



# Low Temperature Micro-Boiler™ Residential Space/Water Heating 5-, 7-, 9-, 11-, 14-, 18-, 22-, 28-KW Models

## 10-Year Limited Warranty\* Chamber and Parts

### Features & Benefits

**High Efficiency Compact Design Provides Unlimited Heat and/or Hot Water**-Micro Boilers provide unlimited space and/or water heating while operating within their designed BTU output and gallons per minute range, providing the perfect source of heat for radiant floor heating systems, in-duct heating coils, baseboard radiators and combination water/space heating systems. Micro-Boilers are the ideal replacement for traditional boilers and tank-type water heaters for applications requiring up to 155°F water temperature. When installed as part of a total system energy conservation solution, Micro-Boilers facilitate the use of active renewable energy sources such as solar and geothermal. Micro-Boilers can be used in potable water systems (specify when ordering) or with glycol-based low pressure/low temperature hydronic heating systems. Micro-Boilers install inside closets, or on almost any wall. Heat is provided only on demand, virtually eliminating standby heat loss, resulting in over 99% efficiency.

**Microprocessor Control**-On-board computer logic controls temperature through a modified proportional, integral, derivative (PID) control scheme. The control also provides self-diagnostics, alerts the homeowner in case of a water leak inside the Micro-Boiler, incorporates optional off-peak control capabilities for local utilities, and intelligently controls power distribution to the heating elements while continuously monitoring critical functions in order to shut down the Micro-Boiler if a failure occurs.

**PowerShare™ Technology**-Patented power distribution control technology utilizes computer algorithms and electronic triacs with patented cooling technology to pulse power on and off to all heating elements resulting in uniform temperature modulation between 1-100% of the element's range. PowerShare also eliminates electrical disturbances in the home from the water heater, such as flickering lights.

**Thermistor Temperature Sensing**-Five thermistors to continuously monitor inlet/outlet water temperature and the temperature in each heating element chamber.



Two & Four Chamber Models Shown

Outlet water temperature is factory set to 120°F and is field adjustable between 90-145°F. In addition, water flow is sensed using the same thermistors, eliminating the need for troublesome flow switches. Micro-Boilers work independently of circulating pumps and auxiliary wall thermostats.

**Heating Elements**-Industry standard 1 ½" hex head, direct immersion, heating elements utilize PowerShare technology to help eliminate scale build-up and prolong element life far beyond that of tank type water heaters. If an element fails, a replacement can be purchased from virtually any plumbing distributor.

**Redundant Safety Features**-Two water level sensors are located at the top of the Micro-Boiler's chambers preventing power to the heating elements if sufficient water level is not detected inside the Micro-Boiler. In addition, two safety cutoff switches, one manual and one automatic reset, shut down power to the heating elements should an unsafe condition occur.

**Built-in Leak Detector and Alarm**-A switch located at the bottom of the Micro-Boiler activates an alarm when contacted by water and shuts down the Micro-Boiler (this feature disabled on combination space/water heating models).

**Code Approvals**-UL/CUL 834/165, HUD Mobile Home-Ref. NFPA 70, ISRAEL, NOM, and NEC. Hydrostatically tested to 300 psi.

\*Limited Warranty-See Written Warranty For Details.

