



# POWER GENERATION

GLOBAL SOLUTIONS



ALLWEILER® HOUTTUIN™ IMO®



## REDEFINING WHAT'S POSSIBLE

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CIRCOR is redefining what's possible in Power Generation, collaborating with engineers and operators like you to develop the best fluid-handling solutions for your application.

Your toughest challenges are addressed with more than just an off-the-shelf product when you partner with CIRCOR. You get 150 years of application experience, technology that's relied on to support numerous power plants every day worldwide, and a team of product and service specialists tasked with maximizing the efficiency of your operation - from the very start to the finish of your project.

All of this is enabled by a broad portfolio of pumps and engineered systems from brands you and your clients know and trust - Allweiler®, Houttuin™, Imo® and Warren® - ensuring that you get the reliability your operations demand and expert levels of service that you require during design, commissioning and throughout operations.

As your single-source global supplier, we call this "Total Savings of Ownership" reducing the overall costs of your operation and increasing your profitability.



## WHEN FAILURE IS NOT AN OPTION IMPROVING THE METRICS THAT MATTER MOST

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You've got a tough job. Today's power plant operators and engineers are faced with more issues than ever before -environmental, operational, security and availability. As power generation sources expand and evolve to meet increasing electricity demands, your market and your jobs are getting

even tougher. CIRCOR can help. With pumping solutions that are integrated with your business, CIRCOR provides a range of product and engineering capabilities that improve the performance metrics of your power plant.



## YOUR SINGLE SOURCE

### REDEFINING WHAT MATTERS MOST TO YOU

Pumps and fluid handling systems from trusted CIRCOR product brands -Allweiler®, Houttuin™, Imo® and Warren® - support a wide range of mission critical applications in all types of power plants: Combined Cycle, Combustion, Steam, Stationary Diesel, Solar Power, Cogeneration and Hydro.

Through our standard and custom engineered solutions, we offer a wide range of designs for fluid handling systems in power generation applications.

Power generation operators and engineers turn to CIRCOR to help redefine the metrics that matter most to them:

- › **Technology:** providing the right pumping & system solution for every application
- › **Reliability:** maintaining performance of the system regardless of operating conditions
- › **Availability:** maximizing the time for power production
- › **Uptime:** ensuring run-time consistency without fail
- › **Compliance:** sustaining the commitment to environmental responsibility
- › **Cost-effectiveness:** keeping the plant competitive in a tough global economy



