HOT WATER GENERATOR SYSTEM
[COMPACT & AUTOMATIC SYSTEM]
UHWGS- 0.1 to 10.00 Lac Kcal/hr

Description

Uni klinger hot water generator system (UHWGS) is skid mounted pre-fabricated compact system. All components used for steam supply and accessories like Moisture separator, Strainers, Control valves, Isolation valves, Automatic pumping trap, etc are manufactured in-house.

Uni klinger instantaneous hot water generator system (UHWGS) is having plug and play feature. After installation, users need to set the desired outlet temperature and rest of the work is automatically taken care by the system, delivering accurate and constant temperature of hot water.

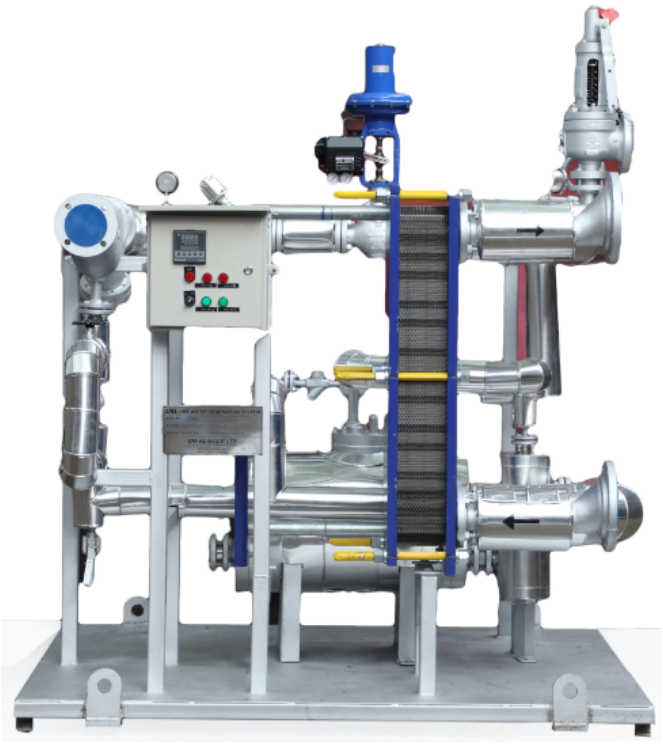
This system eliminates numerous drawbacks of the conventional heating systems, some of them are listed below:

Drawbacks of conventional heating system :-

- High temperature variations (±5 to 10 ^{o}C)
- Radiation heat loss
- Frequent manual intervention
- Bulky and non-movable
- Delayed heating

Salient Features of UKL Hot water generator:-

- Pre-assembled compact skid, with ease of installation & minimum site work
- Automatic operation and innovative design ensures zero loss of energy
- Constant temperature & accurate in range of ±1 ^{o}C
- Efficient heat exchanger
- Use of automatic pumping trap (APT) ensures 100% condensate recovery, even in stall condition
- Single panel to take care of all electrical & electronic devices
- In-built baffle type moisture separator to eliminate moisture, enhancing the dryness fraction of supply steam
- Provision to install temperature gauge or temperature sensor on all nozzles of the heat exchanger
- Quick response, light weight, modular and movable
- Least operating cost



Working principle :-

UHWGS works on most efficient technology of heat transfer, i.e. counter flow heat transfer. The primary media is low pressure saturated steam and secondary media is water.

Models and Capacities (Heat Load) :-

Model No : UHWGS-30 to UHWGS-500
Capacity : 10,000 kcal/hr to 10,00,000 kcal/hr
(Capacities above 10,00,000 Kcal/hr can also be supplied)

Applications :-

1) Single fluid heating and cooling systems in **Pharmaceuticals** companies
2) Hot water or degreasing baths in **Automobile** and **Engineering** companies
3) Bath, shower & swimming pool in **Hotels**
4) Sterilization, Sanitization, hot wash & hot air generation in **Food** processing units
5) CIP/SIP process in **Pharmaceuticals, Hospitals, Dairies**, **Food & Beverages**, etc
6) Dyeing, bleaching, finishing and other varied applications in **Textile industries**
7) Barrel washing, bottle rinsing, brewing equipment cleaning in **Breweries**

Operating Conditions :-

Steam supply (recommended range)

Operating pressure	: 1.5 to 3.5 kg/cm^2
Operating temperature	: 125 to 150 ^oC
Enthalpy	: 521 kcal/kg to 512 kcal/kg
Flow	: 40 to 4000 kg/hr

Water supply (recommended range)

