

Water Technologies

Water Champ® Chemical Induction System

SIEMENS





Enhanced Chemical Feed

INNOVATIVE TECHNOLOGY

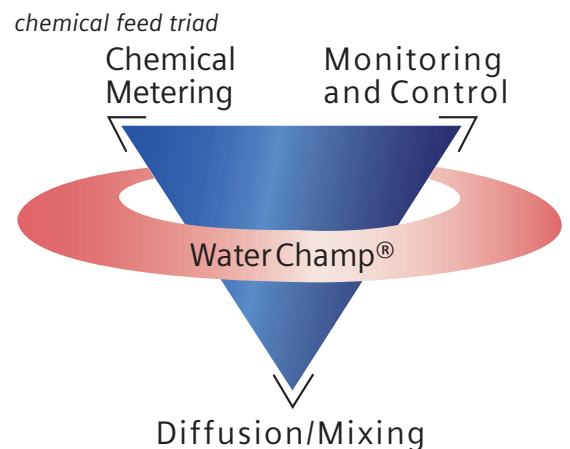
The Water Champ® vacuum chemical induction system has revolutionized the concept of chemical feed systems with its innovative design and unlimited chemical feed applications in potable water and wastewater treatment. The system's superior mixing characteristics represent a major step forward in chemical feed and disinfection applications. Virtually any process feed application can benefit from Water Champ's® direct vacuum chemical induction capability. The Water Champ® system eliminates the necessity of costly carrier/make-up water and conventional rapid mix systems. A unique feature of the Water Champ® system is its ability to provide the mixing intensity required to maximize chemical reaction while using less energy. Siemens and its ChemFeed and Disinfection Group stand committed to the design and production of quality systems that will provide efficient and dependable service.

The introduction of the Water Champ® chemical induction system represents an important advancement over conventional vacuum chemical feed and disinfection systems. That early Wallace & Tiernan® technology, introduced in the 1920s, was based on the use of an injector system for the gas and liquid withdrawal process. The innovative Water Champ® vacuum chemical induction concept eliminates the need for an injector, and can be retrofitted to any existing chemical feed/disinfection system. The Water Champ® system consists of a motor-driven open propeller which creates a vacuum in the chamber directly above the propeller. This vacuum is transmitted to the chemical metering/control system by a vacuum line similar to current remote injector systems.

The Water Champ® chemical induction system is the dynamic component of the triad that forms any modern chemical feed system. The other elements of the triad are chemical metering, monitoring and control equipment, i.e. Siemens' Wallace & Tiernan® and Stranco® product lines.

INNOVATIVE FEATURES AND BENEFITS

- Quality Diffusion/Mixing
- Maximum Chemical Concentration
- No Chemical Off-Gassing
- Elimination of Carrier/Make-Up Water
- Efficient Energy Transfer
- Vacuum Gas Feed to 10,000 PPD
- Vacuum Liquid Feed to 150 GPM



Superior Mixing Efficiency



Fig 4



Fig 5

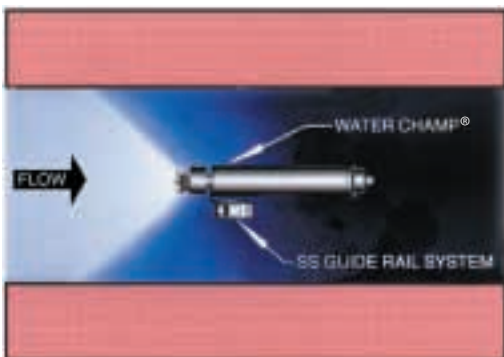


Fig 6

ZONE OF INFLUENCE

The area where rapid mixing occurs is referred to as “the zone of influence.” The zone of influence can be visualized as a three-dimensional cone or “frustum” (Figure 4). This zone with its highly turbulent axial flow pattern extends away from the propeller outward into the process flow. The chemical (gas or liquid) is dispersed directly into the process stream without the need for dilution water.

The Water Champ® system instantly creates a homogeneous solution. The unit’s propeller rotates at 3450 rpm. At this speed the chemical molecules are blasted into the process stream in excess of 60 ft./sec. Flow can be directed either vertically or horizontally (Figure 5) developing a zone of influence across or into an influent pipe. In some open-channel applications, a horizontal configuration (Figure 6) achieves the greatest diffusion zone.

