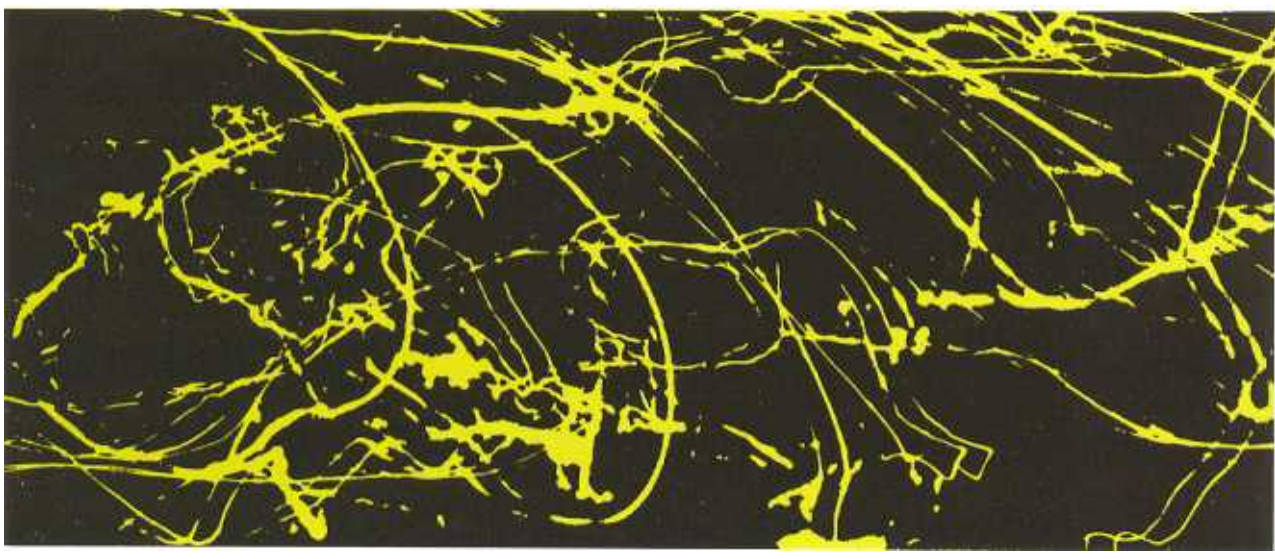


SOITM

Bubble Generator Systems*
Air Flow Visualization and Measurement



***sai*[™] HELIUM BUBBLE GENERATOR SYSTEMS**

FOR AIRFLOW VISUALIZATION

What Is a Helium Bubble Generator?

Airflow visualization is an extremely powerful tool for gaining insight into complex aerodynamic phenomena. It can also save valuable time in the design of various configurations and provide considerable assistance in subsequent interpretation of test data. Flow velocities can be measured, too, if the visualization technique used allows the motion of discrete particles, or groups of particles which do not diffuse, to be recorded.

The SAI[™] HELIUM BUBBLE GENERATOR is a compact and unique tool that produces helium-filled, neutrally buoyant bubbles of controlled size for such airflow visualization. The bubbles have been shown to trace airflow patterns at speeds as high as 200 fps. Since they follow the flow streamlines, the bubbles rarely collide with objects in the airstream and are extremely durable. For example, they will pass through fans and blowers quite readily.

The motion of the bubbles in low-speed flows can be photographed or videotaped with conventional lighting. For better results and higher speeds, a special SAI[™] Basic Light is available. A SAI[™] Modulated Arc Lamp is also available. This can be used to obtain instantaneous measurement of velocities everywhere.

Key Features:

Superior Tracing of Air Motions - The helium-filled bubbles will follow complex laminar and turbulent airflows which cannot be traced by any other technique.

Ease of Operation - The SAI[™] HELIUM BUBBLE GENERATOR has been designed for ease and simplicity of operation in practically any location. Fine controls are provided to adjust bubble size, specific weight and rate of generation.

Safe Operation - Non-toxic and non-corrosive constituents may be used at room temperature for clean and safe operation.

Quality of Construction - Quality components assure high reliability and durability.

SAMPLE APPLICATIONS

The Analysts	<i>Oil Drilling Equipment Testing</i>
Baker Company	<i>Biological Safety Hood Flow Analysis</i>
Bell Aerospace	<i>Surface Effect Ship Development</i>
Bell Laboratories/North Andover	<i>Natural vs. Forced Convection For Electronic Cooling</i>
Bell Laboratories/Whippany	<i>Underground "Vault" Ventilation</i>
Boeing/Seattle	<i>Flow Over Wing Flaps</i>
Boyce Thompson Institute	<i>Plant Environmental Chamber Efficiency</i>
Caterpillar	<i>Cascade Tunnel And Flow Through Axial Fans</i>
Cornell/Agriculture	<i>Calf Barn Ventilation</i>
Cornell/Plant Science	<i>Plant Pollination</i>
Electrolux	<i>Vacuum Cleaner Power Nozzle Efficiency</i>
Federaciones/Puerto Rico	<i>Airflow About Grain Storage Tanks</i>
Ford Motor	<i>Motor Cylinder Swirl</i>
Fram	<i>Truck Pre-Air Cleaners Circulation</i>
G. E. Environmental	<i>Electrostatic Precipitators</i>
Gulf Science	<i>Flow Through "Channels"</i>
Harrison Radiator	<i>Radiator Flow</i>
Hewlett - Packard	<i>Airflow Patterns In Disk Drives</i>
IBM/East Fishkill	<i>Clean Room Airflow Patterns</i>
IBM/San Jose	<i>Disk Drive Containment Control</i>
Lincoln Laboratories	<i>Electrostatic Precipitator Duct Flow</i>

