

# **Sioux® Solution Heaters**

## **For Precious Metals Mining**

- **Strip Your Carbon Column Up to Five Times Faster**
- **Designed Specifically For The Precious Metals Mining Industry**
- **Easy To Install, Operate & Maintain**
- **Compact**

**Model S-1**



# Application

Sioux Corporation's solution heaters are designed to heat the solution used in the heap leaching process in precious metals mining. Sioux engineered these units for this specific purpose in mining. For over 40 years Sioux Solution Heaters have been operating in mines throughout North and South America and in many other countries throughout the world. The rugged, reliable design provides an instant, continuous supply of hot solution which increases stripping speed, therefore lowering overhead and increasing profit.

Sioux Solution Heaters are easy to operate, and will last for many years with little maintenance required. These rugged units come fully equipped with controls and instrumentation.

# Benefits

- Hot solution is available within minutes of start-up.
- Units can be run continuously.
- No preheating and no recovery time are needed.
- Increases stripping speed, therefore lowering overhead and increasing profit.
- Units contain 100% stainless steel wetted parts to prevent corrosion.
- Units are modular so you can make a minimal investment to start, and expand your system as your operation grows.
- Easy to install, operate and maintain.
- Third party approved to UL508A and CAN/CSA-C22.2 No. 14-10, ensuring that the entire control panel assembly meets the UL and CSA safety standards.



Model S-2

# Operation

Basic operation of a Sioux Solution Heater is simple: A burner (which is fueled by your choice of oil, LP gas, or natural gas) heats solution as it passes through a heavy-duty welded stainless steel coil, producing a rise in the solution temperature. Discharge temperature limit set point is adjustable. Hot solution is available within minutes of start-up and units are designed to operate continuously.

Installation is simple. Just install the solution heater to the required utilities and you're ready to operate the unit. Units are compact and can be moved easily if necessary. Units have few moving parts so maintenance is minimal.

# Specification Chart

Model	Nominal BTU/Hour (in millions)	Continuous Current, (Amps)			Number of Burner Systems in the complete heater		Number of Solution Connections	Electricals	Approximate Unit Dimensions L" x W" x H" (cm)		Approximate Unit Weight (lbs.)		Approximate Shipping Weight (lbs.)	
		Oil, 115v.	Oil, 230v.	Gas	Oil	Gas			Oil	Gas	Oil	Gas		
S-1	1M	5.0	2.5	1.0	1	1 (A)	1 (B)	(C)	60 x 37 x 77 (153 x 94 x 196)	60 x 37 x 71 (153 x 94 x 180)	1,000	960	1,030	1,010
S-2	2M	10.00	5.0	1.0	2	2 (A)	2 (B)	(C)	60 x 72 x 77 (153 x 183 x 196)	60 x 72 x 71 (153 x 183 x 180)	1,700	1,800	1,800	1,900
S-3	3M	15.00	7.5	1.0	3	3 (A)	3 (B)	(C)	60 x 104 x 77 (153 x 264 x 196)	60 x 104 x 71 (153 x 264 x 180)	2,500	2,700	2,780	2,960

A. Gas inlet connection is 1" (25.4 mm) diameter pipe.

B. Inlet water connection is 1" (25.4 mm) diameter pipe.

C. Standard electricals are 115/1/60 or 230/1/60.

## GENERAL INSTALLATION GUIDELINES:

- Oil-fired units:
  - Approximate fuel consumption: 7.3 GPH (27.6 LPH) [at 150 PSI (10.3 BAR) with No. 1 fuel oil] per 1,000,000 BTU/hour burner
  - Preferred fuel is No. 1 fuel oil or good grade kerosene. No. 2 fuel oil may be used, but may cause coil to become coated with carbon/soot.
- Gas-fired units:
  - Approximate fuel consumption (when fired in accordance with gas pressure requirements) below:
    - Natural gas-fired units: Estimated 1,400 CFH per 1,000,000 BTU/hour burner (reducing fuel consumption will increase efficiency).

