**I. General information:**

1. Mission name: **SENEX 2013**

2. Instrument name: iWAS (Improved Whole-Air Sampler)

3. What is measured: VOCs (saturated and un-saturated hydrocarbons, halogens, alkyl nitrates, aromatics, biogenics)

4. Short description of measurement technique: Canister samples for post-flight GC-MS analysis of hydrocarbons, alkyl nitrates, and halocarbons

5. Contact information for all personnel going to the field with this instrument:

 (*for multiple investigators,* *please list the PI or primary contact person first*)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Email** | **Office phone** | **Cell phone** |
| 1. Jessica Gilman, PI | jessica.gilman@noaa.gov | 303-497-4949 | 720-470-0932 |
| 2. Brian Lerner | brian.lerner@noaa.gov | 303-497-5296 | 303-881-5295 |
| 3. |  |  |  |
| 4. |  |  |  |
| 5. |  |  |  |
| 6. |  |  |  |

**II. Specific information:**

**1. Total installed weight: 306 lbs**

(rack, gas cylinders, hoses, cabling, pumps, inlets, permeation tubes, etc.)

|  |  |  |
| --- | --- | --- |
| **Rack weight and balance info** | **Allowed** | **Actual** |
| Weight, lbs.: |  |  |
| Overturning moment, in-lbs.: |  |  |

**Pod weight and CG:**

**NOTE**: Please also provide weight-and-balance information for all installed equipment. Templates for standard electronics racks are available for download [here](http://esrl.noaa.gov/csd/groups/csd7/measurements/2013senex/P3/integration/). PIs with non-standard installations will need to provide relevant information in a similar format.

**2. Individual subassembly info** (weights should sum to total listed above)

|  |  |  |
| --- | --- | --- |
| **Component name** | **Location name and flight station** | **Weight, lbs** |
| 1. Canister assembly (qty 6) | AMPS pod | 250 (41.7 ea) |
| 2. DSM/pump tray | AMPS pod | 30 |
| 3. Gas tray | AMPS pod | 22 |
| 4. Cabling | AMPS pod | 4 |

**3. Component power consumption in Amps**

Please provide an electrical power diagram in Appendix A

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Component name** | **Location name** | **400 Hz****3Ø** | **400 Hz****1Ø** | **60 Hz** | **28VDC** | **28VDC****WOW** |
| 1. Compressor, cont. (start) | AMPS pod | 3 (6) |  |  |  |  |
| 2. Data system module | AMPS pod |  |  |  | 7 |  |
|  | **Totals:** | 3 (6) |  |  | 7 |  |
|  |  | **400 Hz****3Ø** | **400 Hz****1Ø** | **60 Hz** | **28VDC** | **28VDC****WOW** |

**4. Inlet and exhaust information:**

Please provide an inlet/exhaust line diagram in Appendix B

|  |  |  |
| --- | --- | --- |
| **Inlet/exhaust name** | **Location name and flight station** | **Hole size through hull, inches** |
| 1. iWAS inlet | Existing doubler/plate ~ 36” from nose tip and slightly above centerline on right side of AMPS pod | n/a |

**5. Source of flow** (name and location of pump or venturi)

|  |  |
| --- | --- |
| **Pump name** | **Location name and flight station** |
| 1. Bellows compressor | AMPS pod |

**6. Installed hazardous materials or equipment:**

(only for items *installed* *in the aircraft for use during flight*)

**A. Lasers**

 Type: None

 Class:

 Wavelength:

 Output power:

 Eye-safe?

 Beam fully contained within instrument during normal operation?

*For non-eye-safe lasers, please attach a description of safety measures taken (safety interlocks, beam fully enclosed within instrument, etc.) and a procedure for safe instrument operation during testing and laser alignment. Please contact the* *AIC* *for an example of laser safety documentation from TexAQS 2006.*

**B. RF transmitters**: (note that mass spectrometer RF generators are not designed to transmit, and do not need to be included here)

 Description: None

 Transmitted RF power:

 Frequency range:

**C. Radioactive materials:**

Isotope: None

Half-life:

Type of emitter:

Generally licensed?

# installed and location:

# of spares and location:

**D. Compressed gases:** (1 ft3 = 28.32 liters; cabin volume = 4260 ft3 = 1.21 x 105 liters)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cylinder number:** | **1** | **2** | **3** | **4** | **5** |
| Gas description | Air | Air |  |  |  |
| Mixing ratio | 100% | 100% |  |  |  |
| Cylinder size (ft3) | 0.1 | 0.1 |  |  |  |
| Max pressure (psig) | 1850 | 40 |  |  |  |
| # installed on aircraft | 1 | 72 |  |  |  |
| Location on aircraft | POD | POD |  |  |  |
| Service frequency | Each flt | Each flt |  |  |  |
| *toxic/flammable gases:* | None | None |  |  |  |
| In containment vessel? |  |  |  |  |  |
| Gas alarm provided? |  |  |  |  |  |
| MR if vented to cabin, ppmv |  |  |  |  |  |
| OSHA 8-hr PEL, ppmv |  |  |  |  |  |
| 30-min IDLH, ppmv |  |  |  |  |  |

**E. Chemicals (solids and liquids):**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Chemical number:** | **1** | **2** | **3** | **4** | **5** | **6** |
| Concentration |  |  |  |  |  |  |
| Amount |  |  |  |  |  |  |
| Container description |  |  |  |  |  |  |
| Purpose |  |  |  |  |  |  |
| Solution pH |  |  |  |  |  |  |
| Spill kit provided? |  |  |  |  |  |  |

**F. Cryogens:**

 Location: None

Description:

Container description:

Quantity on board per flight:

Serviced on the aircraft?

