



# Heavy-Duty Thermal Fluid (Hot Oil) Heaters

Sizes 1,000,000 to 40,000,000 BTU/HR

The Fulton 2-pass design features versatility and longevity for a wide range of applications, including:

- Gas Processing Applications
    - Amine Plant Processing
    - Chemical Processing
  - Petroleum Terminal Heating
    - Heavy Oil Applications
  - Hazardous Duty Applications
  - Standard and Custom Coil Designs
- ...and more!



The heat transfer innovators.

# Fulton's 2-Pass Thermal Fluid Heaters feature a rugged and durable design with the capability to burn a variety of fuels.

Based on the original Hopkins design, the Fulton 2-pass heaters utilize a helically-wound coil to heat circulated thermal fluid. Our heaters have ample surface area with low heat flux rates, which means lower film temperatures and longer fluid life.

## No high pressure with thermal fluid

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

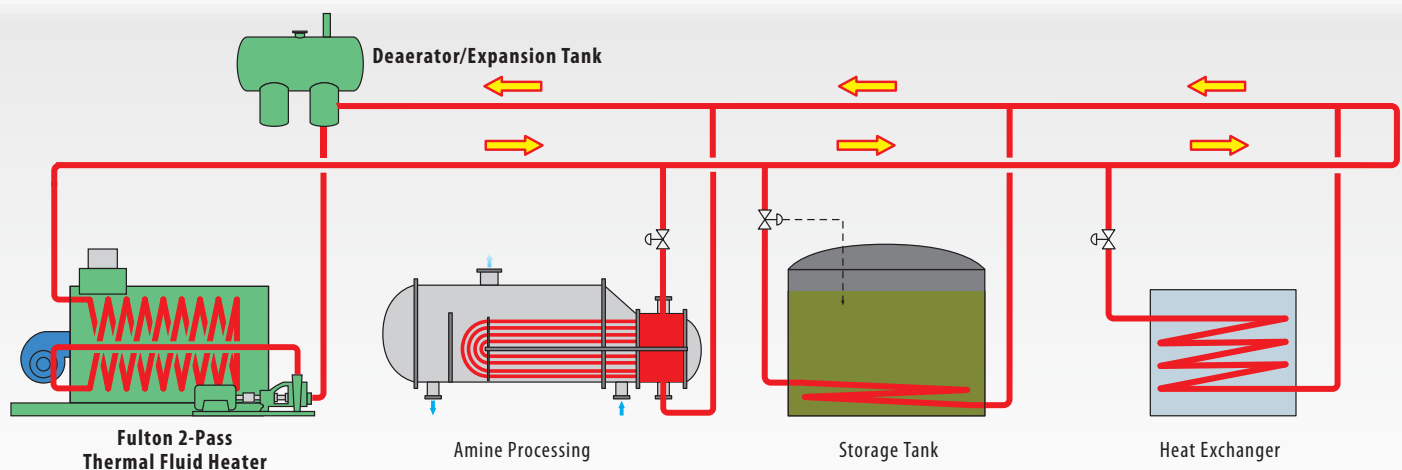
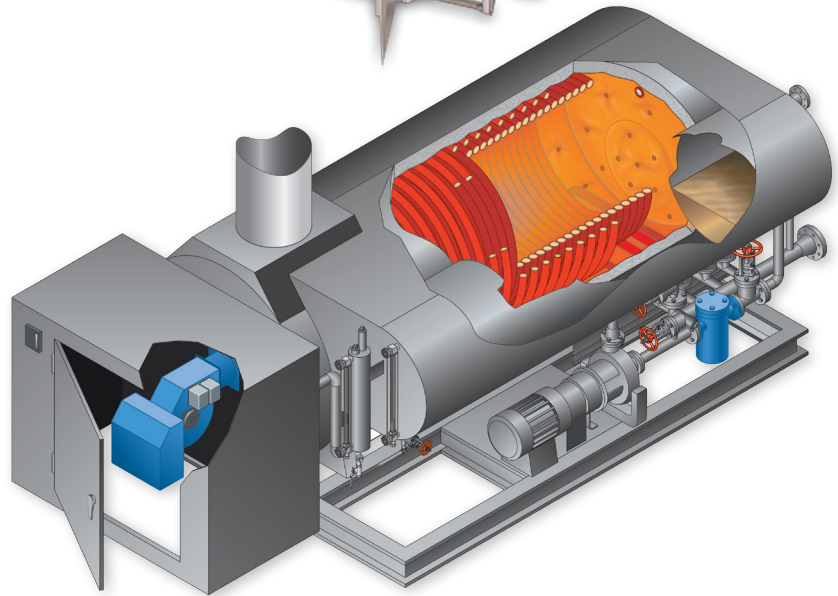
*\*Saturated Steam or pressurized water*

