PACKAGED MARINE THERMAL FLUID (HOT OIL) HEATERS

VOLCANIC

VOLCANIC

Packaged Marine Design Thermal Fluid (Hot Oil) Heaters

For Heating Asphalt Barges, Tankers, And Any Other Application Requiring Dependable Heating

13 Models Starting At 500,000 BTU/HR Topping Out At 20,000,000 BTU/HR

Volcanic Heaters are available with single or double wound helical coils pending requirements

Volcanic Heater, Inc.

Volcanic marine type thermal fluid heaters operate within a closed loop

The end mounted burner fires down the inside of the helical coil unit, heating the thermal fluid, which is pumped through the coils and travels throughout the system back to the expansion tank. These 2 pass gas flow systems operate with precise temperature control, and can reach temperatures up to 399º with class II barge piping or higher with class I barge piping while operating at minimal low pressure.

Heat transfer takes place by convection and radiation on the inside of the coil surface -- convection on the outside.

The Volcanic heater, using its original Hopkins design is a long proven rugged work horse suited for on-deck usage.

Volcanic marine heaters are complete packaged heaters with these great features

- Low maintenance.
- Unattended operation.
- Automatic running and safety controls.
- No rust, no corrosion, no freezing with hot oil systems.
- Built to customer specs. Control panel and expansion tank can be mounted in "right hand or left hand" position.
- No pressures associated with a thermal fluid closed loop system.
- Volcanic heaters come with a one year warranty.

The burner and control panel are protected by a waterproof housing. Control panel and expansion tank can mount left or right.

Several Volcanic Heaters can be seen "on-deck", heating asphalt cargo on this inland waterways barge

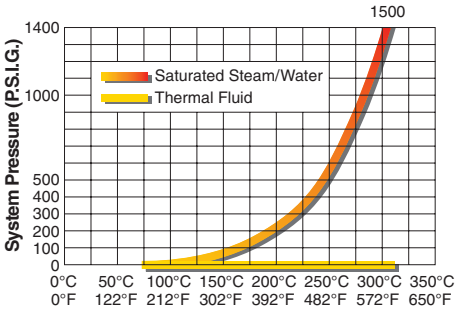
Volcanic - a sound name in Marine Heaters riding the waterways for years

A Volcanic marine heater is no ordinary thermal fluid heater. It's a durable long lasting work horse unlike most "land based" designed heaters. And, Volcanic still uses the original Hopkins design helical coil concept.

Volcanic heaters have been working the Canadian and American waterways from coast to coast for years.

These hot oil helical coil design heaters are designed and built, in fact, overbuilt, for years of hard work on asphalt barges, tank farms, anywhere heat is needed to deliver the goods.

Volcanic heaters are used with unattend operation.

