

Worldwide Turbomachinery Support

Automated High-Pressure Engine Cleaning System

The Automated High-Pressure Engine Cleaning System from Solar Turbines extends a turbine engine's operational periods, and thus its overall efficiency, by simplifying on-line and on-crank cleaning procedures.

A major cause of performance degradation in turbine engines is the build-up of airborne contaminants on compressor blades. Most of the performance loss due to fouling can be recovered through periodic on-line or on-crank engine cleaning using de-ionized water or a detergent solution.

The automated high-pressure engine cleaning system for Centaur®, Taurus™, Mars® and Titan™ 130 packages enables operating staff to maintain cleaner, more efficient engines through easy-to-use integration with Solar's TurboTronic™ control system.

Primary Goals	
●	Operational Efficiency
●	Machinery Efficiency
●	Optimize Productivity

Benefits

Improved Revenue and Production—Regular use of Solar's automated high-pressure engine cleaning system for on-line cleaning allows for longer intervals between on-crank cleaning shutdowns. The Turbomachinery remains more productive, thereby providing a greater return on investment.



Improved Performance—As a result of more frequent on-line cleaning, power-robbing airborne contaminant build-up on compressor blades can be removed easily, thus maintaining package performance.

Greater Staff Efficiency—Integrated with the TurboTronic control system, both on-line and on-crank cleanings can be operated and monitored automatically, saving staff time.

Reduced Environmental Impact—More frequent on-line cleaning extends the time between on-crank cleanings, thereby reducing detergent use and minimizing environmental impact.

Simplified Operation—Using common nozzles, water pressure, and liquid flow rate for both on-line and on-crank operations, the Automated High-Pressure Engine Cleaning System is reliable and effective while greatly simplifying the system's operation.

Multiple Engine Use—One cleaning module can be used to clean up to four engines, creating an even greater return on investment.

Worldwide Turbomachinery Support

A Complete Solution

The fixed-installation Automated High-Pressure Engine Cleaning System consists of the following major components:

• Engine Cleaning Module

This module incorporates a stainless steel water tank and a non-metallic detergent tank, each served by its own dedicated electric motor-driven stainless steel pump.

The water tank pump operates at approximately 900 psig, which assists in atomizing the liquid as it is being discharged from the cleaning nozzles arrayed in the turbine engine air intake.

Other standard features include:

- Painted carbon steel or 316 stainless steel enclosure
- Immersion heaters
- Separate water and detergent tanks
- Color touch screen display
- Cleaning operations initiated and controlled from the *Turbotronic* control console
- Capable of serving up to four units

• Package Selection Valve Module

This module facilitates the delivery of cleaning fluids to the selected turbomachinery package.

Standard features include:

- Modular high pressure unit selection valves
- Easy expansion for additional unit selection valves

• Package Isolation Module

This module simplifies the purging of feed lines at the beginning and conclusion of each cleaning operation, thus preventing water of unknown quality from entering the turbine engine.

Standard features include:

- Line shutoff/diverter valve
- Water filter
- Water delivery pressure transmitter

• Package Nozzle Kit

Standard features include:

- High pressure atomizing nozzles
- Flexible fluid-delivery manifolds

• Turbotronic Control System Software/Hardware Modification

Standard features include:

- Monitor and control
- Cleaning system status
- Wash counters
- Operator interface

Operating Range

The Automated High-Pressure Engine Cleaning System is suitable for outdoor installation in ambient temperatures ranging from 0° to 50°C (32° to 122°F) for CSA/NEC Class 1, Division 2 and 0° to 40°C (32° to 104°F) ATEX Zone 2.

Technical Data

Engine Cleaning Module

Length:	1168 mm (46 in.)
Width:	990 mm (39 in.)
Height:	2210 mm (87 in.)
Dry Weight:	680 kg (1500 lbs.)

Tank Capacities

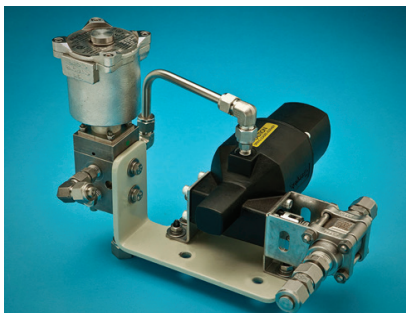
Water:	151 liters (40 gal.)
Detergent:	95 liters (25 gal.)
Operating Temp:	4°C to 60°C (39°F to 140°F)
Storage Temp. (Dry)	– 54°C to 82°C (– 65°F to 180°F)

Required Utilities

Water and Cleaning Solution:	Must comply with Solar's Engineering Specification ES 9-98.
Air:	Clean and dry air supply at pressure between 100 – 150 psig, capable of sustaining a minimum flow of 16 SCFM for purging the manifold lines. Air must comply with Solar's Engineering Specification ES 2201
Electric:	380-420 Vac, 3 Ph. 480 VAC, 3 Ph. 50/60 Hz. 120 VAC, 1 Ph., 50/60 Hz (for ATEX)

Additional Information

For more information about the Automated High-Pressure Engine Cleaning System, contact Solar's field office nearest you or go to www.solarturbines.com



Package selection valve module



External manifolds, water injection nozzles and hardware



Package isolation module