## No corrosion or freezing problems

Thermal fluid does not cause scaling or corrosion. Thermal fluids contain no solids which precipitate when heated. Water treatment or chemical conditioning is not necessary. Thermal fluids are readily available from major oil or chemical companies.

## Low maintenance with thermal fluid

Maintenance is limited to burner, pump, controls, and an annual thermal fluid check. Licensed pressure vessel operators are not required. The heater is a non-pressurized vessel with an expansion tank vented to the atmosphere.



# FEATURES

- Fulton uses application-specific burners per request. Low NOx, high turndown, and heavy oil burners are common applications for a Fulton 2-pass heater.
- An extra-heavy steel shell encloses the coil with ample support from a rigid frame.
- Fulton uses 4" of ceramic fiber insulation in all 2-pass heaters with rigidizer to protect the insulation from the high velocity convective flue gas in the chamber.
- Coils come as a single or dual concentric arrangement as with our HE (High Efficiency) model.
- Custom coil designs available.
- An access door is furnished with each unit for periodic inspection of the heating coil.
- An observation port is furnished for checking the flame pattern and flue combustion conditions.
- Every heater installed outdoors comes sandblasted, with an inorganic zinc primer, and premium topcoat. Customer color changes are available by request.
- Capable of manufacturing for hazardous duty / explosion proof environments.
- Available with or without integral expansion tank.

## Fulton offers two types of expansion tanks for industrial applications:

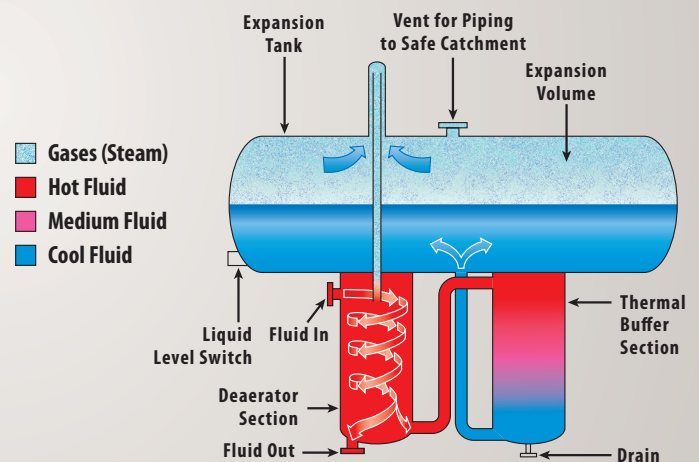
### Combination deaeration and thermal buffer tank

Our combination deaeration/thermal buffer tank (shown above) works as an open system. The deaerator expels steam and other non-condensables to a safe catchment, and also prevents hot thermal fluid from oxidizing. This is achieved by allowing only cool thermal fluid to come into contact with outside air. The combination deaeration/thermal buffer tank features ease of installation and the continuous deaeration of thermal fluid, which prevents pump cavitation.