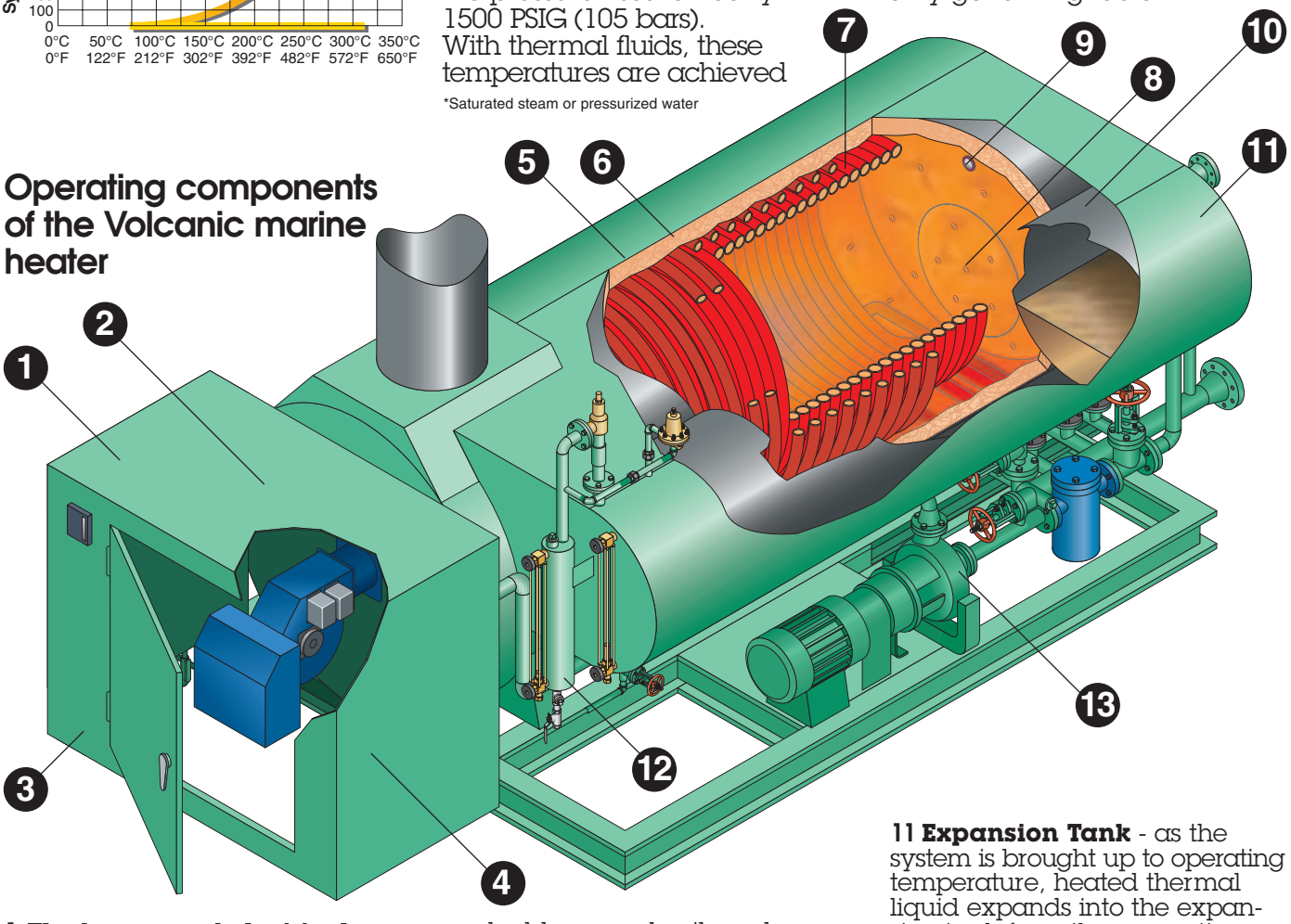


Miles of barge heating piping carries hot oil to users with minimal to no pressure

With steam* at 338°F (170°C), a pressure of 100 PSIG (7 bars) is required and at 572°F (300°C) the pressure rises to nearly 1500 PSIG (105 bars). With thermal fluids, these temperatures are achieved at low pressures and system pressure drop for pump circulation of the fluid is the only governing factor.

*Saturated steam or pressurized water

Operating components of the Volcanic marine heater



1 The burner and electrical control panel are protected by a waterproof housing for on deck usage. Control panel meets NEC and UL Codes.

2 High combustion efficiency is obtained by pressure atomization of fuel oil and high pressure air. An electric pre-heater heats the residual fuel oils for proper atomization.

3 Electrical panel meets all required codes and can be mounted on either side of the heater package.

4 Optional controls provide full modulation with low fire start and up to 6:1 turn down ratio. Burners meet USCG requirements and ABS on request.

5 Extra heavy steel cylindrical shell surrounds the helical single or double wound coil made from Schedule 40/80 seamless pipe. Spacers separate the coil and shell.

6 The shell is covered with layers of ceramic fiber blanket insulation. A rigidizer is sprayed on the surface to protect against velocity of exiting gases.

7 Helical Coil - single or double wound designed by Volcanic.

8 Access door allows for inspection and maintenance tasks.

9 Observation port allows for checking flame pattern and flue combustion conditions.

10 Separation/surge tank velocity of thermal fluid returning from the system is decreased to allow any steam or air in the system to escape into the expansion tank.

11 Expansion Tank - as the system is brought up to operating temperature, heated thermal liquid expands into the expansion tank from the separation tank. Thermal liquids expand approximately 4% by volume for each 100°F temperature increase. When the system is shut down and the liquid cools, liquid is withdrawn from the expansion tank to maintain a filled circulating loop.

