

Whatever the industry or application, process control actuators are selected for precision and accuracy. They operate control valves to provide a level of consistency and reliability that only automation can provide.

Control valves are at the heart of process control: when operated by an actuator, they vary the flow of a liquid or gas in response to a variable such as flow rate, pressure or temperature. Modulating control valves are commonly used in process control systems and variable flow systems which require flow to be adjusted according to the process system's set point requirement. Process control actuators provide exact position control and continuous modulation and are therefore used within a wide variety of applications, including chemical production, food and beverage, mining, power stations and water sites. In oil and gas applications they can be found at wellheads, choke valves on shale gas installations and stroke adjusters on metering pumps. The high degree of precision provided by process control actuators can significantly reduce process variability, positively impacting on the quality of the product produced and the production capacity a plant can achieve.

ELIMINATION OF PROCESS VARIABILITY

Within process control applications that use a closed loop system, process variability is an extremely undesirable behaviour. It is a large contributor to poor control loop performance and is destabilising. The greater the precision, the greater degree of control that can be exerted over the process. This creates consistency. Process control actuators adjust frequently in closed loop control applications; they must remain consistent to ensure the final target output is always achieved. An example of the importance of process consistency, as provided by actuators, is industrial combustion (for example, within glassmaking). Here, the key requirements are operational efficiency and the elimination of process variability. A standard combustion process is monitored by sensors sending signals within the control loop to ensure the process is performing as expected.

An important feature of process control actuators is precise positioning performance capability. Rotork's CVA



A Rotork CVL actuator on an electrolysis skid

CONTINUOUS CONTROL

Process control actuators provide precision and repeatability, explains Nicola Curtis

precision modulating actuators, for example, can respond to a change in position that is almost instantaneous. Position control (using a 4 to 20 mA signal) provides up to 0.1% accuracy. For combustion, when the correct injection of fuel and air is controlled by the actuator, complete and efficient combustion is ensured. This complete combustion, producing an optimum level

of heat without leaving any unburned and wasted fuel, is key to reducing emissions, saving money and meeting regulatory standards. With actuators that eliminate process variability (designed and built to be on control loop applications), process applications such as industrial combustion are truly reliable and stable. For example, CVA actuators were installed on globe valves at an Asian fibreglass manufacturer

to provide accurate control of the ratio of natural gas and oxygen to melt raw glass in the furnace. The precision of the appropriate process control actuators allowed complete combustion, saving gas and oxygen.

IN CONTINUAL USE

There are many industries and applications that require process control actuators, largely because of the need for continual use. Appropriate flow control solutions should offer continuous, modulating control that can withstand the high demands of operating over an extended period without sacrificing accuracy and precision. Modulating control is not a simple on/off mechanism, but precisely controls the flow rate. Within food and beverage production, repeatable position control ensures repeatability and a product that has no variability. Creating a consistent final product that is the same, day after day, is a fundamental requirement within the industry. Rotork's CVA control valve actuators provide modulating and failsafe duties at a Coca-Cola Enterprises site in Wakefield, UK. They were chosen as part

of an upgrade from existing pneumatic actuators to reduce the cost of providing and maintaining an air supply. The actuators are used in production and clean-in-place operations.

HYDROGEN PRODUCTION

Process control is found within emerging energy systems. Global energy provision must move away from fossils fuels to meet international targets of reducing emissions. Alternative energy production, such as hydrogen, continues to grow in importance. Green hydrogen (that is considered completely emission free because it is fed by renewable energy and releases only water when burnt) can be produced through electrolysis, which requires process control actuators for precise control. The current relatively high cost of producing hydrogen means that production must be run smoothly and efficiently. Process

control actuators allow for the automation of the flow of water, hydrogen and any associated hydrocarbons in the electrolysis process; this precision is essential. Process control actuators in such an application have explosionproof certification (such as ATEX, CSA, IECEx) to guarantee safety.

Dedicated process control solutions are essential in applications that require continuous/modulating action, including within chemical production, water, food and beverage, power, mining and various oil and gas systems. Process control actuators provide repeatable, reliable performance to reduce or eliminate process variability and to ensure consistent and reliable results. ●



The CVA actuators are a popular process control solution

Nicola Curtis is with Rotork.
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