Marley Cooling Tower	<i>Airflow About Cooling Towers</i>
McDonald's	<i>Circulation Around Grills And Fryers</i>
McDonnell - Douglas	<i>DC9 Body Ventilation</i>
Merck Sharp & Dohme	<i>Clean Room Airflow Patterns</i>
NASA/Ames	<i>Helicopter Flow Field</i>
NASA/Lewis	<i>Turbine Blade Cooling And Horseshoe Vortex Analysis</i>
NCR	<i>Electronic Cooling - Forced And Natural Convection Studies</i>
Oklahoma State University	<i>Combustor Flow Patterns</i>
Overly	<i>Air Bar Effectiveness In Paper Drying</i>
Owens - Corning Fiberglas	<i>Cooling Nylon Fibers</i>
RCA	<i>Satellite Communication Terminal Flow Patterns</i>
Reel Vortex	<i>Lawn Mower Development</i>
Riley Stoker	<i>Coal Burner Flow Studies And Mixing Patterns</i>
Singer	<i>Gas Meter Design</i>
Texas A & M	<i>Space Shuttle Turbulence Study</i>
Thatcher Glass	<i>Furnace Jet Effects</i>
University Of Florida	<i>Greenhouse Ventilation Design</i>
University Of Wyoming	<i>Aeolian Process And Sand Erosion</i>
U. S. Bureau Of Mines	<i>Mine Ventilation And Safety Studies</i>
U. S. Navy	<i>Parachute Aerodynamics</i>
Walker	<i>Flow In Exhaust Systems</i>
Weyerhaeuser	<i>Dry Kiln Circulation</i>

sage action, inc.

P. O. BOX 416
ITHACA, NEW YORK 14851

PHONE 607 844-8448



**SAI™ HELIUM BUBBLE GENERATOR
MODEL 5 CONSOLE**

DESCRIPTION AND SPECIFICATIONS

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EMAIL ordway@sageaction.com

www.sageaction.com

FAX 607 844-9399

DESCRIPTION OF

SAI™ HELIUM BUBBLE GENERATOR MODEL 5 CONSOLE

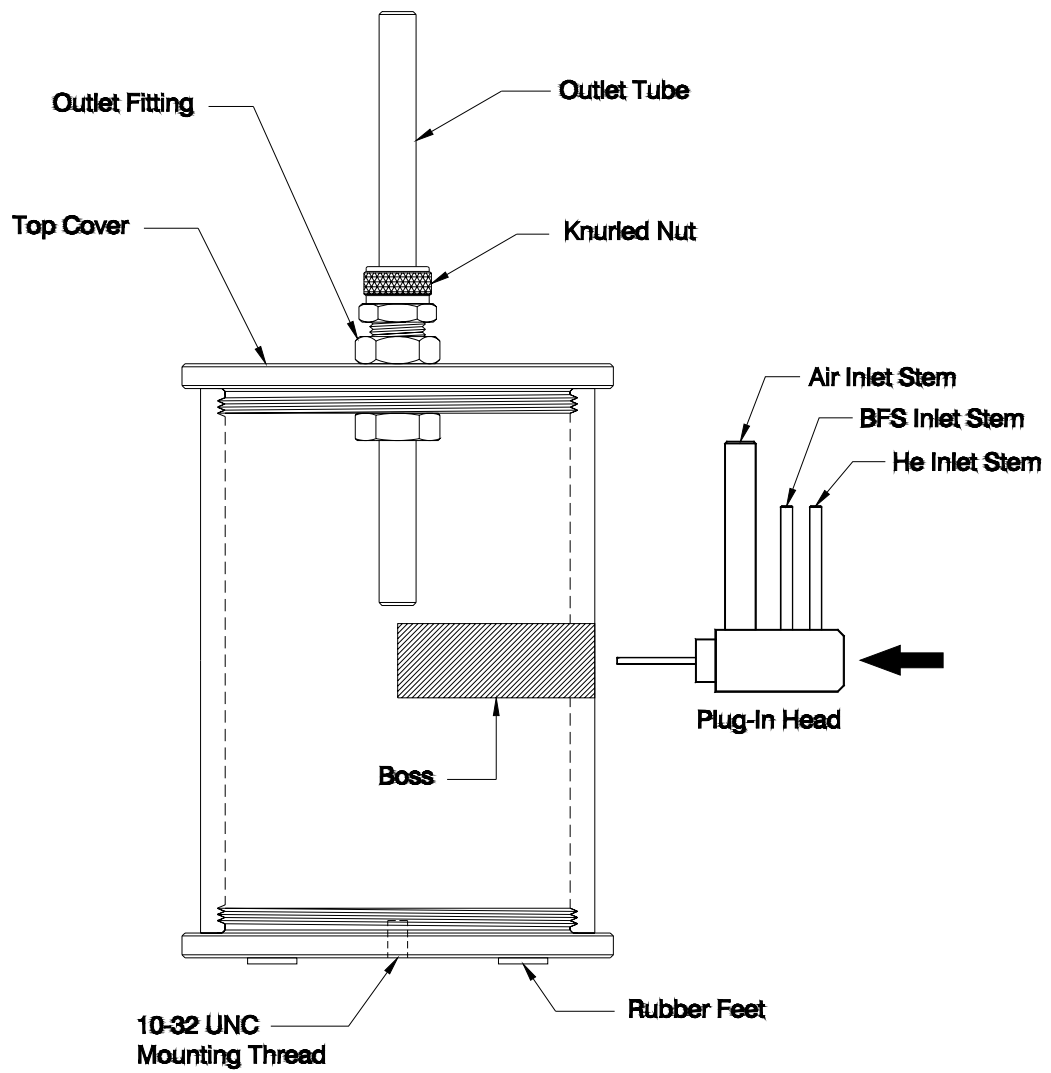
The SAI™ Model 5 Bubble Generator provides a compact and unique tool for visualizing complex airflow patterns. Helium-filled, neutrally-buoyant bubbles of uniform size, adjustable from 1/32" to 3/16" in diameter, can be generated simultaneously from one or two "Heads". These bubbles are capable of tracing intricate air motions without bursting or impacting on objects within the airflow. The whole unit, including the control "Console", Heads and associated equipment, is packaged within a convenient, durable case. It is designed for simplicity of operation in any location where helium and compressed air are available.

