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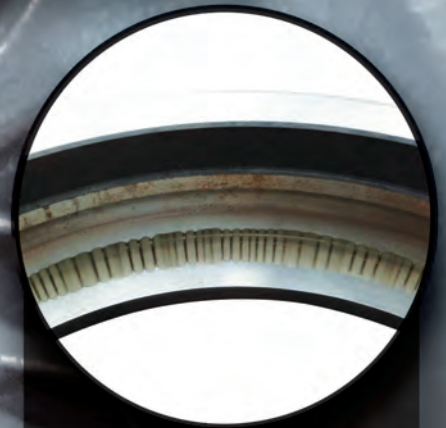
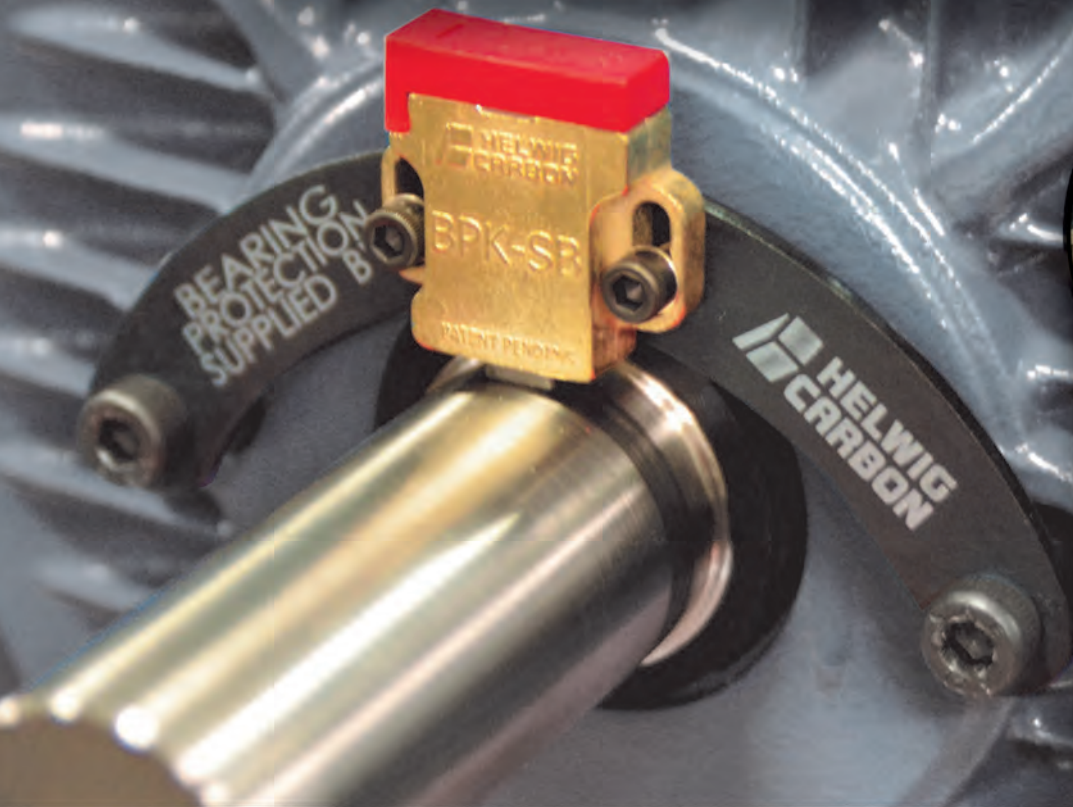
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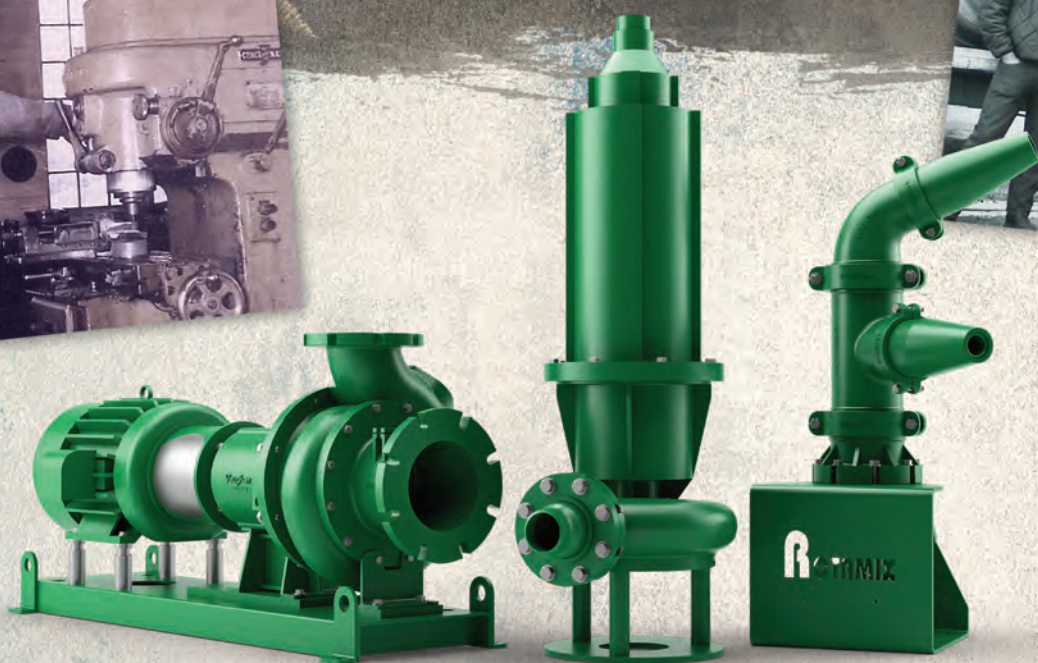
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# Making it easy to get what you want

Let's face it, there's never a good time for failed equipment, especially when it's preventable. Clogged pumps lead to downtime and downtime leads to frustration, to say the least. With thousands of installations solving clogging issues, the XFP submersible pumps, utilizing the Contrablock Plus system, have proven themselves to prevent problems before they even start. With superior solids and rag handling and lower maintenance costs for long-term reliability, the choice is easy when it comes to replacing your failing equipment.

And to make it even easier, the XFP is available with a wide range of competitor retrofitting solutions for drop-in replacements, saving time and costly rehabilitation of a pump station. From retrofit brackets to controls to custom solutions, Sulzer makes it easy to get what you want. Don't you think it's time for change?





## GE UNVEILS CARBON CAPTURE PLANS FOR ASIA AND OCEANIA

GE Gas Power signs a memorandum of understanding with Korea's leading engineering, procurement and construction company, DL E&C Co. Ltd. and its subsidiary, CarbonCo, a company specialized in decarbonization, to jointly explore a roadmap for carbon capture technology integration with natural gas combined cycle plants in Asia and Oceania, powered by GE power technology. The collaboration aligns with GE's commitment to support the region's transition towards a lower-carbon future in the power generation sector, rapidly and with scale.

As part of the MoU, DL E&C, CarbonCo, and GE will collaborate to advance the adoption of low carbon gas power plants by embedding carbon capture expertise. All three parties will identify and develop potential project opportunities for an existing or new combined cycle power plant, as well as conduct feasibility and front-end engineering design (FEED) studies to explore possible locations to implement CCUS technologies within a combined cycle power plant. GE together with DL E&C and CARBONCO will also jointly explore the commercialization of CCUS technologies integrated with combined cycle power plants for interested customers.

## CIRCOR BRAND WARREN PUMPS CELEBRATES 125TH YEAR ANNIVERSARY

Circor International, Inc. joins their brand Warren Pumps in celebrating their 125th year anniversary. On October 19, Warren Pumps invited esteemed guests and employees to their Warren, Massachusetts, facility for a factory tour, classic car exhibition, and corn hole tournament to celebrate 125 years in the pump business.

In addition to the employees, guests at the event included U.S. Representative Richard Neal of the Ways & Means committee, State Senator Anne Gobi, and State Representative Todd Smola. Warren also received a citation from Governor Charlie Baker in honor of the achievement.

"Congratulations to the Warren team and their amazing history," shares Tony Najjar, Circor's president and CEO. "We are very proud to be associated with this team and the work they do supporting our Navy and Industry customers."

For 125 years, Warren Pumps has provided solutions for the U.S. military, as well as for a wide variety of industrial and marine customers. The company was founded based on steam-powered reciprocating pumps and still provides parts to this day. Today, it specializes in highly engineered centrifugal pumps for naval submarines.

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## EMERSON RELEASES LATEST CONTROL SYSTEM UPDATE

Emerson has released a new version of its DeltaV distributed control system (DCS). Version 15 helps plants digitally transform operations through improved production optimization and enhanced operator performance. New software designed to reduce the burden of IT support and modernization spend coupled with expanded analytics will help increase flexibility and speed to market and drive operational improvements.

Market forces place more pressure than ever on manufacturers to drive improved performance and sustainability. Meeting these goals, especially in an era of personnel shortages, means making the most of available data. DeltaV version 15 expands access to critical data to provide every operator with actionable decision support. New infrastructure makes automation easier to set up and maintain while real-time analytics and an improved human machine interface help operators improve situational awareness.

"As the Purdue Model of control system engineering continues to flatten and more manufacturers need visibility across the enterprise, the control system plays an increasingly important role in providing real-time access to highly-contextualized, democratized data," says Claudio

Fayad, vice president of technology for Emerson's process systems and solutions business.

## C-INNOVATION SIGNS CONTRACT FOR NEW WELL DELIVERY PROGRAM AND IRM SERVICES

C-Innovation, LLC signs a multi-year contract with a major operator in the Gulf of Mexico, securing the C-Constructor to support the New Well Delivery Program and the Holiday for inspection, repair, and maintenance (IRM) services. The C-Constructor and Holiday are both light construction vessels equipped with subsea cranes and two Schilling UHD work class ROVs each. The C-Constructor will support the New Well Delivery Program and the Holiday will support IRM and emergent scopes for the operator.

The C-Innovation New Well Delivery Program manages all aspects of well delivery operations post drill rig completion through well startup. The program reduces costs for operators by combining tree and well tie-in scopes. Historically, these two scopes were separated with tree installations being performed from the rig, which is more costly than performing the work from a vessel.

Leigh Anderton, New Well Delivery team lead for C-Innovation, says, "This program stemmed from our client's need for results without additional costs, and we were able to deliver the speed, flexibility, knowledge and experience to satisfy their goals." ■

## HOW LONG BEFORE YOU KNOW SOMETHING IS WRONG?



- Levels
- Vibration
- pH
- Flow
- Temperature
- Dissolved Oxygen
- Turbidity
- Power Failure



## MONITORING, DATALOGGING & ALARMING WITH WIRELESS DATA TRANSMISSION

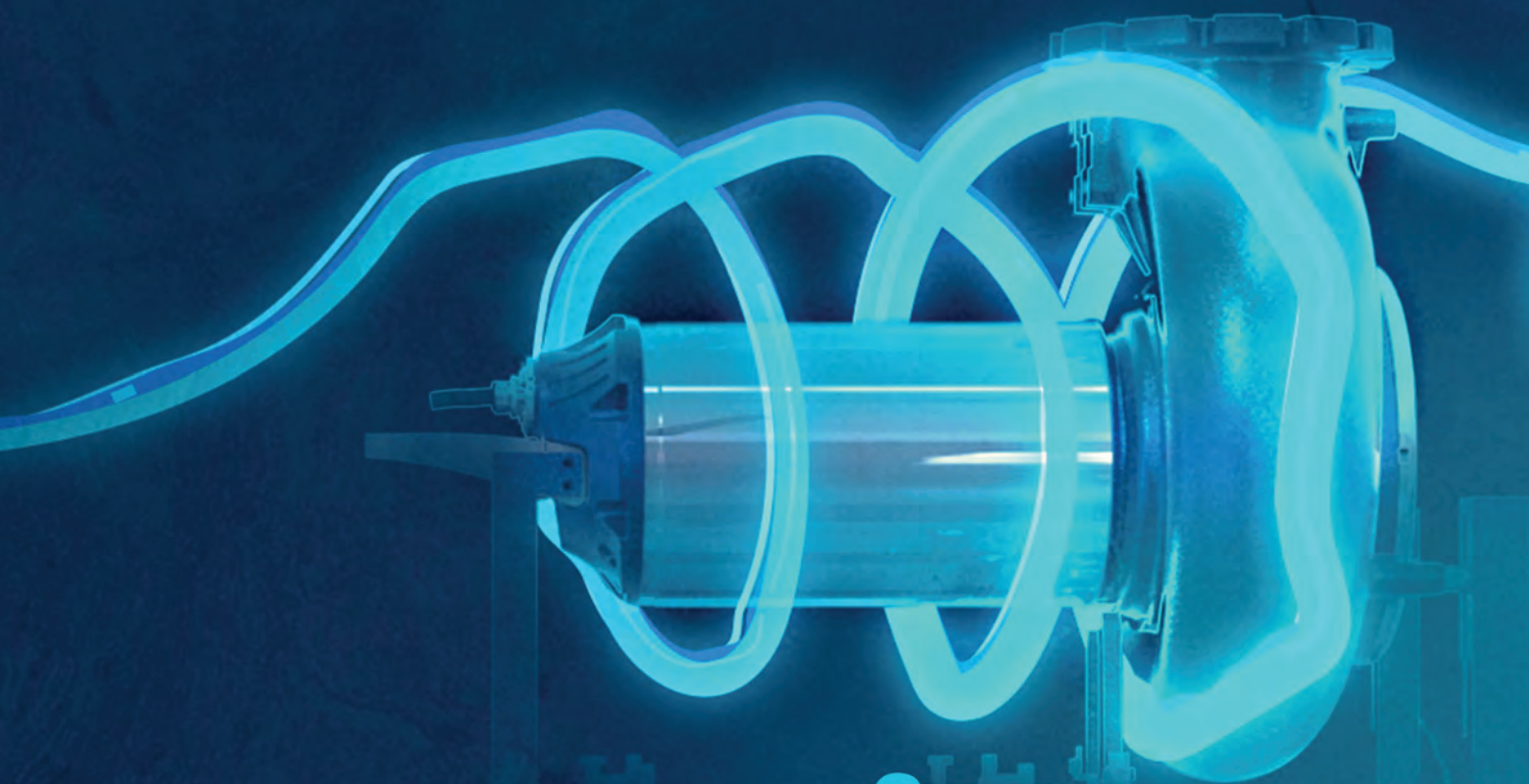
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# SUBMERSIBLES GOING GREEN

## *The next wave of electric motors for pumps*

BY SWPA EXECUTIVE DIRECTOR ADAM STOLBERG AND DAVID M. WILLIAMS, LIBERTY PUMPS

From OEMs to municipalities, every sector along the pump industry's path is seeking more sustainable approaches to traditional operations. Below, SWPA Executive Director Adam Stolberg and Liberty Pumps' director of engineering, David M. Williams, discuss how the combination of electric motors with submersible pumps has proven a reliable, cost-effective, and versatile option for many pump users.

### ***As the push toward greater efficiency continues, where do you see electric motors expanding in the submersible pump market?***

Ongoing design advancements and the resulting efficiency improvements being achieved in electric motor design will support continued growth in the use of AC electric motors in submersible pump applications. As pumping applications make up a significant portion of the world's overall energy consumption, it is critical that users and manufacturers continue to work together to optimize pump system design, selection, and utilization. In addition, ongoing advancements in controls such as VFDs (variable frequency drives) allow further tuning and optimization to meet exact system requirements while maximizing efficiency.

### ***Are there horsepower ranges available in today's electric motors that weren't possible in the past?***

AC electric motors have always been available in a wide range of horsepower levels, but advances in design and manufacturing techniques have supported continued growth in higher horsepower submersible pump applications. Lately, several manufacturers have been developing larger horsepower submersible grinder and chopper pumps to help combat today's modern wastewater challenges.

### ***How do you convince the skeptics wary of combining electric motors with submersible applications?***

Decades of successful AC motor use in submersible pump applications is indisputable evidence that the technology is both proven and reliable. The specific benefits, as we discuss later, come together to ensure that users can be confident that a properly selected submersible pump will provide a long-term reliable solution to their wastewater pumping needs.

### ***What makes electric motors such a versatile power source for submersible pumps?***

Electric motors are the ideal power source for submersible pumps because pump manufacturers can work with motor designers to develop motors with power curves tailored for the specific load points, and also incorporate custom motor shafts which serve as the main shaft for the pump wet end.

