa Canister as described in Section 4.
5. Make sure all wires and tubing are safely secured so as not to make a tripping hazard.
6. Engage main circuit breaker (8). Toxic gas monitor will take approximately 5-10 minutes to warm up.
7. If all is well no alarms will sound. If alarms sound, please check display for problem and correct.

## SECTION 4: INSTALLING THE EUROPA CANISTER

1. Familiarize yourself with the photos of the Europa Canister on the following pages.
2. Please ensure that process piping is configured for the canister in keeping with the dimensions shown in the facility drawing (Appendix A).
3. Please make sure you have all Europa components as shown in Section 2 of this manual.
4. Please wear proper personal protective equipment.
5. Please ensure that all process flows to the piping are turned off and that all personnel know not to turn on gas to those pipes.
6. Place the Europa canister in position. Install wheel anchors to the canister wheels (they can prevent canister from rolling during earthquake).
7. Remove blanks from Europa inlet and outlet. Put blanks in safe place for later use.
8. Keep clamps nearby for use soon.
9. Leave centering ring in place on inlet and outlet.
10. Connect inlet and outlet pipe to canister and secure with the clamps.
  - a. It is recommended that the user place a flexible bellows at the inlet and outlet for ease of change and to prevent loosening of connections from vibration.
11. Attach thermocouples to canister,
  - a. Place the top magnetic thermocouple next to the top thermocouple label on the canister
  - b. Place the middle thermocouple next to the middle thermocouple label on the canister
  - c. Place the bottom thermocouple next to the bottom thermocouple label on the canister
12. Attach thermocouple connectors to thermocouple lead wires from Europa Control Box. Please make sure the label on the thermocouple wire matches the position of the thermocouple (for example, connect top thermocouple wire to the top thermocouple).
13. Attach gas sample connection and gas return connection from Europa Control Box to Europa Canister using PTFE tubing.
14. Attach pressure transducer to canister at the labeled location.
15. Attach pressure transducer cable from Europa Control Box to pressure transducer.
16. Check for any leaks.
17. Activate Europa Control Box.