In the past, several types of Heads were developed and used for generating bubbles and implanting them in airflows. The Model 5 Bubble Generator is intended primarily for operation with one or two Plug-In Heads, each driving a device that is called a "Mini-Vortex Filter". The Plug-In Head and Mini-Vortex Filter combination represents the most advanced means for high generation rates of "good" bubbles within a compact space.

The "heart" of the Head, itself, consists of a concentric arrangement of two stainless steel hypodermic tubes, one inside the other, attached in a cantilever fashion to a cylindrical manifold base or body. Within the Head, helium passes through the inner hypodermic tube and "Bubble Film Solution" (BFS) through the annulus between the inner tube and the outer tube to form the helium-filled bubbles at the tip. A much larger, concentric jet of air, in turn, blows the bubbles continuously off the tip.

Some of the bubbles generated are too heavy and some, too light. The Mini-Vortex Filter removes these "bad" bubbles. Basically, it is a clear, plastic cylinder which utilizes the jet of air from the Head to set up a rotational or cyclonic motion inside. The resulting radial forces then cause the bubbles which are not neutrally-buoyant to separate out.

SAI™ MINI-VORTEX FILTER AND ASSEMBLY WITH PLUG-IN HEAD



Within the case, the Console is mounted to the left and the Mini-Vortex Filters with the Heads attached, in the middle. To the right, space is provided for storage of outlet tubes and tubing for the Filters, as well as other miscellaneous items. The whole unit may be readily disassembled for maintenance and repair.

The Console accurately meters the flow of the helium, air and BFS to the Heads. The helium and air are connected to external supplies. The BFS, though, is stored in an internal PVC cylinder. This solution is driven by pressure tapped from the helium circuit through a check valve.

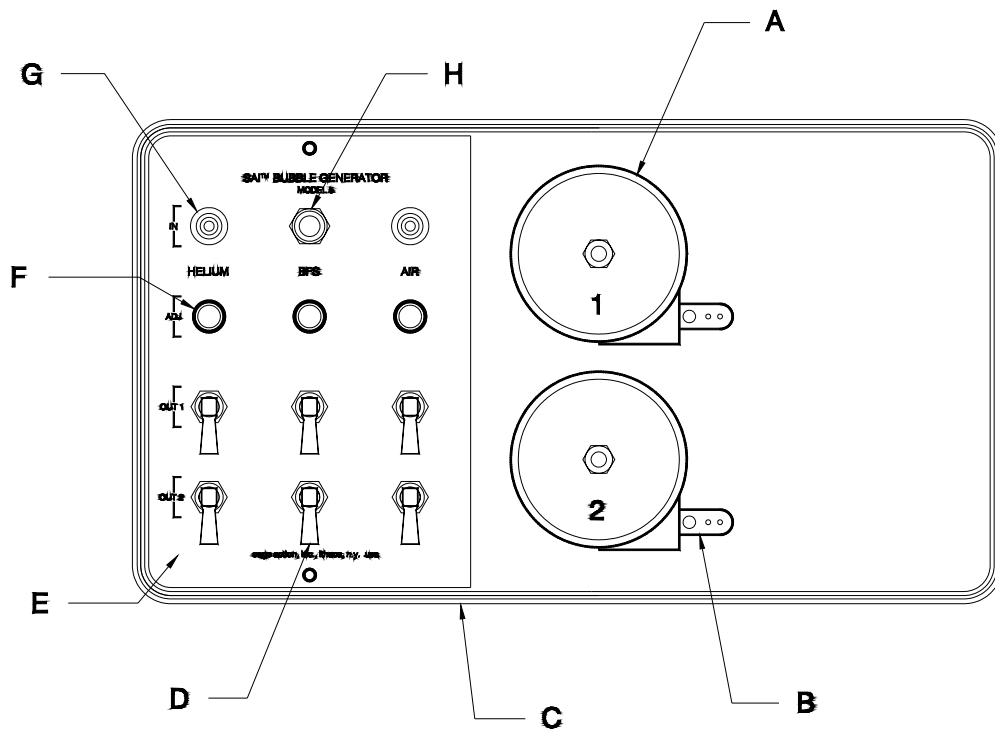
The requirements for external sources of helium and compressed air are quite modest. A cylinder of compressed helium with a 0 to 30 psi pressure regulator is adequate. The helium flow rate is less than 200 ccm for each Head. Air may be from any source which is capable of delivering 1.2 cfm, per Head, at 30 to 60 psi.

The Console panel is laid out for easy identification of the fittings and valves. From the left, the columns are labeled "HELIUM", "BFS", and "AIR". Starting at the top of the panel, the fittings designated by "IN" are the inlets to the Console. The helium and air supplies are to be connected to their respective inlets in this row. The inlets are 1/4" female quick disconnect fittings. The large fitting in the center of the inlet row is the refill port for the Bubble Film Solution.

Below each inlet is a micro-metering valve to regulate the flow of the corresponding constituent to the Head. Micrometer vernier scales are incorporated in the handles of the metering valves to enable the user to reproduce the desired flow rates very precisely. This row of valves is designated by "ADJ".

The two rows of toggle valves below the micro-metering valves are designated by "OUT 1" and "OUT 2". These toggle valves allow quick shutdown of any constituent to either Head. The valves are open when the handles are perpendicular to the panel and closed, when they are parallel to the panel.

GENERAL LAYOUT OF SAI™ DOUBLE OUTPUT MODEL 5 CONSOLE



A Mini-Vortex Filter

E Console

B Plug-In Head

F Metering Valve

C Case

G Quick Connect

D Toggle Valve

H BFS Union

The constituents from the Console are fed to the Heads by means of 2 to 1 paratubing, two 3/32" I.D. and one 1/4" I.D. plastic tubes side by side. There are two holes on the side of the Console panel. The paratubing comes through these holes from the Console and connects to the Plug-In Heads.

