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# Tips for Choosing a Reliable Temperature Control System in the Chemical Industry.

When considering a temperature control system for chemical processing, precision and accuracy are critical. To keep up with increasing demand, Mokon's expert engineers have developed process heating and cooling equipment that regulates jacketed pipe, vessels, mixers, reactors, etc. to ensure effective product control. Find out how to select the best temperature control system by following these five key steps.

## 1 | Calculate System Size

Effective selection and sizing of the temperature control system can make a significant difference in reducing waste, achieving higher quality, increasing output, realizing faster heat up and cool down rates and improved profitability.

Collecting the application details to calculate the size of the temperature control system is a crucial element to achieve accurate process temperature control. Never assume that a comparable existing installation has been effectively sized or that the proper temperature control system has been designed to deliver the product quality and throughput management you're looking for.

Sizing parameters should be determined by performing a thorough calculation of the process load conditions to ensure the correct heating, cooling and pump capacities are selected. It is essential to understand that the heating and



Combination heating/chilling system with all stainless steel cabinetry, NEMA 4X and wash down design.

cooling loads fluctuate depending on the materials used and complexity of the materials being processed. Therefore, the size or capacity of a temperature control system must be designed to accommodate the varying conditions, including ambient conditions, that may affect system efficiency.

Typical sizing questions often include equipment ambient conditions, type, shape, dimensions and weight of the container, chemical mixture specific heat and weight per hour being treated, process temperatures, inlet/outlet quantity and size of lines, and control requirements.

You should always include a safety factor to allow for unknown or unexpected conditions. The size of the factor is dependent on the accuracy of the wattage calculation. Generally speaking, the smaller the system with fewer variables and outside influences, the smaller the safety factor.

## 1 | Calculate System Size Continued

On the other hand, the larger the system and the greater the variables and outside influences, the greater the safety factor. Here are some general safety factor guidelines:

- 20% safety factor is the average
- 30% for larger systems with varying loads, cycle times, etc.

## 2 | Find the Right Fluid



Liquid Temperature control systems provide a uniform medium to transfer heat or cooling to a process. Liquid can circulate into areas that are challenging or ineffective by

other means of temperature control like steam, cartridge heaters or other heating elements. Control accuracy within fractions of a degree is possible with the correct system and options selected. Compact and energy efficient designs allow for control of processes in limited spaces and offer reduced operating costs.

Circulating liquid temperature control of your process can be handled through three (3) different mediums: water, water/glycol or heat transfer oil. The decision of which fluid type should be selected depends upon the temperature you are trying to achieve, heating and/or cooling loads, process flow capabilities, cycle times, material, etc.

## 3 | Assess Control Features

Your process control demands accuracy and reliability, while operators need easy-to-use, highly visible controls and indicating lights.

Microprocessor based controls provide ultimate control performance and are configurable to meet specific application needs. These types of controls can greatly optimize your process. A variety of control features and communication options are available to ensure you are obtaining easily configured and optimal results.

## 4 | Plan System Installation Carefully

For optimum performance, safety and durability ensure the system is designed for the application and the environment surrounding it. Selecting the right materials and rated components will help minimize corrosion and protect against explosive vapors. Before installing/starting up any system read the manufacturer's instruction manual and follow their installation/startup procedures carefully. Complete an inspection of all electrical and mechanical components of the system including wires, fittings, etc. If a startup checklist is provided, follow that closely.

## 5 | Prolong the Life of Your Temperature Control System



Preventive maintenance procedures should be performed regularly to keep the temperature control system clean and well-maintained. Performing weekly, monthly, and quarterly checks will extend the life of your system. Refer

to the procedures provided in the manufacturer's instruction manual.

By following some basic guidelines before, during and after installation, you can avoid problems and ensure that your temperature control system will provide a high level of efficiency, reliability and an extended life.

For additional information on process heating and cooling equipment for chemical processing, contact Mokon today.

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