- LP gas-fired units: Estimated 15.58 GPH (59 LPH) or 66 lbs./hour per 1,000,000 BTU/hour burner.
- Gas pressure requirements:
  - Natural gas-fired units: 7-9" water column pressure (1.74-2.24 kPa) at burner [0.25-0.33 PSI (0.017-0.023 BAR)]
  - LP gas-fired units:
    - 11-13" water column pressure (2.74-3.24 kPa) at burner [0.40-0.47 PSI (0.028-0.032 BAR)].
    - One 1,000 gallon (3784.3 liter) LP fuel tank is required for each 1,000,000 BTU/hour burner
    - Consult your local gas supplier for capabilities and requirements of your local service.

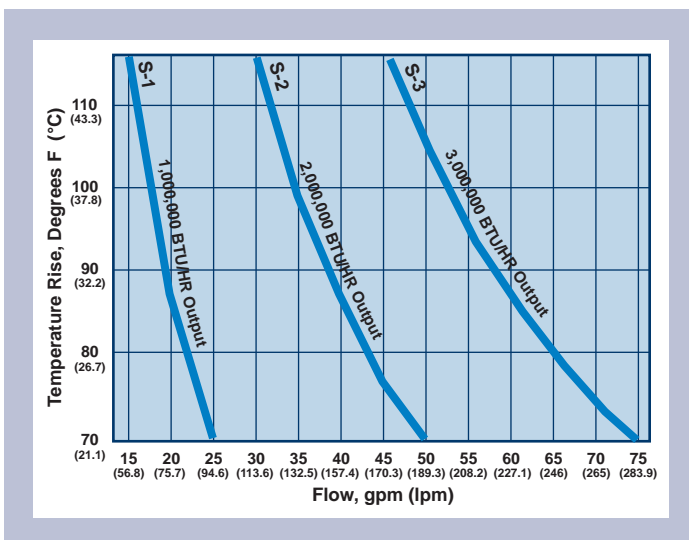
**Note:** Units are designed to be operated indoors, above 45°F (7°C).

## Performance

Use this chart to select basic solution heater size. Locate the desired flow of solution, then locate required temperature rise (temperature rise is the difference between the desired output solution temperature and the incoming solution temperature). Select a model that meets or exceeds the BTU/hour figure from the specification chart below.

Performance shown on curve is based on heating water and is conservative. Recommended maximum discharge temperature is 300°F (149°C) for all models. Minimum flow is 15 GPM (56.7 LPM) per module. [15 GPM (56.7 LPM) for S-1; 30 GPM (113.6 LPM) for S-2; 45 GPM (170.3 LPM) for S-3]

**Performance for Sioux Solution Heaters**  
Temperature Rise vs. Flow Rate

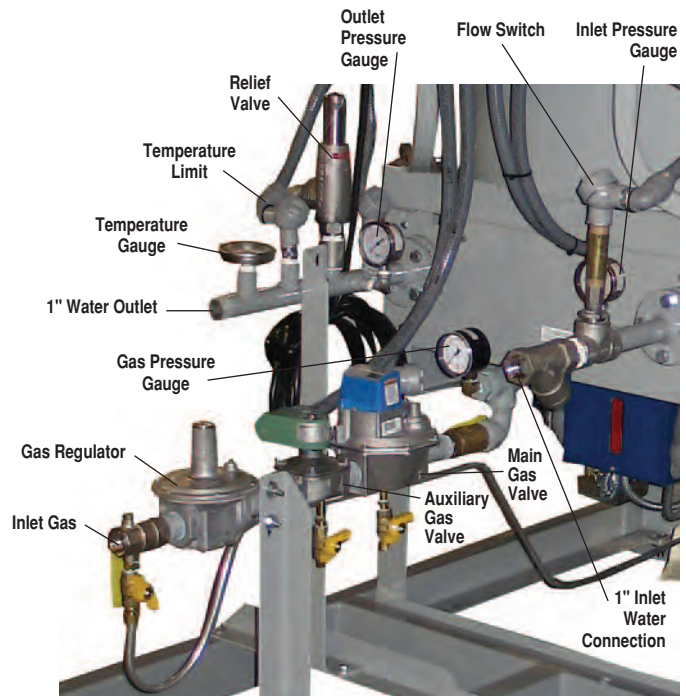


### Performance Chart Notes:

- Solution flow rates vary with pressure. Required pressure at inlet is 40 to 80 PSI (2.76 to 5.52 BAR), flow would be 15 GPM (56.78 LPM) and 25 GPM (94.63 LPM) respectively.
- All ratings are based upon operation in an ambient temperature of 70°F (21.1°C) at sea level [2,000 ft. (609.6 m)].
- Derate 4% per each 1,000 feet (604.8 meters) altitude above 3,000 feet (914.4 meters).