Operating pressure	: 2.5 to 4.0 kg/cm^2
Operating temperature	: 30 ^oC (Ambient) to 95 ^oC
Flow	: 500 to 50,000 kg/hr
	(> 50,000 kg/hr can also be given)

Pressure rating :-

This System will be supplied with flanges and nozzles as per ANSI B 61.5 Class 150

Nozzle details:-

Nozzle 1 [N-1]	: Steam inlet to PHE
Nozzle 2 [N-2]	: Condensate outlet from PHE
Nozzle 3 [N-3]	: Cold water inlet to PHE
Nozzle 4 [N-4]	: Hot water outlet from PHE
Nozzle 5 [N-5]	: Pressure safety valve outlet

Terminology:-

Heat Load : The quantity of heat per unit time that must be supplied to maintain the temperature of the media being heated is called **Head Load**

Expressed in any one of the below units

(1) kcal/hr (2) kW (3) kJ/hr (4) BTU/hr

Battery limit : A **Battery Limit** is the geographic boundaries identifying scope of works for unit, facility, system as well as contractor or subcontractor

PHE : A **plate heat exchanger** is a type of heat exchanger that uses metal plates to transfer heat between two fluids

Conversion factors:-

Heat load

- Convert from kJ/hr to kcal/hr : Divide the value by 4.184
- Convert from kcal/hr to kW : Divide the value by 833
- Convert from BTU/hr to kcal/hr : Divide the value by 3.966

How to calculate Heat load and quantity of steam :-

Customer parameters (example):-

Quantity of hot water required	: 15,000 kg/hr
Initial temperature (cold supply water)	: 30 ^oC (Ambient)
Final temperature required	: 70 ^oC
Δ T (during start-up)	: 40 ^oC
Δ T (normal operation)	: 10 ^oC
Steam supply pressure @ site	: 3.5 kg/cm^2

Computation

Considering above requirement of customer, we can calculate the Heat Load as below :-

Values to be computed

1. Heat load, Q (kcal/hr)
2. Quantity of steam, m (kg/hr)

Formulas to be used to calculate Heat load

Formula-1
[Primary side, media – Saturated steam]

Heat load, Q = m X Xfg

m = mass (quantity) of steam
Xfg = latent heat of steam at corresponding supply pressure

Formula-2
[Secondary side, media – water to be heated]

Heat load, Q = m X cP X ΔT

All values for water side are known, which we can incorporate in Formula-2

Heat load = m X cP X ΔT
= 15000 X 1 X 10
= 150000 kcal/hr ≈ 1.5 Lac Kcal/hr

In a heat exchanger, the heat lost by one side is equal to heat gained by other side,

PRIMARY SIDE = SECONDARY SIDE

m * xfg = m * cP * ΔT

m * 506.7 = 15000 * 1 * 10

m * 506.7 = 150000

Therefore, m = 150000 / 506.7 = 296.03 ≈ 296 kg/hr

Mass of steam (to achieve above heat load) = 296 kg/hr

Specific heat, cP of water = 1

Latent heat of steam at 3.5 kg/cm^2 = 506.7 kcal/hr
(From Steam table)

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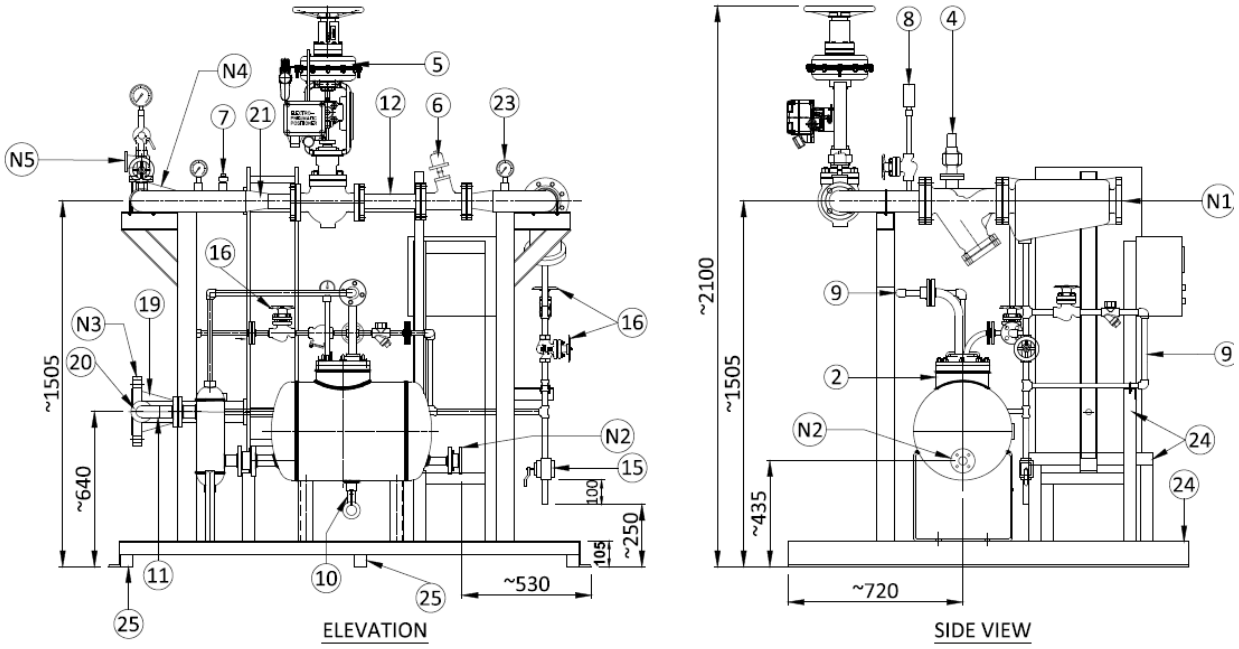
GENERAL ARRANGEMENT