### ***How would you best describe the benefits of using an electric motor in submersible pump application?***

There are numerous benefits related to incorporating the electric motor into the pump design that facilitate installation and minimize or eliminate maintenance. With the motor and pump sharing a common shaft, issues such as motor mounting and alignment are eliminated. Further, as submersible pumps are hermetically sealed and most are oil filled, there is no need for periodic bearing maintenance or lubrication, and the circulating oil efficiently transfers heat to the housing, which is then cooled by the pumped media going through the volute as well as surrounding the pump in the wet well. The motor is also inherently protected from damage that could occur during floods or other events.

### ***How do those benefits extend over the life-cycle of the pump?***

With the motor isolated from contamination or damage, protected from heat through efficient and uniform cooling, and with bearings and seals permanently lubricated, the ongoing maintenance activities and related costs are minimal and lead to significant long-term savings over the life of the pumping system.

### ***What are some of the best ways to assess true efficiency for submersible pumps and electric motors?***



Pump manufacturers generally provide efficiency information in one of two ways—either pump (hydraulic) efficiency, which is the efficiency of the pumping portion of the device, or “wire-to-water” efficiency, which takes into account the total amount of energy consumed by the pump including heat, friction losses, etc. Either method provides useful information when comparing various pumping solutions, but the key is to ensure that you are looking at all options using the same method, and then focusing on the solution with the best efficiency point where it meets the system curve.

***For pump users shopping today for an electric motor, what are some of the features you'd recommend they consider?***

With an ever-increasing focus on energy efficiency, I'd encourage pump users to look for motors that are constructed per NEMA® IE3 Premium Efficiency standards and suited for

inverter duty applications with proper shaft grounding for use with VFDs (for larger horsepower applications). As always, SWPA encourages users to take the Systems Approach to pump station design. It is critical to ensure that the motor/pump/system combination is properly designed for the application to maximize efficiency and ensure long-term and trouble-free operation. ■

SWPA is the industry's leader in providing accurate, up-to-date technical information about submersible wastewater pumps and the component parts and accessories in lift stations using solids-handling pump systems. Now in its fourth decade of service, SWPA has become the recognized voice for the submersible pump segment of wastewater industry and looks proudly upon its long legacy of service. For more information or to join, visit [www.swpa.org](http://www.swpa.org).



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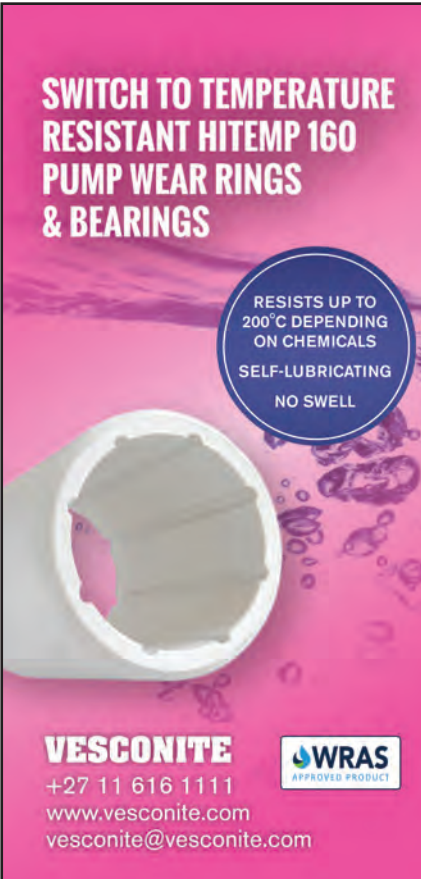


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# DIRECT IN-LINE PUMP SYSTEM SAVES THE DAY

*"Flushable" wipes plague an Austin, Texas, high-rise until OverWatch® arrives*

BY AMANDA AUGER, INDUSTRIAL FLOW SOLUTIONS

Submersible pump stations around the world share a common enemy, the not so "flushable" wipe. In a traditional wet well system, these wipes are separated from the pumped liquid, solidify and form clogs that result in costly maintenance service calls. But one system solves this problem entirely: OverWatch® Direct In-Line Pump System eliminates the root cause, the wet well.

## PROJECT OVERVIEW

In Austin, Texas, a twenty-three-story, 320-unit high-rise residence building with a grocery store and restaurant was plagued by frequent pump clogs—six faults in two months! The culprit, as is often the case in contemporary waste streams, so-called flushable wipes. Despite multiple notifications to the building occupants, the building management

team had no control over what the occupants flushed. Clogs persisted and non-budgeted pump service charges were piling up. They needed a solution that would allow the team to refocus on their main priority—providing premium living conditions for the residents.

The team selected the OverWatch Direct In-Line Pump System to solve the repeated clogging and maintenance problems.

## PROBLEM UP-CLOSE

Although many people believe that cleaning wipes and other modern conveniences are flushable, they do not belong in municipal waste streams. Below are some of the problems that result from these items landing where they don't belong:

- Constant clogging from "flushable" wipes

*"Yes, we would recommend the OverWatch considering how bad our pumps were before, now the OverWatch pump is working problem free. There's no smell, so we are all happy."*

—MARSHALL DUFFIN | AUSTIN, TEXAS

- Excessive maintenance costs for emergency service visits to remove clogs and fat, oil, and grease (FOG)
- Offensive odors

## SOLUTION

The Pumps of Houston service team quickly removed the antiquated submersible pumps, piping, rails, and control panel. With the equipment



Unlike other options, the OverWatch Direct In-Line Pump System eliminates the root cause, the wet well.



# LEARN MORE ABOUT OVERWATCH

FEATURES:	BENEFITS:	RESULTS:
ELIMINATES THE WET WELL AND HAZARDS ASSOCIATED WITH IT	<ul style="list-style-type: none"> <li>• MINIMIZES COSTS TO RETROFIT EXISTING WET WELL</li> </ul>	<ul style="list-style-type: none"> <li>• REDUCED POTENTIAL FOR CLOGGED PUMPS</li> </ul>
ADJUSTS PUMP PERFORMANCE IN REAL TIME TO MANAGE FLOW	<ul style="list-style-type: none"> <li>• MINIMIZES EXCAVATION FOR NEW PUMP STATIONS</li> </ul>	<ul style="list-style-type: none"> <li>• ELIMINATES MAINTENANCE—NO NEED FOR VACUUM TRUCKS</li> </ul>
PREVENTS CORROSION WITH STAINLESS STEEL WETTED COMPONENTS	<ul style="list-style-type: none"> <li>• PREVENTS DOWNTIME FROM A CLOGGED PUMP</li> </ul>	<ul style="list-style-type: none"> <li>• CLEAN, DRY, AND RELIABLE MACHINE ROOM</li> </ul>
REDUCES MAINTENANCE	<ul style="list-style-type: none"> <li>• ELIMINATES UNPLEASANT SEWAGE ODORS</li> </ul>	<ul style="list-style-type: none"> <li>• NO MODIFICATIONS NEEDED TO CURRENT WET WELL</li> </ul>
ELIMINATES CLEANING AND PUMP DOWNTIME	<ul style="list-style-type: none"> <li>• PREVENTS CLOGS, RAGGING, AND FOG</li> </ul>	



removed, the 60-inch diameter fiberglass basin prepped for the new dry-pit system. The OverWatch arrived factory pre-tested, pre-wired, assembled, and ready to be installed. Within two and a half hours, the wet well was transformed into a dry pit and the OverWatch installation had begun 10 feet below ground.

In a safe, clean, and dry environment, the team was able to connect the suction directly to the invert and construct the discharge piping. A sump pump was used in conjunction with the system to handle any water ingress from the hatch. The valve vault was no longer needed and could be removed during future construction. In just

one day, the source of much pain and expense had been converted from a wet well into a dry, clean, and reliable pump station.

## WHY OVERWATCH?

The management team needed a robust and sustainable system that also detects and annihilates potential clogs without human intervention. By removing the wet well and installing an OverWatch system, influent is lifted directly from the gravity invert, wipes, and fat, oil, and grease (FOG) do not have the opportunity to separate from the pumped liquid, keeping the fibrous material in solution and ejecting it as it arrives. Since the influent is contained, it never become atmospheric, eliminating odors, a huge issue in the Texas heat.

This game-changing technology not only eliminates the wet well, but also eliminates clogs, odors, gases, and maintenance. The building management team is saving time and money with this installation. ■



Industrial Flow Solutions (IFS) headquartered in New Haven, Connecticut, specializes in the design, manufacturing, sales, and service of wastewater pumps and controls including OverWatch® Direct In-Line Pump Systems, BJM Pumps®, Stancor®, Oil Minder®, and DERAGGER™ products ideal for the municipal, industrial, commercial, and residential applications. With over 200 years' technical and application experience, IFS supports partners through the design, build, test, install, and post-install processes. In the New Haven location, a state-of-the-art, in-house testing facility that is built to Hydraulic Institute Standards enables comprehensive testing with rapid results. With a focus on turning customers' flow problems into flow solutions, IFS products lower costs, increase efficiencies, and minimize the environmental impact. IFS is committed to offering industry leading response times with a high human touch from initial inquiry to post-installation support. For more information, visit [www.flowsolutions.com](http://www.flowsolutions.com).





*The line produces pharmaceutical pellets containing the active ingredients in capsules.*



# CRUCIAL TEMPERATURE CONTROL IN PHARMA MANUFACTURING

## *Bespoke system expands production capacity*

BY ELLA TAGHAVI, HRS HEAT EXCHANGERS

**M**ayne Pharma, a listed Australian company, commercializes branded and generic pharmaceuticals in a range of product areas. Its GMP accredited manufacturing facility is located in Salisbury, South Australia, approximately 12 miles from Adelaide, where it produces tablets, capsules, liquids, and creams.

Capsules are a popular method of drug delivery, comprising of two-piece dissolvable outer shell containing miniature pellets which carry the active ingredients. The pellets are prepared using a fluid bed dryer in order to reduce moisture content and are sometimes spray-coated with a solution containing key ingredients. The spray-coating solutions use an alcohol-based formulation to ensure correct mixing and maintenance of the fundamental chemical properties. The solutions must be prepared and applied within a tight temperature range.

### STRIKING THE RIGHT BALANCE

Mayne Pharma wanted to expand and upgrade its existing production capacity for capsule production by adding a third fluid bed dryer and the associated equipment, while simultaneously improving temperature regulation to its existing lines. HRS Heat Exchangers was asked to provide a quotation for a hot water heater to support the new line, but quickly realized that a turnkey

package offering active heating or cooling as required would provide a much better solution.

"The alcohol for the solutions is drawn from our outside tank farm," a spokesperson for Mayne Pharma explains. "One of the issues with the old systems was that on hot days the

factory had to wait for the alcohol to cool down before mixing the solutions, which could sometimes take hours. The HRS solution means that we can actively cool it if we need to. Alternatively, if we bring in the alcohol on a cold day, we can heat it up, as necessary."



The HRS unit utilizes two K Series multi-pass corrugated tube heat exchangers to maintain solvent temperature as required.



The solution produced by HRS is a heater/cooler with the ability to reduce hours of cooling time to less than sixty minutes. Due to space constraints in the existing factory and the requirement to connect various pieces of equipment, the unit was supplied on a compact skid with integrated controls and automation of both heating and cooling processes. Other challenges faced by HRS Engineers were uncertainties about heat transfer in the existing tanks and having to overcome unknown pressure losses in a small jacket annulus which would otherwise affect the performance of the unit.

### K-SERIES: UP CLOSE

The HRS unit utilizes two K Series multi-pass corrugated tube heat exchangers to maintain solvent temperature at 77 or 86 degrees Fahrenheit (25 or 30 degrees Celsius) as required. The hot water loop is composed of one heat exchanger, a

centrifugal pump, safety features, and the necessary ancillaries such as a pressure gauge, temperature transmitter and manual valves.

The service water is recirculated in a closed loop with the selected solution tank to heat the solvent from 59 degrees Fahrenheit (15 degrees Celsius) to the target temperature.

The process is controlled by temperature transmitters and an autonomous control system and given the importance of the temperature in the process; product temperature is also monitored via a secondary control loop with transmitters located on each solution tank.

Moreover, the cooling section is designed to maintain the product temperature at the targeted set point. Incoming service water from a buffer tank is cooled using chilled water at 42 to 50 degrees Fahrenheit (5.5 to 10 degrees Celsius) from elsewhere in the factory using several passes

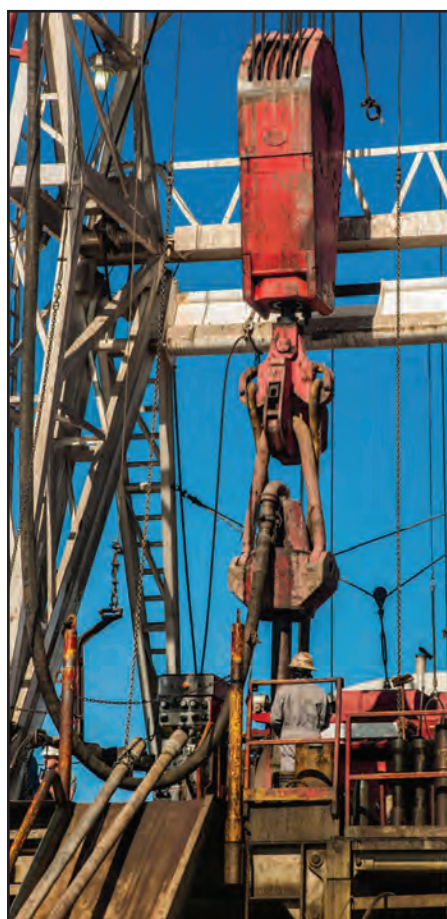
through the second heat exchanger.

The tank jacket service water is recirculated in a closed loop with the selected solution tank to cool the solvent from 104 degrees Fahrenheit (40 degrees Celsius) to the target set temperature of 77 or 86 degrees Fahrenheit (25 or 30 degrees Celsius). Again, temperature transmitters control the process via an autonomous control loop.

### HELP ON SITE AND WORLDWIDE

Despite the COVID-19 pandemic, the process of manufacturing, installing, and commissioning the unit ran smoothly, taking less than six months from the order being received to the unit being fully operational.

"COVID-19 meant that we weren't able to undertake Factory Acceptance Testing (FAT) at HRS's manufacturing facility in Spain, but as it was such a straightforward job, we wouldn't have insisted on this anyway," says the spokesperson. "We undertook the commissioning on site with remote support from HRS's engineer in Melbourne, but apart from a couple of phone calls nothing else was required." ■



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# IMPROVING MONITORING AT WATER AND WASTEWATER TREATMENT FACILITIES

*Big picture success comes from watching the details*

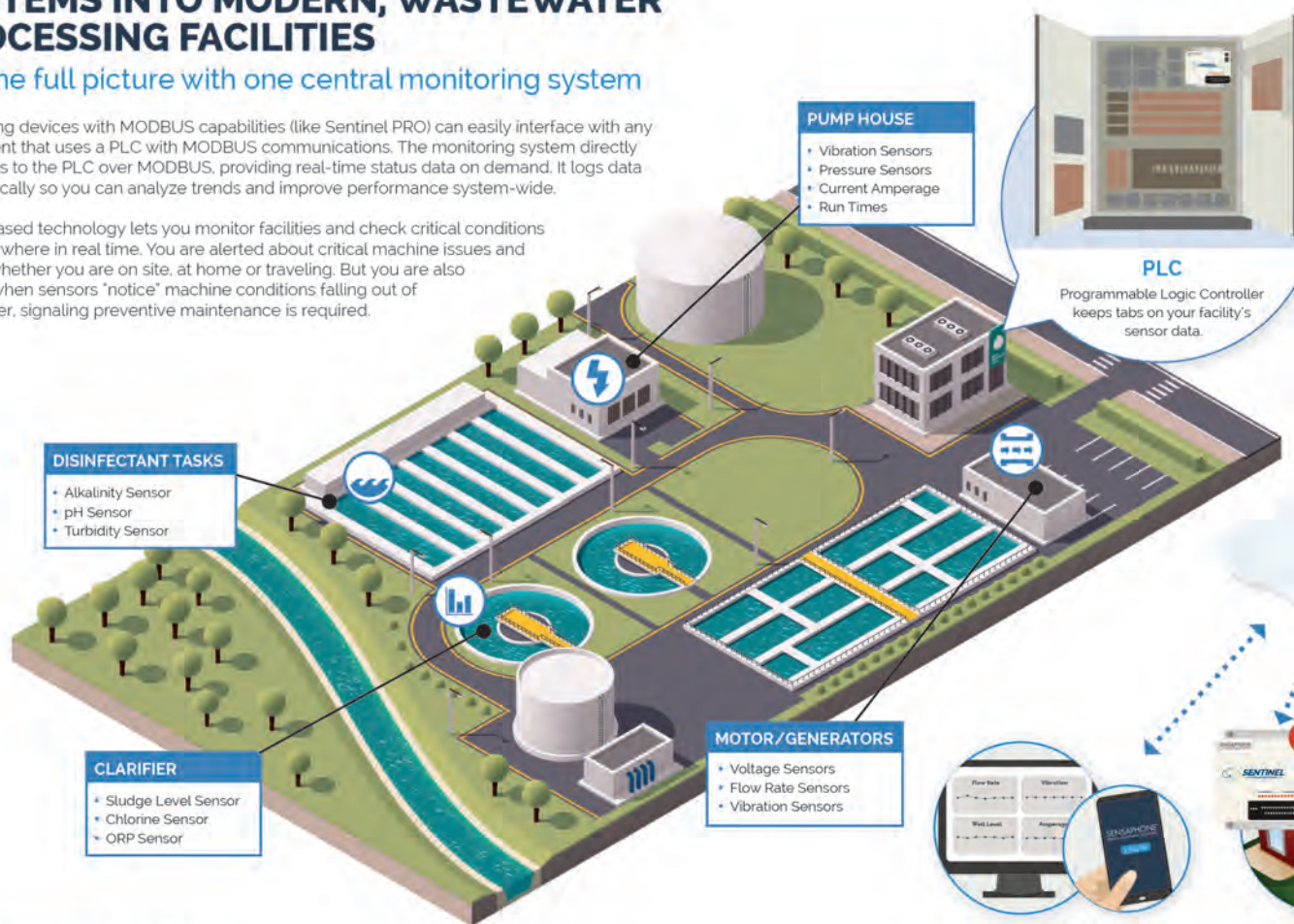
BY ROB FUSCO, SENSAPHONE

## INTEGRATING REMOTE MONITORING SYSTEMS INTO MODERN, WASTEWATER PROCESSING FACILITIES

Get the full picture with one central monitoring system

Monitoring devices with MODBUS capabilities (like Sentinel PRO) can easily interface with any equipment that uses a PLC with MODBUS communications. The monitoring system directly interfaces to the PLC over MODBUS, providing real-time status data on demand. It logs data automatically so you can analyze trends and improve performance system-wide.