## Standard Features

The heavy-duty construction of the Sioux Solution Heater features an all-welded 3/16" (4.76 mm) angle iron and 3" (76.2 mm) channel steel frame and stainless steel wetted parts. Paint is baked on alkyd primer with grey finish coat, free of heavy metals. Heating coil is 1" (25.4 mm) schedule 40, type 304 stainless steel pipe, vertically-mounted, and electrically-welded with flanged connections for easy replacement or maintenance. Alternate grades of stainless steel are available (consult factory). The burner (oil, LP, or natural gas) includes a flame monitoring safety ignition system. Standard safety features include high temperature limit switch, low flow limit switch, bi-metal thermometer, and stainless steel relief valve.



# Options and Accessories

**Draft Diverter/Damper Exhaust Assembly**—Draft diverter equalizes stack pressure, while damper (motorized) restricts cold air from coming down stack, which may freeze liquid in the heating coil. Motorized version is 115-volt electrically-operated. Stack opening is 12" (30.5 cm) diameter and the assembly is 48" (122 cm) high. (**NOTE:** When using a motorized draft diverter/damper, each 1,000,000 BTU/hour section requires one draft diverter/damper assembly; 2,000,000 BTU/hour section requires two assemblies; 3,000,000 BTU/hour section requires three assemblies.)

**SA00153** Motorized Damper, 115 volt electrically operated.

**SA00154** Motorized Draft Diverter/Damper – 115 volt, electrically-operated.

**Inlet/Outlet Isolation Valve**—Inlet and discharge valves are needed if operator wants to shut off solution flow at an individual unit, for maintenance or repair, instead of shutting down complete system. The discharge valve can also be used for throttling flow.

**FT01295** 1" (2.5 cm) ball valve

**Rain Cap**—Helps keep rain water out of burner. One 12" (30.5 cm) diameter rain cap required for each 1,000,000 BTU/hour section.

**AC00696** Rain Cap

**Alternative Electricals**—Electrical voltage, frequency or phase other than standard; any voltage and 50 Hz models are available – consult factory.

## What Makes Sioux Different?

Since 1939, Sioux has been helping customers in a wide range of industries solve challenging problems by engineering and manufacturing innovative, application-specific equipment. Proven durability and reliability make Sioux the best value for demanding applications.

### Reliability Guarantee

Sioux offers the only twenty-year reliability guarantee in the industry which includes same day shipment of stock parts orders, and lifetime parts department support. See details in form 308 and form 847.

### Conservative Design

Sioux does not undersize components such as motors, pumps, burners, frames, or engines, which is common elsewhere.

### Proven Performance

Sioux machines are dependable in the field. Combining high quality components with over 70 years of custom manufacturing experience and extensive engineering design capabilities allows Sioux to provide the industrial workplace with the best equipment for continuous operation.

### Simple Operation

Sioux machines are designed to be simple to install, operate, and maintain.

### Safety

In addition to dependability and simple operation, operator safety is a top design consideration for all Sioux products.

### Factory Testing and Parts Availability

Every Sioux machine is thoroughly tested in our on-site testing facility before it leaves the factory. Records by serial number for every machine are maintained by Sioux, to support spare parts for the life of the equipment.

### A Well-Deserved Reputation — The Best

Sioux solution heaters are engineered specifically for the mining industry to provide long life and trouble-free service, and include standard features that are often considered options on competitive models. These features may initially cost a little more, but provide equipment that runs better, lasts longer, is safer to operate, easier to maintain, repair and troubleshoot, and over the life of the unit, provides a superior return on investment.

**Call us toll-free at (888) 763-8833  
or visit us at [www.sioux.com](http://www.sioux.com)**



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