## SECTION 4: INSTALLING THE EUROPA CANISTER

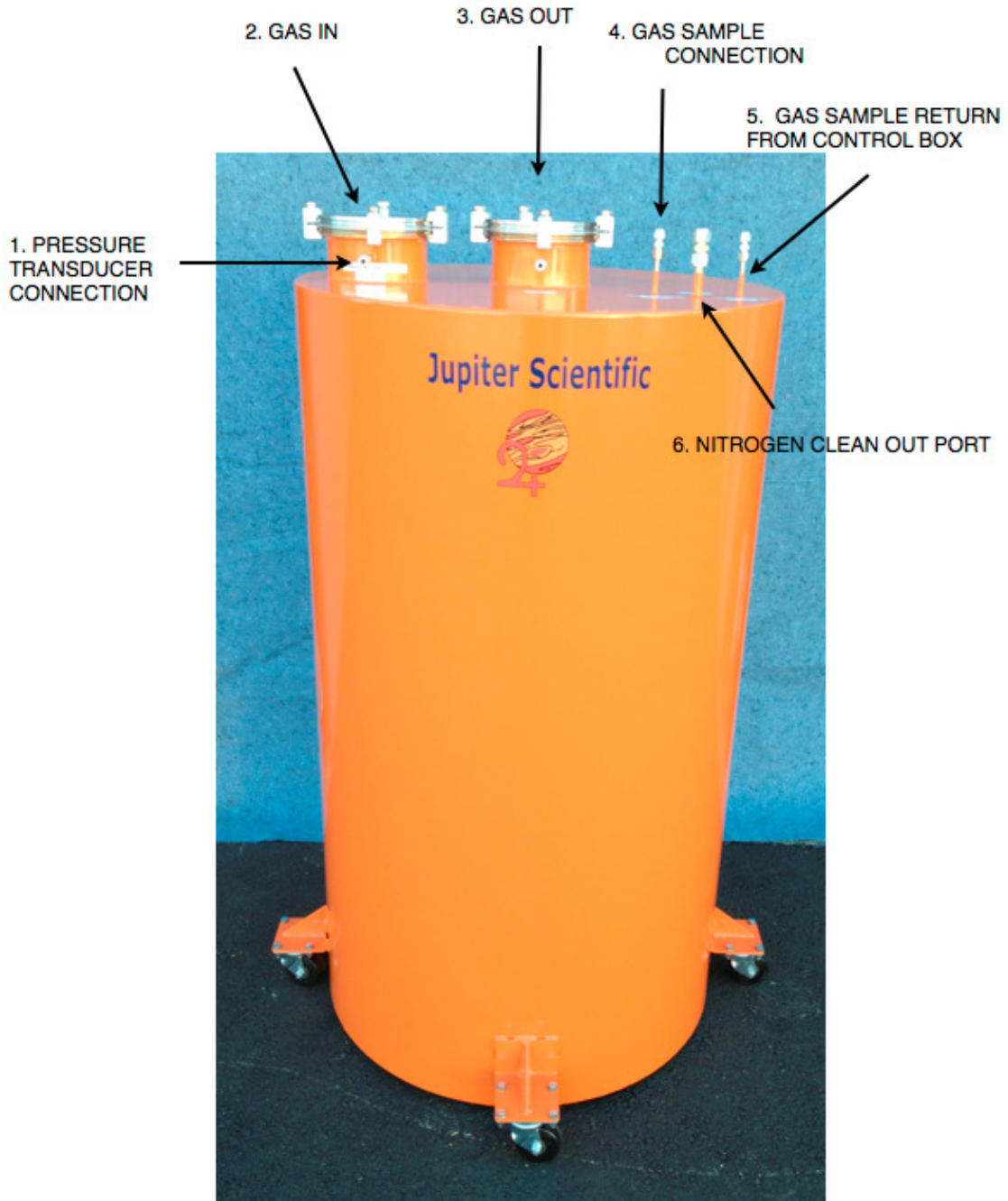


Figure 3: Front View of Europa Canister

## SECTION 4: INSTALLING THE EUROPA CANISTER



Figure 4: Back View Showing Thermocouple Placement

## SECTION 4: INSTALLING THE EUROPA CANISTER

**Translation Chart for Europa Canister**

Number	English Name	Chinese Name
1	Pressure Transducer Connection	
2	Gas In	
3	Gas Out	
4	Gas Sample Connection	
5	Gas Sample Return	
6	Nitrogen Clean Out Port	

## SECTION 5: THE JUPITER SCIENTIFIC EUROPA CONTROL BOX OPERATION

### **TOUCH PANEL DISPLAY**

The user primarily interacts with the Jupiter Scientific Europa through the color touch panel display. This display has several screens that we shall review on the

following pages. Across the bottom of any screen is shown the last alarm if that alarm has not been repaired and viewed in the ALARM HISTORY.

