Achieve greater safety, reliability, and energy efficiency, along with easier operations and installations

Combustion Systems

Proven automation solutions and local expertise to help you overcome your toughest challenges.

EMERSON™

Outdated, inferior combustion systems cause difficult installations, demand constant maintenance, and are inefficient with natural resources.

Need to ensure safety, improve energy efficiency, reduce operating costs and mitigate downtime?

For industries such as oil and gas, commercial and industrial construction, food and beverage and hospital HVAC, there is high demand for superior combustion solutions that offer safety, reliability and energy efficiency. Fuel train installers must procure combustion valves and controls which enable the user to meet safety and energy efficiency standards, while ensuring reliability and optimizing operational cost and performance. OEMs, distributors, contractors and end users also face challenges in acquiring the necessary field devices from a single source supplier. Total cost-of-ownership is also affected by high maintenance frequency, installation time and labor-intensive steps.

Debris could damage fuel train devices and burner. Up to 20% annual heating cost savings if safety shut-off and control valves are properly maintained.
— ASCO industry research and guidelines

A burner consumes large quantities of fuel, whose price has been rising at an increasing rate since 1999. Even modest gains in overall efficiency can yield significant savings.
— Power Flame Inc. 2005

Boiler efficiency and energy/fuel consumption can account for a large portion of a plant's utility cost. Measures to improve boiler efficiency can bring about a significant improvement in your bottom line.
— Lathrop Trotter 2017

Increase safety and reliability, with precise flow control and greater energy efficiency.

A reliable, energy efficient system with reduced operational costs is a common goal across the worldwide combustion application market – so are more precise flow control, express delivery, lower installation costs, and easy installation/maintenance. As the global leader of gas train solutions, Emerson understands this. That's why we continue to demonstrate a commitment to this industry, offering you a complete solution, with global safety approvals, increased reliability, flow performance and easy-to-install field devices.

Operate with safety and reliability in mind, with robust and durable products

- Meet global industry standards and regulations – spanning UL, CSA, Factory Mutual, RoHs, CE and IEC
- Enable operations to run in the most demanding scenarios with low source pressure, in frigid temperatures, minimal power supply and for remote and hazardous locations
- Routinely test with easy to access pressure taps
- Reduce the risk of warranty repairs and maintenance calls

"The ability to control, monitor, and report—plus the worldwide supply of product—these are game changers. OEMs can put our solutions into any product going anywhere globally."
— Mark Hicinbothem, director, industrial business development at ASCO Valve, L.P., TopWorx, AVENTICS, TESCOM

Increase energy and operational efficiency to optimize resources and save cost

- Maintain low pressure drops with high flow ratings
- Control greenhouse gas emissions through ventless solutions
- Save fuel and meet fluctuating boiler demand with multi-position safety shut-off actuators
- Meet challenging requirements with components from a single-source supplier

"Emerson's Industrial Energy team helped overall boiler efficiency with up to a double-digit reduction in fuel usage and a significant drop in carbon levels in the ash. The boiler also operated more reliably."
— Engineering and operations teams, a multinational sugar mill

Easily install field devices perfect for retrofits and spatially constrained areas

- Routinely test with upstream and downstream pipe taps
- Increase accuracy and reliability
- Reduce the risk of warranty repairs and call-outs

Based on Emerson's research, ASCO™ valves provide more solenoid-operated combustion valves to the non-residential heating equipment market than any other supplier.

Emerson can help you overcome your reliability issues with a complete combustion system

Burner-boiler

Catalytic reactors

Gas generators

Heat exchangers

HVAC equipment

Incinerators

Industrial furnaces

Kilns and ovens

Regenerative thermal oxidizer

Thermal fluid heaters

Safety Shut-Off

Fuel shut-off in pipe trains and gas systems is a safety measure required by industry standards and regulatory bodies such as UL, CSA, FM, CE, ASME, NFPA. The ASCO range of solenoid and motorized combustion valves meets global safety requirements and offers high performance in flow and pressure. Learn more. ▶ p6

Pressure Regulation

Managing pressure is critical in combustion processes and fuel trains. The control of pressure will allow users to meet the required demand of heat needed for heating equipment and unit operation. Learn more. ▶ p10

Precise Flow Control

Air-to-fuel ratio and modulating flow control are adjustable through an entire range of pneumatic and electrically motorized ball, butterfly globe and angle seat control valves. Learn more. ▶ p8

Burner controls

Safe operation is achieved through Emerson's burner controls, flame scanners, oxygen probes and actuators for fuel valves. This control system executes burner management and entire start-up and shut-down sequences for fuel trains. Learn more. ▶ p12

Safety Shut-Off

Known for reliability and performance, Emerson offers an extensive range of ASCO™ safety shut-off valves. The ASCO Series 158 and 159 is a new-to-industry motorized safety shut-off valve, which offers global approvals, significantly higher flow ratings, easy configuration, decreased installation time and a monoblock offering. The ASCO product range also consists of motorized and solenoid safety shut-off, vent and pilot valves for multiple media (natural gas, oil type #2-6), along with specialty solenoid gas valves for low temperature and power applications.