For Additional Features See Inside Page

# Low Temperature Micro-Boiler Residential Space/Water Heating

## 5-, 7-, 9-, 11-, 14-, 18-, 22-, 28-KW Models



Endless Hot Water

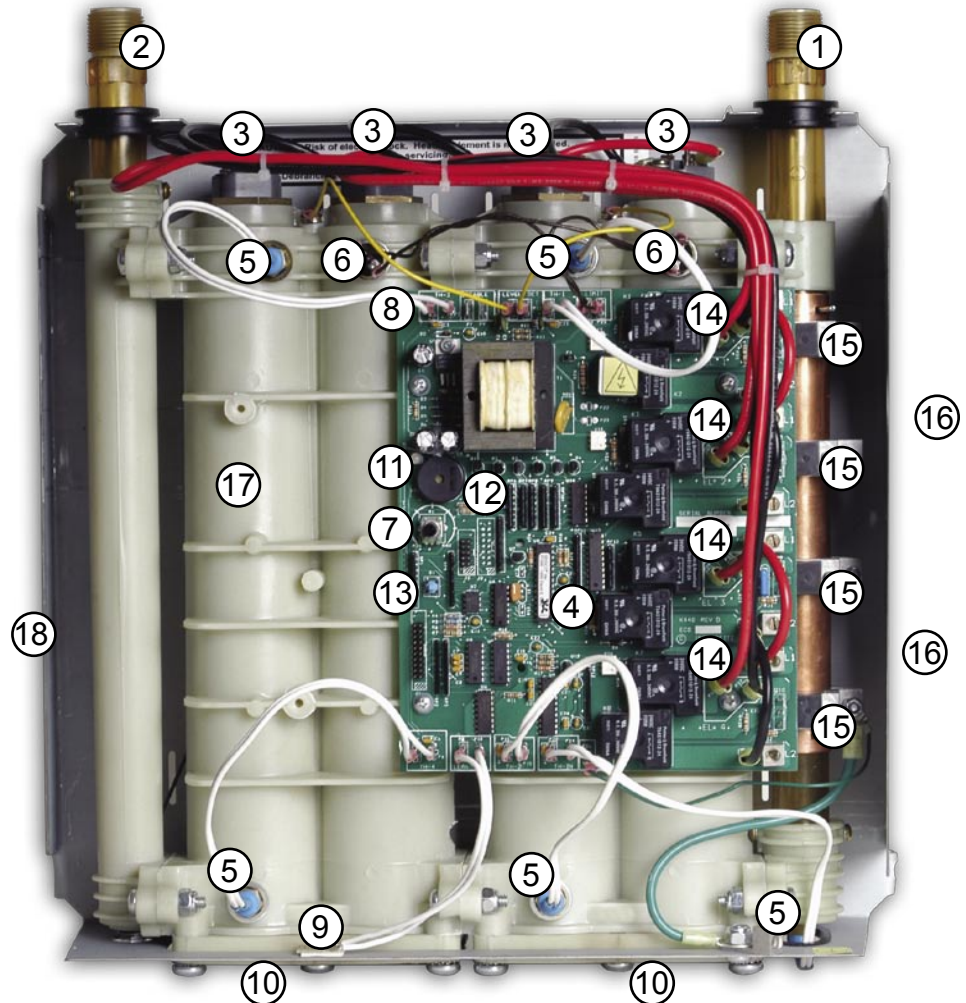
### Do You Know?

*... for every three degrees the heating fluid temperature in a hydronic heating system is dropped, an additional 1% is saved in heating the space... Seisco models are designed to operate EFFICIENTLY at the full range of temperatures.*

*... radiant floor heating systems operating at low temperature are the only heating systems where the temperature at the ceiling is lower than at the floor. High ceiling temperatures associated with other types of space heating contributes to substantially higher heat loss from the home and higher space heating bills.*

*... Micro-Boilers virtually eliminate standby heat loss and are 99+% efficient compared to industry standard boilers that operate at high temperatures with high standby heat losses while idle.*

*... TWO FOR ONE...now there is a Micro-Boiler that can be used to replace both a furnace or boiler as well as a water heater to provide for space heating as well normal domestic hot water needs. Best of all you can enjoy a significant overall efficiency gain!in.*



Four Chamber Design-Inside View

- |   |                                |    |                                  |
|---|--------------------------------|----|----------------------------------|
| 1 | Cold Water Inlet               | 10 | Cleanout Plates                  |
| 2 | Hot Water Outlet               | 11 | LED Indicator Light              |
| 3 | Heating Elements               | 12 | Speaker                          |
| 4 | Microprocessor                 | 13 | Service Button                   |
| 5 | Thermistor Temperature Sensors | 14 | Power Lugs                       |
| 6 | Safety Cutoff Switches         | 15 | Triacs                           |
| 7 | Temperature Control Knob       | 16 | 3/4" Conduit Connections         |
| 8 | Off Peak Control Connection    | 17 | Non-Ferrous Water Passages       |
| 9 | Water Leak Detector            | 18 | Heavy Gauge Steel Mounting Panel |



# Low Temperature Micro-Boiler Residential Space/Water Heating 5-, 7-, 9-, 11-, 14-, 18-, 22-, 28-KW Models

## **Additional Features & Benefits**

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**Service Button/LED Light/Speaker**-While on the phone with a Microtherm technician, the service agent pushes a service button in order to activate an audible diagnostic sequence. The service agent can also diagnose a problem through observing an LED that indicates service issues through a series of flashes.

