



Ten Steps to a Leak-Free Connection

White Paper



ENGINEERING YOUR SUCCESS.

Achieving a leak-free connection in any environment is the Holy Grail for many piping and instrumentation engineers. Traditional hookups use a multitude of valves and fittings – creating lots of potential leak points. The good news is, adopting ten easy steps can radically reduce leakage risks and achieve substantial cost and efficiency savings.



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Step One

Use integral fittings

Using integral fittings is one of the quickest ways to cut the risk of galling.

Integration negates the need for PTFE tape or sealant; valves are shorter, lighter and more compact, leading to smaller installation size; and this approach is less labour intensive

– cutting the likelihood of sealant application errors, which can lead to drops in valves and cause contamination.

Best of all, valves with integral fittings are actually lower in cost so using integrated valves from a reputable fittings manufacturer such as Parker can save you both time and money.

Step Two

Go PTFree connect™

Over-tightening manifolds can be a problem, particularly if NPT elbows are involved. Over time, this can cause component damage, reducing the life of the product.

With manifolds such as Parker's PTFree connect™, connections are fitted into the body of the valve, with a metric parallel thread onto a stainless steel gasket. The fitting is then tightly torqued, pinned and leak-tested prior to sale.

That means less likelihood of any damage to the manifold, as well as making it easier to align impulse lines perfectly first time.

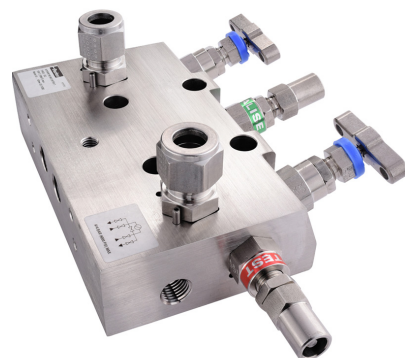
Step Three

Switch to integrated tube connections

When connecting pipe to tubing, one typical solution is to create a flange connector. Often this involves back welding to create a permanent joint.

However, that also creates additional expenses in the shape of a welder and a weld permit; and as welding involves dissimilar materials, this also increases the risk of product corrosion.

By using products machined from one piece, there's no need for the fitting to be put in, as it's already integral to the design. That means no welding, no corrosion and quicker installation times.



PTFree connect™ manifold.

Step Four

Reduce the number of valves

Traditional multi valve hook ups valves are especially prone to vibration, and require support fabrication.

Putting all the valves in one body (modular valves and Monoflanges) removes the need for additional support, is less vibration-susceptible and simultaneously reduces the amount of leak paths. Added with quicker install times, there's potential for substantial cost savings.

Step Five

Change to a Parker differential pressure transmitter

In fluid environments such as oil refineries, precise flow rates are critical. If a differential pressure transmitter (DP cell) doesn't read correctly, the flow may display one result when the actual flow through the pipeline is completely different. That's why transmitters are regularly taken to workshops for recalibration.

The downside of many conventional hookups is that they typically feature lots of bolts, making unhooking and rehooking the equipment time-consuming. But Parker differential pressure transmitters have a unique release mechanism key, which allows the engineer to remove the unit in less than a minute; and with no obstructions on either line, the possibility of gaugeline error is reduced.

What's more, by coupling direct to the process pipeline, there's less need for NPT and tubing (thus removing potential leak points and galling risks).

Step Six

Use fugitive emission class valves

For operators in a sour gas environment (such as H₂S), any leakage to atmosphere through the stem carries significant risk. Using fugitive emission (FE) class valves can help cut the likelihood of leaks and contribute to a safer professional environment.

Parker's ProBloc process-to-instrument valve range was one of the first to achieve ISO15848 Class A standard for products. All valves are Type Approved Tested, as well as being TAMAP two-star approved by Shell.



TAMAP Ultra low emission double block and bleed valve.

Step Seven

Speed up system build with modular units

Creating a conventional cabinet-based system takes considerable time and financial investment. But these days, more and more operators are turning to modular systems – and achieving much lower costs and lead times in the process.

A modular system can be built on a desk, significantly reducing the size of a cabinet. Design and installation times are typically much faster than conventional models, and with no threads and no tubing involved, the risks of leakage are considerably lower.

There are also various products that can be module-based to further reduce the footprint; plate can achieve much shorter lead times, whilst also avoiding the need for welding.

As a case in point, one of Parker's customers needed to reduce tapping points on its pipeline. Mounting three pressure transmitters onto one manifold system resulted in one tapping point on the process pipeline.



Step Eight

Use quality connections and tube

Controlling the quality of tubing and fittings is a quick way to secure quality throughout a system. Parker recommends using similar materials, to avoid the risk of corrosion and ensure that components work effectively in line with the product design process.



Step Nine

Consider installation training

Anyone working in the tube fittings industry should consider installation training. This type of session provides practical insights and tuition to make sure that tubes are selected correctly and stored and handled with care; it's why more and more companies are turning to this approach as a guarantee of good workmanship.

Reputable providers should cover specifying, storage and handling, pre-assembly inspection and product assembly. For example, Parker provides certificated small bore expert training, which is renewed every two years.

When choosing a provider, it's useful to check for formal qualifications, industry experience and membership of relevant bodies, such as the British Fluid Power Association. As product specifications and regulations change, it's vital to choose a company that keeps up-to-date, so exploring industry knowledge and recommended reassessment times can be helpful too.

Step Ten

Innovate with bespoke products

Customers in complex environments often have highly technical needs that aren't easily met by off-the-shelf products. Working with a manufacturer to design bespoke products (suited to a specific industry or environment) can be surprisingly cost-effective and provide the ideal solution to operational challenges.

As a case in point, Parker worked with Total to design an API valve for a wellhead assembly. The company wanted a double block-and-bleed API valve plumbed to transmitters and constantly monitoring casing pressure.

Looking for a leak-free solution?

For further information and advice on achieving leak-free connections and overcoming operational challenges in technical environments, please visit Parker's Instrumentation Products Division pages or find your local distributor.



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