SPECIFICATIONS FOR

SAI™ HELIUM BUBBLE GENERATOR MODEL 5 CONSOLE

Bubble Generation Rate: 300 - 400 bps / Head

Bubble Diameter: 0.050" - 0.150"

Bubble Life: 1 - 2 Mins

Minimal Spatial Resolution: 0.025" - 0.075"

Helium Operating Pressure: Regulated @ 20 psi

Air Operating Pressure: Regulated @ 30 psi - 60 psi

BFS Cylinder Capacity: 250 cc

Recommended Bubble Film Solution: SAI™ 1035 BFS

Helium Flow Rate: 200 ccm / Head

Nominal Air Flow Rate: 1.2 cfm / Head

Nominal BFS Consumption Rate: 50 cch / Head

Input Lines: Two 10' x 1/4" O.D. Black Flexible Nylon Lines, each w/ a Male 1/4" NPT Fitting at one end for hook up to the respective Helium and Air Regulators, and 1/4" Quick Connect Fitting, at the other, for connecting to the Console Panel

Console Panel: Painted 1/16" Thick Aluminum w/ Epoxy Lettering

Console Panel Fittings: Stainless Steel, Chrome Plated Brass

Console Case: Rugged black A.B.S. Case w/ Heavy Wall Aluminum Valance and Take Apart Hinge for Cover removal

Dimensions: 22" L x 13.5" W x 11" H

Overall Weight: 20 Lbs

SAI™ PLUG-IN HEAD

Materials: Black Anodized Aluminum, Stainless Steel

Weight: 21 Gms

Head Body: 0.63" Dia x 1.50" L

Helium & BFS Inlet Stems: 11 Ga Tube

Air Inlet Stem: 5/16" O.D. x 9/32" I.D. Tube

Helium Outlet Stem: 22 Ga Tube

BFS Outlet Stem: 16 Ga Tube

SAI™ MINI-VORTEX FILTER

Materials: Acrylic, Delrin, Stainless Steel

Weight: 649 Gms

Overall Dimensions: 4 3/8" Dia x 7 3/8" H

Mounting: Threaded 10-32 UNC Insert In Base

Outlet Fitting: 3/8" I.D. w/ Knurled Nut

Output Tube(s): 6 3/4" L x 3/8" O.D.

Output Tubing: 15' L x 3/8" I.D. Clear Flexible Vinyl Tubing

sage action, inc.

P. O. BOX 416
ITHACA, NEW YORK 14851

PHONE 607 844-8448



**SAI™ AUXILIARY AIR & HELIUM SUPPLY
AA&HS-02**

DESCRIPTION AND SPECIFICATIONS

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EMAIL ordway@sageaction.com

www.sageaction.com

FAX 607 844-9399

DESCRIPTION OF

SAI™ AUXILIARY AIR & HELIUM SUPPLY AA&HS-02

The SAI™ Auxiliary Air & Helium Supply System provides a good way to operate the SAI™ Model 5 Bubble Generator in any location where air and helium are not conveniently available. Weighing 58 lbs, the unit is quite compact and portable. This makes it ideal for the study of ventilation patterns, cleanroom airflows and similar applications.

The air is supplied by a Thomas industrial duty oil-less piston compressor that generates 2.62 cfm at 50 psi. This unit has its own regulator to provide the required flow rate and pressure to the SAI™ Model 5 Console with one or two Plug-In Heads. The compressor is powered by a 3/4 hp, direct drive motor with an on/off switch and thermal overload protection that operates on 115 Vac/60Hz supplied by an electrical cord 6 ft long.

The helium is stored in a rechargeable aluminum cylinder. A helium regulator maintains the necessary working pressure of 20 psi. This cylinder is capable of delivering 10 hrs of continuous running time with both Plug-In Heads in operation, or 20 hrs with one Plug-In Head. The inlet port of the regulator is equipped with a CGA 580 bullet shaped nipple fitting. Since this fitting is the same fitting that is commonly used on larger bottles, it can be used interchangeably. The cylinder may be taken to a compressed gas supplier to be recharged. Alternatively, a Transfill Manifold is supplied for you to recharge the cylinder on-site.

The air compressor, helium cylinder and regulator are all mounted to a aluminum base plate and set in a heavy duty case with a removable cover, about 24" L x 18" W x 16" H. Integrated wheels and a tow handle also provide for easy movement of the unit during testing or travel to and from a test site. Internal components can be removed from the case for general operation and, as necessary, to recharge the helium cylinder. This also allows for easy maintenance and/or repair.

SPECIFICATIONS FOR

SAI™ AUXILIARY AIR & HELIUM SUPPLY AA&HS-02

Helium Supply Pressure: Regulated @ 20 psi

Air Supply Pressure: Regulated @ 30 psi - 60 psi

Helium Flow Rate: 200 ccm / Head

Maximum Air Flow Rate: 2.6 cfm

Helium Cylinder: 4.38" Dia x 10.60" L, 8.8 cu ft Capacity,
2015 psi Service Pressure

Helium Cylinder Recharge: Recharge Off-Site at Helium Gas Supplier
or recharge On-Site w/ Transfill Manifold
Supplied

Air Compressor: Thomas Industrial Duty, Oil-less Piston Compressor,
115 Vac 50/60 Hz or 230 Vac (Special Order)

Base Plate: 21 3/4" L x 16" W x 1/8" T, Black Painted Aluminum w/
Trimlok Edging and four 2" Dia Rubber Feet

Console Case: Rugged Black A.B.S. Case w/ Heavy Wall Aluminum
Valance and Take Apart Hinge for Cover Removal

