

SIoux[®] **WATER HEATERS**

**Hot Water for Cold
Weather Concrete
Production**

- **Better
Concrete**
- **Higher
Profits**



Model M-1

Sioux Water Heaters and Steam Generators

Hot Water: Higher Profits, Better Concrete

Heating the water with a Sioux® Water Heater is five times more efficient than heating the aggregate.

Pouring at a precise temperature produces higher quality concrete. Other benefits are faster screeding and a better finish, which increases production and profits, while reducing labor costs. In fact, with a Sioux Water Heater, increased profits can pay for the unit in less than one season.

Using the proper water temperature in concrete greatly reduces cracking due to shrinkage. In addition, many federal, state and local municipalities are now specifying exact pouring temperatures; a Sioux Water Heater can

help you meet these specifications.

Hot water from a Sioux Water Heater provides a much better finished product than with chemical additives, such as calcium chloride. In fact, the American Concrete Institute says “Under certain conditions, calcium chloride should not be used to accelerate setting and hardening because of the increased chance of corrosion of metals embedded in the concrete or other adverse effects.”

With a Sioux Water Heater, problems such as “leopard spotting” or darkening are also greatly reduced. Furthermore, hot water is much less expensive than chemicals and is environmentally friendly.

Features and Benefits

Sioux Water Heaters provide an instant and continuous supply of hot water. Operation is simple: water at 50-100 PSI is run through a heating coil, which is heated by an oil or gas burner. The heater produces up to a 100°F temperature rise within one minute of startup. Outlet temperature and flow rate can be held at precise levels. Sioux Water Heaters feature heavy-duty steel construction.

- **Easy conversion from NG to LP, or LP to NG** in less than five minutes and at no added cost. Heaters are also convertible from gas to oil, or oil to gas. Gas conversion is done by adding or removing one small orifice, supplied with each NG or LP heater. To convert from oil to gas, or gas to oil change the burner and burner control. All oil and gas models use identical frames, heating coils, electrical pumps, skids etc. This feature allows the customer to change to the lowest-cost fuel, and move the heater to another location where another fuel may be available.
- **Insulation** beneath the external steel jacket provides higher heater efficiency, reducing fuel consumption. Low temperature of steel outer jacket provides a higher safety level.
- **Dual thermometers and pressure gauges** provide indication of inlet and discharge water temperature and pressure, which is useful during operation and maintenance.
- **Flanged disconnects** allow customer to easily replace the heating coil and gas burner.
- **Ball valves** allow easier delimiting of the unit.
- **Water light** alerts customer of low water flow conditions.
- **Modular Units** allow a minimal investment to start, with the option to expand your system as your operation grows.
- **Exhaust gas** is separate from heated water, to produce non-contaminated hot water.
- **Ease of maintenance**
Simple and complete draining of coil lowers maintenance costs, reducing down time.
Draining reduces risk of damage due to freezing temperatures and minimizes corrosion, increasing coil life.
Coil replacement is easier and less expensive than replacing the heat exchanger of other types of water heaters.
- **Optimum combustion chamber** provides high efficiency, a clean burn, and low emissions.
- **Three-Pass Coil Design** is superior to alternative heat transfer methods, giving simple, long-lasting performance which reduces fuel consumption, saving the customer money.
- **Meets Section IV of the ASME code** for hot water boilers, third-party inspected to insure compliance.
- **Ease of installation**
A service-rated disconnect is provided on each M, HWP, PWP heater, eliminating the need to add another disconnect switch as required by the National Electrical Code. Increases safety and lowers installation cost.
Pre-plumbed and pre-wired, installation is easy. Just connect the water heater to required utilities and you're ready to go. One day installation and set-up vs. as long as one to two weeks for alternative equipment.
Small footprint – using as little as 3' x 6' floor space.
Lower exhaust temperature of approximately 350°F, may allow using a single wall chimney vs. double wall chimney, lowering chimney installation cost, (check local codes).
- **Instantaneous and continuous** supply of hot water within one minute of start up vs. up to three hours with other systems.
- **Stainless steel condensate collection pan** prevents corrosion from condensate in exhaust gases from rusting the heater.
- **High-quality power gas burner** contains flame within combustion chamber, so performance does not vary with the weather. This design is ideal for high altitude installations.
- **Power gas burner and gas train** are UL Listed, and are built to ASME CSD-1 code.
- **Standard pump and motor** is a seven stage, stainless steel centrifugal pump with stainless steel impellers, stainless steel housing and comes standard with a 3-HP motor. Pump life is increased due to strong corrosion resistant stainless steel. This seven-stage pump can handle water at higher temperatures, provides 37% higher water flow through the heating coil, and overcomes much higher friction losses in your piping system. This reduces the temperature rise in the heater, increasing the attainable tank temperature, and reaching the desired tank temperature much faster. This also reduces burner cycling, increasing burner life. Higher flow reduces chance of low-flow shutdown, even with minor liming in the system.
- **Application flexibility.** Can be run as either a once-through heater, with discharge temperatures up to 200°F, or can be used in a storage tank system where temperatures up to 190°F can be achieved. This meets the needs of a larger number of customers and applications.
Wide range of options are available, such as the configuration types D, M, HWP and PWP, fuel types of NG, LP or oil. Can be designed for almost every customer voltage. Sioux can provide the best unit for your application.

