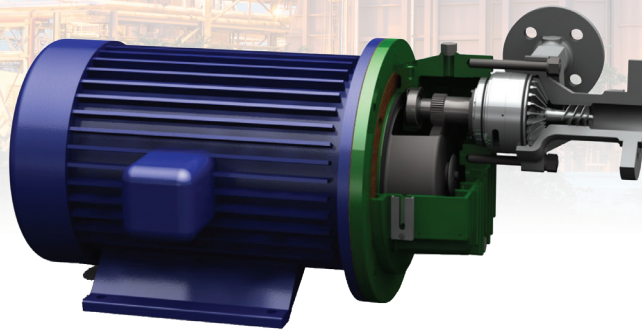




# Industrial Power Generation Utilizing Sundyne's Sunflo Pumps

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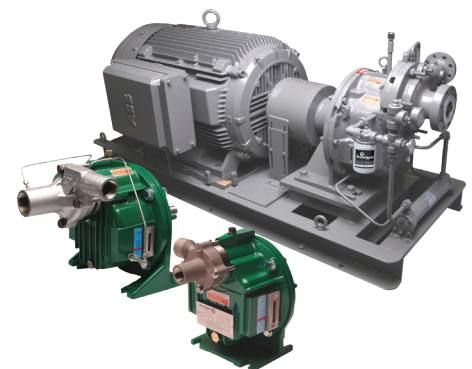
Sundyne's Sunflo product line is a high-pressure centrifugal design that utilizes a single-stage pump to provide multi-stage performance while providing reliability and serviceability. This product line is designed as a commodity product with the flexibility to be tuned to each customer's conditions and demands based on the application. Utilizing 316SS construction as a standard wet-end material and design temperatures up to 350 deg F; this product line has provided a great track record of success in the Power Generation market with a focus on Boiler Feed, Condensate, and Desuperheating applications.

## Application:

These Sunflo applications can be used for either power or heat generation through steam to create an efficient system for the customer's demands. These demands tend to be cyclical depending on both power requirements and seasonal weather. Sunflo can be used for applications of up to 800 psi boilers or 25MW.

The success of Sunflo has been driven by the high pressure demands to overcome the boiler pressure while maintaining a low Net Positive Suction Head Required (NPSHr) to accommodate for a low Deaerator Tank (DA). The Sunflo product line utilizes a pre-engineered inducer to allow for a low DA tank without the need for a booster pump. With

cyclical demands, Sunflo offers a wide operating range from 40-110% of Best-Efficiency-Point (BEP) without the need for recirculation. If the demand drops below 40% of BEP, Sundyne will provide an engineered bypass based on the application to allow for full performance curve operation, or a Sundyne package utilizing a Variable Frequency Drive (VFD) that can be either a standalone system or tie into the customer's current Programmable Logic Center (PLC).



# Pump Design:

**Bearing:** With low Net Positive Suction Head Available (NPSHa), a pressure transient condition may occur, which can lead to premature failure. The Sunflo product line mitigates this possibility by providing a hydrodynamic thrust bearing that can withstand this upset to allow for continuous operation while maintaining a Mean Time Between Repair (MTBR) of 5 years.

**Seal Design:** To accommodate for elevated temperatures of 180-250 deg F, the Sunflo product line uses a specifically designed seal as well as a flush plan (Plan 11, 21 or 23) to provide the most reliable system. The rotating face is also provided in a Silicon Carbide material to resolve any leaching concerns with ultra-pure water, as a result of water conditioning standards for boilers.

