

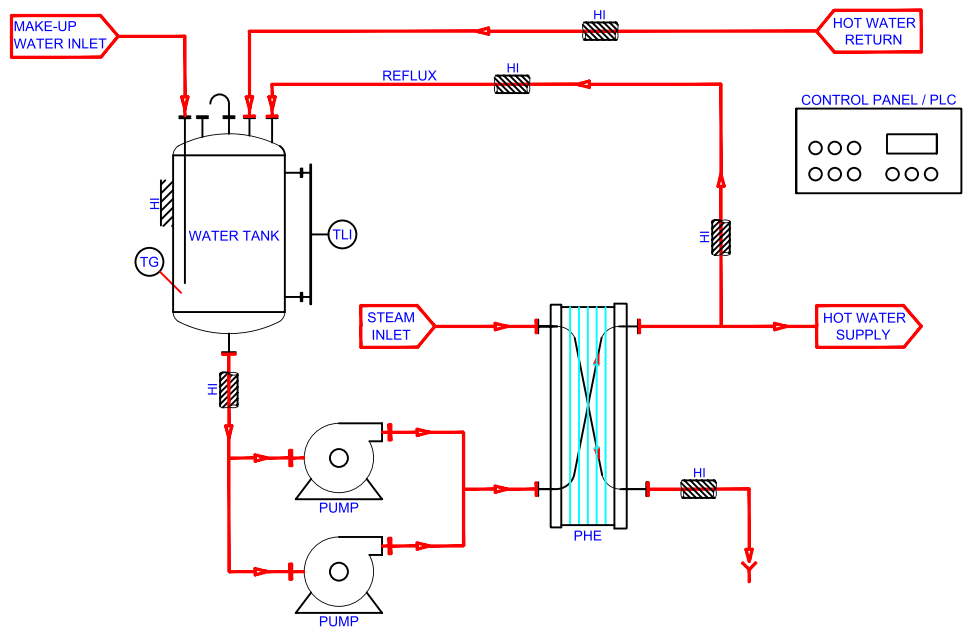
HOT WATER GENERATOR

Metal Plants **Hot Water Generator** (HWG) System is versatile and compact, it provides highly efficient solution for instantaneous generation of hot water using energy efficient Heat Exchangers (viz. Shell & Tube or Plate Type) or Electrical Heater (in cases wherein utility at site is not available). The System can be customized with storage or buffer vessel and can be installed (specifically for HWG with electrical heaters) in conjunction with solar based hot water system.

The system generates hot water of desired temperature (< 100°C) by utilizing low pressure steam (and in case of electrical option, Electrical Heaters) and water is maintained at required temperature using automation and control.

Application Areas

- Pharma
- Food
- HVAC
- Hospitals
- Hotel
- Textile
- Breweries



TYPICAL SCHEMATIC DIAGRAM FOR HOT WATER SYSTEM (PHE TYPE)

Features:

- Standard system from 10000 kcals/hr to 300000 kcals/hr and above
- Compact, Complete Package & Customized solutions to meet all process requirements
- Pre-assembled skid for ease of installation
- Versatile heating controls for consistent temperature
- Hassle free condensate removal and recovery with no energy losses
- Standard units supplied with control packages comprising of PID controllers. Special control packages available with PLC systems

Advantages:

- Accurate temperatures of hot water required for the most heat sensitive processes.
- Available for fluctuating process loads and urgent demands
- System designed with heat exchangers with very high heat transfer rates and efficiency
- Inexpensive solution
- Compact yet efficient when compared to conventional hot water tank heating systems

Disadvantages of Conventional Systems:

- Sensible heat is not consumed totally
- Hammering & Noisy
- Consistent monitoring is required
- Radiation losses, more operating cost and steam losses

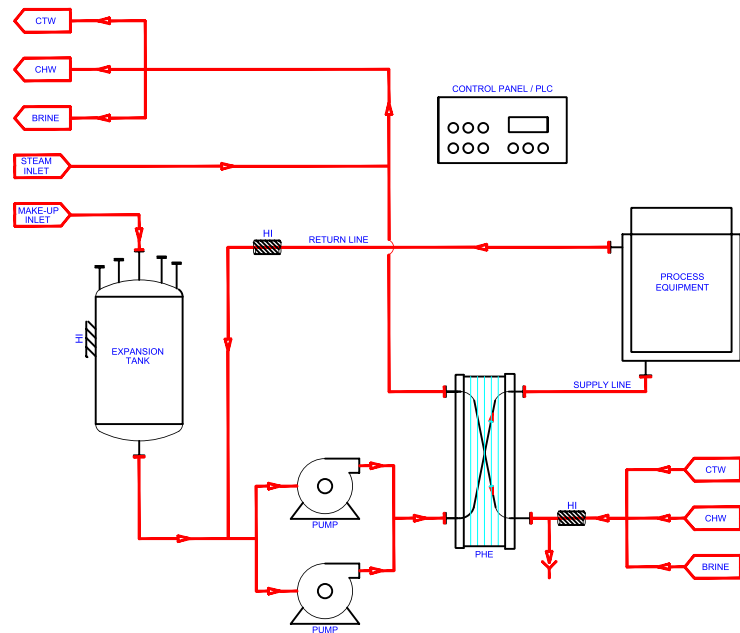
Hot Water Generators are available in construction with PHE, Shell & Tube Type and Electrical, both in flameproof and non-flameproof.

SINGLE FLUID TRANSFER SYSTEM

Manufacturing

Process such as API, involve batch reaction, separation, filtration, distillation and drying; batch reaction involves heating and cooling stages ranging from -40°C to 150°C . Conventionally, this is done with multiple utilities such as chilled brine, chilled water, cooling water, hot water, low pressure steam, high pressure steam etc....

Contrary to the traditional use of multiple utilities, single fluid heat transfer systems are advantageous. These system can be designed for specific applications.



TYPICAL SCHEMATIC DIAGRAM FOR SINGLE FLUID HEAT TRANSFER SYSTEM

The conventional approach has following disadvantages:

- Thermal shocks due to sudden change in temperature
- Poor temperature control
- Cross Contamination of utility fluids
- Utility headers required near operating area
- Operator intervention for utility changeover
- Utilities are wasted if drained due to mix up, recovery not feasible

Being a critical parameter, accurate temperature control is crucial for any process. While heating to temperature above 150°C and cooling after the reaction is critical – the use of cooling water will lead to formation of steam in the jacket – over pressurization besides thermal shock. Due to these factors, single fluid heat transfer systems have gained importance in pharmaceutical and chemical industries in developed countries.

The advantages of Single Fluid Heat Transfer System (SFHTS or SFS) are:

- No hot or cold spots (results in consistent product yields and quality, a regulatory requirement for Pharmaceuticals)
- Accurate temperature & centralized control, hence no thermal shocks to process equipment
- Helps in maintaining a clean plant, as no leakage in process area & piping network looks aesthetic
- Operation is corrosion free
- No cross contamination of utilities
- No steam straps at process equipment
- Ease of maintenance

Single Fluid Heat Systems are available in construction with PHE, Shell & Tube Type and Electrical, both in flameproof and non-flameproof.