

Delivering on the requirement for ATEX control panels

Designing and building process control panels requires considerable experience and expertise, especially when they are destined for hazardous areas. These potentially explosive atmospheres, or zoned areas, are more common than you'd think, with applications spread across a number of industries from obvious ones like oil & gas to less well recognised areas such as food & drink or rail.

Bürkert is one of the few OEM manufacturers of large hazardous area Ex rated process panels and as such supplies engineering firms and end users as well as other panel builders and system integrators. This puts the company in an ideal position to define what makes an ATEX rated panel so different from a more standard item.

Safety, above all else

The primary emphasis for all equipment operating in a zoned area is safety; the identification of different zones categorises the risk and therefore the level of protection required to avoid danger. Any component or system that is to be used in a zoned area must meet the relevant standards and be installed by suitably qualified engineers in order for certification to be valid.

The task of designing process control systems that meet DSEAR, ATEX and other similar standards requires considerable levels of competence in order to deliver a suitably compliant process that meets the demands of the application. The primary concern in such conditions is safety and often this may need to be maintained at the expense of performance.

Designing and implementing efficient and reliable process control systems also requires an excellent understanding of the application. Manufacturers have developed a huge range of products and systems that can be combined and integrated to produce bespoke process control systems. However, when the application involves operating in potentially explosive atmospheres, designers could be forgiven for thinking that the choice of design might be restricted.

Many manufacturers of control components produce an 'ATEX' range or similar and several system integrators have the required expertise to create control solutions for zoned areas. The difficulty lies in creating a design that minimises the number of component suppliers and ensures compatibility between those that are selected.

In terms of the individual components, manufacturers spend considerable amounts of time and effort in producing products that are certified for use in particular applications under specific conditions. In situations where the requirement is simply for a replacement part, it is a relatively easy task to ensure continued compliance with the regulations.

However, when there is a more wide ranging project, such as modifying an existing control system or building a completely new one, the task of delivering a fully certified installation is more complex.

Centralised or decentralised

Many smaller systems and standalone equipment use a centralised control concept, which is based around a control cabinet that contains all of the necessary components to operate the control valves, including the PLC, network connections, input/output systems and valve islands.

In many cases, especially in larger facilities, working towards a decentralized system of process control can provide a number of benefits compared to the more traditional approach. This concept uses intelligent, pneumatically operated process valves at the field level which can be equipped with all the required automation components such as a pilot valve with manual actuation, electrical feedback units and optical status indication, field bus interfaces and even positioners and process controllers.

To bridge the gap between centralised and decentralized automation concepts, flexible pneumatic valve units and compact automation systems can be used. These units are typically wall-mounted directly inside small cabinets that can be installed close to the process in question. These small, pre-configured and standardised units eliminate the long runs to valves and field devices, and can be maintained easily.

Each and every client will have a unique scenario that requires the manufacturer of the control panel to take a very individual approach to the project. At Bürkert, a network of specialist design and manufacturing facilities, known as a Systemhaus has been in operation for several years. Their purpose is to deliver precise fluid control systems designed to meet very specific process requirements and regulatory standards.

The Menden Systemhaus maintains a very high level of expertise in delivering control cabinets for installations in potentially explosive atmospheres. From initial concept to on-site commissioning, a dedicated team is assigned to each project to ensure continuity and understanding of the project requirements are maintained.

Due to the multiple competencies within each team, it is possible to design compact, integrated solutions that often contain both electrical and pneumatic circuits and even fluidic connections as well. In this way it is possible to deliver a single control cabinet, minimising space requirements as well as all the equipment that will deliver the process control itself, which reduces commissioning time and improves final delivery.

Very often the theoretical design of a control cabinet for a zoned area is the simplest task, finding the components that will deliver the design in reality whilst also meeting the required ATEX or IEC-Ex standard can be more difficult. This is especially true for electro-pneumatic automation systems that are designed for installation in Zone 1, a product that is only available from a select number of manufacturers.

This system is particularly suited to decentralised process control tasks concerning fine chemicals, pharmaceuticals, cosmetics and oil & gas; it can be used for example to automate the filling of potentially volatile solvents, alcohol or lacquers. In these application areas, it is necessary to have a compact electro-pneumatic automation solution allowing integration of EEx ia rated pneumatic valves without additional wiring.

Systems such as this can only really deliver the expectations of the client if they are conceived, designed and manufactured by a single, dedicated team with the experience to appreciate the fine detail involved. Ideally, a dedicated team is assigned to each project, from initial concept to on-site commissioning, to ensure continuity and understanding of the project requirements are maintained.

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While many control panel manufacturers can develop designs, source components and assemble complete solutions, getting these tested and certified with all the necessary documentation can be a more difficult task. Some suppliers may need to develop additional partnerships in order to possess all the required skills to deliver a complete project, and this could lead to an extended project duration.

Clearly the overriding concept for process control within zoned areas is that of safety, but in today's market it is still possible to design and deliver efficient and compact systems that provide all of the control and precision required. The key is to understand the application and be able to deliver a control solution that will conform to the current standards.

Combining the technical knowledge of a component manufacturer, which has a wide range of products for use in zoned areas, with the expertise of a system designer allows a fully integrated and compatible solution to be delivered.

Photo Captions:

Photo 1: The Menden Systemhaus maintains a very high level of expertise in delivering control cabinets for installations in potentially explosive atmospheres.

Photo 2: Bürkert is one of the few OEM manufacturers of large hazardous area Ex rated process panels.

Photo 3: Combining the technical knowledge of a component manufacturer, which has a wide range of products for use in zoned areas, with the expertise of a system designer allows a fully integrated and compatible solution to be delivered.

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 by breweries and laboratories as well as in medical engineering and space technology. The company employs over 2,500 people and has a comprehensive network of branches in 36 countries world-wide.

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