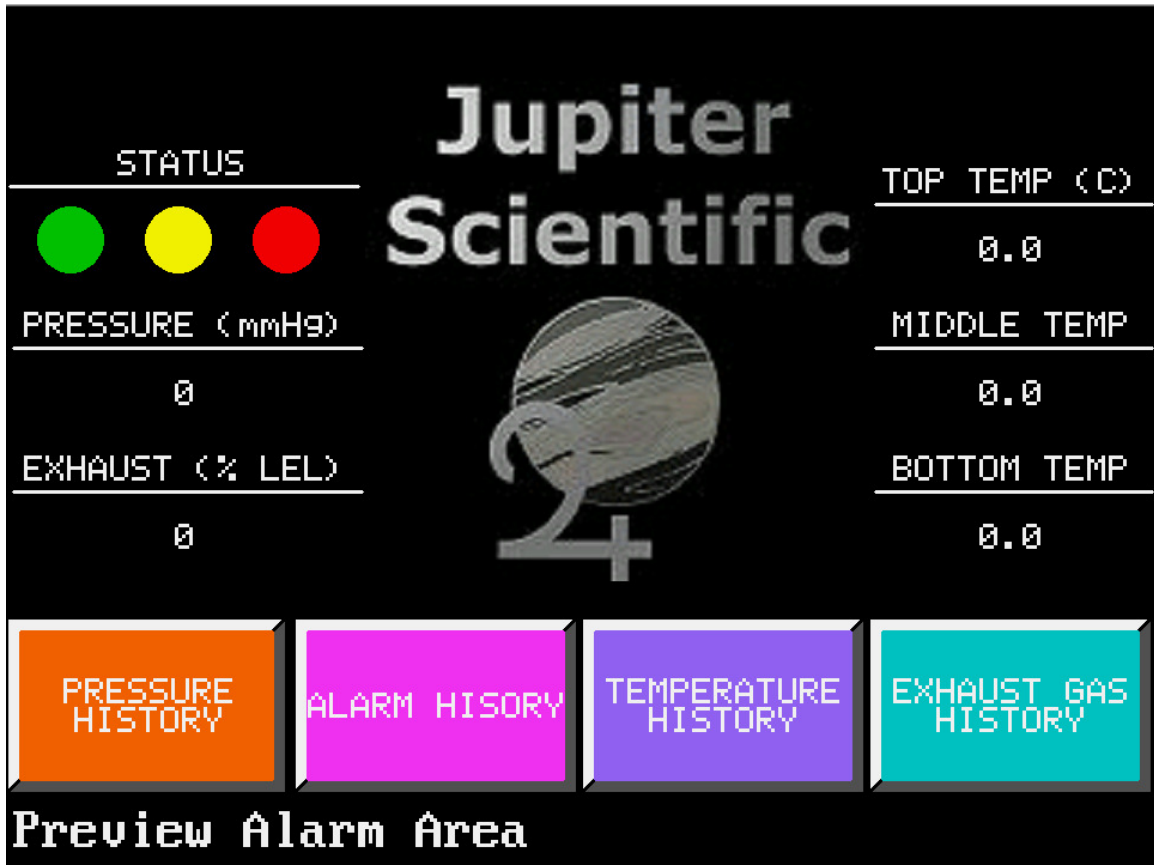
## MAIN PAGE

The MAIN page is shown by default. The user can return to this page by pressing the exit button on the ALARM HISTORY page or by pressing the MAIN button on any other page.

From the MAIN page the user can:

- Access all other pages
- View the current pressure, temperature, and outlet gas level
- View the alarm status

The MAIN page is shown below.



## ALARM HISTORY PAGE

Pressing the pink ALARM HISTORY button on the MAIN page accesses the ALARM HISTORY page. This page shows past alarms and the time of the alarm. The user can

clear the list of alarms by pressing *CLEAR ALL*, The user can return to the MAIN page by pressing the *EXIT* button. A Sample of the ALARM HISTORY page is shown below.



The list of alarms that may be shown is in the table below.

ALARM #	TEXT	CAUSE	LIGHT TOWER
1	Bottom Temperature High	Bottom Temperature > 150 °C	Red
2	Middle Temperature High	Middle Temperature > 150 °C	Red
3	Top Temperature High	Top Temperature > 150 °C	Red
4	Pressure High	Pressure > 900 Torr (mm/Hg)	Red
5	Gas At Exhaust High	Exhaust > Flammable Limit	Red
6	Control Box Temperature High	Control Box > 150 C	Red
7	Warning Top Temp	Top Temperature > 125 C	Yellow
8	Warning Temp Middle	Middle Temperature > 125 C	Yellow
9	Warning Temp Bottom	Bottom Temperature > 125 C	Yellow
10	Warning Pressure	Inlet Pressure > 800 Torr (mm/Hg)	Yellow