D Series: Conventional Water Heaters

Introduced in 1960, the D Series is a very reliable water heater. It is the most simple and compact of any water heater Sioux manufactures. Its rugged construction is the basis for all Sioux Water Heating Systems. All three models come with a heavy-duty welded steel skid.

The D Series is ideal for smaller volumes of water for direct feed into your ready mix truck. The D Series is also a great add-on to your present water heating system. Standard primary electricals are 115 volts/single phase/60 Hz.

Standard construction features include: Indicator light to alert operator that low water flow limit switch has shut down (locked out) burner due to inadequate water flow. The temperature control switch and the manual reset high temperature limit switch shut off burner in case of excessive water discharge temperature. ASME-rated pressure relief valve opens to discharge water in case of excessive pressure buildup. Pressure gauges and bi-metal thermometers on both inlet and outlet allow monitoring of differences between incoming and outgoing water temperature and pressure. Y-strainer on water inlet ensures foreign particles do not enter heater water supply. For additional information see specifications on page 8.



Basic Water Heater
• Oil Fired
Sioux Model D-1000



MODELS*	OIL FIRED			NATURAL GAS OR LP GAS FIRED		
	Output BTU/hr	Efficiency	Boiler HP	Output BTU/hr	Efficiency	Boiler HP
D-1000 or M-1	900,000	90%	27	860,000	90%	26
	1,080,000	86%	32	1,010,000	86%	30
D-2000 or M-2	1,800,000	90%	54	1,720,000	90%	51
	2,160,000	86%	64	2,020,000	86%	60
D-3000 or M-3	2,340,000	82%	70	2,120,000	82%	63
	3,240,000	86%	97	3,030,000	86%	90

This performance is based on standard conditions at 1,000 feet elevation and may vary +/-5%. For each model, the burner can be adjusted to produce highest efficiency (first rating shown), standard efficiency (second rating shown), or highest output capacity (third rating shown).

Performance must be derated for altitude. Derate 4% for every 1,000 feet of elevation over 3,000 feet.

This performance data is applicable to the D Series, M series, HWP series, and the PWP series.

*Factory Set Performance

M Series: Water Heater/Pumping Stations

The M Series incorporates the same basic unit as the D Series (see page 4), plus a high quality centrifugal pump for recirculating hot water to the customer's holding tank. Water heater, pump and electricals are mounted on a rugged steel skid. Electrical control box includes starters for each heater/pump section.

This system is designed for applications where there is a need for a large quantity of water in a short time period, such as when multiple ready mix trucks need to be loaded quickly. Using your vented water tank (not included), water is circulated by the pump through the heater and back into the tank, achieving the desired water temperature.