12 Cold Seal Tank - The thermal liquid system is vented to the atmosphere through this tank to expel air and any steam during system start up.

13 Circulating Pump - A centrifugal pump is used to supply thermal liquid for the entire system. Pumps are selected to meet flow and pressure drop requirements of the system. Pumps are jacketed for water cooling when thermal liquid in the pump is above 350°F when required.

Features of the standard safety and limit controls

Flame Program & Safety Control - The flame program control provides for ignition and flame failure protection for automatically ignited burners. With limit, operating controls and interlocking devices, the control automatically programs the operation of burner-blower motor, ignition, fuel valves and modulator.

Low Flow Cut Out - Protects the heater and the fluid. This differential pressure switch measures pressure drop through the heater coil, indicating flow. Low flow will shut down the burner. (Manual reset).

Low Level Control - This float cage type switch is usually attached to the expansion/ surge tank. It will shut the burner down on low liquid level and turn off the red limit light, and will restart the burner when the proper level has been returned and reset.

High Temperature Cut Out - The sensing element is located in the heater fluid line. The set point which is set by factory technician to customer and USCG specifications, should never be above the maximum temperature permissible for the fluid used in the system. In case the set point is reached, the instrument will shut the burner down.

Low Fuel Oil Pressure Cut Out - Control shuts off the burner if the pressure in the fuel oil supply line drops below the minimum required for proper atomization.

Alarm circuit and Signal Light - The burner wiring is arranged in such a manner as to ring an alarm in case of flame failure. Manual resetting is required. In case of "flame failure" the button on the flame program control must be pushed. All other limit safety switches will only energize the red limit light if closed. Once the cause of stoppage is eliminated, the burner will restart after resetting.

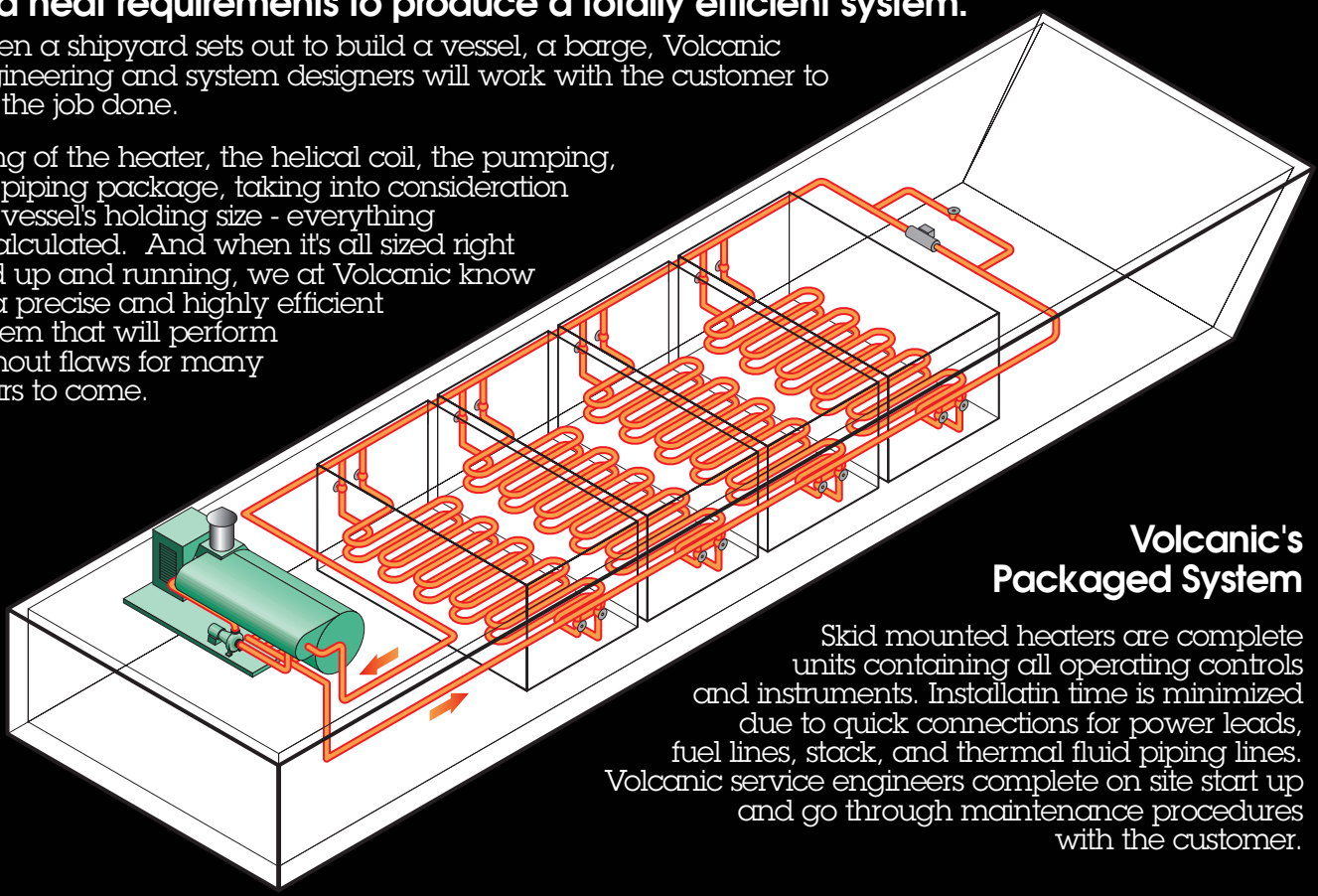
Low Fire Interlock Switch - This switch is part of the modutrol motor, and serves as a safety interlock which will prevent the burner from starting unless its components are set to provide "low fire" only. This provides for safe ignition.