Cloud-based technology lets you monitor facilities and check critical conditions from anywhere in real time. You are alerted about critical machine issues and alarms whether you are on site, at home or traveling. But you are also alerted when sensors "notice" machine conditions falling out of parameter, signaling preventive maintenance is required.



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### REMOTE ACCESS

View equipment status and run reports from anywhere. Access data and status via the Sensaphone mobile App, and get alerts via voice, email or text message.

One of the biggest challenges of monitoring multiple water and wastewater facilities is maintaining real-time visibility of critical conditions at all sites. Facilities need to provide safe drinking water and protect the environment from contaminants. That means water and wastewater treatment plants have to ensure continuous monitoring of conditions like pump status and tank level.

Today, many water and wastewater treatment plants are using remote monitoring systems to monitor the status of multiple locations.



Monitoring equipment like the Sentinel™ PRO alerts you to issues that threaten your unattended sites.

### THE SENTINEL PRO

The Sentinel PRO offers a low-cost way to monitor conditions at unattended pump stations, wells and tank farms. The system notifies you immediately of any changes in status, including:

- Power failures
- Pump status
- Tank level
- Changes in pressure
- Temperature fluctuations
- Equipment malfunctions

If monitored conditions reach dangerous levels, the Sentinel PRO sends an instant notification. End-users can set up the device to send alerts via a phone call, text message, or email.

### SEAMLESS INTEGRATION WITH MODBUS SENSORS

The Sentinel PRO can monitor data from third-party Modbus sensors, transducers or programmable logic controllers (PLCs). The system supports Modbus RS-485 and TCP protocols. One Sentinel PRO unit can monitor up to sixty-four Modbus registers and twelve different digital or analog status conditions. The system allows you to use the existing controller's configuration without adding additional sensors.

### ACCESS DATA FROM A CLOUD-BASED DASHBOARD

The Sentinel PRO gathers data and sends it to the cloud, so that you can access it remotely at anytime. You can check the status of multiple locations through Sensaphone's website or the iPhone/Android app. Users can also set alerts, acknowledge alarms, generate reports, and review data.

The Sentinel PRO system also functions as a data logger, which allows users to record and store data over time. It allows graphing of monitoring points from any selected date range, a summary of data points, alarm logs and more. The system



is Ethernet-based, but satellite monitoring options are available for remote sites without phone lines, broadband, or cellular service.

In addition to the Sentinel PRO, Sensaphone offers a full line of water and wastewater monitoring equipment.

### SAT4D SATELLITE-BASED MONITORING SYSTEM

The SAT4D system is ideal for remote locations where telephone, Ethernet and cellular connections are unavailable. Because the SAT4D communicates via satellite, it can be used virtually anywhere throughout the United States and many other countries. It can monitor up to four conditions 24/7, including tank floats, security, pump status and power failure. The system can be programmed to send notifications to up to eight telephone numbers and six email or text messages.

### EXPRESS II

The Sensaphone Express II monitoring system provides 24/7 monitoring of critical conditions such as pump failure and tank levels. This system is ideal for large facilities that require many monitoring points or are planning future expansion. The system can send alerts to up to 48 people and is expandable to up to 40 input/output channels. In the event of a power outage, the internal rechargeable battery backup





provides 12 hours of continuous monitoring and alerts.

#### SENSAPHONE 1400 & 1800

Sensaphone 1400

The Sensaphone 1400 and 1800 systems offer an easy and inexpensive way to monitor smaller operations 24/7. When an alarm occurs, these systems send notifications to up to 8 people with custom phone calls. An internal rechargeable battery backup

provides 24 hours of continuous monitoring and alerts in the event of a power outage.

#### SENSAPHONE WATER QUALITY SENSORS

Sensaphone water quality sensors help water treatment facility operators ensure that water is safe and clean. These sensors monitor oxidation-reduction potential (ORP), pH, dissolved oxygen (DO) and toroidal conductivity. The sensors are compatible with most Sensaphone


remote monitoring systems, which send an immediate alert to personnel when conditions fall outside of the preset range.

#### SENSAPHONE VIBRATION SENSOR


Sensaphone vibration sensors continuously monitor changes in vibration level. Detecting these changes early on helps to prevent equipment failure and expensive downtime. The sensors can be permanently mounted on water facility equipment like pumps, motors and generators. They are compatible with monitoring devices that accept a 4-20 mA input. ■

**ROB FUSCO** is director of business development with Sensaphone, a developer and manufacturer of remote monitoring and alerting systems. He can be reached at [rfusco@sensaphone.com](mailto:rfusco@sensaphone.com) or 877.373.2700. For more information, visit [www.sensaphone.com](http://www.sensaphone.com).


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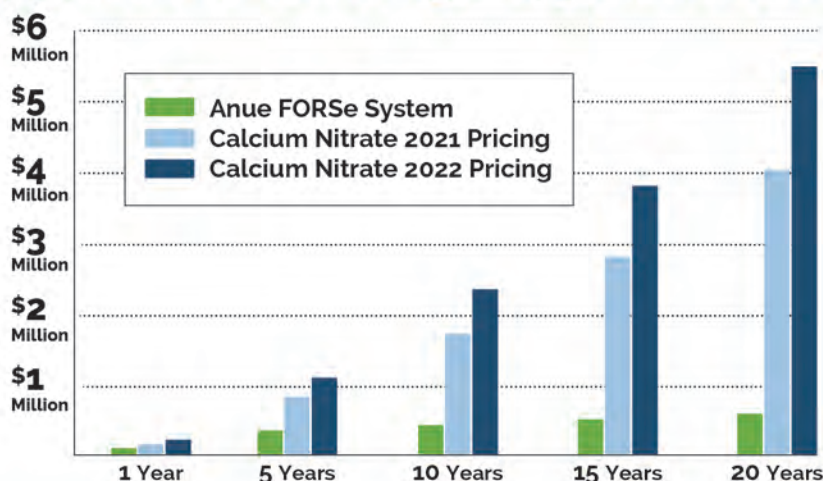
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# HOW TO LOWER YOUR MAINTENANCE COST WITH THE SELECTION OF DURABLE VALVES

*With proper oversight, durable valves are less costly to maintain*

BY GILBERT WELSFORD JR., VALVEMAN

Industrial processes rely on multiple valves that require proper maintenance for sustainable operation. Valves provide means to control the direction and flow rates for different fluids. The deterioration of these devices due to mechanical stress, wear and tear, or fatigue results in inconsistent fluid flow control, increasing safety risks, and reducing the reliability of other equipment in the system.

The demand for valve maintenance varies depending on the process valve used. Each valve has unique performance characteristics affecting its durability and maintenance requirements. For instance, ball valves are preferable for most industrial processes because they are fast-acting flow control devices with fewer internal parts, and require minimal maintenance. Process engineers use valve cycles to estimate the durability of industrial valves and customize their maintenance schedules.

Although valves have an estimated lifespan, some fail earlier. The failure can occur anywhere—the valve body may rupture, seals weaken and cause leakages or emissions, or the flow control mechanism (disk, ball, or flapper) wears and becomes

unresponsive to pipeline pressure changes. The premature failure is usually a result of improper valve installation, exceeding recommended valve operation limits, of poor sizing, and service media incompatibilities.

A reliable valve maintenance program prescribes timelines for routine inspections, implementing preventive measures like lubrication and cleaning, and corrective tasks like component replacements. Although maintenance increases the total cost of valve ownership, it is crucial for enhancing the efficiency and quality of industrial processes. How can facilities lower maintenance-related valve costs? Does the selection of a durable valve offset these costs?

## **CORRECTLY SIZE AND SPECIFY VALVES**

There is a vast number of different valves in the market, ranging from manually-operated ball valves to solenoid valves. These valves are available in different sizes to suit any industrial fluid application. The availability of options in the market complicates the selection process—several valve types can perform the same function, but only one particular

alternative is the most suitable for each fluid application and a certain role in the pipeline. Proper valve sizing and specification extend durability and can minimize costly valve failures.

When sizing valves, process engineers need to calculate the optimal fluid flow conditions, factors of safety, and the desired valve characteristics, including sealing efficiency and sensitivity. Once they define these properties, they explore the operating principles of different valve options. It helps them to narrow down their choices and optimize valve sizes. Manufacturers assign pressure and temperature classes to every valve in their catalog. However, engineers cannot depend solely on these specifications to select process valves. They must evaluate other fluid flow conditions like viscosity, fluid velocity, allowable pressure drops, and temperature variations.

For example, using a smaller valve in an industrial process increases its risk of failure. The valve is subjected to high flow velocities that increase internal valve wear and tear rates. The valve also limits fluid flow quantities past it, increasing congestion. An oversized valve is more sensitive to



pipeline operating conditions and can result in inconsistent flow rates, affecting the quality of subsequent processes. Oversized valves are more susceptible to water hammer, which compromises the valve stem leading to premature damage caused by repetitive stress.

Proper valve sizing optimizes flow rates, and reduces the impact and effect of flow-related component wear. It also reduces friction on the sealing components, guaranteeing valve reliability in the longer term. It helps companies to decrease valve failures, the frequency of repairs and component replacements, thus reducing maintenance costs.

## CONFIRM THE QUALITY OF VALVE MATERIALS

The choice of valve materials significantly affects its durability. Industrial valves convey fluids bearing different physical and chemical characteristics. Some fluids are acidic, while others contain suspended particles that raise their viscosities. Process engineers also deal with several process variables that can alter the stability of valve materials.

For example: If a valve is required to sustain elevated process temperatures and fluctuating fluid pressure, the build material for all the components must be compatible with the service media and the required conditions.

How is a ball valve designed for chemical or cryogenic fluid

service different from the one used for potable water service? Potable water valves should provide excellent shutoff characteristics and utilize durable, non-hazardous materials that do not impact human health. Valve materials for water distribution should be corrosion-free and meet the minimum chemical resistance requirements. Extreme fluid service requires valves with excellent chemical resistance and strength. These processes handle highly corrosive fluids and operate at high temperatures and pressure. Cryogenic applications operate at very low temperatures. These conditions can deteriorate valves rapidly.

When choosing industrial valves, process engineers must understand the qualities of the service fluids, and the level of temperature and pressure fluctuations in the system. It allows them to identify the most compatible valve materials. Internal valve components, including closure mechanisms, packings, stems, and seals, should provide adequate chemical and frictional resistance to fast-moving service media. They must sustain duty cycles without failure, and depict consistent performance as the operating conditions change.

The valve body should be fabricated using resilient materials that accommodate extreme temperature and pressure changes. A weaker valve shell may rupture due to increased fluid pressure and frequent thermal expansion and

contraction. The correct quality of materials extends the useful lives of valves and enhances their safety. The valve will offer predictable performance while lowering the need for frequent repairs to replace worn-out components or overhaul valves.

## USE THE RIGHT ACTUATION MECHANISMS

Automating the operation of industrial valves enhances their performance and provides more consistent flow control through different types of actuators. The choice of the actuator depends on the availability of power, the size of the valves, and torque requirements. Multiple mechanisms for automating valves include electric, hydraulic, and pneumatic actuators. Each actuator has its advantages that also influence the selection process.

Using the wrong actuator size increases the demand for valve maintenance. To size actuators correctly, process engineers should calculate the limits of fluid supply pressure in the system, and the required valve operation torque. They also need to evaluate the desired temperature variations and stem packing friction limits to estimate torquing requirements. In the end, engineers should select the right size of an actuator, actuators that operate valves at required speeds, are safe, and cost-effective to run and maintain.

An oversized actuator delivers excessive torque that can easily damage valve stems. It also increases energy consumption and the cost of the actuator. An undersized actuator struggles to deliver valve actuation forces. It causes erratic fluid control and impedes emergency valve shutdown procedures. It increases the probability of valve and other equipment failures, raising maintenance costs further. The correct actuator sizing enhances valve operations and reduces failures and component breakdowns that can increase process downtimes and repair costs.

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## IMPLEMENT A PREDICTIVE VALVE MAINTENANCE PROGRAM

Modern facilities are implementing digital technologies to improve the autonomy and quality of industrial processes. The utilization of these technologies transforms asset maintenance strategies and schedules. Implementing these technologies is equally beneficial to valve operations and maintenance. Some companies may still rely on a run-to-failure valve maintenance strategy, which is costly and increases safety risks.

Companies can enhance the durability of valves and minimize maintenance costs by establishing a predictive maintenance program. By installing industrial sensors, and leveraging existing data networks to monitor the performance of valves in real-time, they can identify potential valve defects using this abundance of data. The sensors monitor vibrations, temperature fluctuations and flow rates, and generate alerts when changes exceed the recommended limits.

Through predictive maintenance, companies can identify and rectify valve defects in good time. That reduces maintenance workloads and the number of replacement parts. Such strategies can significantly minimize valve maintenance costs.

## SUMMING UP

Companies can reduce the total cost of valve maintenance by choosing the right valve sizes made using high-quality materials. They can reduce maintenance costs by establishing the best valve installation, operation, and maintenance practices. Operators should adhere to the recommended valve operating procedures and implement proactive measures to reduce the level of damage. Companies should also allocate sufficient valve maintenance budgets to ensure teams have access to the correct inspection tools, technologies, and spare parts whenever needed. ■

**GILBERT WELSFORD JR.** is the founder of ValveMan.com and a third-generation valve entrepreneur. He has learned valves since a young age and has brought his entrepreneurial ingenuity to the family business in 2011 by creating the online valve store. Welsford's focus is building on the legacy his grandfather started, his father grew, and he has amplified.

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# WHEN THE GOING GETS TOUGH, THE TOUGH GET SMART

*IoT-based remote pump monitoring system now comes with advanced features*

BY RAJAT KHANNA

Based in Pune, India, Kirloskar Brothers Ltd. has established itself as a world-class pump manufacturing company with proficiency in engineering and fluid management systems and has recently introduced an advanced version of its signature IoT (internet of things)-based pump monitoring system, KirloSmart. Continuing its trend of setting a new benchmark in engineering excellence and using technology for customer convenience, the advanced version of KirloSmart is set to further strengthen the first mover advantage to the company. KBL is the first company to commercially launch this solution in 2016 in India after using it in-house at the Kirloskarvadi factory since 2010.

