Flange Connectors, Defined

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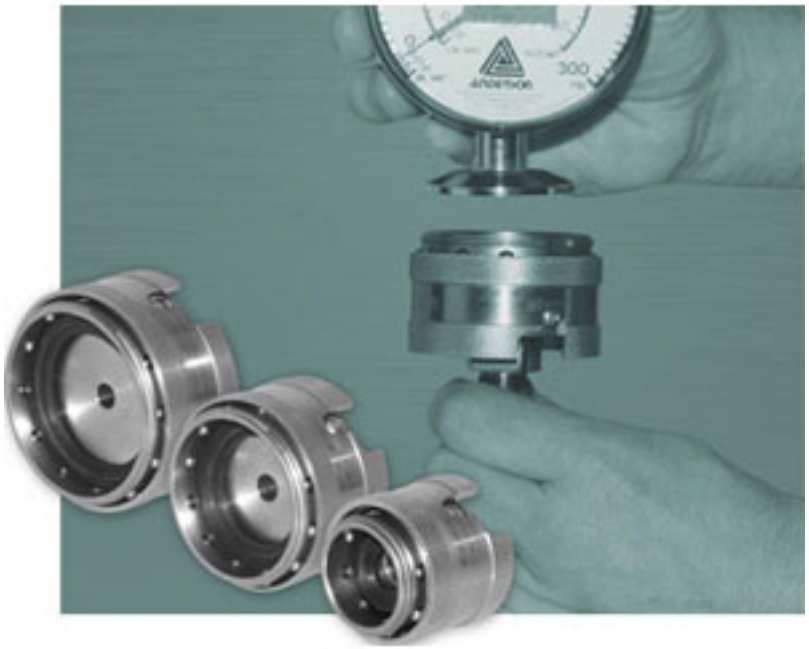

For industries and applications that rely on precision execution, such as pharmaceutical and biopharmaceutical, as well as instrumentation manufacturers of sanitary products, reliable, repeatable manufacturing and processing results are crucial. Due to this, devices such as pressure gauges or transmitters equipped with sanitary diaphragms must be calibrated when first commissioned and regularly throughout their working lives. Achieving exact calibration depends on the security of the connection; leaks can lead to inaccurate results, extra man hours of technicians time and, ultimately, process, regulatory and manufacturing issues down the line.

With recent advancements in connector technology, innovative flange connectors provide fast, reliable calibration both in the field and in metrology labs. By offering simple connectivity and proper sealing, flange connectors are ideal for demanding pharmaceutical and biopharmaceutical applications. Including benefits such as faster project velocity and increased productivity, flange connectors provide greater process efficiency and cost-effectiveness in a single high-performing calibration solution.

Flange Connector Technology

Conventional connectors result in a labor- and time-intensive process. By using cumbersome swinging tri-clamp configurations, closing and locking the connectors for a secure fit can be difficult and time-consuming — particularly in cramped pharmaceutical suites. These methods can result in unreliable connections, leading

to unwanted leaks. Such leaks can make calibration difficult and time consuming, potentially causing inefficient equipment operation. These inadequacies can impact production consistency, product quality or regulatory compliance for diverse industry standards.

To avoid faulty connections and achieve a secure seal on sanitary flanges, some robust flange connectors are specifically designed to provide quick, leak-tight seals. These reliable connections are achieved through a series of simple steps. First, the technician slides the connector collar open, places the diaphragm of the gauge or transmitter into the connector and extends the collar to the locked position. Finally, the technician rotates the collar to secure the connector to the diaphragm, compressing it against the provided gasket and locking the device in place. The connectors provide the ability to compensate for varying flange and gasket thicknesses.

Ideal for both applications in process or on the bench in a calibration lab, the connectors enable devices to be connected and calibrated in a fraction of the time. Featuring stainless steel construction, robust flange connectors deliver continuously reliable connections even in harsh or corrosive environments — enhancing the connector’s longevity for a long-lasting calibration solution.

These innovative flange connectors ensure a superior seal with every connection. Using the same standard seals (gaskets) currently used by industry, connectors are available in the most common size options from 1/2 up to 2 inches, offering a convenient and versatile calibration solution. Flange connector kits are available to provide a selection of sizes and reduce productivity losses that occur when a calibration service provider does not have the needed connector sizes on a job site.