**G. UPS and battery installation:**

 Location: None

 Description: (Manufacturer, model no., power)

 Battery type:

 Has an adjustable input voltage tolerance? (highly recommended)!

**H. Motors**

Description: Compressor motor, Metal Bellows/ Senior Flexonics / K097-C38184

Motor current draw: 3Ø, 400Hz, 6A startup, 3A running

Thermal interlock enabled? Yes

**I. Operator seat requests -**

Test flights: One seat, second test flight

Transit flights: None

Science flights: None

**7. Data and plumbing drops**

 Network (Cat. 5/6 ethernet) drops requested: One (in AMPS pod)

 Serial drops requested: None

 IRIG-B drops (BNC coax connector) requested: None

 Vacuum/exhaust/ emergency dump lines: Exhaust in POD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Flow rate, slpm** | **Line pressure, Torr** | **Pump type** | **Trace gas concentration(s)** |
| 1. iWAS exhaust | 5-50 | 40 psig | Bellows | Ambient air |

 Ground gas service lines (number, location, type of service): None

 Other gas lines (number, location, type of service): None

Will you be sending data to the AOC data station? If so, please provide the following information: No

|  |  |  |
| --- | --- | --- |
| **Parameter name** | **Voltage range** | **Unit conversion** |
| 1. |  |  |
| 2. |  |  |
| 3. |  |  |

**8. Aircraft access**

 **a. flight days:**

 Pre-flight time requested at aircraft (hours): One (1.0) hour at AMPS pod

 Routine pre-flight ground support required? None

(stands, ladders, forklifts, covers, external equipment, etc.)

 Routine post-flight time requested at aircraft (hours): One hour at AMPS pod

Routine post-flight ground support required? None

(stands, ladders, forklifts, covers, external equipment, etc.)

**b. non-flight days:**

 Routine external access to inlets or zenith mounts required? None

(please describe location, how often, for how long, type of ground support equipment needed, weather constraints, etc.)

*Please note there is zero access and zero power to the aircraft (including pods) on hard-down days. These occur at least once every seven calendar days while in the field.*

**9. Aircraft maneuvers**

Briefly describe in-flight calibration frequency, duration, altitudes desired: None except for attention of person in charge of “special” or “plume” samples.

Briefly describe instrument sensitivity to flight conditions: None

(issues during roll/pitch, ascent/descent, sampling in cloud, icing etc.)

**10. Miscellaneous**

 *1. Hazmat for preflight/postflight calibrations*: Please describe fully any additional hazardous materials - compressed gases, solvents, radioactive ion sources – that you anticipate *temporarily* bringing onto the aircraft for periodic instrument calibration purposes (e.g., *n*-butanol in a CN counter, 210Po in a DMA, a UPS for power, compressed gas cylinders for calibrations, etc.)

None

 *2. Fabrication and sheet metal support:* Please describe fully any anticipated requests for fabrication or sheet-metal support during installation in Tampa. This list should be kept to an absolute minimum; please recognize that this superb AOC resource is quite limited. To ease the strain on the AOC shop, we will work with each PI to ensure they arrive in Tampa with as much in hand as possible.

None

 *3. Ferry flight/check flight procedures.* On occasion, AOC will perform an aircraft check flight, during which the instruments may be flown without power. Aircraft maintenance needs may also dictate a ferry flight without science crew or SED techs on board. Instruments should be designed with these eventualities in mind. However, if your instrument requires standby power during this kind of flight, this may be provided at the discretion of AOC personnel.

 If so, the flight crew will need to be briefed well ahead of time to ensure proper instrument operation. Please provide with this document a bare-minimum checklist of instrument startup and shutdown procedures requested for these flights.

Not applicable

**III. Ground laboratory space**

**1. Tampa space requests**:

 Power requirements: Two (2) 20A, 125VAC 60Hz circuits

Special requests: We will need conditioned lab space for our can-prep station (19” rack), along with enough room for 2 sets of cans in their shipping boxes (storage can be in hanger).

**2. Field space requests**:

 Workspace, ft2: 300 for can prep and analysis area

 Number of tables/chairs: 3 tables and 6 chairs

Power requirements: Three (3) 20A, 125 VAC 60 Hz circuits for instruments, plus additional standard outlets for several laptops, etc.

 Storage space, ft2: 25 for container storage

Other requests: We will need conditioned lab space for our can-prep station (19” rack) and sample analysis.