**PRESSURE HISTORY, EXHASUST GAS HISTORY, AND TEMPERATURE HISTORY**

The PRESSURE HISTORY page shows a graph of recent pressure measurements from the transducer. The EXHAUST GAS HISTORY page shows the reading of the

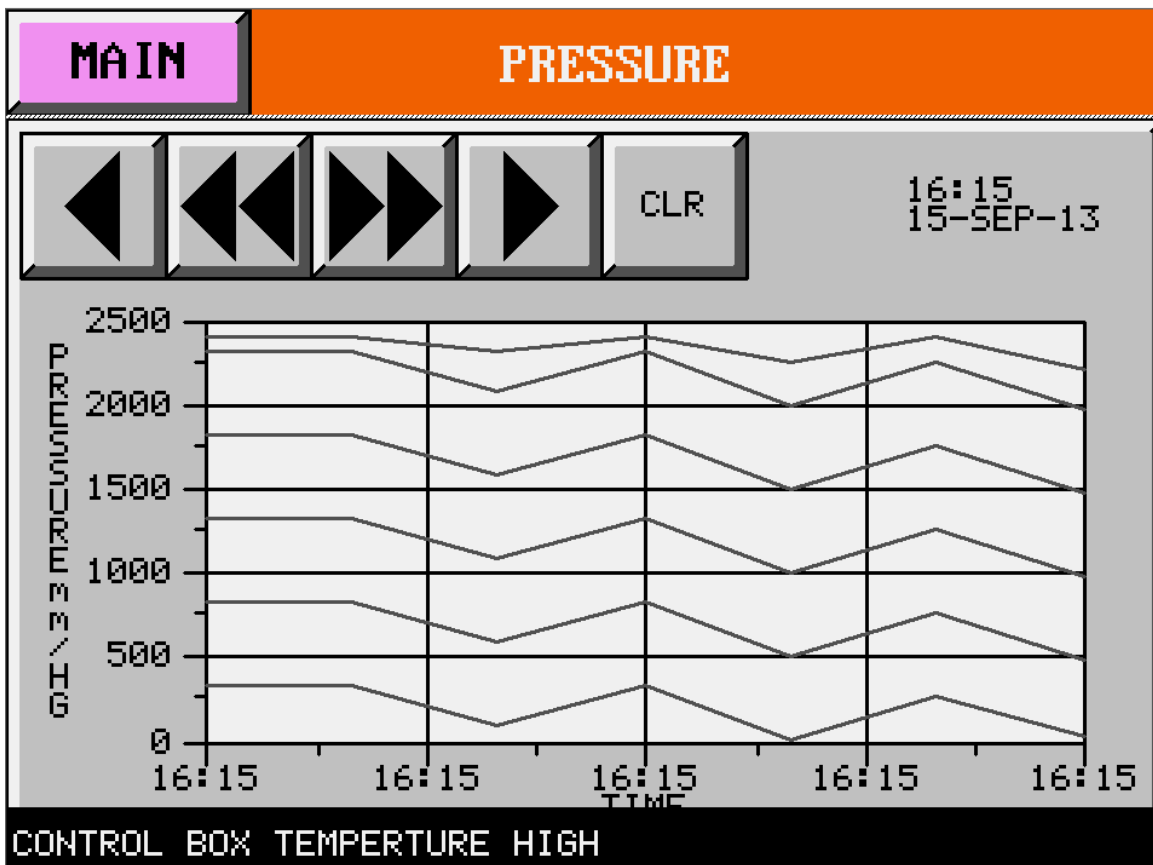


flammable gas sensor for the recent past. The TEMPERATURE HISTORY page shows the readings from each of the three thermocouples for recent history. Touching the appropriate button from the MAIN page accesses each page.

The user can scroll back and forth in time by pressing the *arrow* buttons. The user can erase the history by touching the *CLR* button.