## APPLICATIONS

### **H** HYDRO

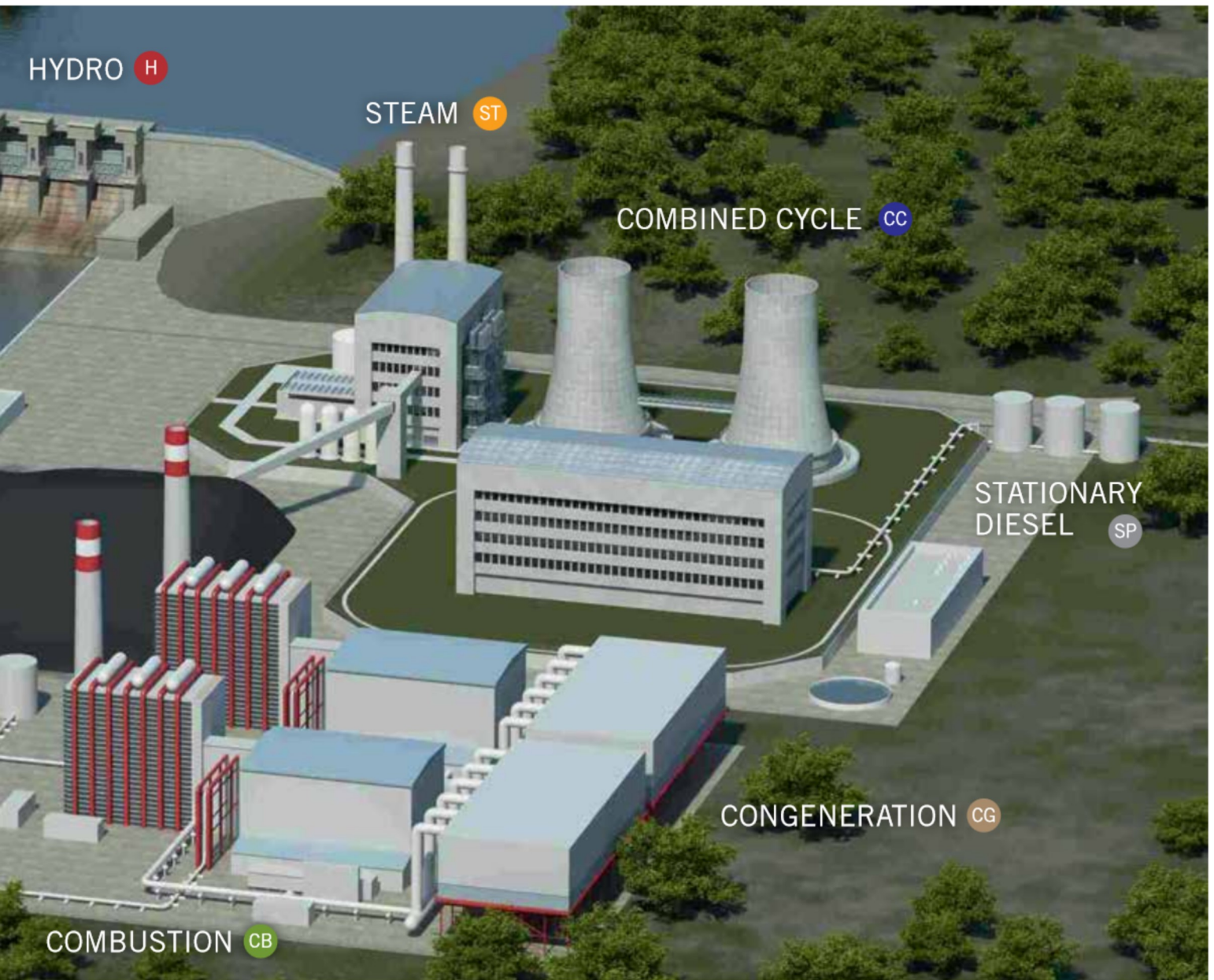
- › Lubrication
- › Hydraulic Governor
- › Bearing lift
- › Oil service

### **SL** SOLAR

- › Heat transfer fluids

### **CB** COMBUSTION

- › Fuel unloading
- › Fuel forwarding
- › Fuel transfer
- › Rotor jacking
- › Lubrication
- › Fuel injection
- › Chemical metering
- › Seal oil



### ST STEAM

- › Fuel transfer
- › Fuel unloading
- › Rotor jacking
- › Lubrication
- › Fuel or burner injection
- › Wastewater treatment
- › Oil service
- › Seal oil
- › Chemical metering

### CC COMBINED CYCLE

- › Fuel transfer
- › Rotor jacking
- › Lubrication
- › Oil service
- › Seal oil
- › Fuel or burner injection
- › Waste water treatment
- › Purge water
- › Washing system
- › Cooling water
- › Nox reduction
- › Sump

### SP STATIONARY DIESEL

- › Fuel unloading
- › Fuel forwarding
- › Fuel transfer
- › Fuel injection
- › Lubrication
- › Cooling water

### CG COGENERATION

- › Lubrication
- › Rotor jacking
- › Oil service
- › Fuel transfer
- › Fuel or burner injection

# POWER GENERATION APPLICATION SOLUTIONS

## WITH PERFORMANCE AND EFFICIENCY BUILT-IN

We build reliable performance and operational efficiency into our fluid handling systems for power plant applications, leveraging innovations in core pump technologies that significantly reduce your costs . Depending on the application, CIRCOR can help you save up to 40 percent, by reducing energy use and downtime, as well as costs associated with unscheduled maintenance, labor and replacement parts:

We call this value to you “Total Savings of Ownership”.