In situations where multiple connections of various sizes are necessary to complete calibration, flange connectors can be attached to a calibration hose assembly to provide secure, sealant-free connector changes in seconds. The hose assembly eliminates the risk of sealant tape plugging an instrument, while the small diameter of the hose minimizes nitrogen usage or, in the case of manual pumps, operator fatigue.

For increased application efficiency, flange connectors can be mounted onto a manifold system. Providing secure connections in applications with multiple fitting styles and size configurations, manifold systems connect to and calibrate up to four separate devices simultaneously. The manifold system is a high-pressure system however the pressure rating of the individual connectors installed will determine the maximum overall system pressure rating. The manifold system allows fast, wrench-free connections to sanitary devices, and also can double as a fixture to mount both male and female NPT connectors providing accurate, efficient calibration results in significantly less time than alternative methods. Further, connecting to multiple flange connectors at the same time enables transmitters or gauges to be swapped out in seconds, accommodating rapid changeover rates, for increased productivity with minimal labor requirements.

Advantages & Applications

Providing quick-connect performance and the ability to accommodate multiple fitting styles and thicknesses, these flange connectors offer users a wide range of benefits. By eliminating inefficient conventional connecting procedures, the connectors deliver consistent calibration results, providing the reliability necessary for high-precision industries such as pharmaceutical. With their innovative collar-locking connection capabilities, the flange connectors facilitate rapid instrument swapping, while maintaining high degrees of accuracy — increasing productivity, process efficiency and ensuring product quality. Further, by completing a greater number of calibrations in less time, users can experience a faster return on investments or increased profits from new systems being brought on line.

Utilizing flange connectors with repeatable, reliable connections allow pharmaceutical and biopharmaceutical enterprises to significantly increase project velocity, which decreases the time between the initial investment and profit realization. During initial commissioning of a pharmaceutical or biopharmaceutical facility, it is customary to require the pharmaceutical company to calibrate all instrumentation to ensure instrument accuracy prior to commencement. Commissioning a new pharmaceutical product can be a multimillion-dollar operation, which the company invests at the onset. Therefore, by utilizing a solution that enables every instrument to be calibrated faster, the company can begin production sooner, leading to earlier product distribution. Due to this, the company can start generating profits and begin receiving returns on their initial investment.

For example, an instrumentation installation team employed advanced connector technologies during installation and commissioning of a large new pharmaceutical facility. They found that the leak-tight connections to gauges and transmitters occurred on the first attempt and much quicker than with conventional techniques. This insured that the time line for commissioning was maintained. Additionally, the finger-tightened, leak-tight connection ensured that no instruments were damaged due to over-torqueing a connection to prevent leaks — as had occurred with conventional solutions.

Since it is crucial that pharmaceutical instruments remain precise, they require regular calibration, which can lead to frequent loss in productivity. Process downtime throughout pharmaceutical and biopharmaceutical manufacturing plants is extremely costly. Therefore, utilizing a connector solution with manifold system compatibility can allow completion of calibrations with unparalleled speed. By providing accurate results for multiple instruments simultaneously, facilities can limit process downtime and reduce costs associated with lost productivity.

Additionally, pharmaceutical suites and biopharmaceutical applications have a very high cost per square foot. To control installed costs, taps on reactors and vessels are often crowded together to minimize their foot print or vessel size. The compact design and space saving construction of flange connectors as compared to the swinging tri-clamp solutions, enable connections to be made directly on closely spaced industry equipment. The improved density created by the condensed spacing provides cost-saving impacts for pharmaceutical manufacturers.

Looking Ahead

As advanced connectors continue to replace conventional alternatives, industries will experience greater efficiency while performing calibration procedures, assuring instrument accuracy and improving overall process control. Implementing innovative flange connector solutions for diverse industry applications provides increased effectiveness, while reducing cost and labor requirements associated with traditional calibration connectors. The speed and accuracy offered by flange connectors deliver the ideal solution for pharmaceutical applications, which can lead to increased profit returns along with more reliable results.

For more information, please visit www.fastestinc.com *[1].*

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