## HARDWARE AND SOFTWARE WORKING TOGETHER

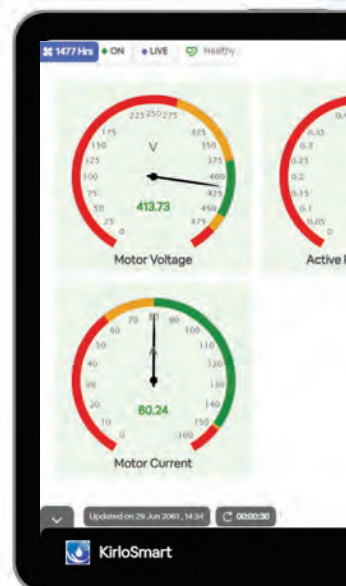
KirloSmart is a unique hardware-software technology developed by KBL that enables the user to remotely monitor and troubleshoot the pump on a real-time basis without any manual intervention, predict and take corrective measures to prevent any breakdown, and ensure the pump gives optimal performance. This is achieved by transmitting the pump's analytical field parameters or operational behavior on KBL's web-based portal and interactive mobile application. In terms of data security,

the cloud services are SOC (system and organization controls) compliant. The KirloSmart technology with built-in analytics and spare management modules can generate alerts for the probable causes leading to the failure of the pump. Thus, a KirloSmart-enabled system helps the user in monitoring the pump health by appropriately sensing the critical health parameters of the pump.

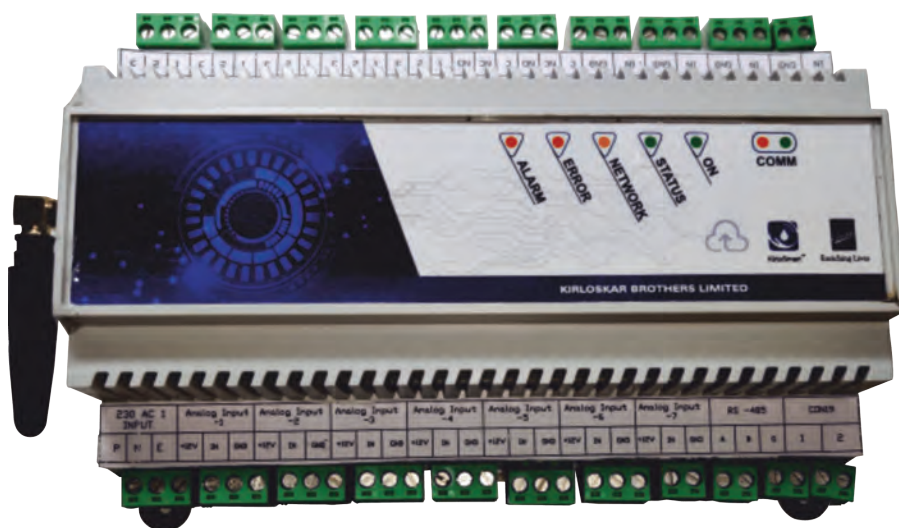
## ADVANCEMENT POWERED BY EXPERTS

Real-time notifications help users in quick diagnostic and resolution of issues. KirloSmart can send alerts and notifications through SMS, email, and mobile push notifications.

Monitor pumps remotely and view historic data through smart devices.



"The advanced version of KirloSmart has new additional features like enhanced web application and mobile app with user-friendly next generation UI/UX and easy navigation," says Alok Kirloskar, member of the board of directors at KBL and managing director of SPP Pumps Limited. "This is more interactive and has an enhanced speed. It comes with multiple screen options to show various parameter dials and mimic or process diagrams with sensor data. KirloSmart tracks the overall performance of the pump and notifies the user of any degradation in the efficiency or performance. Also, our team of experts at the back end suggests to





*Predictive maintenance alerts help reduce cost of breakdown.*

customers the correction measures to bring the performance on the track. This way, the solution helps to save electricity cost, prevents pump shutdown, and helps to increase the life of pumps."

### EFFICIENCY MEANS SAVINGS

Energy efficiency is a key concern in the Indian industrial sector as a quarter of the energy consumed by industrial motors is used by pumps. It is estimated that around 75 percent of pump systems in India are oversized, many by more than 20 percent. Further, electricity costs account for 40 percent of the total cost of ownership of a pump.

The advanced KirloSmart allows the customer to see multiple trends on a single screen and provides interactive help in troubleshooting. It offers documentation of weekly reports with trends, observations, and recommendations, and gives the customer access to the pump installation and operating manual, catalogue, pump datasheet, and so on.

### COMMUNICATION MEANS COMPATIBILITY

In yet another benefit, the enhanced hardware used in KirloSmart is both 4G and 5G compatible. It offers excellent wireless solutions for hazardous areas and has battery-

operated wireless sensors with ATEX/IECEx and PESO certifications. With its advanced features, reliability, and compliance to safety norms, the new version of KirloSmart is set to add more value to users.

KBL's KirloSmart is made to work satisfactorily in the Indian weather conditions and challenging scenarios like rural areas with low or limited bandwidth connectivity. This system also offers users the flexibility to use multiple units with a single SIM card.

### CUSTOMERS COME FIRST

KBL follows the "customer convenience always first" philosophy and KirloSmart is one such powerful and ideal product that reflects this customer-centric approach in the truest sense. With the launch of this advanced version of KirloSmart, KBL is confident to add many more customers to its long list of existing ones who are already using and taking benefit from this solution.

All manufacturing plants of KBL have the necessary Quality, Environment, Occupational Health & Safety and Energy standard certifications under the Integrated Management System (ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, and ISO 50001:2018). Additionally, the company's Kirloskarvadi plant

is a state-of-the-art integrated manufacturing facility and home to Asia's largest hydraulic research center and testing facility. ■

Kirloskar Brothers Ltd. is the flagship company of the \$2.1 billion Kirloskar Group. The company was established as Kirloskar Brothers in 1888 from which various group companies emerged later. KBL, a global conglomerate, provides complete fluid management solutions for large infrastructure projects in the areas of water supply, power plants, building and construction, process industries, irrigation, oil and gas, and marine and defense. It engineers and manufactures industrial, agricultural, and domestic pumps, valves, and hydro turbines. It is also India's largest centrifugal pump manufacturer with eight manufacturing facilities in India along with other international subsidiaries and operations in the Netherlands, South Africa, Thailand, the United Kingdom, and the United States. KBL has 12,700 channel partners in India and eighty overseas. For more information, visit [www.kirloskarpumps.com](http://www.kirloskarpumps.com).



# HOW TO USE SEISMIC TRANSMITTERS AND SWITCHES

*These useful tools help minimize unscheduled downtime*

BY RETT JESSE, METRIX VIBRATION

Unscheduled downtime costs a business valuable time, productivity, and money. Depending on the reason for downtime, these losses can be short- or long-term. Unscheduled downtime results in a loss of profitable output while your machinery is not functioning. This can add costs for standby labor, cause quality issues, necessitate emergency repairs, and may create safety concerns for employees. Worse, downtime can jeopardize customer trust and result in delivery delays.

Unscheduled downtime is, by nature, impossible to plan for. Unfortunately, it can also be an expensive inconvenience. However, although you can't predict when downtime will occur, you can stay prepared by taking the necessary steps to prevent it. Below, we'll explore how seismic transmitters and switches can play a part in minimizing unscheduled downtime and keeping your operations running smoothly.

## THE METRIX VIBRATION METHODOLOGY

Metrix vibration methodology makes vibration monitoring easy by employing the right number of sensors for the application for early warning of an impending machine problem. We create solutions that make economic sense, prioritizing prevention and proactivity over reactivity.

For machinery that has a critical role in your production, Metrix Vibration advocates for a high-value solution. These solutions will monitor each movement of your machine from every rotation, thrust, and throw. Our high-value seismic sensors mirror the high-value equipment used in your plant—the more critical the machine, the more intensive the monitoring solution we advocate. This can save you money and provide value both in the short and long-term.

We advocate using lesser number of sensors for non-critical machinery that only marginally impacts plant productivity. This solution still monitors and protects your equipment, but at a

level that mirrors the machine's return on your investment. As you can see, at Metrix Vibration, we believe in selling value, not just products.

## HOW SEISMIC TRANSMITTERS AND SWITCHES HELP MINIMIZE UNSCHEDULED DOWNTIME

Seismic transmitters and switches can help you minimize unscheduled downtime. Here's how these components can prevent critical downtime issues.

### SEISMIC TRANSMITTERS

Seismic transmitters provide a 4-20 mA output to your control system (for example, PLCs, SCADA systems, RTUs, etc.). This 4-20 mA output can be trended along with the other machine parameters like speed, pressure, temperature, flow, power level, and other process parameters. This gives an operator a better understanding of what is going on with the machine. Under steady state conditions of speed



and power level, the vibration levels should not be changing significantly. From a statistical perspective under steady state conditions, the vibration level should not change more than two standard deviations from the average (mean) vibration value. If the vibration value changes by more than two standard deviations from the mean, an investigation into why the vibration is changing is warranted.



Under non-steady state conditions, the 4-20 mA output needs to be balanced with the other process variables to determine if an abnormal vibration situation is present. Vibration levels can change when the machine is subject to changes in speed, load, and other major process variable changes.

#### SEISMIC SWITCHES

Seismic switches can be mechanical or electrical in nature and are used to protect rotating and reciprocating machinery. A mechanical switch is used to prevent catastrophic failure and provide personal safety. A mechanical switch does not provide early warning of an impending failure. They are considered a catastrophic failure device. In other words, when a mechanical switch activates to protect a machine, it is usually after mechanical damage has occurred to the machine. Whereas in an electronic switch, the protective device can be setup to monitor vibration specific to the machine in terms of inches per second or millimeters per second based on



known vibration values. An electronic switch can be setup to be much more sensitive than a mechanical switch.

Electronic switches offer a predictive maintenance strategy whereas a mechanical switch fits into a more preventive maintenance strategy. Preventive maintenance is where machines are repaired periodically, but not necessarily based on their condition. Although a preventive maintenance strategy is



less expensive than a run to failure strategy, in some cases, preventive repairs can cause more damage than just leaving a machine alone. The best maintenance strategy is predictive in nature and the electronic switch is more conducive to that strategy. Keep in mind, the mechanical and electronic switches do not collect vibration data but are usually paired with a manual vibration data collection process. We have found that combining the electronic switch with a 4-20 output is a powerful combination to protect or manage a machine.

## ELECTRONIC SWITCHES WITH 4-20mA OUTPUT

In a proactive maintenance strategy, an electronic switch combined with a 4-20 mA output to your control system (e.g., PLC, SCADA system, RTU, and so on), provides the actionable information you need to take positive action.

This monitoring solution is usually permanently mounted on the load side of the machine, it could be the switch

itself or a sensor, like an accelerometer, connected to an electronic switch. The electronic switch that includes a 4-20 mA output is like a transmitter that is integrated with the plant information network that offers a predictive maintenance and possibly a proactive maintenance strategy. When the vibration 4-20 mA output is combined with the plant information network, a proactive maintenance strategy can be realized. This 4-20 mA electronic switch option provides the most cost-effective maintenance strategy above the other mechanical and electronic switches. It is great for rotating and reciprocating machinery. The electronic switch combined with the 4-20 mA output provides actionable information via early warning of a vibration issue, plus diagnostic information accessible by portable tools.

## FIND THE SOLUTION FOR YOUR NEEDS

Metrix Vibration has the monitoring systems needed to alert you to

changes in machine condition well in advance of impending or imminent failure. Using seismic monitoring equipment can help reduce the duration of unscheduled downtime, which results in quality operations, expediting repairs, remediating safety concerns, and improving delivery. ■

Metrix Vibration pioneered the concept of simple, affordable machinery protection with its mechanical vibration switch offerings, revolutionary 4-20mA vibration transmitters, robust high-temperature velocity sensors, and innovative impact transmitter technology for reciprocating machinery. Metrix has been ISO-9001 certified for more than two decades and is committed to quality and continuous improvement of its manufacturing processes. For more information, visit [www.metrixvibration.com](http://www.metrixvibration.com).

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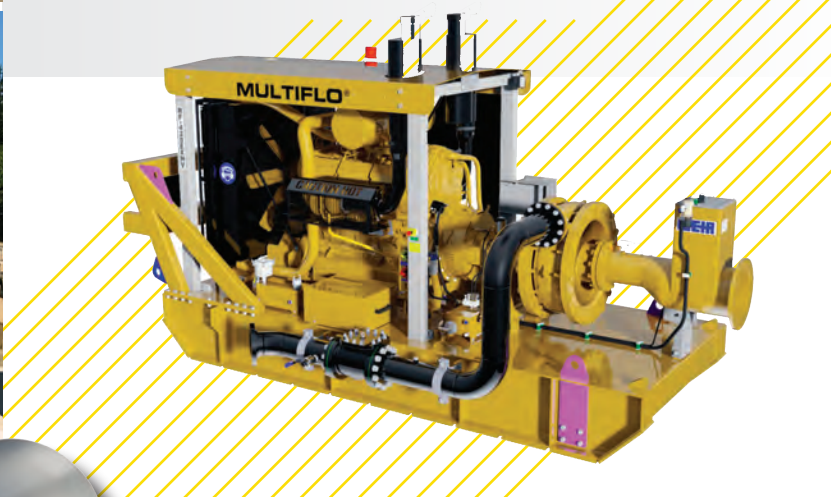
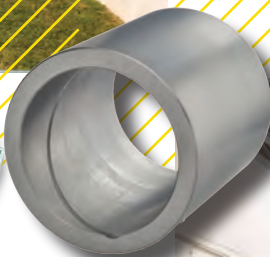
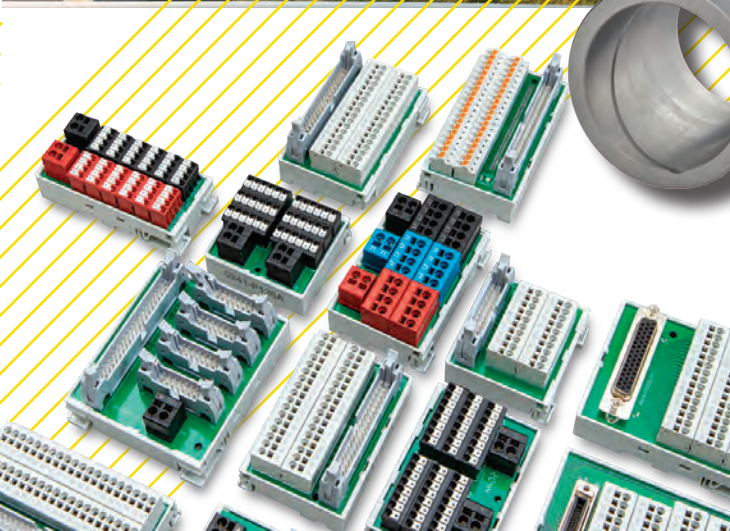
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make power simple

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Lovato  
electric

MENCOM

IBOCO  
Integrated Power Management

SELEC  
Creating Best Value



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THE DNA OF SAFETY

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TERZ  
TECHNICAL & INDUSTRIAL

See what our customers are saying:

**Excellent** 4.8 out of 5 ★ Trustpilot

“ Easy to use website,  
great price, and quick  
FREE shipping. ”

“ Fantastic service all around.  
Knowledgeable and accessible tech support,  
and above and beyond customer service. ”

“ Easy ordering and super  
fast shipping. Will order  
from them again. ”





# Gas Clip Technologies

**G**as Clip Technologies believes that quality and affordability go hand-in-hand, which is why they manufacture top-of-the-line gas detectors and accessories that meet every budget. Each product meets the highest standard of reliability and longevity to ensure that every user's safety remains uncompromised. Gas Clip's multi gas detectors are perfect examples.

## MULTI GAS DETECTORS

The Multi Gas Clip was Gas Clip's first multi gas detector, and it was also the first portable gas detector in the industry to utilize infrared technology to detect combustible gases (LEL). The continuous run time of the Multi Gas Clip is two months. However, its sisters—the MGC Simple and the MGC Simple Plus—have continuous run times of two years and three years respectively. Additionally, after being charged and calibrated during manufacturing, neither the MGC Simple nor the MGC Simple Plus require recharging or routine calibration, although bump testing prior to each day's use is advised. Also, all three of these detectors are designed to identify the presence and level of hydrogen sulfide, carbon monoxide, oxygen, and combustible gases (LEL).