Standard primary electricals are 230/3/60, 460/3/60. For additional information, see specifications page.

M-Series models all include a service-rated electrical disconnect switch, eliminating the need to add a second service-rated disconnect switch as required by the National Electrical Code.



**Sioux Model M-3
Water Heater with
Pumping System**
Oil Fired • Seven-Stage Pump

- Available in Oil, LP or Natural Gas
- Alternate Electricals Available
- Custom Designs Available

On all M Series Water Heaters, choose either a Gould 3 HP vertical circulation pump or a Grundfos® 3 HP vertical pump. See "Pump Selection" on page 9.

**G-suffix denotes Grundfos circulation pump*

Other Models Available:

Sioux Model M-1 Water Heater with Pumping System

- Oil, LP, or Natural Gas Fired
- Seven-Stage Pump
- 1,000,000 BTU/hr

Sioux Model M-2 Water Heater with Pumping System

- Oil, LP or Natural Gas Fired
- Seven-Stage Pump
- 2,000,000 BTU/hr

HWP Series: Self-Contained Water Heating Systems

The HWP Series is ideal for remote locations or construction sites, such as dams or bridges.

The HWP Series combines the rugged Sioux Water Heater/Pumping System combination of the M Series (see page 5) with a 1,000 gallon atmospherically-vented water tank. The unit has multiple pumps: one for each million BTU section to circulate water through the heater, and one to discharge water. Tank includes liquid level sensor with water solenoid valve, liquid level sight gauge, adjustable tank temperature control with immersion well, thermometer, ladder, inspection port, and motorized damper. The entire system is mounted on a rugged steel skid for portability.

Standard power source is 230/3/60 or 460/3/60; alternate electricals are also available.

- Available in Oil, LP or Natural Gas
- Standard with Seven-Stage Circulation Pump(s) and one Single-Stage Discharge Pump



Model HWP-1000

Self-Contained Water Heater with 1,000-gallon tank

- LP Gas Fired
- Seven-Stage Circulation Pumps and Single-Stage Discharge Pump shown

PWP Series: Self-Contained Water Heating Systems

The PWP Series is designed for applications such as precast, pipe, vault, pre-stress, or block operations, where hot water is needed on a constant basis, with smaller tank than the HWP Series.

The PWP Series includes the water heater/pumping system of the M Series (see page 5) with a 225-gallon mild steel atmospherically-vented water tank. The PWP has two pumps, one to circulate water through the heater and one to discharge water from the system. Tank includes liquid level sensors with water solenoid valve, liquid level sight gauge, adjustable tank temperature control with immersion well, and thermometer. Comes complete with motorized damper. The entire system is mounted on a rugged steel skid for portability.

- Available in Oil, LP or Natural Gas
- Standard with Seven-Stage Circulation Pump(s) and one Single-Stage Discharge Pump
- Stainless Steel Tank Option Available



Model PWP-1000

with Motorized Damper (SA00103)

Self-Contained Water Heater with 225-gallon tank

- LP Gas Fired
- Seven-Stage Circulation Pump and Single-Stage Discharge Pump shown