The Water Champ® system's axial mixing pattern is important in wastewater post-chlorination applications because it achieves a rapid homogenous mixture that improves process control. Another important feature of the system is its ability to locate the propeller close to the process water surface, thus eliminating off-gassing—regardless of the chemical flow rates or channel depth.

A network of factory trained representatives are available to assist you with product selection, application questions, start-up, and on-going service and support. Important installation considerations include: motor, propeller, and vacuum chamber sizing; unit location, orientation, guide rail design; and chemical handling and delivery.

Streamlined Process

COST EFFECTIVE

How cost-effective is the Water Champ® system? With a Water Champ® system installation, you eliminate the need for a water supply, pump, strainer, injector, mixer or diffuser. Figure 1 illustrates the chemical induction system's efficiency in capital equipment savings and water savings when compared to conventional injector systems. In systems where potable water is used for make-up solution, the Water Champ® system eliminates 100% of these components (Figure 2). This translates into substantial savings. In either system, all you need is the existing chemical metering equipment and the Water Champ® unit. The Water Champ® system can be easily retrofitted to any current system (Figure 3).

INSTALLATION & MAINTENANCE

The Water Champ® chemical induction system is easy to install due to its light weight, simplicity of construction and non-corrosive moving parts. Maintenance is kept to a minimum due to:

- Heavy Duty Bearing Design
- Mechanically/Hermetically Sealed Motor
- Titanium Construction in Chemically Wetted Areas
- 316 Stainless Steel Corrosion Resistant Motor Housing

POTABLE WATER TREATMENT CHEMICALS

In addition to chlorine and ammonia, many other chemicals used in potable water treatment depend upon proper mixing. This is particularly evident during the coagulation process, where chemicals (alum being the most predominant) are added for charge neutralization and flocculation.

The chemical reactions that precede charge neutralization with alum occur within microseconds and within one second if hydrolyzed aluminum (III) polymers are present. Due to the competitive nature of these reactions, it is imperative that the coagulant be dispersed in the raw water stream as rapidly as possible. This will allow the polymer products that develop instantaneously to efficiently destabilize the colloidal suspension. Incorporating the Water Champ® system into this initial mixing phase maximizes liquid/solid separation.

WATER CHAMP® VERSUS THE TYPICAL INJECTOR SYSTEM

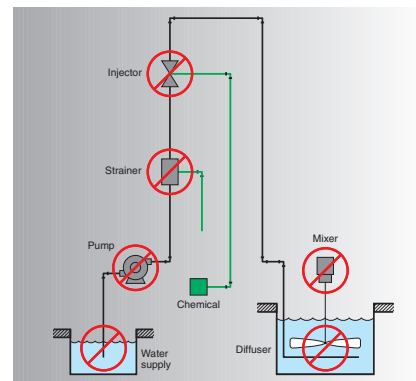


Fig 1

With the Water Champ® system installation, there is no need for a water supply, pump, strainer, injector, mixer or diffuser.

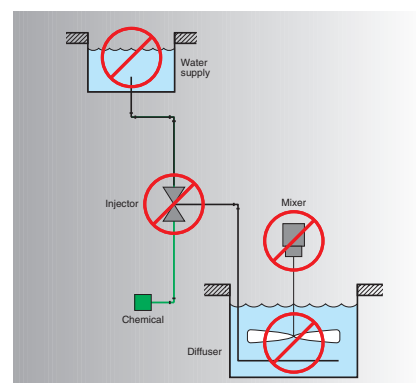


Fig 2

In systems where potable water is used for make-up solution, the Water Champ® system eliminates the need for an injector, mixer or diffuser.

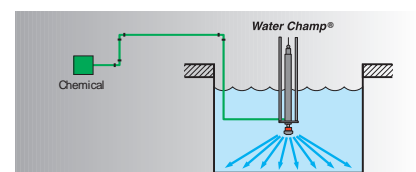


Fig 3

Water Champ® system can be easily retrofitted to any current system.

Available Models

SWCF SUBMERSIBLE

The Submersible Water Champ® F Series chemical induction system (SWCF) offers the highest quality design and construction of any submersible chemical induction unit. The hermetically sealed motor is constructed of 316 stainless steel for the highest level of durability and performance. All chemically wetted components are Grade 2 Titanium (unalloyed) and are compatible with most treatment chemicals. The innovative mounting system is configured for open-channel applications and can be easily retrofitted to existing basins. In addition, the Water Champ® XP system is available for hazardous location applications. The Micro-Champ® chemical induction system is the smallest system in the Water Champ® F Series product line. It offers instantaneous diffusion / mixing and the highest level of durability and performance required for chemical feed applications -- only at a smaller size for use at smaller water and wastewater treatment facilities.