Dimensions: 23 1/2" L x 18" W x 15 1/2" H

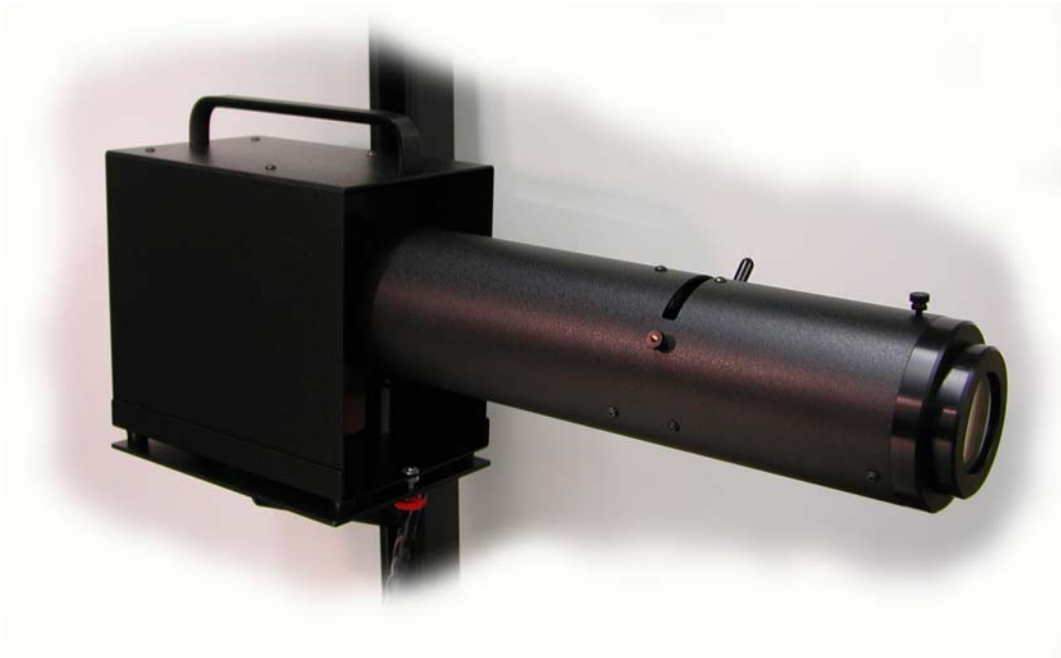
Overall Weight: 58 Lbs

Supply Lines: 10' Power Cord, 15' Air Line and 15' Helium Line

sage action, inc.

P. O. BOX 416
ITHACA, NEW YORK 14851

PHONE 607 844-8448



***SAI™ MODULATED ARC LAMP
ALS-300W/SW***

DESCRIPTION AND SPECIFICATIONS

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EMAIL ordway@sageaction.com

www.sageaction.com

FAX 607 844-9399

DESCRIPTION OF

SAI™ MODULATED ARC LAMP ALS-300/SW

The SAI™ Modulated Arc Lamp has been developed as part of a system for both visualization and measurement of complex airflows with small, neutrally-buoyant soap bubbles. In particular, it provides an intense, collimated light beam of uniform intensity which can be modulated over a wide range of frequencies. This allows the motion of the bubbles to be determined from speeds as low as 2 fps to speeds as high as 200 fps or more. For different flow situations, the beam can be readily modified to optimize the lighting.

The principal component of the Modulated Arc Lamp is the SAI™ Optical Shroud. Our current Model OS 300-3 is designed expressly for use with the PE300 Watt Cermax Lamp manufactured by PerkinElmer Optoelectronics. This unique unit is a xenon-filled, short-arc lamp containing an integral reflector. The Cermax Lamp is housed in the PerkinElmer HX2 Frame and



powered by the PerkinElmer PS300-13 Laboratory Power Supply.

The Optical Shroud, itself, contains three basic elements: (i) A condensing lens, (ii) a special aperture cradle and (iii) a projection lens assembly.

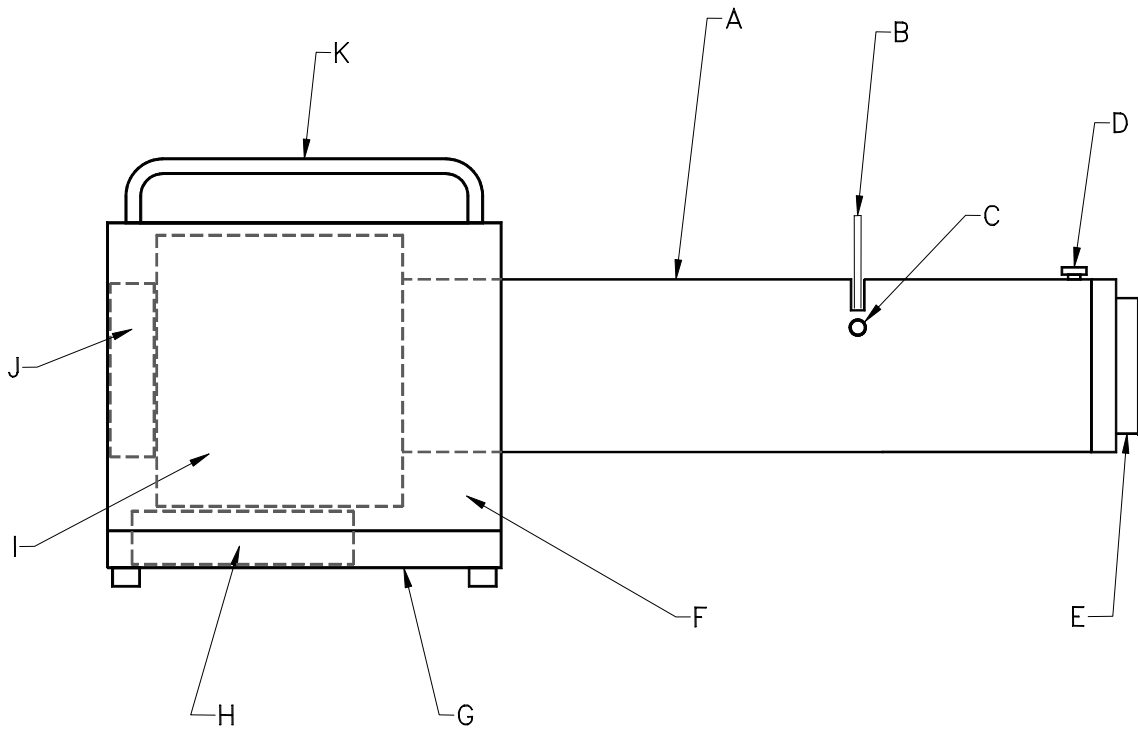
The condensing lens serves to redistribute the light emitted by the Lamp more uniformly and a special Aperture, to change the cross-section shape and size of the beam. The third element, the Projection Lens Assembly, focuses an image of the Aperture at the desired distance from the system. A handle on the Aperture extends outside the Optical Shroud for insertion, removal and adjustment.