Volcanic Marine Heaters feature convenient lifting rings for ease and safe positioning on deck

Volcanic personnel work with the customer, creating layout, piping, and heat requirements to produce a totally efficient system.

When a shipyard sets out to build a vessel, a barge, Volcanic engineering and system designers will work with the customer to get the job done.

Sizing of the heater, the helical coil, the pumping, the piping package, taking into consideration the vessel's holding size - everything is calculated. And when it's all sized right and up and running, we at Volcanic know it's a precise and highly efficient system that will perform without flaws for many years to come.



Volcanic's Packaged System

Skid mounted heaters are complete units containing all operating controls and instruments. Installatin time is minimized due to quick connections for power leads, fuel lines, stack, and thermal fluid piping lines. Volcanic service engineers complete on site start up and go through maintenance procedures with the customer.

Specifications - Volcanic Thermal Fluid Heater

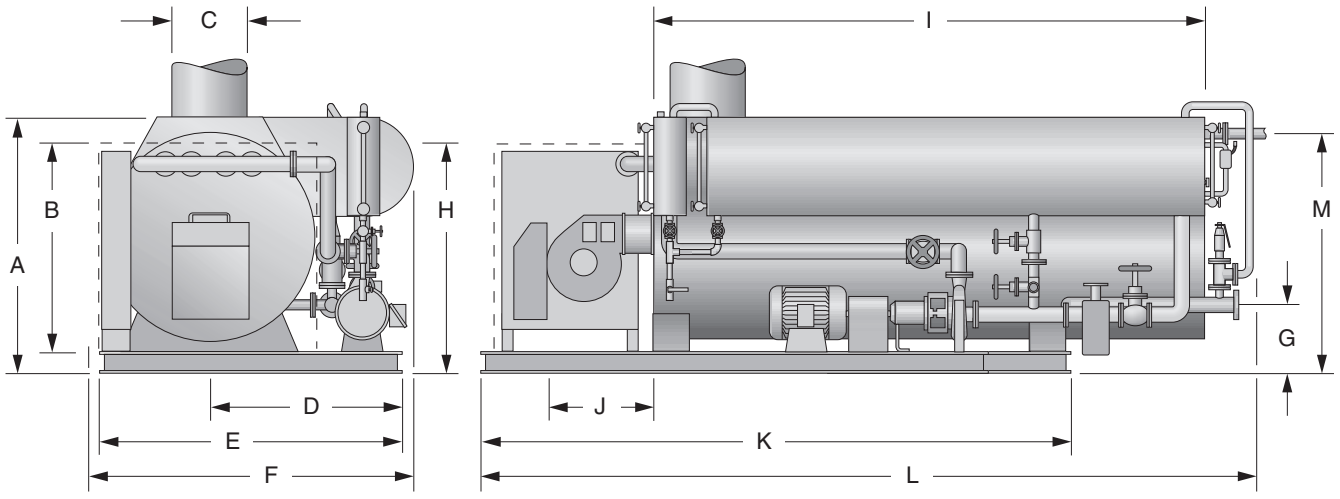
Model	50	75	100	200	300	400	600	800	1000	1200	1500	1800	2000
Output Cap. Million BTU/HR.	0.50	0.75	1.0	2.0	3.0	4.0	6.0	8.0	10.0	12.0	15.0	18.0	20.0
Heat Trans. Sur., Sq. Ft. *1	55	85	111	220	335	445	670	890	1110	1330	1660	2000	2220
Thermal Liq. Fow, GPM *2	50	60	75	150	225	300	425	600	725	900	1100	1350	1500
Coil Pressure Drop, PSI	8	17	8	18	18	17	23	16	15	25	11	20	10
Circulating Pump, HP *3	5.0	7.5	7.5	10.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	75.0	100.0
Burner Combustion Air, cfm	114	170	228	456	684	912	1368	1824	2280	2740	3420	4100	4560
Blower Motor, HP	1/3	0.5	0.5	1.0	2.0	3.0	5.0	7.5	15.0	20.0	25.0	30.0	40.0

