HIS Boiler and Heat Exchanger Training Unit (Model: HE 665) has been developed to teach students about basic principles of steam generation and application of steam in heat exchanger. This model is a self-contained unit, installed on a sturdy and corrosion resistant mobile platform and designed for safety and ease of use. The control panel is protected with anti-splash features. The boiler is of industrial grade and electric powered. It comes with blowdown tank and condensate tank as well. The boiler steam output is used to heat up water in a shell and tube heat exchanger system.

**EXPERIMENTAL CAPABILITIES**

- Introduction to controls and safety features of steam system such as safety relief valves, automatic reset operating control and manual reset operating control.
- Skills training on operation of boiler, including boiler blowdown, startup, and shutdown.
- Measurement of Temperatures and Pressures
- Investigation on temperature and pressure conversion.
- Understanding steam power concepts and steam table.
- Performance analysis of steam to water heat transfer in shell and tube heat exchanger.

**SPECIFICATIONS**

*Electric Boiler:*

The boiler power is 12kW with steam output (F&A 100°C) of 18 kg/hr. The boiler vessel is constructed to British Standard BS1894 1992 and CE certified to PED.
The boiler comes fitted with the following features:

- Enclosure with access door
- Main on/off switch with pilot light
- Automatic and Manual reset operating control
- Blowdown Valve
- Water sight glass with shutoff valves
- Safety Relief Valve
- Steam pressure gage
- Low water cutoff/ level control
- Electric heating elements

**Blowdown Separator:**
This unit tank is constructed in accordance with British Standard BS5500 cat. 3. It comes complete with after cooler assembly consisting of globe valve, strainer, temperature regulator valve, check valve, thermometer, and mounting legs.

**Condensate Return and Feedwater System:**
This system include a 45 litre condensate lank. The tank comes complete with sight glass, globe valve, and mounting legs. The water flow is driven by turbine type condensate pump with 0.5 hp motor. The piping includes make-up valve and strainer.

**Steam to Water Heat Transfer System:**
This system core component is a Shell and tube heat exchanger with 4-pass construction. The water to be heated will be flowing through the tube side, while the steam will be flowing through the shell side. The shell and tube heat exchanger is connected with the rest of the system via iron pipe and centrifugal pump to form a process system to control the temperature of water in a stainless steel 50L tank. This heat transfer system is designed with safety and serviceability in mind. Hence, all critical hot pipes will be insulated and pipe union fittings are used. A Y-type Strainer is used to reduce scaling problem. The following features are also included in the system:

- a) Steam Trap, inverted bucket type
- b) Steam Pressure Regulator (5-50psig)
- c) Pressure relief valve
- d) Temperature regulator Valve
- e) Vacuum breakers
- f) Steam traps, float and thermostatic types
- g) Thermostatic air vent
- h) Temperature Gauges
- i) Pressure Gauges
- j) 3 way valves
- k) Check valve
- l) Sight glass

**OPTIONAL ITEMS**

**-DAS**
**SOLDAS DATA ACQUISITION SYSTEM**
- A PC with latest Pentium Processor
- An electronic signal conditioning system
- Stand alone data acquisition modules
- Windows based software

**-CAL**
**SOLCAL COMPUTER AIDED LEARNING SOFTWARE**
- Interactive multimedia features
- Graphical simulation
- Experiment results samples
- Full experiment manuals

**DIMENSIONS:**

- Height : 2000 mm
- Depth : 1200 mm
- Width : 2400 mm

**MANUALS**

A manual covering theoretical, experimental, operating and maintenance of both steam generation system and steam to water heat transfer will be provided.

**UTILITIES REQUIREMENT**

- Electric: 440Hz/3 phase/50Hz
- Water: 20LPM at 2 m head
SOFTWARE & E - LEARNING

Our range of teaching equipment can be complemented with our SOLDAS and SOLCAL software.

SOLDAS™ - Supervisory Control & Data Acquisition
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- Signal Analysis
- Process Control
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SOLUTION ENGINEERING SDN. BHD.
(Co. No. 174876-M)

Sales Office:
No.3, Jalan TPK 2/4, Taman Perindustrian Kinrara,
47100 Puchong, Selangor Darul Ehsan, Malaysia.
Tel. No. : +(603) 80758000
Fax. No. : +(603) 80755784

R&D Office:
G-2A, Incubator 3, Technology Park Malaysia,
Bukit Jalil, 57000 Kuala Lumpur, Malaysia.
Tel. No. : +(603) 8996 0023

Email : solution@solution.com.my

AGENT:

LABORATORY EQUIPMENT SUPPLIES
www.labelquip.co.za
lab21000@iafrica.com
Tel: 011 873 5001
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