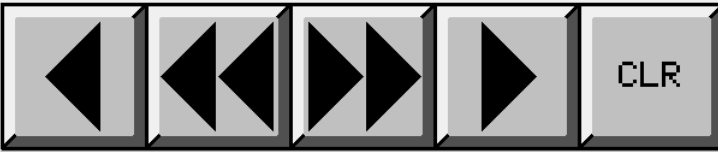
In each of these screens the user can return to the MAIN page by touching the MAIN button.

A sample of the PRESSURE HISTORY, EXHASUST GAS HISTORY, AND TEMPERATURE HISTORY, pages is shown below.

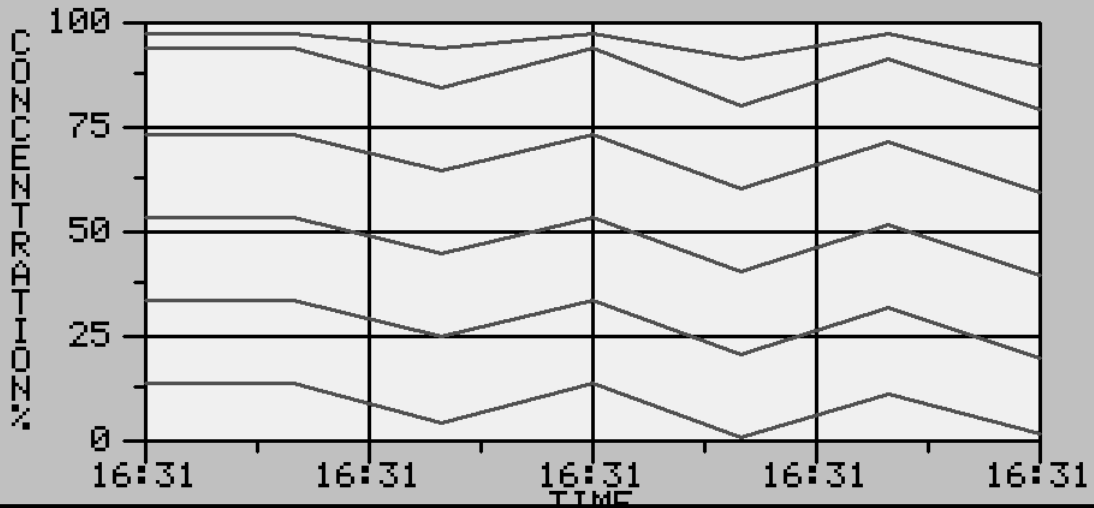


MAIN

GAS AT OUTLET % LEL



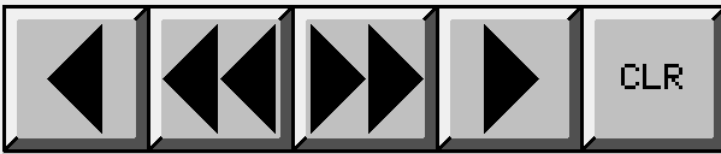
16:31  
15-SEP-13



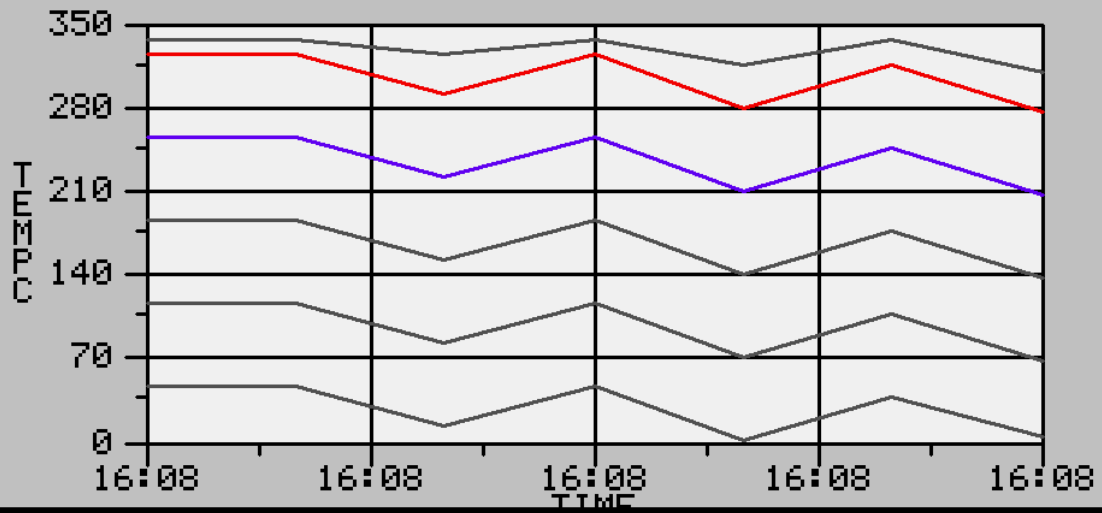
GAS AT EXHAUST HIGH

MAIN

# TEMPERATURE



16:08  
15-SEP-13



BOTTOM TEMPERATURE HIGH

## SECTION 6: TROUBLESHOOTING

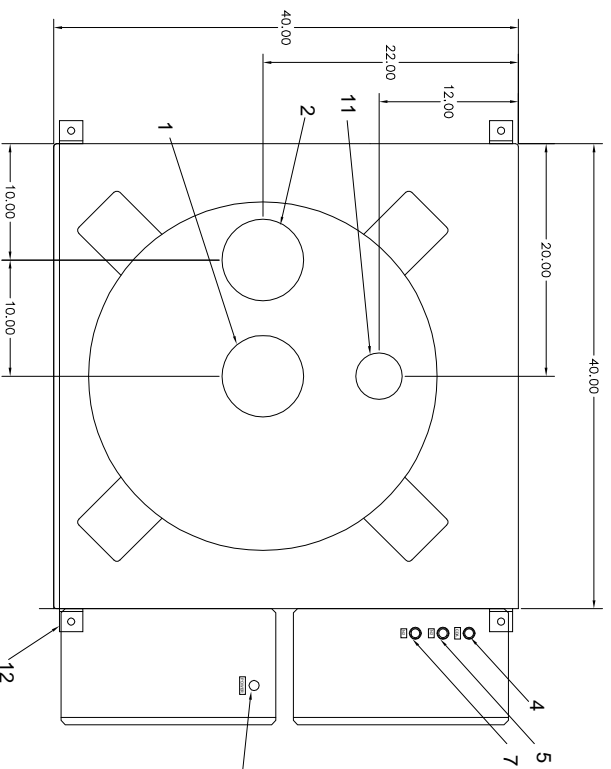
From time to time alarm conditions may present themselves. Fixing these conditions may be possible by following these steps.

CONDITION	POSSIBLE CAUSE	CORRECTIVE ACTION
No lights or display on Europa Control Box	There is no power	Ensure power is connected to box and all circuit breakers engages
	Blown Fuses	<ul style="list-style-type: none"> <li>• Check that main circuit breaker is engaged</li> <li>• Check that all fuses are good</li> </ul>
High or Warning Pressure Alarm	Loose wire to pressure transmitter	Ensure that pressure transmitter wiring is in good condition
	Pressure transmitter defective	<ul style="list-style-type: none"> <li>• Ensure control box responds to changes in pressure.</li> <li>• Ensure pressure transmitter is calibrated correctly</li> </ul>
	High pressure condition exists	<ul style="list-style-type: none"> <li>• Ensure that all piping is not obstructed</li> <li>• Ensure exhaust blower from facility is adequate</li> </ul>
High or Warning Temperature readings	Loose wire or connector	<ul style="list-style-type: none"> <li>• Ensure that all wires are connected</li> <li>• Ensure that plugs are wired correctly</li> </ul>
	Defective thermocouple	Ensure system responds to changes in temperature
	Defective Thermocouple card in PLC	Ensure system responds to good thermocouple
	Over temperature condition exists	Ensure system is not overheating
Flammable gas alarm	Sensor cartridge out of date	Replace sensor cartridge
	Monitoring system offline	Ensure Honeywell Midas device does not report an error
	High flammable gas condition exists	Replace canister