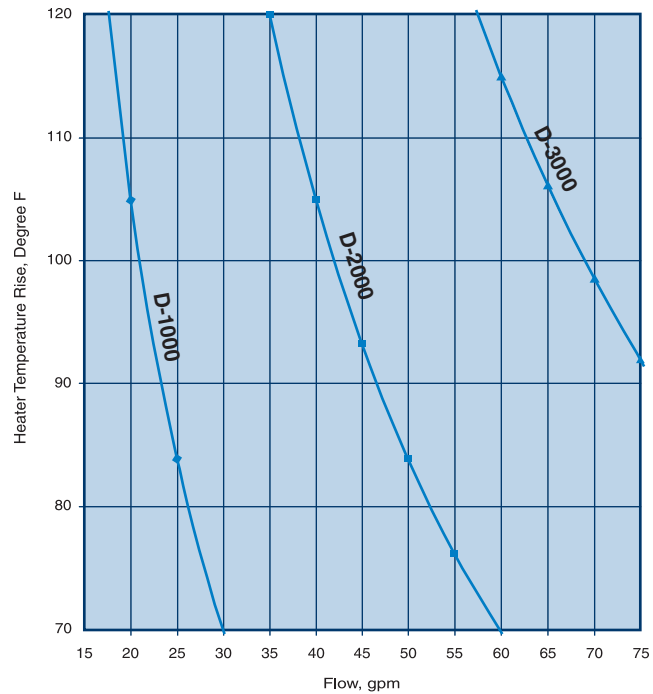
Water Heater Performance

Use these two performance charts to select the heater size for your application. Locate the gallons per minute of hot water needed, then locate required water temperature rise (temperature rise is the difference between the heater discharge water temperature and the heater inlet water temperature). Select a model that meets or exceeds the BTU/hour figure from the specification chart on page 8.

Minimum recommended flow is 15 GPM per circulation pump.

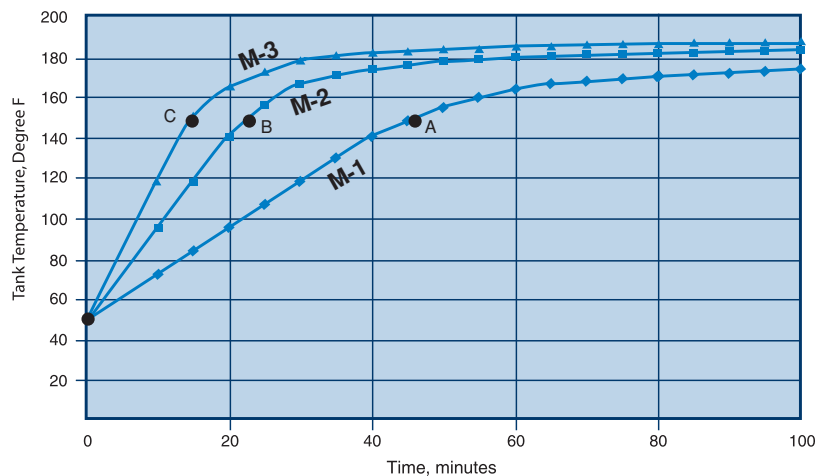
Performance for D Series

Temperature Rise vs. Water Flow Rate



Performance for M Series

1,000 Gal. Tank Temperature vs. Elapsed Time.



Performance Chart Notes:

1. All ratings are based upon operation at 70°F and at sea level conditions.
2. Derate 4% per each 1,000 feet altitude over 3,000 feet.

NOTE: As an example of the application of the second chart, consider the time to heat a 1,000 gallon storage tank of water from 50°F to 150°F (a 100°F temperature rise in the storage tank). The M-1 (one burner unit) takes 45 minutes (Point A). The M-2 (two burners) takes 22.5 minutes (Point B), or half the time of the M-1. The M-3 (three burners) takes 15 minutes (Point C), or 1/3 the time of the M-1 unit.

Water Heater Standard Construction

Frame is welded, heavy-duty steel, built to last many years.

Water Supply is pressure-fed. Flanged disconnects on inlet and outlet for easy coil removal. Features ball valves for easier draining and delimiting of water system.

Coil is heavy-duty 1" schedule 40 pipe, replaceable, vertically-mounted, electrically-welded. Vertical mounting eliminates hot spots and allows complete drainage, eliminating damage from freezing. Each Sioux Water Heater coil is built to stringent ASME (American Society of Mechanical Engineers) standards, individually tested and inspected, and is permanently registered with the National Board of Boiler and Pressure Vessel Inspectors.

Electrical System features magnetic starters, low-flow indicator light, water-tight wiring and connectors. Electrical components are mounted in NEMA-12 standard industrial enclosures. Alternate enclosures, voltage, frequency, and single phase or three phase electrical systems are available for all models.