## SINGLE GAS DETECTORS

In turn, on the days that require a single gas detector, Gas Clip Technologies has two lines to choose from—the Single Gas Clip (SGC) and the SGC Plus. Both include superior sensor reliability along with adjustable alarm set points, a programmable six-digit detector ID code and a two-year battery life. However, the SGC Plus also includes a built in “hibernate” mode that allows users to place it in a rested state when not in use. It is currently only available in one model—SGC Plus H<sub>2</sub>S for detecting hydrogen sulfide. The SGC, on the other hand, comes in three different versions—SGC O<sub>2</sub>, SGC H<sub>2</sub>S, and SGC CO.



## THE GCT EXTERNAL PUMP

Whether a worker uses a multi gas detector or a single gas detector, simplicity and longevity are guaranteed as is compatibility with the newest addition to Gas Clip Technologies' collection of gas detection solutions—the GCT External Pump. This accessory is a motorized sampling pump that allows any Gas Clip diffusion detector—single gas and multi gas—to take remote samples from up to 75 feet away. It has a forty-hour continuous run time on average,



and the battery typically recharges in four to six hours. Audio and visual alerts will inform the user of possible errors including blockages and a low battery charge.

Additionally, the sleek, ergonomic design of the pump allows it to sit comfortably in the user's hand, which helps prevent potential drops. However, an alligator clip allows the user to firmly attach the pump to their belt, jumpsuit, etc. as needed. Either way, if the device takes a tumble, the durable casing can withstand the fall as well as other harsh treatment. For more product information, visit [www.gascliptech.com](http://www.gascliptech.com) or call 972.775.7577.

## CLOSING THOUGHT

After more than a decade of creating industry-changing products, including its most recent addition—the GCT External Pump—Gas Clip Technologies continues to keep its focus on the future and how to further develop simpler and even more reliable gas detection solutions that will inevitably help keep workers safer so they can return to their families at the end of the day. ■





# MGC Simple + Where Simplicity Meets Reliability.

- Three-year continuous run time
- Recharging not necessary
- Recalibration not necessary
- One-button operation
- Failure alert function
- Functional in inert atmospheres
- Data logs in one-second intervals (from point-of-detection)
- LEL sensor immune to poisoning
- Detects combustible gases (LEL),  $H_2S$ , CO &  $O_2$



Portable Gas Detectors You Can Count On  
[gascliptech.com](http://gascliptech.com) +1.972.775.7577 1.877.525.0808

Contact us today for more information  
about the MGC Simple+ and other  
Gas Clip products.





# Global Pump

Being the largest customer of your own product line provides unique insight into equipment designs that perform well. That is certainly true in the case of Global Pump and its parent company, Mersino Dewatering. Since Global Pump's inception in 1997, our standard has been to provide nothing less than cost-effective, durable products, and quality services.

Through the years, we have designed and supplied pumps and accessories for a wide variety of applications and industries. The construction and sewer industries heavily utilize our portable trash pumps capable of handling solids up to 4.5 inches. Mines, quarries, and the oil industry, which require the ability to move clean water up high elevations or over long distances, utilize our high-head pumps capable of over 700 feet of head. Our hard metal CD4MCu pumps are commonly used by the environmental and industrial sectors, while municipalities value our Global SafeGuard backup pumps and our trailer-mounted units, which are easy to use and maintain and offer low operating costs. The disaster relief and recovery industry, which urgently demands all hands and equipment on deck when nature calls, relies on Mersino to respond 24/7/365 with our extensive fleet and resources, fourteen branches nationwide, and a distributor network throughout North America.

With the exception of our rotary and piston style pumps, the Global Pump product line utilizes an enclosed impeller design which results in greater fuel efficiency than pumps with an open impeller. These fuel savings accumulate over the course of a year of continuous operation and may even add up to the cost of the brand new pump itself! For example, at a duty point of 2,500 gallons per minute at 105 feet of TDH, our 8-inch Global Standard Trash Pump (8GST) performs at an efficiency of 80 percent! That translates to an 82.8 Brake horsepower requirement and a fuel consumption of approximately 4.5 gallons per hour. How much does your pump cost you per project?

For over twenty-five years, Mersino has been the largest end-user of the Global Pump product line. Mersino's direct channel for feedback to the engineering and development teams and in-the-field research and development allows pump designs to continually evolve to meet market demands. This evolution includes



*Global Pump at work during hurricane relief from Hurricane Ian.*

maintaining our supreme quality, durability, and ease of use—which lend to a project's, and participating parties', profitability and success. For instance, the removable suction spool and placement of the mechanical seal on our SAE-mounted pumps allow for front removal and eliminate the need for shaft re-alignment after replacement or repair. Anyone who has experienced this repair first-hand in the field will appreciate our easier and faster option, which substantially reduces downtime on a project.

Whether you are involved with construction or mine dewatering, pipeline bypass, water transfer and supply, or emergency response, we have the pumps and expertise to meet your needs. If you dream of a purple pump on a trailer with baskets for fittings and various bells and whistles, our in-house design team can make it a reality! We can customize a pump to your specific requirements—diesel or electric, trailer or skid, trash-handling or high-head. Our applications specialists will work with you to find the right solution, customized to your situation.

Mersino is a full-service contractor with experience in design, engineering, installation, service, and on-site project management. Global Pump designs, tests, manufactures, services, sells, and rents equipment to customers around the world that is made in the USA. If you are unsure of your project needs or have a list of required dewatering/pumping equipment, the Mersino and Global Pump teams are only a phone call away—twenty-four hours a day, seven days a week. 🇺🇸

**800.360.PUMP**  
**[www.globalpump.com](http://www.globalpump.com)**







**25TH ANNIVERSARY**

# **GLOBAL PUMP**<sup>®</sup>

A MERSINO COMPANY

Since Global Pump's inception in 1997, the product line has developed out of the need for a more rugged, reliable, and efficient pump. The designs are tested and proven in the field - not only by our parent company Mersino Dewatering but also by valued end-users and rental customers from around the world.

Global Pump's in-house application engineering and vertically integrated designs are unparalleled for providing solutions to tackle your pumping and groundwater challenges!



[WWW.GLOBALPUMP.COM](http://WWW.GLOBALPUMP.COM)



866.360.PUMP





# Gorman-Rupp Pumps

**G**orman-Rupp has been revolutionizing the pumping industry since 1933. Many of the innovations introduced by Gorman-Rupp over the past eighty-five years have become industry standards.

We continue to update our machinery, processes, research and development, and engineering to ensure that our pumps and systems are among the most reliable and efficient on the market. With nearly one million square feet under roof, our facilities house some of the most modern manufacturing, testing, and warehousing facilities in the world. Our experienced engineers take advantage of the latest technologies and innovations to custom-design, manufacture, and assemble our products.

With over one million Gorman-Rupp pumps installed to date, we have the knowledge and experience understand your specific application. We provide solids- and clean-fluid handling pumping solutions for municipalities, industrial plants, construction and rental businesses, refineries and petroleum plants, mining sites, agricultural operations, and a variety of original equipment manufacturers.

One of our most successful and innovative lines of pumps has been our self-priming models. Gorman-Rupp also manufactures complete lines of submersible, priming-assisted (dry-prime), standard centrifugal, horizontal end suction centrifugal, and rotary gear products built for the most aggressive pumping applications. In addition, our ReliaSource® pump packages that incorporate these

products are designed, manufactured, and tested and include pumps, motors, piping, and controls to ensure superior operation and easy installation.

We perform rigorous testing based on Hydraulic Institute Standards and test to customers' actual operating conditions in our one-of-a-kind testing facility guaranteeing innovative, superior-quality products that are ready to tackle your toughest jobs. To ensure you get the right equipment for your requirements,



Gorman-Rupp partners with a worldwide network of distribution and provides them with the most extensive training. Gorman-Rupp distributors will work hand-in-hand with you to recommend, customize, and specify equipment. And Gorman-Rupp is always available should you ever require any assistance.

## PHILOSOPHY

Gorman-Rupp stands behind the quality of our pumps to ensure they meet your requirements for the long haul. To maintain industry-leading client satisfaction well beyond product installation, we offer a variety of services to meet your needs, including world-class training, service, and industry-leading warranty.

## INDUSTRY-LEADING SUPPORT AND WARRANTY

Gorman-Rupp stands behind the quality of our pumps to ensure they meet your requirements for the long haul. To maintain industry-leading client satisfaction well beyond product installation, we offer a variety of services to meet your needs, including:

### INDUSTRIAL

If your application deals with abrasive, corrosive fluids, or liquids containing large solids, we have the right pump for the job. Gorman-Rupp pumps are constructed in a variety of materials to move fluids in steel mills, paper mills, underground mines, food processing, automotive and chemical plants, canneries, power plants, tanneries, glue and resin plants, and any other facility where dependability and ease of service are essential.

### MUNICIPAL

When you choose Gorman-Rupp, you benefit from one of the largest and highest quality lines of municipal pumps, engine-driven pumps, sewage lift stations and water booster/reuse stations available on the market. Our ReliaSource® packaged lift and booster stations ship complete from the factory with pumps, motors, and controls and are 100 percent tested before they leave the facility to ensure product efficiency and operation. ■

#### GORMAN-RUPP PUMPS

P.O. Box 1217  
Mansfield, Ohio 44901





# THE STRONG SILENT TYPE



## » SILENT PUMP. SIZED FOR PERFORMANCE.

Gorman-Rupp Prime Aire® sound-attenuated pumps are engineered to operate much quieter than industry standards. And, they are now available in sizes up to 14" with flows up to 10,000 GPM to handle your toughest bypass and dewatering applications. Features include spill containment environmental base, corrosion-resistant, acoustically treated enclosure and the latest in Tier IV engine-driven technology.

Call Gorman-Rupp at 419-755-1011 or visit [GRpumps.com](http://GRpumps.com) to find a distributor near you.



*The Pump People®*



# Industrial Flow Solutions

## TURNING FLOW PROBLEMS INTO FLOW SOLUTIONS

Industrial Flow Solutions™ (IFS) headquartered in New Haven, Connecticut, specializes in the design, manufacturing, sales, and service of wastewater pumps and controls including OverWatch® Direct In-Line Pump Systems, BJM Pumps®, Stancor®, Oil Minder® and DERAGGER™ products ideal for the municipal, industrial, commercial, and residential applications.



With over 200 years' technical and application experience, IFS supports partners through the design, build, test, install, and post-install processes. In the New Haven location, a state-of-the-art, in-house testing facility that is built to Hydraulic Institute Standards enables comprehensive testing with rapid results. With a focus on turning customers' flow problems into flow solutions, IFS products lower costs, increase efficiencies, and minimize the environmental impact. IFS is committed to offering industry leading response times with a high human touch from initial inquiry to post-installation support.

eliminating odors, and reducing maintenance. The stainless-steel body is designed to withstand the effects of corrosion from harsh materials and solutions, making OverWatch® an ideal solution for the municipal, industrial, and commercial industries.

- Save time and money with smart sensing systems that adjust in real time to manage flow and avoid clogs.
- Create safer working environments for maintenance crews by eliminating hazards associated with a wet well.
- Eliminate downtime resulting from clogged pumps.
- Increase operational efficiencies with reduced maintenance.
- Improve environmental impact with less invasive ground construction.



### DERAGGER™—THE END OF RAGGING

The DERAGGER™ award winning, smart technology detects rags early and eliminates wastewater pump blockages in real time. DERAGGER is a cost saving solution for the municipal, industrial, and commercial industries. Available in a range of models, the DERAGGER offering provides intelligent data monitoring and analytics designed to meet specific application needs.

- Eliminate pump ragging by monitoring the dynamic torque waveform in real time.
- Increase pumping efficiency and reduce operational costs.



- Premium solution offers a high-resolution power analyzer that provides essential data for remote insight into the pump station.
- Modular solution may be added to new or existing control panel.

### BJM PUMPS® AND STANCOR® — POWERFUL PUMPING SOLUTIONS

BJM Pumps® and Stancor® submersible pump products are designed for harsh environments to save money by minimizing downtime and increasing efficiency. This results in improved total cost of ownership over the service life of our pumps.

BJM Pumps offers tailored solutions for heavy solids-laden liquids, abrasive slurries, acidic or caustic fluids, and fluid temperatures up to 200 degrees Fahrenheit. Our industry leading Fahrenheit® series high-temperature pumps are capable of continuously handling 200-degree-Fahrenheit solutions.

Stancor® offers dewatering and solids handling submersible pumps that operate in challenging, harsh environments, including utilities, mining and oil and gas industries.

Part of the Stancor product family, the Oil Minder® solution-based system integrates submersible pumps and oil-sensing controls to deliver code compliance while reducing environmental risks.

### CONTACT IFS TODAY

IFS offers industry leading lead times and unsurpassed responsiveness with a personal touch. For more information on the pumping and control solutions IFS offers, visit [www.flowsolutions.com](http://www.flowsolutions.com) and connect with the IFS team. ■



### OVERWATCH® DIRECT IN-LINE PUMP SYSTEM— CHANGING THE WORLD ONE WET WELL AT A TIME

The OverWatch®

Direct In-Line Pump System is a breakthrough technology designed to lift influent the point of entry, eliminating the wet well. Influent is contained,



# OverWatch®

## Direct In-Line Pump System



“OverWatch® made my job a lot less stressful”

- Marshall Duffin  
Community Service Manager | Simpson Housing

**Learn how OverWatch® made a difference in the full case study on [page 10](#)**



INDUSTRIAL  
FLOW  
SOLUTIONS™

[www.flowsolutions.com](http://www.flowsolutions.com)  
[sales@flowsolutions.com](mailto:sales@flowsolutions.com)



# Mod-Tronic Instruments

WHEN QUALITY AND PERFORMANCE ARE AS IMPORTANT AS PRICE,  
YOU CAN COUNT ON OUR PROVEN BRANDS

This has been our company motto since 1972, and forty-nine years later we pride ourselves more than ever on providing our customers with quality products at competitive prices. RewindSensors.com is a market focused website of Mod-Tronic Instruments Limited. Its purpose is to display only the sensors (RTD, thermocouple, current, vibration), anti-condensation heaters, controls, and monitors applicable to the rotating machinery OEM and MRO markets.

Plus, the Mod-Tronic team's technical knowledge is unparalleled. Our sales force has over 114 years of combined experience solving our customers unique and diverse application challenges. We have earned a valued reputation in our industry for working with our customers. We take the time necessary to fully understand your application, analyze your requirements, and offer you the correct products at competitive prices. Not sure what type of temperature sensor you just pulled out of that old motor? Just ask! We have seen almost everything and can help you figure it out.

One of the secrets to Mod-Tronic's success is our team. Customer service is #1 and all of our sales people are friendly, conscientious, and motivated to get answers to our motor industry customers as quickly as possible. They recognize the inherent urgency of the motor repair industry and the need to respond to inquiries promptly with stock part solutions whenever possible.

Every week, we hear from customers calling us, "I can't believe I found someone who will talk to me that actually knows their products!" Our open office environment encourages peer-to-peer support, helping and supporting each other with any challenges or issues. Every

employee's remuneration includes a portion that is a commission on all sales, reinforcing our team approach.

Mod-Tronic is the largest Minco distributor in Canada or the United States for the rotating machinery market. We are located in Brampton, Ontario, Canada, just outside of Toronto, occupying 6,600 square feet of office and warehouse space with an additional warehouse and freight forwarding location in Warren, Michigan.

We have a low \$100 minimum order and we can ship parts the same day from stock to anywhere in Canada, the United States, or around the world. And we ship to Canada and the United States with no cross-border fees! We replenish our stock weekly so if the parts you need are not in our stock, we can still provide them quickly for you. Don't see the exact product you require? Tell us what you need, most of our manufacturers offer custom-built solutions to meet your exact requirements or we can modify stock parts as shown below.

Our emphasis on quality extends to our manufacturers. All of our manufacturers were carefully chosen for the high-quality products they produce. Especially MINCO, whom we have had a business partner relationship with since 1972.

We modify MINCO parts for quick shipment of stock parts including:

- Assembling stock sensors, fittings, connection heads, and thermowells into complete assemblies
- Programming transmitters to your sensor input type and temperature range

Ten of our thirteen key manufacturers are located in the United States and are all known for their top quality. Our other three manufacturers are located in Japan, Switzerland, and Germany. We have carefully selected our manufacturers so that their products complement each other so our customers can call us for all of their temperature sensor, thermostat, thermistor, heater, and instrumentation needs for electric motors.

We have selected manufacturers with products that do not compete with each other. We have maintained a positive long-lasting relationship with all of our manufacturers—some of them for over forty-five years! Our reputation in the market is that we only sell top quality products. Our customers know that their initial cost from us may not be the lowest but their long-term cost and headaches from failures is the absolute lowest. We are so confident in the quality of all of our suppliers that we provide a five-year limited warranty on every product we sell.