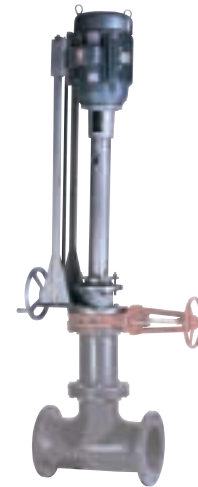


ILWC IN-LINE

The In-line Water Champ® Series chemical induction system (ILWC) is designed to offer the same high level of quality and performance as the submersible unit. The ILWC Series is installed through a packing gland/knife gate valve arrangement.

This arrangement allows the ILWC Series to be installed into closed conduits to maximize the chemical induction/mixing. This configuration eliminates downtime during construction and scheduled maintenance, saving time and money.

The unit is fitted with a chemical-duty motor for the highest level of atmospheric resistance and maximum durability. The ILWC features Grade 2 Titanium (unalloyed) induction body, stainless steel packing gland, and stainless steel mounting system. The unit can also be configured with an optional insertion/retraction device that simplifies routine maintenance.



CONTROL PANEL

The Water Champ® Control Panel offers the ultimate protection for your Submersible Water Champ® F Series chemical induction system. The Control Panel features the Motor Protection Device.

This microprocessor-based system provides underload and overload motor protection, and incorporates an auto restart feature in addition to an alarm contact for external fault indication.



Rugged Design

TITANIUM CORROSION RESISTANCE

All of the Water Champ® chemical induction system's primary wetted parts subject to initial chemical contact are constructed of titanium. The exceptional corrosion resistance of titanium is virtually unchallenged over a broad spectrum of corrosive agents. Titanium demonstrates excellent resistance to general and localized corrosion under most oxidizing, neutral and reducing conditions.

Titanium derives its corrosion resistance from the protective, stable tenacious oxide film which forms on the metal surface and instantly reforms when damaged. This oxide film protects the metal from both corrosion and mechanical damage at temperatures up to 600° F.

Titanium's greatest benefit lies in its resistance to wet/moist chlorine chemicals and chlorides such as hypochlorite, chlorate, perchlorate and chlorine dioxide.

Titanium also exhibits outstanding resistance to nitric, chromic, and hydrochloric acids.

ENERGY AND CHEMICAL SAVINGS

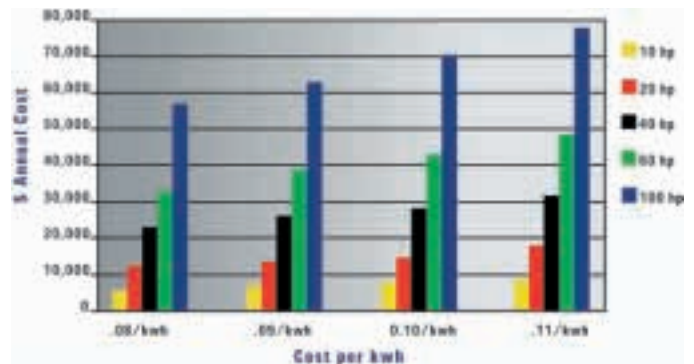
The Water Champ® system provides significant chemical and energy savings by reducing the horsepower requirement as compared to conventional mixing/chemical feed systems, and improving the mixing efficiency of the chemical addition. A Midwestern wastewater treatment plant realized the chemical and energy saving benefits of the Water Champ® system by retrofitting their existing chlorination/dechlorination mixing chambers. Installing two compact 10 horsepower Water Champ® systems (a primary and a spare) enabled the facility to eliminate their 40 horsepower mechanical agitator, 60 horsepower water transfer pumps and the chemical injector.

The energy savings, combined with chemical efficiency savings of 30%, allowed the customer to recover their capital investment in less than 18 months. The chart to the right illustrates a direct comparison of the energy cost between the 10 HP Water Champ® system and the 100 HP conventional system.



THE POWER WITHIN

The unique airfoil design of the propeller enables the Water Champ® system to achieve maximum energy transfer.