Burner (Oil, LP or Natural Gas) includes flame

monitoring safety ignition system to prevent burner operation if flame is not present. **Oil Burner System** is integral package with positive forced air, 1/3 HP TEFC motor, adjustable pressure fuel system, 10,000-volt, UL-listed moisture-proof constant-duty transformer with spark ignition. **Gas Burner System** is a UL-listed high efficiency power gas burner with a 1" ASME-CSD-1 gas train. Gas train has a union for easy removal and maintenance. Combination Oil/Gas Burner Available. Consult factory for details.

Water Tanks (HWP and PWP models only) are heavy-duty, atmospherically-vented and include liquid level sight gauge, thermometer and adjustable tank temperature control with immersion well to monitor water tank conditions.

Paint All heater modules for all designs, and all M-1 and D-1000 skids are painted with a durable, high quality, ANSI 61 gray, TGIC polyester powder paint. Balance of designs are liquid painted.

Skid: Heavy-duty welded steel, including gussets with holes for bolting to concrete slab.

Specification Chart

Model	Net Heat Output BTU/hr	KW Out	Required Input BTU/hr	KW In	Boiler Horse- power	Number of Burner Systems		Water Conn.	Number of Pumps	Number of Water Tanks	Standard Electricals	Approx. Unit Dimensions L x W x H		Approx. Shipping Weights
						Oil	Gas					Inches	CM	
D Series														
D-1000	1,000,000	293	1,180,000	346	30	1	1 (A)	1 (B)	—	—	115/1/60	60 x 37 x 82	152 x 94 x 208	1,030
D-2000	2,000,000	586	2,360,000	692	60	2	2 (A)	2 (B)	—	—	115/1/60	60 x 72 x 82	152 x 123 x 208	1,800
D-3000	3,000,000	879	3,540,000	1038	89	3	3 (A)	3 (B)	—	—	115/1/60	60 x 104 x 82	152 x 264 x 208	2,780
M Series														
M-1 & M-1G	1,000,000	293	1,180,000	346	30	1	1 (A)	1 (B)	1 (C)	—	230-460/3/60	80 x 37 x 82	152 x 94 x 208	1,470
M-2 & M-2G	2,000,000	586	2,360,000	692	60	2	2 (A)	2 (B)	2 (C)	—	230-460/3/60	80 x 72 x 82	152 x 94 x 208	2,890
M-3 & M-3G	3,000,000	879	3,540,000	1038	89	3	3 (A)	3 (B)	3 (C)	—	230-460/3/60	80 x 104 x 82	152 x 204 x 208	4,085
HWP Series														
HWP-1	1,000,000	293	1,180,000	346	30	1	1 (A)	1 (B)	2 (C)	1 (D)	230-460/3/60	124 x 80 x 85	315 x 203 x 203	3,420
HWP-2	2,000,000	586	2,360,000	692	60	2	2 (A)	2 (B)	3 (C)	1 (D)	230-460/3/60	124 x 80 x 80	315 x 203 x 203	4,540
HWP-3	3,000,000	879	3,540,000	1038	89	3	3 (A)	3 (B)	4 (C)	1 (D)	230-460/3/60	124 x 80 x 80	315 x 203 x 203	6,060
PWP Series														
PWP-1000	1,000,000	293	1,180,000	346	30	1	1 (A)	1 (B)	2 (C)	1 (E)	230-460/3/60	93 x 80 x 82	230 x 203 x 208	1,720

Note: Heat output is approximate - refer to pg 4 for detailed information.