Currently, we have over 500 different part numbers in stock for a total of over 10,000 parts and \$1,000,000 of inventory. We assemble and modify our MINCO stock so that we can quickly ship many more part numbers than what is on our stock list. By modifying and assembling our stock, we can ship thousands of different assemblies next or same day for a small upcharge. ■

- Cutting RTD or thermocouple probes to the exact length you require for your application
- Cutting Teflon leads to length or stainless steel braid over Teflon lead wires to length
- Adding stainless steel armor over leads
- Removing stainless braid
- Adding bayonet mount hardware
- Adding PSA adhesive to surface mount sensors or heaters

# **MOD-TRONIC**

Stocking distributor of **MINCO**  
Sensors, Heaters and Controls

## **MOTOR TEMPERATURE SENSORS**

**RTDs Thermocouples Thermistors Thermostats**

**FOR STATORS**



**FOR BEARINGS**



**ANTI-CONDENSATION  
SPACE HEATERS**



**TEMPERATURE  
MONITORS**



# **MOD-TRONIC**

[www.RewindSensors.com](http://www.RewindSensors.com)

**1-800-794-5883**



# Pedrollo



## “MADE IN ITALY” PUMPS THAT ARE SYNONYMOUS WITH QUALITY, RELIABILITY, DESIGN, AND INNOVATION

**P**edrollo S.p.A., founded in San Bonifacio (Verona) in 1974, is one of the major family-owned industrial companies in Italy and is globally recognized as a benchmark in the electric water pumps industry, with more of 2.5 million pumps manufactured every year.

Pedrollo currently distributes products in more than 160 countries around the world through its ten commercial branches and through its parent company, Pedrollo Group Inc, which is led by Giulio Pedrollo, as chairman, and is now officially present in the North American marketplace through its recent acquisition of Superior Pump. Superior Pump is now part of Pedrollo Group Inc. since the majority acquisition in 4Q2020 and is active in the design, production, and marketing of pumps with a particular focus on the United States and Canada markets. Pedrollo USA is headquartered in Minneapolis, Minnesota, and led by Charlie Michel III as president.

Pedrollo is a leading company in manufacturing and supplying electrical water pumps for residential, commercial, agricultural, and industrial use. Pedrollo is a producer of a complete range of electric water pumps, motors, electronic controls—including VSD and pressure systems. With a focus on innovative products, the wide range of pump includes many diverse types of pump products, such as peripheral, centrifugal, horizontal and vertical multistage, self-priming, pool pumps, deep well submersible pump end as well as electric motors, sump, sewage, effluent, and grinder pumps. Pedrollo will also offer a wide array of accessories, electronic controls, including VSP, and pump systems and packages.

Pedrollo's headquarters occupies a significant area of space and is in

continuous expansion, and currently occupies more than 1.6 million square feet with more than 1,200 employees. Pedrollo's physical size and presence makes it a true and proper industrial district, spread over various specialized plants allowing it to offer practically the entire production and supply chain internally.

Pedrollo's highly automated systems guarantee competitiveness and is constantly investing in innovation, accounting for over 16 percent of revenues, and integrating innovative and original solutions in manufacturing, mechanics, design, electronics, and human intelligence.

The research and development performed at Pedrollo does not only concern the final product, which it holds numerous international patents, but is also applied to machinery and the productive processes employed. The required skills on both the engineering and technological levels are so elevated that, in many cases, they require the direct building of ad hoc dedicated production machinery, designed exclusively by Pedrollo Engineering of the same applied to the numerous registered patents—more than 200 exclusive and original patents—which requires maximum protection through the internal realization of processes, machinery, and safe and ergonomic systems. Such a holistic strategic choice determines a positive position of control and guarantee over both the finished products and the entire production process.

Pedrollo's worldwide success is based on a great innovative capacity sustained by constant research and a strong commitment to development. These efforts are ultimately aimed at the technical improvement of systems and products. Upon ensuring the models' functional priorities, Pedrollo continues with regular design updates: a much-appreciated detail in the market and a

distinctive sign of Italian quality. There is also a constant renewal of products also from an aesthetical point of view, making them more pleasing both to the eye and touch as well as being more efficient—another indicator of the complete attention that Pedrollo promises to its customers. Moreover, Pedrollo uses an advanced prototyping center that enables the invention and realization of new increasingly improved performing products and designed to solve to customers' ever-changing requirements. Pedrollo possesses a tradition of creativity and technology that signifies the excellence of “Made in Italy.”

Pedrollo has committed significant investment aimed at guaranteeing its own companies the capability to produce energy from renewable sources with a positive impact on the environment and society, making it almost entirely autonomous from an energy standpoint. Pedrollo has over 2.5 MW of electricity generated by solar panels and the company recovers rainwater and uses it for industrial and commercial purposes in its plants.

Innovation, quality, service, professionalism, self-reliance, and its innovation-focused business model, along with commitment to sustainability and social responsibility ([www.pedrollo4people.com](http://www.pedrollo4people.com)), are the foundations of its long-established reputation.

Pedrollo S.p.A. is a part of Pedrollo Group ([www.pedrollogroup.com](http://www.pedrollogroup.com)). ■

### **PEDROLLO USA**

45 Maryland Avenue East,  
St. Paul, Minnesota 55117  
877.PEDROLLO (733.7655)  
[info@pedrollo-usa.com](mailto:info@pedrollo-usa.com)  
[www.pedrollo.com](http://www.pedrollo.com)



- **Manufacturer of a Complete Range of Electric Water Pumps, Motors, Electronic Controls including VSD and Pressure Systems**
- **Excellent Reliability**
- **Family-Owned and Managed Company**
- **Innovative Designs**
- **100% Made in Italy**
- **High Quality, Efficiency and Performance**

**PEDROLLO USA**

2301 Traffic Street NE - Minneapolis, MN 55413

Email: [Info@Pedrollo-USA.com](mailto:Info@Pedrollo-USA.com) - Phone: 877-PEDROLLO / 877-733-7655 - Website: [www.pedrollo.com](http://www.pedrollo.com)



# Thelco

The Thelco team provides high-quality pump parts and pumps from our 40,000-square-foot warehouse in Englewood, Colorado. For sixty-five years, Thelco has maintained a massive inventory of parts and pumps ready to ship domestically and internationally within twenty-four hours. Our experienced and knowledgeable team, paired with an inventory of 4,500 items, on-site fabrication, and industry relationships provide our customers faster lead times and higher quality outcomes. While Thelco specializes in replicating Flowserve® and Worthington® parts and pumps, Thelco distinguishes itself with its customer service and willingness to help find solutions.

## THE PARTS YOU NEED, WHEN YOU NEED THEM

Thelco supplies all of the turned parts, gaskets, shims, investment cast impeller lock washers, mechanical seals, and many cast parts for Worthington® and Flowserve® pumps.

Our expertise paired with a vast inventory of thousands of available parts and quick turnaround time shipping domestically and internationally (usually within twenty-four hours of order) helps support production across a wide variety of industries. Thelco also removes barriers to getting the job done quickly without the worry of an unexpected expense with pain-free financing options.

## THELCO CAN SUPPLY MORE THAN PARTS

Thelco can also supply whole pumps and unitized pumps on a fabricated steel base. These are supplied as motor driven with coupling and coupling guards. We offer consulting from our senior engineer for your precision pump builds. Call us and

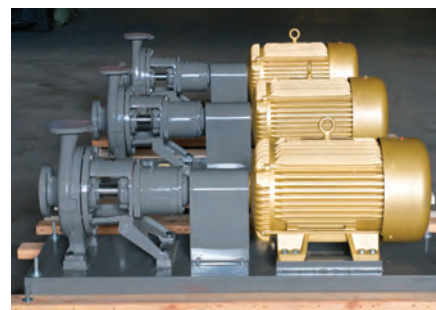
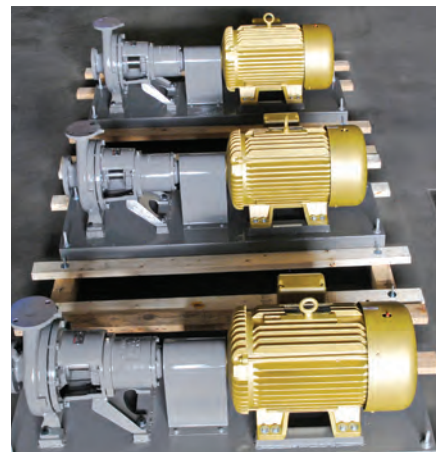
we can help select the pump for your application based on system and fluid conditions. In addition, we have a machining and repair facility on site and would welcome the opportunity to be your repair center.

## VETERAN-OWNED AND FAMILY-RUN

Pumps, parts, fabrication, repair, and financing—Thelco delivers exactly what you need, when you need it. Here at Thelco, we believe the key to success lies in the dynamic relationship between the employees of our company and our customers. We've built our business by focusing on the unique needs of each customer to build strong, long-lasting relationships.

The quality of our product line speaks for itself. The Thelco team's commitment and focus on delivering again and again to our customers fuels their business. In fact, our supply of pumps and parts has grown to support a foundation of hundreds of companies we have had repeat business from for over thirty years.

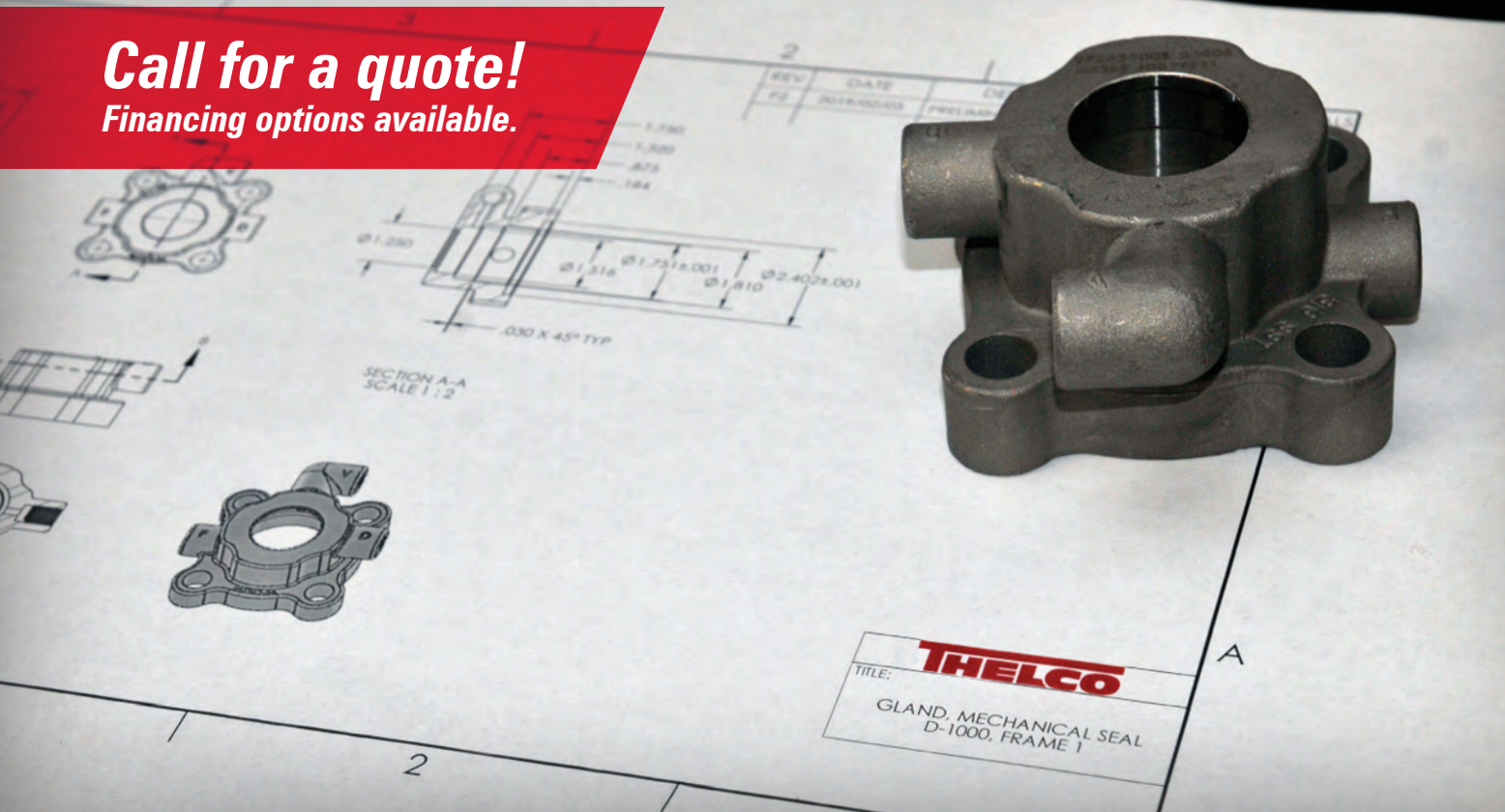
We are proud to be the first call many customers choose to make again and again. Whether it's an overnight parts delivery to a hospital or custom build of an explosion-proof pump: Thelco provides what you need to power your business. ■



## THELCO

2390 West Dartmouth Avenue • Englewood, Colorado 80110  
303.761.7616 • [thelco.parts@thelco.com](mailto:thelco.parts@thelco.com) • [www.thelco.com](http://www.thelco.com)

**Call for a quote!**  
Financing options available.



# The parts you need... When you need them.

Thelco supplies all of the turned parts, gaskets, shims, investment cast impeller lock washers, mechanical seals, and many cast parts for Worthington® and Flowserve® pumps. Our expertise paired with a vast inventory of thousands of available parts, and quick turnaround time

shipping domestically and internationally (usually within twenty-four hours of order) helps support production across a wide variety of industries. Thelco also removes barriers to getting the job done quickly without the worry of an unexpected expense with pain-free financing options.

**THELCO**



**303-761-7616**

thelco.parts@thelco.com

**www.thelco.com**

2390 West Dartmouth Avenue • Englewood, Colorado 80110



# Vaughan Chopper Pumps

## THE VALUE OF MADE IN AMERICA

**E**stablished in 1960, Vaughan Company® is the industry leader in reliable chopper pumps and mechanical hydraulic mixing systems. With more than sixty-two years of experience and four generations of expertise, Vaughan Company remains committed to giving customers around the world outstanding service and the most dependable pumping solutions.

Today, Vaughan Chopper Pumps are THE specified product for tough environments where other conventional pumps have failed. American-made and built to last, our pumps and systems are available in a variety of sizes and configurations to meet the unique needs of any operation.

Vaughan promises you the best in product design, reliability, dependability, and availability—plus, superior service and support to bring life-cycle costs to the lowest they can be. Our high-performing and exceptionally reliable pumps can handle the severe workloads of correctional facilities, dairy farms, wastewater treatment plants, and more.

To maintain our position as the industry leader, Vaughan Company

takes full advantage of cutting-edge technology. We incorporate in-house 3D computer modeling, which allows us to create exact fits and precision castings for all components.

All of this leads to one simple point: when you buy Vaughan, you get the best.

### WORLDWIDE SOLUTIONS THAT GO BEYOND THE BARN

Since the late 1950s, “What could make this better?” was the unwavering motivation Jim Vaughan used to invent the world’s first chopper pump. After countless hours of repairing clogged manure pumps for local dairy farmers, he knew there had to be a solution.

Jim officially introduced the world’s first chopper pump in 1960, and Vaughan Company was born. His brilliant idea met a genuine need that had applications far surpassing the dairy farm. In the decades since, our operations expanded significantly. Vaughan Company now has forty worldwide issued or pending patents, providing pumps and pumping equipment across the globe.

### BENEFITS OF BUYING AMERICAN MADE

For federally funded projects, Vaughan pumps and pumping equipment meet all requirements to receive federal aid under the Build America, Buy America (BABA) act. Nearly all Vaughan Company materials are produced in the U.S. and constructed in Vaughan’s 140,000-square-foot Washington state-based manufacturing facility. With an extensive \$10M inventory and strong relationships with domestic suppliers and foundries, Vaughan ensures reliable quality and fast lead times.

Not to mention, each chopper pump or mixing system is custom-built to meet the end user’s specific needs. Even without current supply chain disruptions, global sourcing would not

allow for this level of customization within a feasible timeline. In addition to fast builds, our manufacturing facility holds a large surplus of spare parts, so Vaughan products are easily maintained.

Knowing that every pump user faces a unique situation, Vaughan Company also has local sales representatives across the country to provide exceptional customer service when it is needed most—whether that is working closely with customers to tailor pump solutions for an exact situation or providing post-installation support.