### **Rust and Corrosion Resistant Engineering Composite**

**Material**- All water passages are constructed of a high temperature resistant DuPont® resin. Grades of the same resin family, but with lower properties, are so strong that they are used as the "header" for automobile radiators. Ability to resist extreme temperature changes, far above those found inside Micro-Boiler models, and superior chemical resistance make DuPont's engineering composite material the ideal material for Seisco's Micro-Boiler.

**Continuous Venting Design**-As water is heated, dissolved gases are released. Tiny bypass air passages at the top of each water chamber allow air and dissolved gases to exit unnoticed through the hot water outlet as hot water is being used.

**Demand Side Management Utility Connection**- Allows local utility to remotely control the water heater (specify this feature when ordering)

**Cleanout Plates**-Should sediment such as sand or silt from the water supply accumulate inside the water chambers, removable plates sealed with reusable gaskets allow access for cleaning without disconnecting wires or removing the heating module and control board.

**3/4" Non-Ferrous Inlet/Outlet Connections**-Factory installed 3/4" MNPT thermoplastic nipples allow easy plumbing connections and eliminate the need for dielectric fittings

**Heavy Gauge Steel Mounting Panel**-Modular water passages, the control board, and other components are assembled and then mounted to a heavy gauge steel back panel that includes four tabs with rubber feet for mounting the unit to the wall. A decorative plastic cover encloses all components.

**3/4" Electrical Conduit Connection**-Standard 3/4" electrical conduit connections allow fast wiring of the water heater.

**Optional Space/Potable Water Heating**-Special control board and relay are installed that give priority to water heating and allow separate set points for each. (specify this feature when ordering)

## *Do You Know?*

*...by using a Micro-Boiler with low temperature radiant floor heating, traditional I=B=R heat loss can be derated by 15%.*

*... water can carry approximately 3,500 times as much heat as the same volume of air... a duct with 180 square inches in cross section would be required to carry as much heat in a forced air system as a 1" diameter pipe.*

*... Micro-Boilers are the perfect appliance for heating an addition to a home, commercial hydronic heating, snow melting, or space heating for an entire home.*

*... in non-potable boiler systems, a Micro-Boiler can be used in conjunction with a plate heat exchanger to meet both water and space heating requirements.*

*... most people feel that radiant floor heat provides the most comfort and warmth of any heating system.*

*... a 90,000 BTU gas furnace operating at 83.5% efficiency can be replaced by a 75,000 BTU (22KW) Micro-Boiler.*

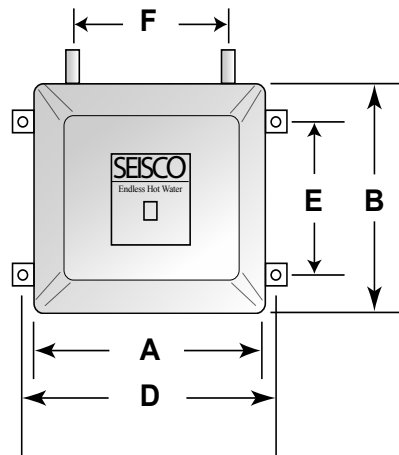
*... most home additions can be handled with a single 14KW, model SH-14, Micro-Boiler!*

# Low Temperature Micro-Boiler Residential Space/Water Heating

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Endless Hot Water



Model	SH-5	SH-7	SH-9	SH-11	SH-14	SH-18	SH-22	SH-28
<b>KW Input</b>	5	7	9	11	14	18	22	28
<b>BTU Input</b>	17,065	23,891	30,717	37,543	47,782	61,434	75,086	95,564
<b>A</b>	10 1/4"	10 1/4"	10 1/4"	10 1/4"	10 1/4"	15 3/4"	15 3/4"	15 3/4"
<b>B</b>	15 3/4"	15 3/4"	15 3/4"	15 3/4"	15 3/4"	15 3/4"	15 3/4"	15 3/4"
<b>C*</b>	6 1/4"	6 1/4"	6 1/4"	6 1/4"	6 1/4"	6 1/4"	6 1/4"	6 1/4"
<b>D</b>	10 7/8"	10 7/8"	10 7/8"	10 7/8"	10 7/8"	16 1/8"	16 1/8"	16 1/8"
<b>E</b>	7"	7"	7"	7"	7"	12 1/2"	12 1/2"	12 1/2"
<b>Weight (lbs)</b>	15	15	15	15	15	23	23	23
<b>240V. Amp. Draw</b>	20.8	29.2	37.5	45.8	58.3	75.0	91.7	116.7
<b># Elements</b>	2	2	2	2	2	4	4	4
<b>Element KW</b>	2.5	3.5	4.5	5.5	7	4.5	5.5	7
<b># Breakers (240V)</b>	1	1	1	1	2	2	2	4
<b>Breaker (amps)</b>	30	40	50	60	40	50	60	40

