



# VIKRANT INDUSTRIES

Boilers, Pressure Vessels, Knock Out Drums, Filtration, Gas/Liquid/Air Separation, Air Elimination, Metering Skids for Oil Gas & Petrochemicals.

## “ENGINEERED SOLUTIONS”

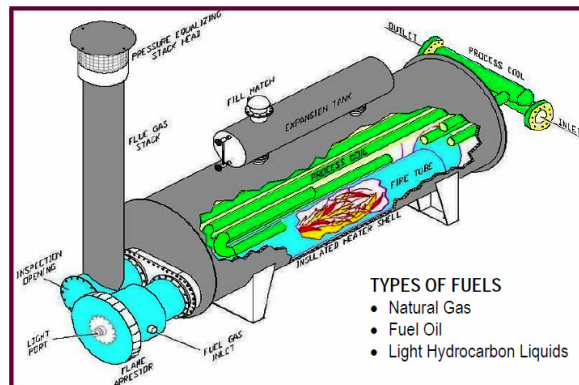
# Indirect Fired Water Bath Heaters

### OVERVIEW

Indirect fired water bath heaters are used successfully in hundreds of utility, processing, and upstream oil and gas industry applications. Water bath heaters are commonly used in applications where process temperatures do not exceed 170°F.

### Typical uses include:

- Heating natural gas prior to pressure reduction to eliminate frost formation downstream of expansion valving.
- Preventing hydrate formation in well stream fluids.
- Heating well stream fluids prior to phase separation.
- Heating process streams to maintain fluid viscosity at a minimum to reduce HP pumping requirements.
- Heating critical feed stocks that require tightly controlled film to bulk temperature differentials.
- Heating turbine fuel gases to maintain a given dew point temperature.



### HEATER OPERATION

The process to be heated flows through a serpentine configured coil that is mounted in the upper reaches of the heater shell. A controlled amount of heat is liberated into the firetube (combustion chamber) which is located in the lower reaches of the heater shell where heat is efficiently transferred from the firetube in the bath media. The heat contained in the bath media is then transferred by natural convection into the process stream which flows through the process coil.

### HEATER COMPONENTS

The indirect fired water bath heater consists of the following components each designed to meet specific design criVIK1a:

**The heater shell** is an atmospheric vessel designed in accordance with API 12 K requirements. The shell contains the process coil, firetube (combustion chamber), and heat media.

**The firetube** is commonly of the U-tube configuration. The tube is removable & designed to efficiently transfer heat into the surrounding heat media and to minimize flue gas friction losses.

**The process coil** is a pressure containing part commonly designed in accordance with API-12K or ASME Section VIII Division 1 code requirements.

**The flue gas stack** is designed to provide positive flue gas flow (draft) by overcoming the friction losses in the complete combustion system.

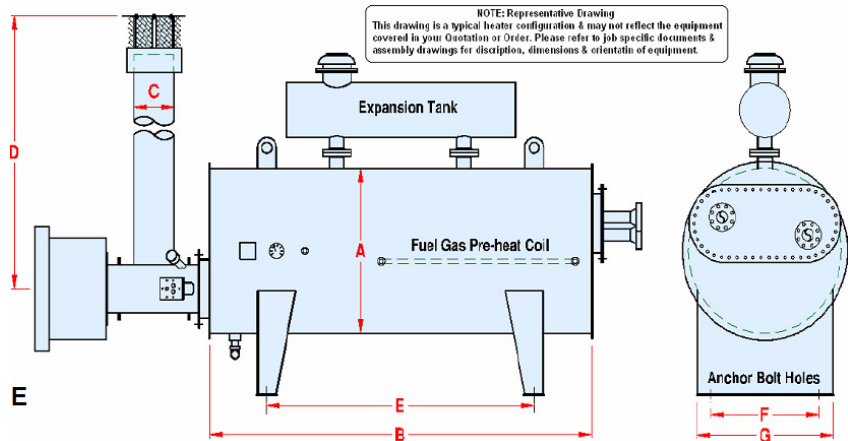
**The heat media** is commonly a mixture of inhibited ethylene or propylene glycol and water which is blended to provide protection for a given application.

**The expansion tank** is designed to reduce internal corrosion within the heater shell by keeping the heater liquid packed & moving the wet dry interface of the expanding bath media from the heater shell into the expansion tank. The expansion tank is designed to contain 100% of the expanded bath media from a temperature of 40° to the maximum operating temperature.

**Accessories Items:** VIKI designs & manufactures heaters with a wide variety of accessories to meet customer

specified mechanical & operation requirements. Including simple pneu-controlled & monitored equipment.