### PRODUCTS THAT SUPPORT AMERICA

Today, we’re still passionate about that original question: “What could make this better?” While Vaughan’s locally sourced and American-made chopper pumps keep projects moving, their benefits don’t stop there.

The answer to Jim Vaughan’s question extends beyond the walls of the manufacturing facility. As a major local employer, we strive to strengthen our community by giving to charities and community organizations. Our scholarship program supports graduates of the Elma and Montesano school districts who are planning to pursue a post-secondary degree or technical certificate in the water and wastewater sector.

Vaughan products are not just made in America, they also support the future of America. ■



### VAUGHAN CHOPPER PUMPS

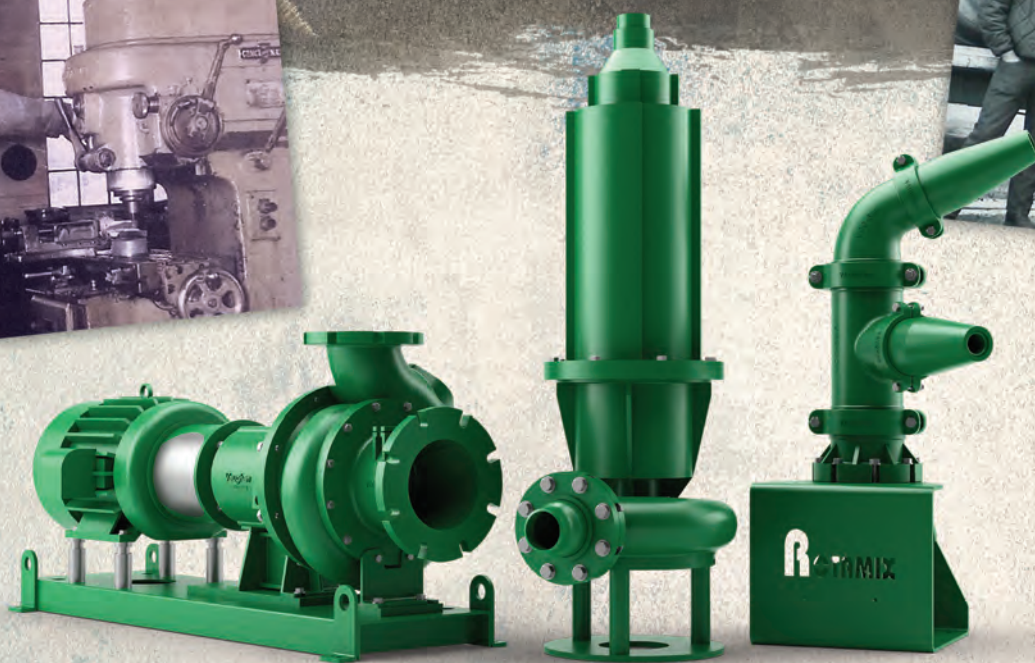
Contact us

888.249.CHOP (2467)

[info@chopperpumps.com](mailto:info@chopperpumps.com)

[www.chopperpumps.com](http://www.chopperpumps.com)





## PROUDLY MADE IN THE USA.

Since 1960, Vaughan Company has been manufacturing the toughest no-clog pumps in the USA. Our 3rd and 4th generation family-owned and operated company builds cutting edge products that are built to last and keep things flowing smoothly.

*Choose the unmatched reliability of Vaughan. Ask about our free trial program and on-site demos.*



EXPLORE THE PUMPS! | 888-249-CHOP | [ChopperPumps.com](http://ChopperPumps.com)

EXPEDITED DELIVERY | ELIMINATES COMMUNICATORS | EXTERNALLY ADJUSTABLE CLEARANCES

**Vaughan**  
Unmatched Reliability



# AW-Lake

AW-Lake believes in making flow measurement and control easy. From quotation to commissioning and startup, we strive to make every step simple and quick. AW-Lake offers a wide selection of flow technologies—Coriolis, positive displacement, turbine, ultrasonic, variable area, and paddle wheel—so we can match the right technology to your application. We only sell instrumentation manufactured in-house or by one of our sister companies so we can maintain the highest quality and design control to assure accuracy and long life for our products. Our expert sales team can walk you through selection of the right technology to meet your application needs.

## EASY AS ONE-TWO-THREE

**Measuring the flow accurately is the 1st step.** AW-Lake offers a wide selection of flow technologies—

Coriolis, positive displacement, turbine, ultrasonic, variable area, and paddle wheel—so we can match the right technology to your application.

**Getting you the data is next.** Our sensors offer the output you want—frequency, analog, voltage, Modbus, or HART—and we make set-up and trouble-shooting easy with intuitive PC and mobile apps.

**Completing your system is the final step.** Our transmitters, displays and controllers make AW-Lake a one-stop-shop for industrial flow measurement, including batch control and ratio monitoring, assuring everything works well together.

## COMMITMENT TO QUALITY

At AW-Lake, we recognize that an organization seeking to advance its business goals through consistent industry leadership must be managed

in a systematic and visible manner. Accordingly, we have established, documented, and implemented a quality management system that has been ISO registered since 2004. Having earned ISO 9001:2015 registration assures our customers that high standards of quality are applied from design, production, and delivery to all AW-Lake processes, products, and controls. All our products are tested and calibrated before delivery, assuring our customer the highest quality and complete satisfaction. Customers view our company as a leader in its industry.

## WHAT AW-LAKE IS ABOUT

Our vision is to be a market-focused, customer-centric organization providing world-class, innovative flow measurement solutions to our customers. ■

# Precision Flow Meters for Industrial Fluids

No matter your operational environment, fluid viscosity, or output requirements, AW-Lake has a flow measurement solution that will deliver reliable, accurate data in the format you need.

## FLOW METER TYPES:

- Positive Displacement
- Coriolis
- Turbine
- Variable Area
- Ultrasonic
- Paddle Wheel

## FLOW ELECTRONICS:

- Explosion-proof transmitters
- Battery-powered local displays
- Smart sensors w/ Bluetooth
- Batch processors
- Ratio monitors
- Industrial enclosures
- Wireless (cellular & 900 MHz)

## DATA OUTPUTS:

- Modbus
- HART
- 4-20mA
- Pulse
- Voltage
- Frequency
- MQTT



**Delivering the accuracy, reliability, and durability you depend on.**

aw-lake.com | 414.574.4300

# Blacoh Industries

Whether it's a common pumping system problem or a complex issue involving fluid dynamics, Blacoh has been providing solutions to improve the performance, reliability, safety, and productivity of pumping systems since 1976. With the most expansive offering of pulsation dampeners, surge vessels, and process system accessories in the marketplace, and backed by a team of engineering and application experts, Blacoh leads the industry in engineered solutions for systems using positive displacement pumps.

To increase pump efficiency and reduce system downtime, Blacoh's best-in-class pulsation and surge dampeners eliminate pulsations, protect pumps, pipelines, and instrumentation from destructive pressure surges, and provide a consistent laminar fluid flow. Pulsation dampeners designed for use on

the inlet side of the pump eliminate acceleration head loss and cavitation, ensure complete chamber fill, and extend pump diaphragm life. Blacoh back pressure and pressure relief valves with patented flow stabilization technology deliver improved flow and eliminate valve chatter. Blacoh rounds out their product offering with its newest line of calibration columns and injection quills for metering/dosing applications and system integrators.

For more complex systems, customers are able to leverage Blacoh's resources, working directly with engineers to design application-specific solutions, engineer custom builds, and codevelop new products. In larger scale applications where more in-depth analysis and support are required to solve critical issues with water hammer and hydraulic surge, Blacoh's Surge Control division

offers large custom surge vessels for complete system-wide solutions.

Blacoh also serves a growing need for continuous transient pressure monitoring to mitigate the risk of system failure. Their patented SurgeWave™ Transient Monitoring System gives pipeline operators the ability to detect and record transient pressure events occurring in water, wastewater and petroleum pipelines. SurgeWave™ is unique in that it employs a system of dynamic pressure transducers and high speed recording technology to monitor pipelines for indefinite periods of time.

As a full system solutions provider, Blacoh continuously tracks product performance and market demand, invests in new processes, tools and technologies, and works closely with customers to ensure Blacoh products achieve results. ■

## BLACOH™ FULL SYSTEM SOLUTIONS

Pulsation Dampeners · Diaphragm Seals · Valves · Calibration Columns · Injection Quills  
Spill Prevention · Transient Monitoring · Surge Vessels

With the most expansive product offering in the marketplace and backed by our team of engineers and application experts, Blacoh offers full system solutions to improve fluid process system performance, reliability, safety and productivity.



**BLACOH™**  
INDUSTRIES

Blacoh.com  
Sales@Blacoh.com  
951.342.3100





# Check-All Valve Mfg. Co.

Since 1958, Check-All Valve Mfg. Co. has manufactured a complete line of in-line spring-loaded piston-type check valves. With worldwide service, Check-All Valve serves a wide range of industries including the chemical, petrochemical, pharmaceutical, food and beverage, water treatment, OEM, MRO, and many others. Lightweight, efficient, and rugged, every Check-All valve is designed and built to perform to exact needs and specifications. The company is ISO 9001-2008 certified and manufactures product lines compliant with CE/PED requirements, Canadian Registration Number guidelines, 3A Sanitary Standards, and others.

Check-All valves are engineered for silent operation. They close quickly and smoothly to eliminate

hammer noise. They are designed to function equally well in either a vertical or horizontal position, with proper spring selection. They are also designed to reduce installation costs. The insert series check valves easily fit into existing line components, which reduces initial cost and installation time. The seating surfaces are parallel to each other thereby eliminating the excessive wear occurring in plug, cone and ball seats. Check-All valves can also be used as low-pressure relief valves and vacuum breakers.

With many styles available, Check-All Valve provides check valves for practically every service application. Valves are offered with metal-to-metal or soft seats in sizes ranging from 1/8-inch NPT to 20-inch flange connections. Pressure

ratings are available from full vacuum to 10,000 PSI. Standard or exotic materials are available and you can choose from a wide variety of spring settings and seat materials for any valve. Most options are available with fast delivery. Specially designed valves are another option that Check-All Valve performs on a regular basis. Check-All Valve Mfg. Co. is staffed to supply you with a quality product as well as personal technical services. ■

## CHECK-ALL VALVE MFG. CO.

Contact us for a complete  
catalog or see us at  
[www.checkall.com](http://www.checkall.com).

## Check All your valve needs at **Check-All®**

### ✓ SILENT OPERATION!

Our check valves close quickly and smoothly to avoid water hammer noise and vibration.

### ✓ SPRING-LOADED!

Multiple spring settings as well as seat and body materials available to meet your application needs.



### ✓ UPSTREAM TRIM!

The upstream trim is protected from corrosive media mixing; thereby, extending valve service life.

And most lead times are less than one week. That's what makes our check valves Check-All®.



Order online at : [www.checkall.com](http://www.checkall.com)

Call us at: 515-224-2301 or  
email us at: [sales@checkall.com](mailto:sales@checkall.com)



Proudly manufactured  
in the USA

# Greasezilla

## FATS, OILS, AND GREASE (FOG) SEPARATION

Developed by Downey Ridge Environmental Company, Greasezilla® is a turnkey system that provides an ecological and cost-effective process to divert FOG from the waste stream. Greasezilla leaves almost nothing to be landfilled and has a total operating cost of one to two cents per gallon, making Greasezilla the ideal front-end pretreatment system for FOG waste. Greasezilla eases the financial sting of ever-increasing disposal fees and labor costs while generating revenue.

Greasezilla is fully automated, making it easy to operate and maintain with minimal staffing. Each system is available in stationary or moveable configurations that are scalable to suit volume capacity.

Greasezilla is the purely ecological alternative to chemically treating,

lagooning, landfilling, incinerating, or dumping FOG waste. The system's ability to generate significant profits from FOG is encouraging liquid waste processors, pumpers, and wastewater treatment facilities to establish or upgrade their own FOG receiving stations.

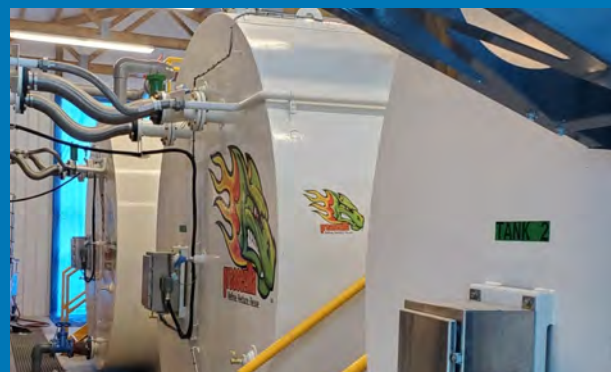
### THE GREASEZILLA SYSTEM

Greasezilla technology heats and separates FOG into three distinct layers:

1. **Brown grease:** The recovered brown grease is also an advanced biofuel (ABF). Approximately five percent of the carbon positive biofuel returns to fuel Greasezilla, and the other 95 percent is a salable commodity. The biofuel can be used as a substitute for Fuel Oil #6. The ABF's low carbon intensity
2. **Batter:** Consisting of organic solids, the batter serves as an excellent feedstock for anaerobic digestion, or it can be composted.
3. **Residual pasteurized water:** The remaining water, nearly free of suspended solids, can be safely discharged into a wastewater treatment facility. ■



Join the growing family of pumpers operating Greasezilla® systems coast to coast.



Call us today! ~ 304.658.4778 ~ [www.greasezilla.com](http://www.greasezilla.com) ~ [info@greasezilla.com](mailto:info@greasezilla.com)



# Helwig Carbon

## BPK: ULTIMATE SOLUTION TO SHAFT GROUNDING

Many pumps utilize a variable frequency drive (VFD) to increase pump motor efficiency. While VFDs lower power consumption, they also induce currents onto the motor shaft. These shaft currents will often discharge through the motor bearings causing fluting, burnt grease, and eventual bearing failure. Downtime, repairs, and warranty claims can be the result of bearing failure and can be extremely costly to any company.

Helwig's BPKs (Bearing Protection Kits) have been leading the industry in shaft grounding solutions for years. Our proven silver graphite brush technology is unlike other shaft grounding system because it eliminates the need for maintenance and will keep bearings protected year-after-year. Helwig BPKs effectively

divert induced electrical currents away from the bearings, protecting them from damage and failure. What's more, our BPKs are economical, easy to install, and can be used on almost any electric motor application!

Another unique feature of the Helwig BPK solution is that one size fits most! While other shaft grounding systems need a different grounding ring for each motor shaft size, the same BPK can be applied to a variety of motor models. Our MultiFit Bracket mounting system allows for a BPK to be attached to multiple bolt designs while keeping constant contact on the motor shaft.

With the success of Helwig's BPK shaft grounding solution, the innovation has continued. Helwig Carbon's Shaft Voltage Detection Device, otherwise known as the BPK-

Probe™, is an instrument designed to measure common mode voltage on a motor shaft. Test results from the BPK-Probe will inform a user if there is current present on the motor shaft, and, therefore, show the risk of bearing damage due to electrical discharges. The patented instrument also has the capability to demonstrate the effectiveness of Helwig's Bearing Protection solution. This feature allows the user to mimic the installation of a BPK and then measure the voltage present on the shaft, proving that the parasitic shaft current is being instantly grounded through the silver graphite brush. The BPK-Probe is an excellent tool for any engineer, technician, or preventative maintenance professional that needs to evaluate motor health on a regular basis. ■

# STOP BEARING FAILURE

## CAUSED BY VFD-INDUCED CURRENTS

WITH HELWIG'S  
INDUSTRY LEADING  
SHAFT GROUNDING SOLUTION



# BPK



Premature bearing failure is a major cause of motor downtime and costly repairs. Helwig Carbon uses proven silver graphite technology in a variety of bearing protection kits (BPK) for motor shaft grounding. They effectively divert electrical currents away from the bearings, protecting them from damage.

For more info, visit  
[www.helwigcarbon.com](http://www.helwigcarbon.com)

# Hoosier Pattern

For twenty-five years, Hoosier Pattern has always been on the cutting edge of innovation. We have consistently raised the bar in our industry while maintaining the highest quality of products for our customers.

Hoosier Pattern opened in November 1997 in a 3,000-square-foot facility with just a couple of machining centers and three owners. In 2005, Hoosier Pattern grew to fifteen employees due to customers' demands.

In 2009, Keith Gerber became sole owner of the company and continued to expand the CNC technology and employ more staff. In 2013, Hoosier Pattern became the first service center to own and operate a 3D sand printer in the United States. Today, we have five 3D sand printers in house.