\*Depth: Not Shown On Drawing. All models are 99+% efficient.

### Recovery (gpm & gph) @ Temperature Rise (F)

Model	Recovery	65	60	55	50	45	40	35	30	25	20	15
SH-5	gpm	0.53	0.56	0.62	0.68	0.76	0.85	.98	1.1	1.4	1.7	2.3
	gph	31.5	34.1	37.2	41.0	45.5	51.2	58.5	68.3	81.9	102.4	136.6
SH-7	gpm	0.74	0.81	0.88	1.0	1.1	1.2	1.4	1.6	1.9	2.4	3.2
	gph	44.1	47.8	52.1	57.4	63.7	71.7	81.9	95.6	114.7	143.4	191.2
SH-9	gpm	0.95	1.0	1.1	1.2	1.4	1.5	1.8	2.0	2.5	3.1	4.1
	gph	56.7	61.5	67.0	73.8	81.9	92.2	105.4	122.9	147.5	184.4	245.8
SH-11	gpm	1.2	1.3	1.4	1.5	1.7	1.9	2.1	2.5	3.0	3.8	5.0
	gph	69.3	75.1	81.9	90.1	100.2	112.7	128.8	150.2	180.3	225.3	300.5
SH-14	gpm	1.5	1.6	1.7	1.9	2.1	2.4	2.7	3.2	3.8	4.8	6.4
	gph	88.2	95.6	104.3	114.7	127.5	143.4	163.9	191.2	229.4	286.8	382.4
SH-18	gpm	1.9	2.0	2.2	2.5	2.7	3.1	3.5	4.1	4.9	6.1	8.2
	gph	113.5	122.9	134.1	147.5	163.9	184.4	210.7	245.8	295.0	368.8	491.7
SH-22	gpm	2.3	2.5	2.7	3.0	3.3	3.8	4.3	5.0	6.0	7.5	10.0
	gph	138.7	150.2	163.9	180.3	200.3	225.3	257.5	300.5	360.6	450.7	600.9
SH-28	gpm	2.9	3.2	3.5	3.8	4.2	4.8	5.5	6.4	7.6	9.6	12.7
	gph	176.5	191.2	208.6	229.4	254.9	286.8	327.8	382.4	458.9	573.6	764.8

### Suggested Written Specification

Electric water/space heater(s) shall be a Seisco Micro-Boiler model \_\_\_\_\_ as manufactured by Microtherm, or an approved equal and shall have a 10-year limited warranty\* when installed in a residential application. Micro-Boiler(s) shall have a rated input of \_\_\_\_ KW at 240 Volts. Electrical control of the Micro-Boiler must be accomplished using an integrated microprocessor that employs a proportional/integral/derivative (PID) control scheme using thermistors for sensing temperature and flow. Heating elements must use PowerShare technology to simultaneously vary KW input evenly across all heating elements from 1% to maximum input. Stepping individual elements on and off at full power is not acceptable. Flow switches that restrict the flow of water in any way are not acceptable. Micro-Boiler(s) shall include an electrical connection for off-peak control by local utility companies (optional), shall include dual water level sensors, high limit control via the microprocessor, and dual high limit cutoff switches, one manual and one automatic reset. Micro-Boiler(s) shall have built-in self-diagnostics with an LED and speaker and must visually and audibly signal the status of all monitored functions including a built-in water leak detector. All water passages must be constructed of a high temperature resistant DuPont® resin. Clean-cut access for removing sediment must be provided without removing plumbing connections or exposing electrical components of the Micro-Boiler. Micro-Boiler(s) are listed UL/CUL 834, HUD-Mobile Home, and NEC approved.

\*Limited Warranty-See written warranty for details.\*Limited Warranty-See written warranty for details.

Written specifications subject to change without notice.