

Solar offers a Heat Recovery Steam Generator (HRSG) specifically engineered to be integrated with any of our gas turbines, using the turbine exhaust to provide steam for your plant, which can be integrated with your overall steam system.

The primary function of the unfired HRSG is to make steam from the turbine exhaust heat without the aid of additional heat being added by a duct burner or auxiliary register burner. The basis of this unfired standard is 150 psig dry and saturated steam, although a range of pressures and temperatures can be accommodated. The design complies fully with Solar's HRSG system specification ES 2206, latest revision.

This standard product package has been configured to receive exhaust gas from all of Solar's gas turbines. Exhaust flow rate at ISO conditions was used to determine steam capacity for each *Solar*® gas turbine model.

Standard product packages are available for all five *Solar* turbine families: *Saturn*®, *Centaur*®, *Taurus*™, *Mars*®, and *Titan*™ gas turbines.

FEATURES

- Uses 99.5% of hot turbine exhaust gas for heat transfer
- Custom-designed furnace volume, convection section heating surface area to meet application
- ASME Boiler & Pressure Vessel Code Section 1 design



- Economizer included for efficiency
- Access to tubes for inspection
- Shop fabricated and assembled within practical, shippable limits
- Automatic three-element controller (drum water level, feedwater flow and steam flow)
- Loose-shipped control panel for remote installation
- Boiler trim provided, including water column, level gauge, level transmitter, safety relief valves, feedwater control valve with manual block and bypass valves, blowdown valves, and other standard valves
- Modulating diverter valve complete with loose-shipped pressure transmitter for mounting on the main steam header and a positioner for the diverter valve actuator assembly
- Designed for nonhazardous area classification, NEMA 4
- 12-month/18-month warranty

MAJOR EQUIPMENT

- Complete evaporator section including mud drum, steam drum, and access platforms
- Economizer section
- Three-way, single-blade diverter valve complete with actuator positioner, and limit switches for open and closed position indication
- HRSG main exhaust stack with gas sample ports, platform and ladder
- Expansion joint, bypass stack and support structure for bypass silencer – loose shipped
- Exhaust silencer interface engineering. Silencers are provided normally by Solar as part of the turbine package.
- Complete ductwork from the turbine exhaust expansion joint through the HRSG and up the stacks – loose shipped

AVAILABLE OPTIONS

- Superheat tube bank section
- De-superheating valve and controls
- Boiler trim options to meet the operating plant needs
- Complete soot blower system or soot blower wallbox with bearings only
- Custom instrumentation
- Additional expansion joints
- Custom designs for gas flow options to optimize pressure drop, space restrictions and minimize cost
- Optional exhaust stack arrangements
- Chemical injection package
- Boiler feedwater treatment system
- Additional water side equipment
- Dual units (S.I. metric and English)
- Auxiliary and/or supplemental firing
- Higher or lower pressures to match your requirements
- Start-up and commissioning support
- Lifting equipment, such as spreader bar, slings and shackles
- Other options available upon request
- Other pressures and temperatures

TECHNICAL SPECIFICATIONS

Standard configuration matrix for the skid-mounted HRSG system includes:

- One turbine
- One HRSG (unfired)
- One diverter

DESIGN PARAMETERS

- Table values for the turbine are sea level at 59°F (15°C) ambient, San Diego natural gas fuel, 60% RH, 100% load, 3 in. water gauge inlet pressure loss, approximately 7 in. water gauge outlet pressure loss, nominal performance
- HRSG design is 150 psig dry and saturated steam, industry standard pinch and approach values, 2% blowdown, 228°F economizer feedwater inlet, 1% casing loss
- Exhaust mass flow loss to bypass while in HRSG mode is 1/2%

Typical Steam Capacities

Turbine Model	Estimated Steam Capacity, lb/hr
Saturn 20	8,630
Centaur 40	18,430
Centaur 50	24,780
Taurus 60	29,300
Taurus 70	31,100
Mars 90	45,280
Mars 100	50,690
Titan 130	61,200

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