The Lamp Holder is mounted inside a rectangular Light Shield to eliminate any stray light coming from the Holder. A Handle is provided on top of the Light Shield to carry and reposition the Optical Shroud. Also, the Light Shield Base has bumper feet for general support on any flat surface.

The Model PS300-13 Laboratory Power Supply is a new switcher design by PerkinElmer Optoelectronics. For a long time, Sage Action, Inc. has used the ILC Technology Model PS300-1 Power Supply and associated components with our various SAI™ Optical Shroud designs to observe continuous bubble trajectories for general airflow patterns. To measure velocities, though, it is necessary to modulate the light output. Initially, we developed an external unit, but later we developed the smaller internal SAI™ VMC-2 Arc Lamp Modulator. This unit was completely integrated into the PS300-1 and worked extremely well. Still, this modification was fairly complex and costly.

The new PS300-13 eliminates these disadvantages. In fact, it is a user programmable lamp power source. There are three membrane switches on the front panel labeled "MENU", "A" and "B". These switches permit selection of four operating modes: Continuous Current Supply Mode, Variable Time Mode, Internal Modulation Mode and External Modulation Mode. The four modes and their functions are monitored from the front panel by means of a LCD Display. The Display is 4 Lines x 20 Characters wide with blue background and white text. This is very convenient to work

GENERAL LAYOUT OF SAI™ OPTICAL SHROUD / MODEL OS 300-3



- | | |
|------------------------------|---------------------------------|
| A Optical Shroud | G Light Shield Base w/ Feet |
| B Aperture Handle | H Potted Ignition Circuit Board |
| C Aperture Thumbscrew | I Lamp Holder |
| D Projection Lens Thumbscrew | J Cooling Fan |
| E Projection Lens Assembly | K Handle |
| F Light Shield | |

with, not only for the status and data it provides, but also the directions for operation.

Output current to the Lamp is supplied by two Multi-Contact Powerline Series connections on the front panel, and power to the fan and lamp interlock on the lamp frame, by a 4 pin socket connector. Although not used at present, there is a 9 pin D-subminiature connector for remote input and two 2mm sockets for external modulation input.

Altogether, the new PS300-13 offers a great replacement to the PS300-1 with a VMC-2. It is extremely compact and light, being a small fraction of the size and weight of the ILC PS300-1. Sage Action, Inc. has worked cooperatively for many months on this effort with PerkinElmer and we believe our Customers will find the new SAI™ Modulated Arc Lamp with the new PE Power Supply really “user friendly”. This, in turn, enhances the application of our MAL for non-invasive velocity measurements of the instantaneous flowfield along the “natural” streamlines.

SPECIFICATIONS FOR
SAI™ OPTICAL SHROUD
MODEL OS 300-3

Circular Beam Spread: 3" - 25" Dia @ 6'

Iris Diaphragm Diameter: 1/8" - 1 1/2"

Rectangular Beam Spread: 19" x 0" - 19" x 6 1/2" @ 6'

Adjustable Slit Width: 0" - 7/16 "

Focusing Range: 28" - Infinity

Projection Lens Focal Length (Each): 220 mm

Lamp: PE300 Watt Cermax Lamp

Cooling: Forced Convection

Average Bulb Life: 1000 Hrs

Overall Dimensions: 21" L x 5 1/2" D x 8 3/4" H

Base Mounting Plate: 8" L x 5 1/2" W x 1/2" T w/ Two 1/4-20 UNC
Threaded Inserts

Holder Cable Length: 10'

Overall Weight: 10 Lbs

XENON ARC LAMP

Beam Half Angle @ 0 Hrs: 5°

Visible Output @ 0 Hrs: 5000 lm

Beam Half Angle @ 100 Hrs: 6°

Visible Output @ 100 Hrs: 3500 lm

Beam Half Angle @ 1000 Hrs: 7°

Visible Output @ 1000 Hrs: 3250 lm

***PERKIN ELMER SWITCHER POWER
SUPPLY MODEL PS300-13***

Line Voltage: 100 - 240 Vac

Maximum Line Current: 7 Aac

Line Frequency: 50/60 Hz

Starting Pulse, Voltage: 30 KV

Lamp Voltage, Operating: 13 - 16 Vdc

Lamp Current, Operating: 4 - 24 Adc

Overall Dimensions: 12" D x 10" W x 7" H

Overall Weight: 7 1/4 Lbs

Operating Temperature Range: 6°C - 45°C

Storage Temperature: (-20°C) - (85°C)

Markings: UL and CE (PENDING)

INTERNAL MODULATION

Current "OFF TIME": 100 - 30,000 μ Sec

Current "ON TIME": 100 - 42,000 μ Sec

Modulation Depth: 0 - 84% (Rectangular Waveform)

The Modulation Depth MD is the ratio of the change in high lamp current I_h to the low lamp current I_l . Maximum attainable modulation depth depends on the individual lamp characteristics, the lamp on time T_h , the off time T_l and the high lamp current I_h .

sage action, inc.

P. O. BOX 416
ITHACA, NEW YORK 14851

PHONE 607 844-8448



Earlier design of Basic Light shown.