- A. Gas inlet connection is 1" diameter pipe on D, M and HWP Series, plus Model PWP-1000; Inlet connection height is 16-1/2" from ground on all units.
- B. Inlet water connection is 1-1/2" diameter pipe on D, M-G, HWP Series; 2" on M Series; 1-1/2" on PWP Series. Outlet water connection is 2" diameter pipe on all models. Inlet connection height is 20" from ground on D Series; 8-1/2" on M Series; 7" on M-G Series; call factory for HWP and PWP.
- C. Pumps on M Series are circulating pumps. Pumps on HWP and PWP Series include one discharge pump, and the balance are circulating pumps. See "Pump Selection" on page 9.
- D. HWP units include one 1,000-gallon water tank. Features 1/4" hot-rolled steel plate construction, 68"D x 72"H. Tank base is 72" square, 1/4" steel plate. Includes ladder, inspection port, 1-1/2" drain valve, and float valve assembly.
- E. PWP units include one 225-gallon water tank. Features 14-gauge mild steel construction, 28"D x 48"H. Includes 3/4" drain plug, liquid level sensors and water solenoid valve.

*Weights are for horizontal two-stage pump(s). For each vertical two-stage pump used, add approximately 50 lbs. to weight.

All data is subject to change; call factory prior to construction for exact data for your model.

GENERAL FUEL SYSTEM GUIDELINES:

1. Oil-fired units:
 - A. Approximate fuel consumption: 9.0 GPH (at 290 PSI with No. 2 fuel oil) per burner system.
 - B. No. 1 fuel, No. 2 fuel, or kerosene usage permissible on all machines.
2. Gas-fired units:
 - A. Approximate fuel consumption (when fired in accordance with Sioux gas pressure requirements):
 - 1) Natural gas-fired units: 1,180 CFH per burner (reducing fuel consumption will increase efficiency).
 - 2) LP gas-fired units: 13.13 GPH or 55.6 lbs./hour per burner.
 - B. Gas pressure requirements:
 - 1) Natural gas-fired units: 7-9" water column pressure at burner (0.25 to 0.33 PSI).
 - 2) LP gas-fired units: 13.13 GPH or 55.6 lbs./hour per burner.
 - a) 8" minimum water column pressure at burner (0.40-0.47 PSI).
 - b) One 1,000-gallon LP fuel tank is required for each 1,000,000 BTU/hour burner.
 - c) Consult your local gas supplier for capabilities and requirements of your local service.

Pump Selection

Sioux® refers to two types of circulation pumps: a vertical seven-stage stainless steel Goulds pump with 3 HP motor, or a Grundfos® eight-stage pump with 3 HP motor.

Goulds Circulation Pump (standard)—The Goulds vertical seven-stage circulation pump with 3 HP motor is the standard circulation pump on M, HWP and PWP 3 phase units. It features a 316 stainless steel housing, impellers and shaft. The pump has a maximum head pressure of 104 PSI (heads to 245 ft). Stainless steel liquid end components offer high quality and corrosion resistance. Back pullout construction allows easy overhaul of impeller and seal without disturbing suction and discharge connections. TEFC (totally enclosed fan cooled) 3 HP motors are standard on all M, HWP, PWP 3 phase units.

The Sioux Portable Water Plant (PWP 1000) comes standard with one circulation pump as described above, and one single stage discharge pump with 3 HP motor.

Grundfos Circulation Pump (optional)—The Grundfos pump with 3 HP motor is recommended for longer piping systems, or where water has high lime or mineral content. The Grundfos pump will produce a greater flow rate and overcome greater system

back-pressure. The vertical eight-stage design of this pump allows it to develop high pressure, and makes it an excellent circulation pump for applications that require high head pressure. The pump features excellent performance in low suction conditions. Its vertical, in-line design ensures easy installation and maintenance. Its 304 and 316 stainless steel impellers, drive shaft and other internal components provide higher efficiencies, lower starting torque and reduced bearing loads. The viton O-ring seals provide added protection against corrosion, especially in coil deliming. Equipped with a 3 HP motor, the pump will deliver up to 150 PSI (head to 350 ft). The additional pressure capabilities of the Grundfos pump will allow the user to achieve better performance where pressure losses from extended piping, elevation head, and liming conditions require increased recirculation system capability. Available in single or three-phase applications.

Price Discharge Pump—The standard discharge pump is a Price brand, single-stage, horizontal pump, with a 5 HP motor on HWP models, and 3 HP motor on PWP models.