■ *1 Provides a heat flux of 9,000 BTU/Hr. sq. ft. ■ *2 Based on an oil temperature increase of approximately 55°F through the heater
■ *3 Based on centrifugal pump @ 150 ft. TDH. ■ *4 For fuel consumption rate, consult factory.

Dimensions - Volcanic Thermal Fluid Heater

Model	50	75	100	200	300	400	600	800	1000	1200	1500	1800	2000
(A) Overall Height	53	53	53	64	72	78	89	89	104	104	112	119	119
(B) Shell Diameter	40	40	40	51	59	65	74	74	86	86	94	101	101
(C) Stack Diameter	8	10	12	15	18	22	26	30	33	36	40	43	45
(D) Pump Extension	38.5	38.5	38.5	44	51	54	62	62	71	71	78	82	82
(E) Base Width	54	54	54	65	75	82	94	94	108	108	118	124	124
(F) Overall Width	58	58	58	69	83	89	104	104	122	122	136	143	143
(G) Outlet Height	29	29	29	34.5	38.5	41.5	48	48	57	57	61	64.5	64.5
(H) Shell Height	49	49	49	60	68	74	85	85	100	100	108	114	115
(I) Shell Length	60	72	86	122	147	171	218	278	286	334	356	385	426
(J) Burner Length	27	27	27	30	37	37	44	44	54	54	74	77	77
(K) Base Length	46	54	66	98	123	143	178	248	253	298	320	349	390
(L) Overall Length	97	109	123	162	194	218	272	332	350	398	440	472	513
(M) Inlet Height	46	46	46	56	64	69	80	80	94	94	101	106	106
Coil Diameter	30	30	30	40	48	52	60	60	72	72	84	97	97
Pipe Size of Coil	1.5	1.5	2.0	2.5	3.0	3.5	4.0	5.0	4.0D	4.0D	5.0D	5.0D	5.0T
Inlet-Outlet Size	2.0	2.0	2.0	3.0	3.0	4.0	4.0	6.0	6.0	8.0	8.0	10.0	10.0
Thermal Liquid Volume/Gal.	35	43	59	114	224	318	568	881	965	1,137	1,767	2,064	2,294
Weight Pounds	3,960	4,420	4,920	8,500	11,315	14,700	20,365	26,360	33,000	38,170	46,500	51,950	54,425
Expansion Tank Volume/Gal.	43	56	71	140	246	293	602	786	1,167	1,379	2,006	2,179	2,425

Volcanic Marine Design Heaters are built to ASME Code, Section I



VMH 1M 1z FLP11/03 Printed in USA

VOLCANIC

Volcanic Heater, Inc.

201 West Hartzell St., Box 2540
Alliance, Ohio 44601
Call 330 | 823·0770
Fax 330 | 823·0772

www.volcanic-heater.com

8302 Reservoir Avenue
Houston, Texas 77049
Call 281 | 860·0063
Fax 281 | 860·0096