	Three-Screw	Two-Screw	Progressing Cavity	Gear	Centrifugal	Oil Mist/PurLube	Propeller	Engineered Systems
Fuel Unloading /Transfer/ Forwarding	●	●			●			●
Rotor Jacking	●			●				●
Lubrication (Rotating Equipment)	●	●		●	●			●
Fuel Injection (Gas Turbine or Burner)	●	●		●				●
Waste WaterTreatment			●		●			
Oil Service						●		
Hydrogen Cooled Generator Seal Oil	●				●			●
Chemical Metering			●	●				●
Nox Reduction	●							●
Purge Water	●				●			●
Washing Systems					●			●
Cooling Water					●		●	●
Sump			●					
HeatTransfer Fluids for Solar					●			
Hydraulic Governor	●			●				

## ENGINEERED SYSTEMS

BARIC®

UNLOADING TRANSFER & FUEL FORWARDING



LUBRICATION SYSTEMS, PUMPS AND SERVICE



OIL PURIFICATION



FUEL INJECTION



## INNOVATIVE, RELIABLE PUMPS AND SYSTEMS FROM THE NAMES YOU KNOW AND TRUST

CIRCOR delivers innovative and reliable pump units as well as engineered systems from names you know and trust: Allweiler®, Houttuin™, Imo® and Warren®. Our engineering and technical specialists conduct extensive research and testing before developing and manufacturing this extensive portfolio of products in accordance with international standards. The focus is singular and clear: to meet the highest levels of manufacturing and product quality.

### TWO-SCREW PUMPS

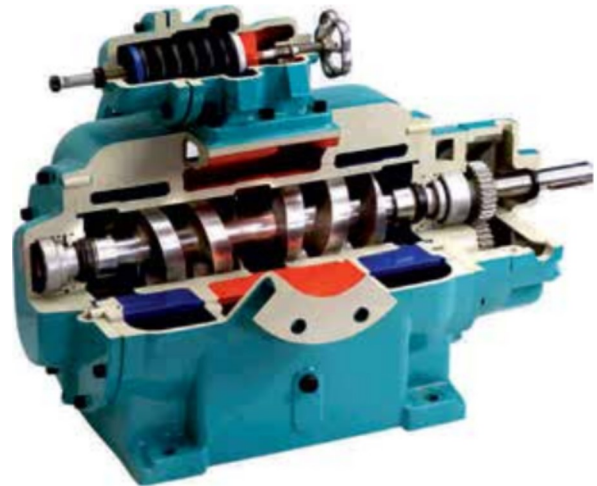
HOUTTUIN® WARREN®

Double-entry, self-priming, high suction lift capabilities with low NPSHR values, capable of running dry .

Application: Especially suitable for balance-of-plant applications, handling large volumes of liquids with or without lubricating properties, especially low viscosity liquids such as Naphtha.

#### PERFORMANCE DATA

Delivery:	up to 5,300 m <sup>3</sup> /h / 23,340 gpm
Discharge pressure:	up to 100 bar/ 1,450 psi
Viscosity:	0.5 to 100,000 cSt
Fluid temperature:	up to 400 °C / 752 °F



### THREE-SCREW PUMPS

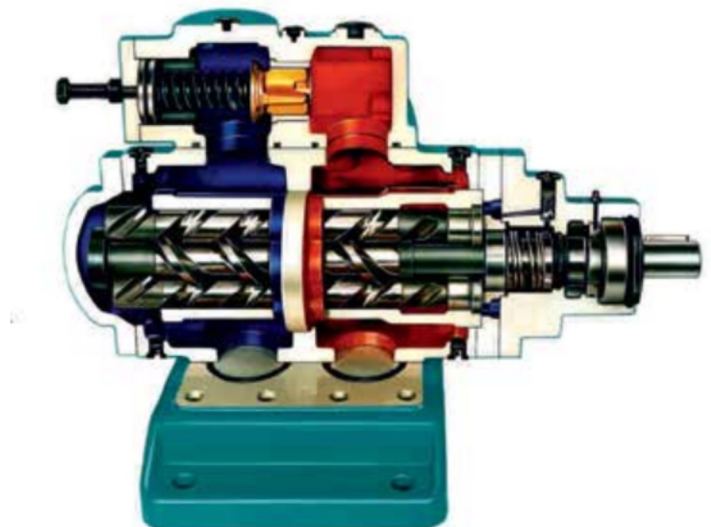
ALLWEILER® IMO®

Self-priming, high efficiencies and very low noise. Provide continuous, pulsation-free flow through the pump.