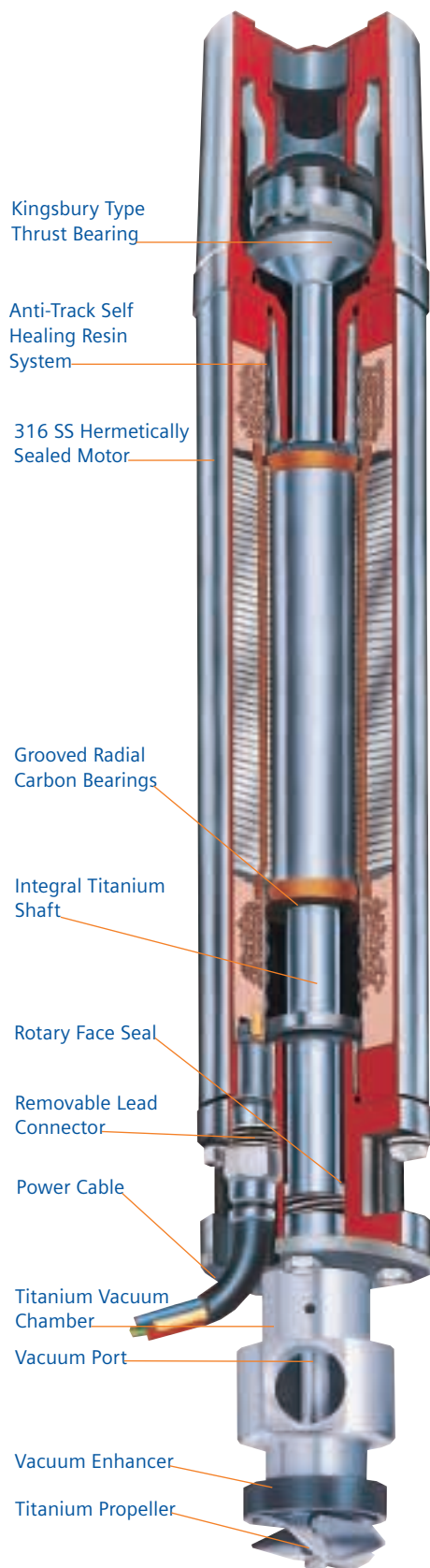
TITANIUM CONSTRUCTION FEATURES

- Light weight
- Chemical resistant
- Cavitation resistant
- Tenacious oxide film
- Temperatures to 600°F

APPLICATIONS

The Water Champ® system operates on the simple principle of applying all available energy directly to the chemical that is being activated. Today's state-of-the-art water and wastewater chemical feed systems, whether municipal or industrial, look to the Water Champ® vacuum chemical induction systems to solve their complex feed requirements.

Remember, with the Water Champ® chemical induction system, the application of chemicals is only limited by one's own imagination.



| WASTEWATER | WATER | INDUSTRIAL |
|--------------------|----------------------|-----------------|
| BNR Process | Coagulation | Refining |
| Coagulation | Disinfection | Petrochemicals |
| Color Removal | Filtration | Pulp & Paper |
| CSO (Disinfection) | pH Control | Steel |
| DAF Systems | Taste & Odor Control | Textile |
| Disinfection | Rapid Mix | Mining |
| Dechlorination | Recarbonization | Food Processing |
| Leachate Treatment | Zebra Mussel Control | Pipeline |
| Odor Control | Chloramination | Plating |
| pH Control | | Cooling Towers |
| RAS (Filamentous) | | pH Control |

CHEMICAL FEED APPLICATIONS

| | | |
|----------------------|-------------------|--------------------|
| Chlorine | Potassium | Sodium Sulfite |
| Sulfur Dioxide | Permanganate | Sodium Thiosulfate |
| Calcium Hypochlorite | Metabisulfite | Carbon Dioxide |
| Sodium Hypochlorite | Sodium Bisulfite | Lime Slurry |
| Air | Anhydrous Ammonia | Soda Ash |
| Ozone | Ferric Chloride | Hydrochloric Acid |
| Oxygen | Aluminum Sulfate | Sulfuric Acid |
| Hydrogen Peroxide | Sodium Aluminate | Ammonium |
| | Ferrous Sulfate | |

WARRANTY

The Water Champ® chemical induction system is warranted for a period of one year from the date of service to be free from defects in material and workmanship. The warranty may be renewed annually by purchasing a preventive maintenance service agreement.

For more information please
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