Twenty-five years later, we now occupy a 90,000-square-foot facility

with state-of-the-art technology and employ over sixty employees with current technology including:

- CAD/CAM software, to design foundry tooling and create toolpaths for our CNC technology
- Over twenty-five machining centers including vertical and horizontal machining
- Five-axis machining
- CNC lathes
- Five 3D Sand Printers for Sand Molds and Cores
- Two 3D Plastic Printers
- CMM and Laser Scanning Technology
- Active Apprenticeship Program for pattern making
- Registered with the Department of Labor
- ISO Certified
- ITAR/EAR Compliant

Our employees are a vital component to our success. Without them, Hoosier Pattern would not be celebrating twenty-five years in business.

Our employees share our vision of excellence in every aspect of their jobs. Our staff is well-trained and well-educated. Hoosier Pattern stays up to date in the latest technology, allowing us to cater to our customers' needs. We also understand our customers' demand for expedient delivery times, and product excellence is a must.

Therefore, these expectations are the driving force behind our day-to-day operations. We are committed to "on-time delivery," and we're constantly striving to meet our



## WE DELIVER A PATTERN OF EXCELLENCE



Get the latest information  
[HoosierPattern.com](https://www.hoosierpattern.com)

See our virtual tour  
[HoosierPattern.com/tour](https://www.hoosierpattern.com/tour)

Hoosier Pattern continues to be an industry leader by setting the bar high to exceed our customer's expectations. With our state-of-the-art technologies along with our highly-experienced team members, Hoosier Pattern continues to deliver the industry's best additive manufacturing molds and cores on time and every time.

### WE EXCEED EXPECTATIONS

- » On Time Delivery
- » Quality Products
- » Experienced Team



Call Us Today at 260.724.9430



# Schenck USA Corp

SCHENCK USA CORP. is a subsidiary of SCHENCK CORP. Its parent company is Carl Schenck AG of Darmstadt, Germany; whose shares are ultimately held by Dürr, AG of Bietigheim, Germany.

SCHENCK USA CORP. is the company's new name as a result of the merger of Schenck Trebel Corp. and Schenck RoTec Corporation into one entity that comprises Schenck's Balancing & Diagnostic Systems Group for North America under Schenck RoTec GmbH.

SCHENCK USA CORP. is on four acres in Deer Park, New York, that includes a 22,800-square-foot manufacturing and assembly plant and 17,000 square feet of office space for sales, service, administration, and engineering personnel. The company's Southfield, Michigan, location is also a manufacturing and assembly plant serving the automotive customer base with a local engineering and service support staff.

SCHENCK USA CORP. provides a range of balancing and vibration analysis equipment for the production, maintenance and repair of rotating components, and recent integration of BENZ Tooling, metal division, expands its capacities. The company's engineering staff offers a range of experience for any balancing application and maintains a close presence on the balancing committees of the International Organization for Standardization (ISO) and the Society of Automotive Engineers (SAE), to ensure the latest practices and procedures are applied. The company is ISO 9001:2015 accredited.

The service team is available for the commissioning and calibration of balancing equipment from multiple North American service points, in addition to leveraging a global service support structure.

With the company's acquisition and merger of the legal entity TEST DEVICES INC. (TDI) of Hudson, Massachusetts, into SCHENCK USA CORP. of Deer Park, New York, it expanded its capacities in the spin testing and balancing services areas and streamlined and strengthened its presence in the North American market.

SCHENCK USA CORP. today has further expanded its footprint in the aerospace industry with the acquisition of the building and property site of SCHENCK's business unit Test Devices, situated on 6.8 acres, in Hudson, Massachusetts, operating a state-of-the-art 57,000 square-foot facility with 5,500 square feet of office space, strengthening its trajectory for growth in support of increased activities with local and global markets in the e-mobility and aerospace industries. The successful business unit is an integral part of SCHENCK's business. ■

## We are SCHENCK USA

- **BALANCING**



- **SPIN TESTING**



- **APPLIANCE FLUID FILL**



- **CNC TOOLING TECHNOLOGY**



- **AUTOMOTIVE FLUID FILL**



- **TESTING - END OF LINE**



**SCHENCK**  
Passion for Balancing

**Test Devices**  
by SCHENCK

**AGRAMKOW**

**BENZ**  
TOOLING

**DÜRR**

LEADING IN PRODUCTION EFFICIENCY

1(800) 873-2352  
sales@schenck-usa.com  
schenck-usa.com

# Trillium Flow Technologies

Trillium Flow Technologies™ is a global designer, manufacturer, and service provider of engineered pumps and valves for critical infrastructure, energy, and industrial applications. Our product portfolio serves our customers in the water and wastewater, power generation, oil and gas, mining, and general process industries.

In the United States, our pumps business boasts more than 220 years of combined experience providing reliable and efficient solutions that perform in the most demanding environments. We design, manufacture, and test our entire U.S. pump brand portfolio from our state-of-the-art facility in Fresno, California.

Floway® Pumps are an industry-leading vertical turbine pump in the water and wastewater, oil and gas, mining, energy, and industrial markets.

Floway® pumps can be manufactured to API, HI, and NSF requirements, using the most durable wear and corrosion-resistant materials.

Our Roto-Jet® brand encompasses high-pressure, single-stage centrifugal pumps with Pitot tube technology for low-flow, high-head applications and can be manufactured to API requirements. The Pitot tube's simple design and performance have earned the Roto-Jet® brand a reputation as the reliable and robust "go-to" solution for low-flow, high-pressure challenges.

WEMCO® is known for reliable centrifugal screw and vortex pumps with an international distribution network. WEMCO® pumps have served municipal and industrial customers in markets as diverse as water and wastewater, agri-food, solid bulk and sand applications, chemicals, and general industry for over fifty years.

The WSP® brand serves the global food and beverage processing, waste management, and material processing industries, and are designed to be rugged and dependable while simplifying maintenance and reducing life cycle costs. Our WSP® line can be manufactured according to strict API, HI, and NSF requirements.

Also included in our global pump portfolio are Begemann®, Gabbioneta Pumps®, and Termomeccanica Pompe, manufactured at our facilities in Italy. Trillium Flow Technologies™ provides complete international support, starting with highly engineered, reliable products for your industry and continuing with a unique level of support and service. Learn more about the performance engineered difference at [www.trilliumflow.com](http://www.trilliumflow.com).

WEMCO® is a registered trademark of FLSmidth. ■

**TRILLIUM**  
FLOW TECHNOLOGIES™

## PERFORMANCE, ENGINEERED.

Customized pump solutions coupled with through-life service throughout your water or wastewater operation.

**Floway PUMPS**

Termomeccanica Pompe

Floway - VHP API 610 Vertical Turbine Pump	Floway - VSB Submersible Vertical Turbine Pump	Floway - VTP General Vertical Turbine Pump	Floway - VTSP Vertical Turbine Solids Pump	Termomeccanica Pompe - Desal BB3 from TMP

[trilliumflow.com](http://trilliumflow.com)



# However large or small, HYDRA-CELL PUMPS

**have no packing  
or seals to leak, wear  
or replace.**



With its seal-less design, Hydra-Cell reduces downtime and annual maintenance costs in a wide range of OEM and processing applications. No leak path also means lower environmental containment costs. Ever reliable, Hydra-Cell pumps can handle abrasive solids up to 800 microns (depending on model) and will run dry without damage.

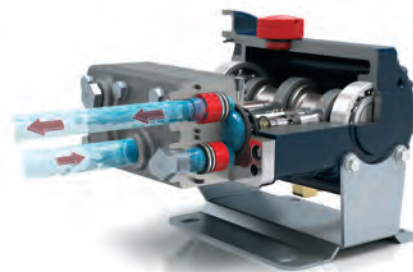
*Contact us today for details.*

  
**WANNER™**  
**HYDRA-CELL®**

[www.Hydra-Cell.com](http://www.Hydra-Cell.com)  
[sales@wannereng.com](mailto:sales@wannereng.com)

## Wanner Engineering

When William Wanner patented the Hydra-Cell positive displacement pump he invented nearly fifty years ago, he hit upon a concept for seal-less pumping technology that would develop into one of the most versatile and reliable pumps on the market today.



*With its seal-less design and check valve orientation, Hydra-Cell can handle abrasive particulates that can often damage other types of pumps.*

Hydra-Cell pumps provide dependable performance for applications as varied as oil and gas in upstream, midstream, and downstream needs, precise metering for chemical injection, pumping high-pressure machine tool coolant, reverse osmosis, boiler feed, and many other plant and processing operations. Its seal-less design and patented diaphragm protection control enable the pump to run dry without damage.

### COMPREHENSIVE PRODUCT LINE

- Hydra-Cell seal-less pumps including the new D66 with higher pressure capability
- Hydra-Cell T & Q Series pumps including new T200 and Q330 models with higher flow capacities
- Hydra-Cell P Series & MT8 "pulse-free" metering pumps including the new P700 for a higher flow rate
- S Series solenoid metering pumps
- Stan-Cor ANSI centrifugal pumps and Vector peristaltic pumps

### WORLDWIDE SALES & SERVICE

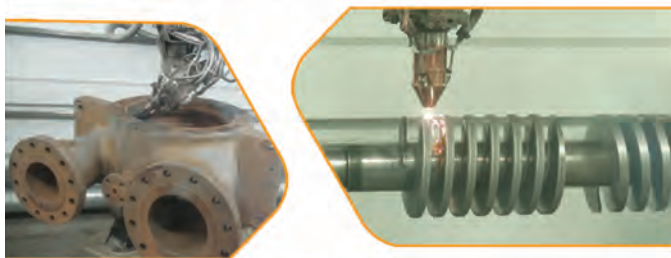
- World headquarters and manufacturing in Minneapolis
- Business units in the United Kingdom, Hong Kong, Shanghai, Brazil, and Texas
- Distributors in seventy-six countries worldwide
- More than 100 distributor locations in North America

### WANNER ENGINEERING, INC.

1204 Chestnut Avenue  
Minneapolis, Minnesota 55403  
612.332.5681 | [sales@wannereng.com](mailto:sales@wannereng.com)  
[www.hydra-cell.com](http://www.hydra-cell.com)

## Alabama Laser

Alabama Laser offers laser cladding/weld overlay services to refurbish damaged parts to OEM specs, repair worn surfaces, and enhance the properties of new parts (wear/corrosion/erosion resistance). We provide laser cladding of pump components, hydraulic shafts, electric motors, downhole tools, valve components, cylinders, boiler tubes, fittings, flanges, sleeves, bushings, and rotors. ASME code stamp certified. Additional laser and advanced machining services include laser cutting (sheet and tube), laser welding, laser etching, waterjet cutting, punching and forming, EDM, robotic welding, CNC milling, CNC screw machining, and powder coating. ■



**ALABAMA LASER**  
256.358.9055 | als@alspi.com  
[www.alabamalaser.com](http://www.alabamalaser.com)



### Laser Cladding of Pump Components

- Refurbish damaged parts to OEM specs
- Repair worn surfaces
- Provide enhanced properties for corrosion / erosion resistance






Phone: 256.358.9055 | E-mail: als@alspi.com  
[www.alabamalaser.com](http://www.alabamalaser.com)

## Cla-Val

Since 1936, Cla-Val has produced the world's highest quality automatic control valves for a diverse array of industries. Cla-Val has continued to strengthen its operational and customer service capabilities around the world by enhancing product lines and building state-of-the-art production facilities and warehouses in Canada, Switzerland, France, the United Kingdom, and New Zealand.

With all our major locations having dedicated training centers, our team of sales personnel and factory authorized sales agents are able to provide exceptional industry expertise throughout the world. Our aggressive research and development programs have resulted in the design and production of technologically advanced electronic and hydraulic control systems that consistently meet the challenges of increasingly complex and diverse applications. ■

**CLA-VAL**  
800.942.6326  
info@cla-val.com • [www.cla-val.com](http://www.cla-val.com)

# XP2F



A non-intrusive flow metering and data acquisition solution for new and existing valves.



[www.cla-val.com](http://www.cla-val.com)





# Sun-Star Electric, Inc.

Sun-Star Electric, Inc. is a Texas corporation established in 1977 and is the principal worldwide distributor for Hitachi submersible motors.

Sun-Star Electric, Inc. designs and manufactures its own Sun-Star branded oil-filled and wet-wound submersible motors for standard and special applications along with the deep-ocean-capable Aqua Star motor.

Sun-Star Electric is an expert for rapid service and repair of the power generation industry's critical, high-pressure water-filled boiler water circulating pump motors.

Sun-Star Electric, Inc. maintains a 75,000-square-foot manufacturing facility, which is fully equipped for the manufacture and repair of submersible electric motors and includes full fabrication, machining, winding, and in-house testing capabilities. In 2011, SunStar Electric, Inc. transitioned to an employee-owned company (ESOP). ■



## SUN-STAR ELECTRIC, INC.

7722 W. 34TH STREET  
LUBBOCK, TEXAS 79407  
SUNSTARUSA.COM

PHONE: 806.793.2812  
800.782.9675  
FAX: 806.793.1989

## SUN STAR TYPE "D" WATER-FILLED MOTOR

The Sun Star Type "D" motor is a water-filled, high efficiency, submersible motor. All exposed metal components are 316 series stainless steel. The motor is completely sealed and employs an internal pressure balancing system. The mounted flange dimensions ensure a standard fit to most pump manufacturers. The Type "D" motor is designed for "across-the-line" and reduced voltage starting. It is also approved for operation with Variable Frequency Drives (VFD).

MANUFACTURING & REPAIR OF WATER FILLED MOTORS SINCE 1977

### ENGINEERING & DESIGN

Type "D" motors are an engineered product and can be custom designed to fit most applications.



### FACILITY CAPABILITIES & CAPACITY

All welding, machining, component fabrication, winding, assembly, electrical and run testing accomplished in house.

### EXPERIENCE

Sun-Star Electric has been designing and manufacturing motors for over 40 years. Our combined expertise with submersible motors culminates to hundreds of years of experience.



2 POLE			4 POLE		
FRAME	H.P.	VOLT	FRAME	H.P.	VOLT
10"	75 100 125	2300	12"	150 200	2300
12"	200 250 300 350	2300	14"	200 250 300 400	460 2300
14"	300 350 400 450	460 2300 4160	16"	300 350 400 450	460 2300 4160
16"	400 450 500 600 700	2300 4160	20"	500 600 700 800 900	2300 4160 6600

### SPEEDS

3600RPM / 1800RPM (2P / 4P)

### AMBIENT TEMP

25°C ambient standard w/H-Temp options available

### MATERIALS OF CONSTRUCTION

316 series SS, Super Duplex, and N/AISr available

Different configurations on request



### CONTACT US

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O: 806.793.2812  
F: 806.793.1989  
T: 888.SUNSTAR  
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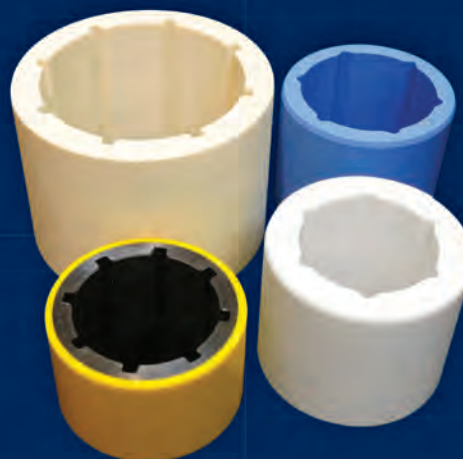
# Thordon Bearings

Thordon is the world's leading manufacturer of long-lasting non-metallic bearings that require no oil or grease. They are easy to design, safely machined and install quickly. Our vertical pump bearings provide long wear life, high abrasion resistance, and can provide dry start up capability. Thordon's proven performance in vertical pumps, power plants, sewage and waste water treatment, refineries, mining, agriculture, and any industry moving water has lowered operating costs.

Our polymer bearings can also be used in aerators, flocculators, screens, butterfly valves, or virtually all applications where greased bronze bearings are currently installed. ThorPlas-White is the newest material in the Thordon bearing family, specifically developed to operate as a drinking water system component used in the treatment and distribution of potable water. It has international certification for NSF/ANSI 61 Drinking Water System Components and NSF/ANSI 51 Food Equipment Materials, as well as WRAS.

By providing engineered, customizable solutions, our bearings improve efficiency, which results in saving companies both time and money by eliminating grease, lowering life-cycle costs, improving equipment downtime, and increasing mean time between failure. Thordon bearing are available and supported globally by its worldwide network of factory-trained authorized distributors. ■

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