**SAI™ UNIVERSAL BASIC LIGHT
300W TUNGSTEN-HALOGEN LAMP**

DESCRIPTION AND SPECIFICATIONS

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EMAIL ordway@sageaction.com

www.sageaction.com

FAX 607 844-9399

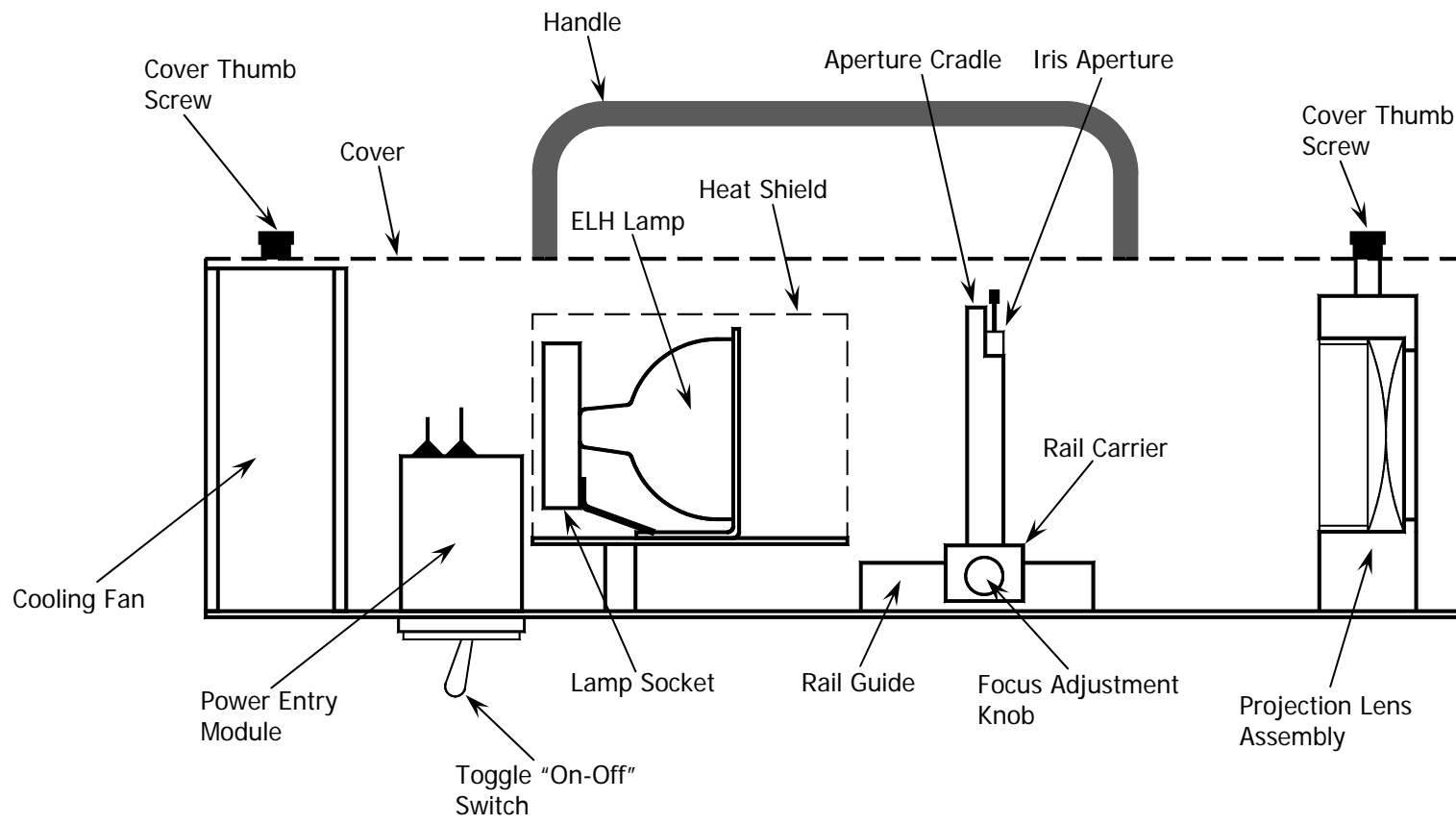
DESCRIPTION OF

SAI™ UNIVERSAL BASIC LIGHT 300W TUNGSTEN-HALOGEN LAMP

The SAI™ Universal Basic Light has been developed as part of a system for visualizing complex airflows with neutrally-buoyant bubbles filled with helium. Like our Modulated Arc Lamp, it provides a beam of uniform intensity to illuminate the trajectories of the helium bubbles. The Universal Basic Light accomplishes this at a fraction of the cost of the Modulated Arc Lamp if velocity measurements are not required. Also, the smaller, compact design allows for more flexibility and quicker diagnosis of "large-scale" airflow patterns.

This Basic Light uses a General Electric ELH 300W Tungsten-Halogen Lamp, generally available from many camera supply stores. Lamp life is rated at 35 hours. Power for the lamp and cooling fan is supplied directly through a grounded power cord and a toggle "ON-OFF" switch mounted in the bottom cover, along with a general-purpose power entry module to allow for either 115 Vac or 230 Vac operation. The projection lens and a unique aperture assembly allow focusing of the light beam on any flow from 24" to infinity. Two apertures are included with the SAI™ Universal Basic Light, an Iris and an adjustable Slit. The Iris provides a circular beam spread that can vary from 2" to 24" in diameter at 6', while the Slit provides a rectangular beam spread from 0" by 22" to 8" by 22" at the same distance.

Overall, the SAI™ Universal Basic Light is extremely simple and rugged in design, easy to use and adjust, and quiet and cool in operation. The complete assembly with a detachable tripod weighs only 7 lbs. This tripod is a full size, lightweight tripod. A flexible carrying case is provided for easy transport and storage of the light.



GENERAL COMPONENT LAYOUT OF THE
SAI™ UNIVERSAL BASIC LIGHT

SPECIFICATIONS FOR

***SAI™ UNIVERSAL BASIC LIGHT
300W TUNGSTEN-HALOGEN LAMP***

Circular Beam Spread: 2" - 24" Dia @ 6'

Iris Diaphragm Diameter: 2.5 mm - 37.0 mm

Rectangular Beam Spread: 0" x 22" - 8" x 22" @ 6'

Adjustable Slit Width: 0" - 7/16"

Focusing Range: 24" - Infinity

Projection Lens Focal Length (Each): 200 mm

Lamp: General Electric ELH 300 W, 120 Vac

Cooling: Forced Convection

Average Bulb Life: 35 Hrs

Main Light Dimensions: 5 1/2" H x 4" W x 13" L

Tripod Height: 23" - 61"

Total Unit Weight: 7 Lbs

Input Voltage: 115 Vac or 230 Vac, 50/60 Hz

Thermal Fuse: 286°F - 306°F

sage action, inc.

