

# Reducing fluid control and automation complexity in pharma process development

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Designing and building pharmaceutical processes or skids demands close coordination between mechanical, electrical and instrumentation, and automation engineering teams. Fragmented design and vendor selection can introduce challenges in integration and validation. Aligning these disciplines through compatible hardware, automation, and measurement technologies can reduce risks in development and accelerate time to market.

*Damien Moran, Industry Account Manager for Pharmaceutical & Biotechnology, explains an efficient development route.*

Designing and building new pharmaceutical processes or skids is complex and expensive. Precise control must be scaled to ensure high productivity and achieve the regulatory hygiene standard, with the process validated by accurate data. For OEMs in the pharma sector to optimise across these areas, the coordination of their design and installation engineering teams is essential.

Designing and installing a new pharmaceutical process typically involves several teams. This includes mechanical engineers that deal with pipework, vessels and valves; electrical and instrumentation engineers that take care of valve control and electrical installation; and automation engineers that are responsible for the control concept and implementation.

**Project coordination challenges**

While each of the disciplines has distinct objectives and timelines, aligning the mechanical, electrical and instrumentation, and automation teams is essential. However, project scale and its complexity make coordination of these teams a demanding task. The first phase of development is often the most crucial from a coordination perspective as challenges emerging at this point can have long-term implications that are more difficult to change. Key to this stage is vendor selection, with compatibility in hardware, software and controls, and associated services integral to the success over a project's full term.

As each team proceeds with design, specifying the components they need from approved vendors to deliver their section of the project, the most important criterion is achieving precise control at the process level. Process valves, flow meters, and control systems may each meet their required individual specifications, but differences in response times or control and communication interfaces can introduce small mismatches that decrease the precision and repeatability of the overall process. This makes exacting compatibility of control hardware and automation architecture essential to optimise process quality.

### **Reliability and compliance**

Even when the desired process quality is reached, achieving productivity means throughput matched with reliability. Here, again, challenges in compatibility can, over time, increase the potential of maintenance issues, and the most significant problem is downtime. When a maintenance challenge develops, the involvement of multiple vendors also increases the time and complexity of diagnosis. Resolving any issues could also demand the coordination of service teams from two or more vendors working together.

Meeting regulatory hygiene standards, including the automated availability of full process data, is another area where separation of hardware and systems has the

potential to introduce risk. Components may comply at an individual level but integrating separate vendor components into the process system or skid is likely to make it more challenging to validate as a complete hygienic unit. Moreover, the independent selection of vendors can complicate data management, whether this results from the software, communications protocols, or the measurement sensors themselves.

### **Project partner**

Unifying the mechanical, electrical and instrumentation, and automation aspects of a process or skid project under a single supplier can remove risks, optimise the capability of the system overall, and enable more efficient development. In practice, this means working with a project partner that has in-depth expertise across fluid control and automation, combined with in-house expertise to develop a full system.

Bürkert's Pharma Project Management (Pharma PM) team offers a central pool of expertise that can be positioned towards resolving a specific design challenge. The Pharma PM team allocates engineers to work with the original project team and provides assistance to all three areas of design. A local project manager is assigned responsibility for coordinating all aspects, similar to becoming an in-house – albeit temporary – member of the original team. This holistic approach provides project management support along with practical expertise and input towards design and documentation, including the development of step files, drawings, 3D models, simulations, and sizing tools for control valves.

### **Flexibility and time to market**

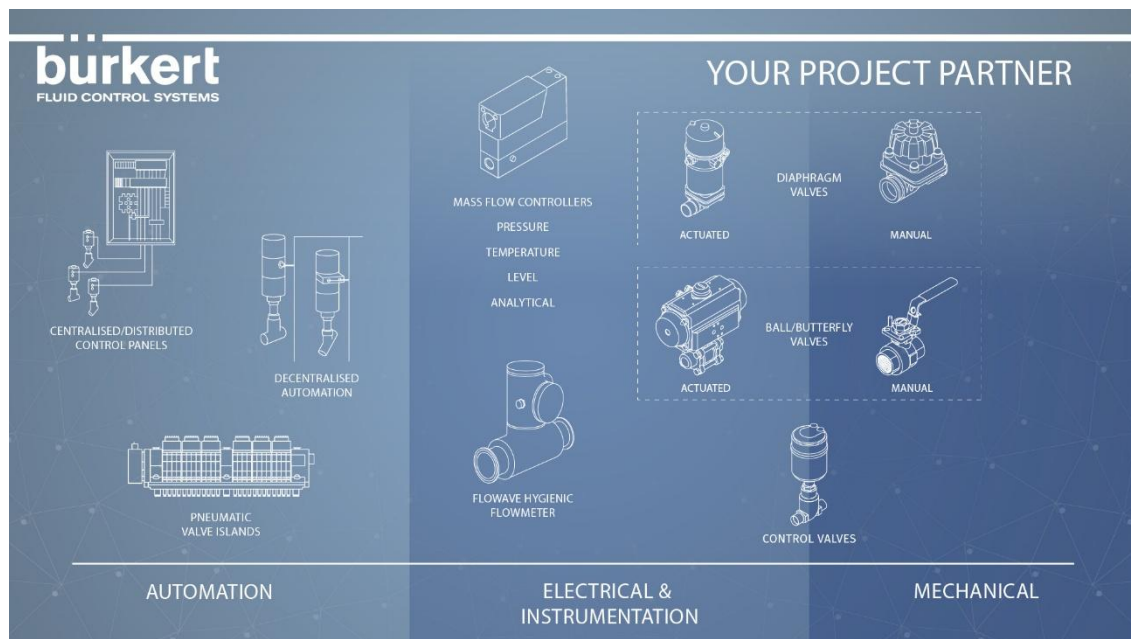
Ensuring a flexible system design is also a frequent requirement for pharma process and skid development, where processes increasingly require modular systems, adaptable recipes, and scalable production. Managing a project with a holistic

approach to the integration of valves, measurement devices, and control systems makes it significantly easier to build-in required flexibility.

Fast time to market is essential for any pharmaceutical development project, and any design adaptations can be quickly realised via a single supplier with the right expertise. Not only does a single partner enhance coordination in project delivery across the mechanical, electrical and instrumentation, and automation teams, but this approach also minimises the potential for compatibility challenges to arise later in the project.

Often, pharma process and skid development is as much about minimising risk as it is optimising performance. To deliver both aims, the project partner approach is nearly always the more secure choice.

[Find out more here.](#)

**Images & Captions:**

**Image 1:** Bürkert offers comprehensive process control integration for pharmaceutical applications.

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## About Bürkert

Bürkert Fluid Control Systems is one of the leading manufacturers of control and measuring systems for fluids and gases. The products have a wide variety of applications and are used within food & beverage, pharmaceutical and water industries as well as in medical engineering and space technology. The company employs over 3,700 people and has a comprehensive network of branches in 36 countries world-wide.

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