Application: For handling oils or other lubricating and noncorrosive liquids, especially in primary applications such as fuel injection and lubrication.

#### PERFORMANCE DATA

Delivery:	up to 750 m <sup>3</sup> /h / 3,300 gpm
Discharge pressure:	up to 120 bar/ 1,740 psi
Viscosity:	1 to 5,400 cSt
Fluid temperature:	up to 260 °C / 500 °F



## PROGRESSING CAVITY PUMPS

ALLWEILER®

Single- or multistage pumps, self-priming. Provide continuous, low pulsation flow, without creating emulsion. Especially suitable for metering.

Application: For pumping or metering fluids in a wide range of viscosities and corrosive properties. Also suitable for multi-phase liquids and contaminated liquids such as sludge and slop oil.

### PERFORMANCE DATA

Delivery: up to 450 m<sup>3</sup>/h / 1,980 gpm

Discharge pressure: up to 64 bar/ 928 psi

Viscosity: 1 to 300,000 cSt

Fluid temperature: up to 150 °C / 302 °F



## PERISTALTIC PUMPS

ALLWEILER®

Dry, self-priming, seal less and valveless rotary displacement pumps for pumping or dosing liquids with high solids content.

Application: For pumping or metering fluids in a wide range of viscosities and corrosive properties. Also suitable for multi-phase liquids and contaminated liquids. Suitable for applications in which the pump may run dry for extended periods of time.

### PERFORMANCE DATA

Delivery: up to 60 m<sup>3</sup>/h / 265 gpm

Discharge pressure: up to 16 bar/ 232 psi

Viscosity: 1 to 100,000 cSt

Fluid temperature: up to 80 °C / 176 °F



## GEAR PUMPS

ZENITH® IMO®

Fixed-displacement pumps, can be engineered with multiple stages for very high pressure or moderate pressure on very low viscosity fuels. Very low pulsation, extremely quiet high-efficiency pumps.

Application: From jacking oil to fuel injection, the CIG gear pump from CIRCOR is the perfect pump option for aero-derivative turbines.

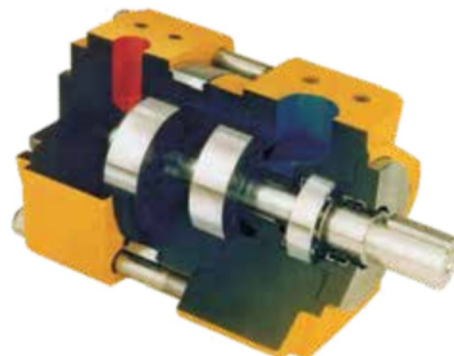
### PERFORMANCE DATA

Delivery: up to 28 m<sup>3</sup>/h / 123 gpm

Discharge pressure: up to 345 bar/ 5,003 psi

Viscosity: 0.5 to 50,000 cSt

Fluid temperature: up to 510 °C / 950 °F





## CENTRIFUGAL PUMPS

ALLWEILER®

Designation, rated power and dimensions according to EN 733 or EN 22858. The EN performance scope has been exceeded with additional pump sizes. High-pressure centrifugal pumps in multistage design, up to 15 stages depending on pump size.

Application: For handling neutral or aggressive, pure or contaminated, cold or hot, and toxic liquids.

### PERFORMANCE DATA

Delivery: up to 550 m<sup>3</sup>/h / 2,420 gpm

Discharge pressure: up to 16 bar/ 227 psi

Viscosity: up to 150 m / 492 ft

Fluid temperature: up to 400 °C / 752 °F



## OIL SERVICES

LSC®

ThermoJet Oil® Purifier is a state-of-the-art, on-line industrial oil-purification system that removes free, emulsified and dissolved water and light hydrocarbons from industrial lubricants and hydraulic oils.