Options and Accessories

Draft Diverter/Damper Assembly—Exhaust assembly equalizes stack pressure and helps prevent cold air from entering stack (which may freeze heating coil). 12" stack opening, 38" high. One assembly required for each one-million BTU/hour heater module. For use on D, M and HWP Series.

SA00153 12" Motorized Damper

SA00154 12" Motorized Draft Diverter/Damper—115 volt, electrically-operated.

Water Solenoid/Liquid Level Sensor—Valve and switch work in tandem to keep water at specified level in customer water tank. For use on D and M Series.

FT00815 1" Water Solenoid Valve

FT00816 2" Water Solenoid Valve

FT00783 1-1/2" Water Solenoid Valve

EC00303 Liquid Level Sensor Switch

Pumps—Circulating Pumps circulate water between water holding tank and heater. **Loading Pumps** move water from water heater tank to truck or other destination. See "Pump Selection" Section above for detailed information on single-stage and two-stage pumps.

SA00105 Circulating Pumping Station, Seven-Stage, Centrifugal, 3 HP, 230/3/60 or 460/3/60.

SA00106 Circulating Pumping Station, Eight-Stage, High Pressure, 3 HP, 230/3/60 or 460/3/60, Grundfos Brand.

SA00107 Circulating Pump, Eight-Stage, High Pressure, 3 HP, 230/1/60, Grundfos Brand.

SA00108 Discharge Pump, Single-Stage, Centrifugal, 5 HP, 230/3/60 or 460/3/60, Price Brand.

Tank Temperature Control—This accessory controls the burner to maintain desired temperature in customer water tank. Includes 1/2" male pipe thread (MPT) brass immersion well. For M Series.

EC00560 Tank Temperature Control

EC00561 Immersion Well for EC00560 (Required)

Rain Cap—Prevents precipitation from interfering with burner operation in outdoor applications. One rain cap is needed for each one-million BTU/hour heater module. Heavy-duty stainless steel construction on all models.

AC00696 Rain Cap

Alternate Electricals—Electrical system other than listed standard. Contact factory.

Sioux Water Treatment System—Sioux's Water Treatment System treats the water by sequestering (binding up) the dissolved scale-causing minerals. A sequestering agent (polyphosphate) is added to the water which binds with the scale-causing minerals and keeps them in solution form, thus preventing hard water scale. This significantly reduces scheduled deliming, and makes descaling of your coil easier and faster, increasing the life of your investment.

AC00423 Sioux Water Treatment Scale Inhibitor Kit: 500,000 gallon usage

AC00421 Pre-filter with 140 mesh screen, recommended for use with **AC00432** if you have sandy or dirty water

AC00418 Replacement cartridge for **AC00423**

AC00426 O-Ring for replacement cartridge **AC00418** recommended for purchase with **AC00418**