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## STANDARD FEATURES INCLUDE

- Laser cut shop fabricated components
- Individually removable firetubes
- 304 SS Flue gas stack or stacks
- Stack clean out tee
- Flue gas stack anti reverse-draft diverters w/rain cap & bird screens
- “Pilot In A Drawer” assemblies for easy maintenance & inspection
- Basic electric & pneumatic in addition to PLC control systems
- Multi mitered firetube bends (no single miter cut to greater than 22.5°)
- Positive seal flange designs
- Bath media expansion reservoir designed to hold 6% of the total bath media
- Heat media level gauge
- Heat media temperature Indicator
- Shell designed in accordance with API 12K
- Coil designed and stamped in accordance with ASME-8-1
- 100% Radiography on process coil welds
- Process coil, National Board Stamped

| MM Btu/Hr  | A    | B     | C      | D     | E     | F     | G     |
|--|------|-------|--------|-------|-------|-------|-------|
| 0.10   | 20"  | 6'    | 6.63"  | 10'0" | 5'8"  | 1'2"  | 1'7"  |
| 0.25   | 24"  | 7'5"  | 8.63"  | 10'0" | 7'2"  | 1'2"  | 1'7"  |
| 0.50   | 30"  | 10'0" | 10.75" | 12'0" | 7'0"  | 1'8"  | 2'3"  |
| 0.75   | 36"  | 12'0" | 10.75" | 12'0" | 9'0"  | 2'0"  | 2'8"  |
| 1.00   | 42"  | 15'0" | 12.75" | 14'0" | 10'0" | 2'2"  | 3'1"  |
| 1.25   | 42"  | 15'0" | 12.75" | 14'0" | 10'0" | 2'2"  | 3'1"  |
| 1.50   | 48"  | 17'5" | 14"    | 15'0" | 12'6" | 2'10" | 3'7"  |
| 1.75   | 48"  | 20'0" | 16"    | 15'0" | 16'0" | 2'10" | 3'7"  |
| 2.00   | 54"  | 20'0" | 18"    | 15'0" | 15'0" | 3'0"  | 3'11" |
| 2.50   | 54"  | 22'5" | 18"    | 16'0" | 17'6" | 3'0"  | 3'11" |
| 3.00   | 60"  | 22'5" | 20"    | 16'0" | 18'6" | 3'0"  | 4'4"  |
| 3.50   | 72"  | 27'7" | 22"    | 17'5" | 22'6" | 4'0"  | 5'3"  |
| 4.00   | 72"  | 30'0" | 24"    | 17'5" | 25'0" | 4'0"  | 5'3"  |
| 4.50   | 84"  | 32'0" | 24"    | 17'5" | 27'0" | 4'6"  | 6'2"  |
| 5.00   | 84"  | 32'0" | 26"    | 17'5" | 27'0" | 4'6"  | 6'2"  |
| 6.00   | 84"  | 32'0" | 28"    | 17'5" | 27'0" | 4'6"  | 6'2"  |
| 7.00   | 96"  | 30'0" | 2@22"  | 17'5" | 25'0" | 5'6"  | 6'11" |
| 8.00   | 96"  | 32'0" | 2@22"  | 17'5" | 27'0" | 5'6"  | 6'11" |
| 10.00  | 102" | 32'0" | 2@26"  | 20'0" | 27'0" | 6'0"  | 7'6"  |
| (OTHER SIZES ARE AVAILABLE ... “ENGINEERED SOLUTIONS”) |      |       |        |       |       |       |       |

### Optional Control Enhanced Designs

- Pneumatic controlled equipment operation
- Electrical controlled equipment operation
- Combination pneumatic & electrical controlled equipment operation
- Flame-Safeguard assemblies including, Pneumatic, 120VAC & 12VDC or Solar Power
- Manual OR Automatic pilot ignition designs

### Optional Fabricated Enhanced Components

- Cushioned (Electrically Insulated) process coil supports & Tube Sheets
- Shell internally grit or sandblasting w/water soluble rust preventive coating
- Customized heater supports to meet existing pier locations
- Hot dipped galvanized heater skids, ladders & platforms

|                       | Units                    | Ethylene | Propylene |
|-----------------------|--------------------------|----------|-----------|
| Freezing Point        | Temp (°F)                | -32      | -24       |
| Boiling Point (1 Atm) | Temp (°F)                | 225      | 222       |
| Specific Gravity      | 60 / 60                  | 1.064    | 1.043     |
| Viscosity @ 200°F     | Centipoises              | 0.75     | 0.75      |
| Specific Heat @ 200°F | Btu / Lb / °F            | 0.83     | 0.91      |
| Thermal Conductivity  | Btu / Hr, Sq Ft, °F / Ft | 0.28     | 0.022     |

\*Properties are representative of 50% Glycol / 50% Water

| Heater Type            | Process Temp (F) |
|------------------------|------------------|
| Water/Glycol           | 160°             |
| LP Steam (<15 Psig)    | 220°             |
| Heat Transfer Oil      | 400°             |
| Eutectic Salt          | 600°             |
| Flue Gas Recirculation | 625°             |



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