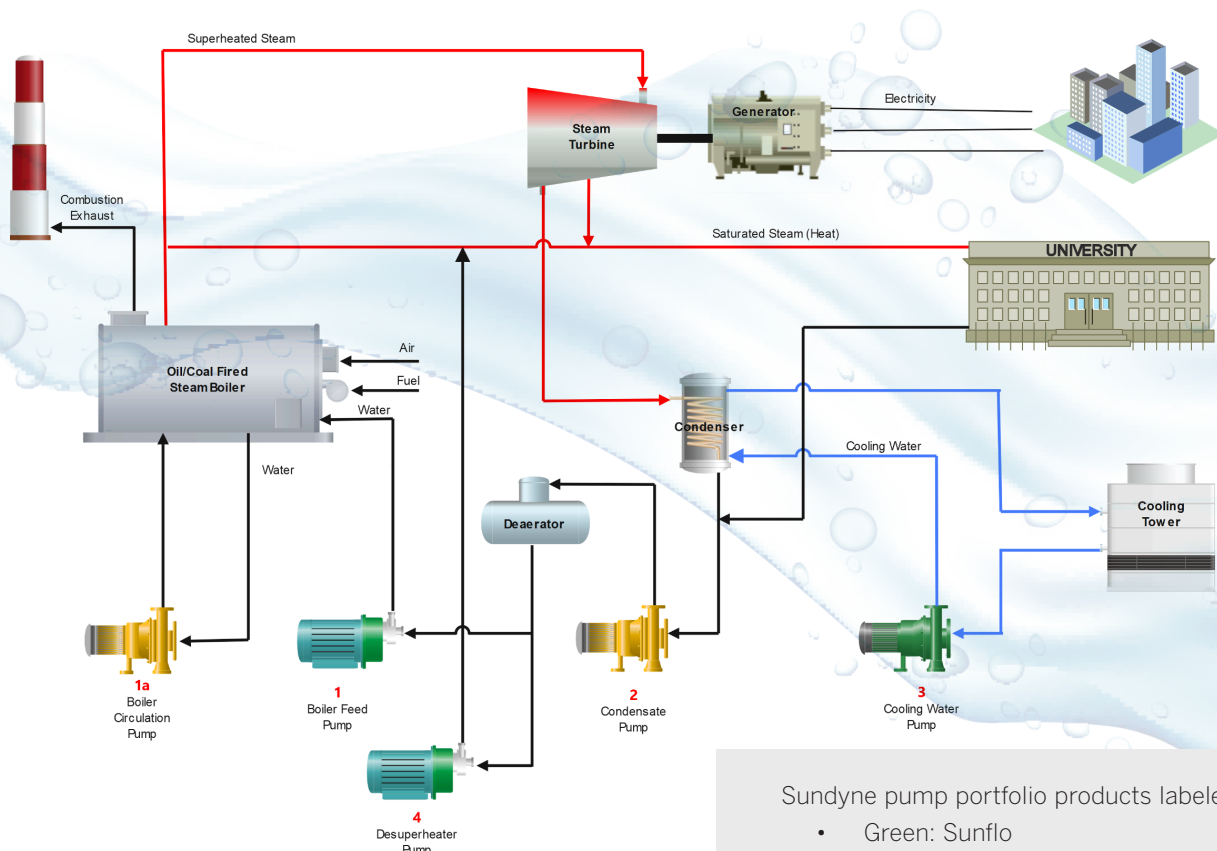
**Impeller:** Sunflo is equipped with a 24 blade Barske impeller that integrally mates to the inducer providing a

smooth, constant pressure to the system. This impeller design also allows for generous clearances, removing the concern of stratification and need for a warm-up line.

**Utility:** The Sunflo product line requires minimum utility as a splash lubrication system is used for the gearbox for units up to 75HP and an air-cooled design can be used up to 250HP. 250-400HP requires external cooling water to the gearbox.

**Serviceability:** The Sunflo product line can be serviced within 1 hour, with 1 man, 1 wrench, and minimum training. This is accomplished by replacing the Sunflo Shaft Assembly which contains all the wear parts within the pump, allowing for minimal downtime and the reduction of third-party maintenance.

## Process Map:



Sundyne pump portfolio products labeled:

- Green: Sunflo
- Yellow: Sealless Pumps (Ansimag/HMD)

Condensate Pump can vary depending on temperature and flow rates



Questions?  
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