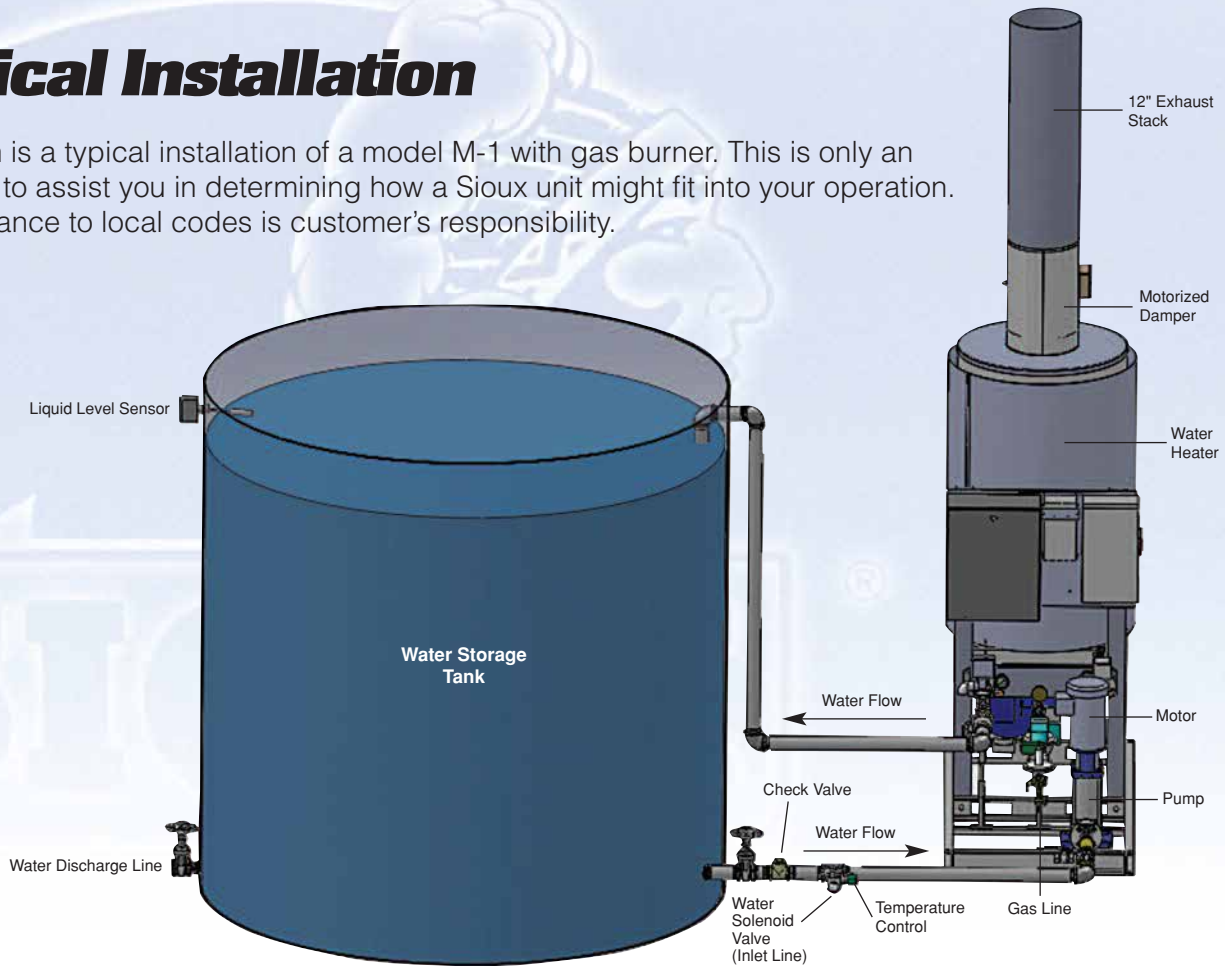
Liquid Biodegradable Descaler—An excellent product for dissolving all water scale, lime, mud and rust deposits that accumulate in the heating coil and plumbing system of Sioux Water Heaters. It is safe to handle, yet will dissolve your heaviest water-formed deposits in a minimum of time. It is much safer, less hazardous, and easier to dispose of than Muriatic acid. Sioux recommends at least 5 gallons per coil. Additional batches may be required in severe cases.

AC00555 Liquid Descaler, 5 gallons

AC00556 Liquid Descaler, 30 gallons

Typical Installation

Shown is a typical installation of a model M-1 with gas burner. This is only an example to assist you in determining how a Sioux unit might fit into your operation. Conformance to local codes is customer's responsibility.



For more information:



1150 Davis Road Suite, J Elgin IL 60123
P: (847) 468-8800 • (800) 788-8867 • F: (847) 468-8811
www.lorchem.com • info@lorchem.com

We Know How To Get Things **CLEAN**



SIoux CORPORATION

One Sioux Plaza • Beresford, SD USA 57004-1500
Tel: (605) 763-3333 • Fax: (605) 763-3334
Website: www.sioux.com • E-mail: email@sioux.com



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