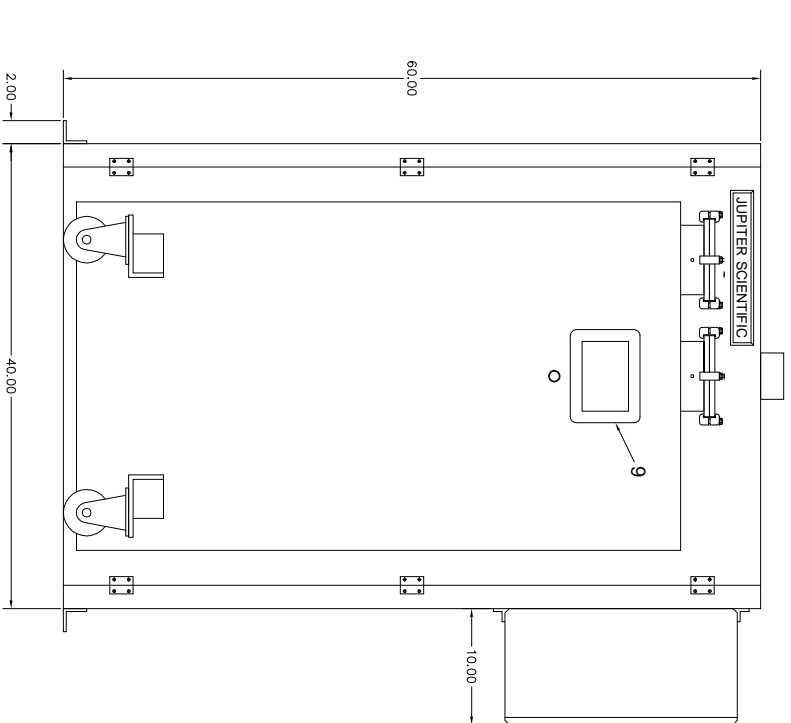
## SECTION 7: SPECIFICATIONS

Parameter	Characteristic
<b>Dimensions (Enclosure Unit)</b>	50" wide x 40" deep x 62 inches high
<b>Weight with canister</b>	1975 lbs
<b>Maximum flow capacity all gases</b>	500 CFM
<b>Recommended maximum flow hydride process</b>	200 CFM
<b>Maximum Concentration target gas</b>	10 %
<b>Recommended peak flow hydride gases</b>	5 %
<b>Nitrogen requirement</b>	Only used for purge. 3/8" line @ 60 psig up to 400 SCFH
<b>CDA Requirement</b>	Only used for Air Ox. Up to 10 SCFH
<b>Power requirement</b>	120 VAC, 1 P, 60 Hz, 7 Amp
<b>Adsorbent charged</b>	18-20 Cu. Ft.
<b>Pressure Drop</b>	Typically 2-3 inches W.C. Depending upon facilities