P. O. BOX 416
ITHACA, NEW YORK 14851

PHONE 607 844-8448



SAI™ ROLLING STAND
RS-BG, RS-BL AND RS-MAL

DESCRIPTION AND SPECIFICATIONS

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EMAIL ordway@sageaction.com

www.sageaction.com

FAX 607 844-9399

DESCRIPTION OF

SAI™ ROLLING STAND RS-BG, RS-BL AND RS-MAL

The SAI™ Rolling Stand has been developed specifically for use with various SAI™ Airflow Visualization Systems. It has three primary applications. The first is to support a Bubble Generator System with one or two Wands; the second, to support one or more Basic Lights; and the third, to support a single Modulated Arc Lamp.

The Stand is all built with substantial, quality parts. It is very simple to assemble or disassemble and easy to operate. It also has a lot of flexibility. Nominally, it can reach a height of 9', but the standard height supplied is to reach a height of 6'.

The base is a 4-leg pedestal configuration about 3' on the diagonal from wheel center to wheel center. The wheels are pivoted on ball bearings and may be locked from wheel rotation. It is enhanced with two trays attached across the legs. The edges of the trays are finished with Trim-Lok. These trays are handy for tools, small parts and so forth while testing. More importantly, with the Trim-Lok, they can serve as good places to put larger pieces of related equipment. For example, one tray can be a base for the SAI™ Bubble Generator, itself, and the other, for the SAI™ Auxiliary Air and Helium Supply when the Stand is used to hold one or two Wands.

Several Wands or Lights may be held by a single Stand since the Stand is quite stable, even at 9'. Adjustment of the height of the Wands or Lights is very easy. This greatly facilitates rapid changes, especially in minimal light.

We are really excited about our new piece of equipment. Based on many years of experience over a wide range of applications, it is our belief that the SAI™ Rolling Stand will prove of considerable value to you!



**SAI™ Rolling Stand w/ Wands, Bubble Generator and
Auxiliary Air Helium Supply**



**SAI™ Rolling Stand w/ Three Basic Lights
and Cord Reel**



**SAI™ Rolling Stand w/ Modulated
Arc Lamp**

SPECIFICATIONS FOR
SAI™ ROLLING STAND
RS-BG, RS-BL AND RS-MAL

Principal Materials: Aluminum, Plated Steel, Plastic, Vinyl, Delrin, Rubber

Overall Dimensions: 26" x 26" x 113.5"

Overall Weight: 22 Lbs

Major Components: 4 Legs w/ Wheels, 1 Connector Cross, 1 U-Channel Section Holder, 3 U-Channel Sections, 2 Section Connectors, 2 Support Brackets w/ Attachment Fixture, 1 Tray, 2 T-Handle Hex Keys, 1 Cord Reel

Minimum Stand Height: 3'

Normal Stand Height: 6'

Maximum Stand Height: 9'

Number Of Basic Lights Per Section: 2

U-Channel Section Dimensions: 1 5/8" x 1 5/8" x 36"

Leg Dimensions: 17" x 1 5/8" x 1 5/8"

Support Bracket w/Attachment Fixture: 1.5" x 6" Shelf, Right Hand, w/ 1.4" Dia x 2.5" Delrin Cylinder

Wheels: Threaded-Stem Caster, 3" Dia x 15/16" Rubber, Ball Bearing Swivel, 100 Lbs Capacity

Cord Reel: 20' 16 Ga 3-wire SJT Cable, 10A Circuit Breaker w/ Reset

Note: For more than 3 Basic Lights, the use of a second Cord Reel is required.

EXPERIENCED AND RESPECTED ...

Into our fourth decade of helping many people solve all kinds of airflow visualization problems, SAGE ACTION, Inc. looks back with a great deal of pride in the company it keeps! Among others, our thanks to:

Air Preheater	MARA Institute Of Technology
Aeritalia	Merck Sharp & Dohme
Alcoa	MIT
Arco	NASA
Battelle Memorial Institute	National Research Council
Bell Aerospace	Nissan Motor Company
Bell Laboratories	Northrop
Bendix Corporation	Ohio State University
Black & Decker	PPG Industries
The Boeing Company	Pennsylvania State University
Burroughs Corporation	Pininfarina
Carrier Corporation	Polaroid
Center for Disease Control	Pratt & Whitney
Clemson University	RCA Whirlpool
Combustion Engineering	Raytheon
Compaq	Riley Stoker
Control Data	Rochester Institute Of Technology
Cornell University	Rockwell International
Danish Maritime Institute	Shell
Digital Equipment Corporation	Sperry Rand Corporation
Eastman Kodak Company	Tandem
E. I. DuPont	Technolab S. A. Aarau
Embry-Riddle Aeronautical University E.P.A.	Tennessee Technological University
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GTE	Toro
Gates Learjet Corporation	Toyota Motors
General Dynamics	Trane Air Conditioning
General Electric	TRW
General Motors	TVA
Georgia Institute Of Technology	Union Carbide Corporation
Grumman Aerospace	United Aircraft Corporation
Gulf Research	University Of Missouri-Rolla
Hewlett - Packard	U. S. Military Academy
Honeywell	U. S. Naval Academy
IBM Corporation	Volkswagenwerk
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James River	Wang
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P. O. Box 416
Ithaca, NY 14851

Phone: 607 844-8448

Fax: 607 844-9399

Email: ordway@sageaction.com

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SAGE ACTION, Inc. is pleased to acknowledge that the development of the Helium Bubble Generator System was supported in part by the Office of Naval Research.

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