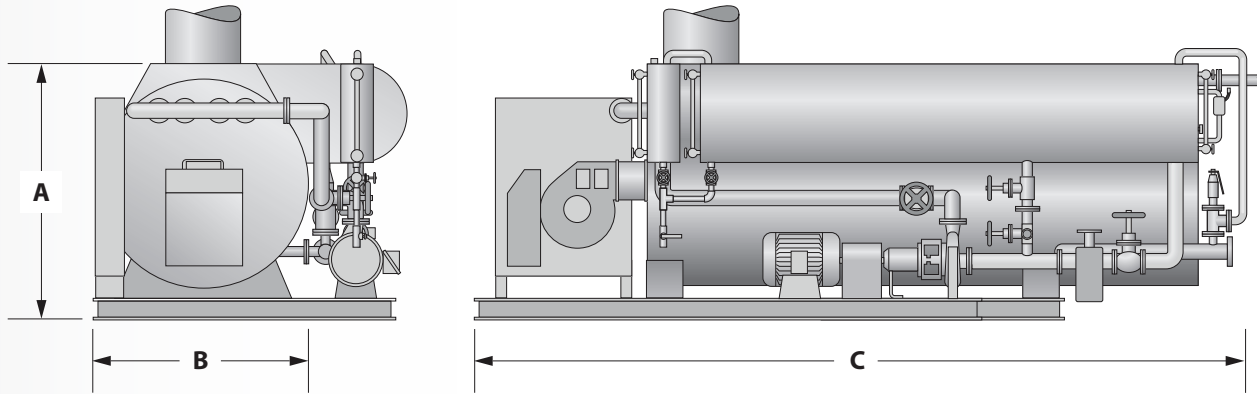
### Nitrogen-blanket standard tank

Our nitrogen-blanket tank features a simplified tank design with an inert gas blanket to prevent thermal fluid oxidation. This design prevents all contact with open air, and comes equipped with a nitrogen blanket regulator and safety relief valve, depending on requirements.

NOTE: Both expansion tanks are available as ASME Section VIII-code stamped as an option.



# SPECIFICATIONS AND DIMENSIONS



Specifications	MODEL	100S	200S	350S	600S	800S	1000S	1200S	1400S	1600S	2000S	2400S	3000S	4000S
Heat Output	Million BTU/hr	1	2	3.5	6	8	10	12	14	16	20	24	30	40
Flow Rate-Standard *1	GPM	75	150	265	425	600	725	900	1050	1200	1500	1800	2250	3000
Flow Rate-Low Flow *2	GPM	40	75	135	225	300	375	450	525	600	750	900	1125	1500
Circulating Pump Motor - STD	HP	7.5	15	20	30	40	50	60	75	100	100	125	150	200
Circulating Pump Motor - LF	HP	7.5	7.5	15	20	30	30	40	30	40	50	60	75	100
Blower Motor	HP	1/3	1	2	7.5	10	10	5	7.5	7.5	15	20	25	30
Light Oil (approx. fuel usage)*3	GPH	8.8	17.5	30.6	52.5	70	87.5	104.9	122.4	139.9	174.9	209.8	262.3	349.7
Natural Gas (approx. fuel usage)*3	FT3/hr	1,334	2,667	4,667	8,000	10,667	13,334	16,000	18,667	21,334	26,667	32,000	40,000	53,334
Pressure Drop - STD	PSI	10	23	11	16	16	13	16	10	15	14	15	9	21
Pressure Drop - LF	PSI	15	19	11	14	15	18	14	11	15	20	14	12	17
Dimensions	MODEL	100S	200S	350S	600S	800S	1000S	1200S	1400S	1600S	2000S	2400S	3000S	4000S
(A) Overall Height (w/o Stack)	IN	51	60	62	82	82	105	105	106	106	125	133	133	142
(B) Overall Width	IN	42	50	50	74	93	87	103	110	110	123	130	130	142
(C) Overall Length	IN	115	152	211	231	302	311	360	408	444	450	550	575	648
Inlet/Outlet Connections	IN	2	3	3	4	6	6	8	8	8	10	12	12	12
Thermal Liquid Volume	GAL	45	86	168	426	661	724	853	1168	1400	1721	2322	3180	4626
Approx. Dry Weight	LBS	3,936	6,800	9,052	14,350	18,500	23,100	26,800	30,500	32,600	41,400	68,000	74,000	80,000
Approx. Flooded Weight	LBS	4,310	7,514	10,447	17,886	23,987	29,110	33,880	40,195	44,220	55,685	87,273	100,394	118,396
Floor Loading	LB/FT <sup>3</sup>	129	143	143	151	123	155	132	129	131	145	176	194	186

**\*NOTE:** Dimensions shown are for the Hopkins model without the integral expansion tank.

\*1 Standard flow rate yields a heater temperature rise of 55° Fahrenheit

\*2 Low flow rate models yield a heater temperature rise of 110° Fahrenheit

\*3 Fuel usages are approximate estimates and will vary by location, fuel quality, and operating condition



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