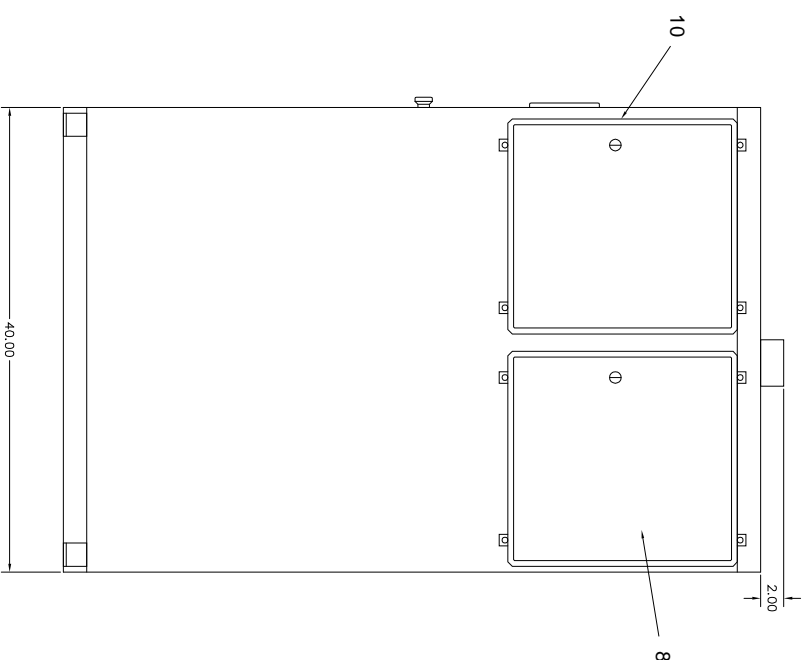
## APPENDIX A: FACILITY DRAWING



TOP VIEW



FRONT VIEW



SIDE VIEW

ITEM	DESCRIPTION	FACILITY REQUIREMENT	REMARK
1	PROCESS GAS INLET	NW160 FLANGE, SS	6" O.D. TUBE (NOMINAL)
2	PROCESS GAS OUTLET	NW160 FLANGE, SS	6" O.D. TUBE (NOMINAL) (Exhaust Out=In)
3	POWER INLET	115 VAC, 1 PHASE, 60 HZ, 7 A	User Discretion (to purge canister - recommended 25 CFM)
4	N2 INLET PORT, PURGE	3/8" SWAGelok, SS, 60-80 PSI	User Discretion (to purge canister - recommended 25 CFM)
5	CDA INLET PORT	1/4" SWAGelok, SS, 60-80 PSI	User Discretion (to purge canister - recommended 25 CFM)
6	ACCESS DOOR		
7	N2 INLET PORT, PNEUMATICS	1/4" SWAGelok, SS, 60-80 PSI	User Discretion (to purge canister - recommended 25 CFM)
8	FLOWMETER/ VALVE BOX		
9	GU / LCD SCREEN		
10	ELECTRICAL BOX ACCESS PANEL		
11	CABINET EXHAUST PORT	4" DIA OD COLLAR	150-450 CFM
12	ANCHOR HOLES	0.6 DIA. THRU- HOLE (4X)	

NOTES:  
1. CABINET DOOR AND TOP PANEL ARE SHOWN AS TRANSPARENT TO SHOW CANISTER POSITION.

<p>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE:</p> <table border="1"> <tr> <th>FRACTIONS</th> <th>DECIMALS</th> <th>ANGLES</th> </tr> <tr> <td>± 1/32</td> <td>.XX ± .02</td> <td>± 1°</td> </tr> </table>		FRACTIONS	DECIMALS	ANGLES	± 1/32	.XX ± .02	± 1°	<p>PARTS LIST</p> <p>THIS DOCUMENT CONTAINS INFORMATION PROPRIETARY TO JUPITER SCIENTIFIC AND SHALL BE KEPT CONFIDENTIAL. NO REPRODUCTION, REPRODUCTION, OR MANUFACTURING IN WHOLE OR IN PART WITHOUT CONSENT OF JUPITER SCIENTIFIC.</p>	
FRACTIONS	DECIMALS	ANGLES							
± 1/32	.XX ± .02	± 1°							
<p>DATE: 03-0056</p> <p>CHECKED: G. DORAN</p> <p>DRAWN: G. DORAN</p>	<p>DATE:</p>	<p><b>JUPITER SCIENTIFIC</b> Custom Air Pollution Control Equipment</p> <p><b>EUROPA WITH CABINET</b></p>							
<p>DO NOT SCALE DRAWING</p>	<p>SCALE: AS SHOWN</p>	<p>DATE: 03-0056</p>	<p>SHEET 2 OF 2</p>						