Application: The unique air/gas stripping technology makes it practical and efficient - allowing the ThermoJet Oil Purifier to outperform centrifuges, coalescers and the more complex vacuum dehydration systems.

### PERFORMANCE DATA

Particulate filtration: ISO 4406 15/13/10

Process flow rate: 680 l/h / 180 gal/h



## REDEFINING SYSTEM PERFORMANCE AND OPERATIONAL COSTS

SmartTechnology- Monitoring and Control in a single unit

Fully automated electronic monitoring and control system that provides Total Savings of Ownership by preventing hazardous running conditions, optimizing processes and lowering maintenance and spare part costs.

SmartTechnology can be used with centrifugal and displacement pumps.





## THE BEST FLUID HANDLING SYSTEM AT THE CORE OF EVERY POWER PLANT

Pumps and engineered systems from CIRCOR are the most trusted names in fluid handling applications all over the world

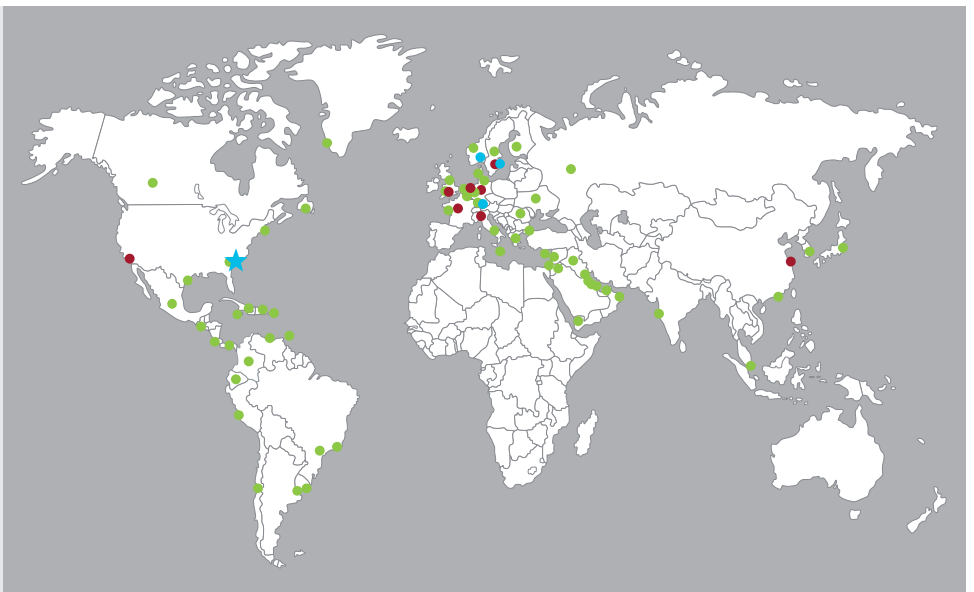
Your CIRCOR team focuses on developing and delivering the best solution for individual requirements, whatever your challenges, wherever they are in the world. We call this "Total Savings of Ownership." Savings from CIRCOR begins with a fair price. But Total Savings of Ownership involves an understanding of what it takes to optimize profitability throughout the life of the power plant.

Partner with CIRCOR for our deep base of industry knowledge, engineering experience, and application expertise that allows us to optimize system performance while ensuring your team has the knowledge and training it needs. With the tools to simplify your design and engineering processes and the global presence to ensure you have what you need when you need it, we are committed to being a partner in your success by redefining what's possible for you and your customers.

### REDEFINING GLOBAL SOLUTIONS

CIRCOR maintains regional engineering and manufacturing facilities facilities, along with a global network of distributors, to support you around the world and around the clock.

-  Global Headquarters
-  Commercial Marine Main Offices
-  Regional Manufacturing and Engineering Support Facilities
-  Global Distributor Network





CIRCOR is a market-leading, global provider of integrated flow control solutions, specializing in the manufacture of highly engineered valves, instrumentation, pumps, pipeline products and services, and associated products, for critical and sever service applications in the oil and gas, power generation, industrial, process, maritime, aerospace, and defense industries.

## Excellence in Flow Control

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