Above dimensions are indicative only. It may differ based on Models

Optional :-

1) Insulation on Hot surfaces
2) Automatic pumping trap (If recovering condensate)
(3) Canopy
(4) Tank/s and recirculation pumps

Weight :-

- Empty weight : 900 to 1500 kgs (depend on models)
- Operating weight : 1100 to 1800 kgs (depend on models)

Bill of Material :-

Sr No	Part Name	Material
1	Plate Heat Exchanger	Plates AISI 316L
2	Automatic Pumping Trap	ASTM A 106 Gr B / Internals – SS316 & Inconel
3	Safety valve	ASTM A 216 Gr WCB
4	Temperature Control valve	ASTM A 216 Gr WCB / ASTM A 216 Gr WCC
5	Pneumatic Piston actuated on/off valve	ASTM A 351 CF8
6	Moisture Separator (Baffle type)	ASTM A 216 Gr WCB
7	Piston valve (Isolation/Throttle valve)	ASTM A 216 Gr WCB
8	Y Strainer	ASTM A 216 Gr WCB
9	Control Panel	C.S., FLP / Non-FLP (based on requirement)
10	Pressure Gauge / Temperature Gauge	Bourdon type, Casing – SS304/SS316
11	RTD PT-100 sensor	Sheath – SS316

Product range

UTD 55 | UTD 62 | UTD 120
Thermodynamic steam Trap

UTST | UCT10
Thermostatic steam trap & Sanitary steam trap

UFT 15 to 100 NB | UCA 20
Float trap for steam and compressed air application

UG 25/45 | UP 64Ti | UP 110Ti | UP 215Ti
Bi-metallic steam trap

UITVS
Compact trap valve station

UIBT 28US
Inverted bucket steam trap in complete stainless steel Construction

UIBT 1701 to UIBT 7004
Inverted bucket steam trap in cast carbon steel Construction

UDCV
Non-slam disc check valve

UMS
Baffle type moisture separator for steam and air

UAV
Air vent(thermostatic type) with air bottle for steam

UAE
Air eliminator for liquid application

UBSV
Bellow seal globe/gate valve

UHPV
High pressure(#1500/#2500) globe/gate valve

USTR
Y & T type strainers in cast carbon steel and stainless steel

USG
Double window sight glass

USI
Steam injector for boiler feedwater

UFV
Condensate

UPPPU
Condensate pressure powered

UDH
Deaerator head(atmospheric) for boiler feedwater tank

UAPT
Automatic pumping trap – Combination of a conventional trap and pump for effective condensate discharge

UCCDS
Online(24X7) condensate contamination detection system

UBBHRS
Boiler blowdown heat recovery system

UPRS
Pressure reducing station

UCCM / USDM
Condensate collection and steam supply manifold

Other Products

Cast / Forged Steel Piston Valves, Bellow seal valves, High Pressure valves (Gate/Globe) , Strainers – "Y" Type, ITVS
Steam Traps (Thermodynamic, Thermostatic, Ball Float Traps and IBT), Pressure Reducing Station, Condensate Recovery Products.
Level Gauges (Reflex, Transparent, Bicolor), Sight Glass, Hot Water Generation System, Safety and Relief Valves.
FSD Products : *Compressed Asbestos / Non-Asbestos Fiber Sheeting / Cut Gaskets, Spiral Wound Gaskets.*

In view of technical progress design and dimensions are subjected to change without notice.

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