What's your opportunity?

- Optimize on/off control with modular valve bodies that mount in any position
- Increase the performance of your entire combustion system with compact footprints and monoblock options
- Simplify maintenance with flow optimized disks that provide the maximum application flow

When you need to increase production efficiency and reduce downtime, Emerson has got you covered – for your complete combustion system.

ASCO valves are synonymous with safety, and our valves and actuators used for combustion systems are no exception. From the opportunity for routine testing with upstream and downstream pipe taps, to the improvement in flow, ASCO products are known to decrease in maintenance cycles. Improve your control and efficiency, all while enhancing product quality and throughput. Emerson has been providing solutions in this market for over 20 years, and now with the advent of global approvals we can continue to lead the industry in safety.

Services offered...

- An extensive distribution channel network that reaches around the globe
- A global express program with many ASCO products' SKUs having same-day / 5-day delivery
- Extensive product portfolio helps minimize the number of vendors managed

Featured Products

ASCO Series 158 & 159 Gas Safety Shut-Off Valve

Combustion safety shut-off valve that increases safety and reliability and enhances flow and control.

- Designed specifically for burner-boiler applications
- High flow rate creates highest BTU (kW) rating in the industry
- Ventless monoblock option simplifies installation and limits emissions

ASCO Series H117/H118/H137 Gas Safety Shut-Off Valve

Hydramotor® operated safety shut-off/control gas valves used for commercial and industrial burner applications.

- Rugged construction, with a cast iron valve body provides high flow and self-cleaning
- Watertight and explosion-proof enclosures
- Self-contained, hermetically sealed, pull-type electrohydraulic actuator
- Motor/pump unit immersed in oil, reducing wear and providing highly reliable operation

ASCO Series 215 Gas Safety Shut-Off Valve

Lightweight aluminum solenoid valve for high flow, low-pressure gas applications in hazardous atmosphere.

- Pilot operated construction works from zero pressure differential with resilient soft seating for tight shut-off
- Valve position feedbacks with highly reliable, long life, dry contact proximity switch
- Explosion-proof approvals with CCC, IECEx/ATEX, KOSHA, TS

ASCO Series 290 Gas Safety Shut-Off Valve

Angle body shut-off valve for gas fuel burners typically used within glass, steel and metal production, and industrial boilers or furnaces.

- Angled seat design provides high flow capacity, high pressure capability up to 10bars (145psi)
- Fast and repeatable closing times, long service life (tested for millions of cycles)
- EN 161 certified for use with fuel gas, suitable for harsh environments, oxygen and other complex media such as coke oven gas

ASCO Series 040 Gas Safety Shut-Off Valve

Highly reliable gas safety shut-off valves for pilot or main control of commercial and industrial gas burners found in generators, heating equipment, and ovens.

- Two-way, normally closed solenoid valve
- Provided with 1/8 inch NPT upstream and downstream pipe taps with plugs for routine testing
- Suitable for air, inert gas and natural gas

ASCO Series HV427 Gas Safety Shut-Off Valve

Low-temperature stainless steel solenoid-actuated fuel gas shut-off valves for industrial gas burners in harsh environments.

- Low power solenoid valve with robust construction providing consistent and reliable operation
- Resilient soft seating for tight shut-off and require zero minimum pressure differential
- Suitable for applications such as tank heaters, line heaters, incinerators and flare stacks

ASCO Series HOV1B/HOV13B Oil Safety Shut-Off Valve

Two- and three-way Hydromotor operated safety shut-off valves that provide reliable on-off control of fuel oil.

- Flexible two-piece actuator and body design
- Broad ambient temperature range
- Flexible field mounting allows installation in any orientation

ASCO Series 377 Fuel Oil Valve

Three-way solenoid valve allows diversion of flow from commercial and industrial oil burners to recirculatory system.

- Approved oil safety shut-off valve suitable for fuel oil up to 1500 SSU
- General purpose enclosure, brass body
- Normally open and normally closed options for 3/8 inch to 1/2 inch pipe sizes

Precise Flow Control

Precise gas flow is essential to maintaining stoichiometric balance and optimizing fuel usage. This is delivered through ball, globe, butterfly and angle body seat valves actuated though a range of solenoid operators, motors and drives. The ASCO Series 290 valve and Fisher™ easy-e™ Type Globe Control Valve are reliable products which enable customers to meet precise control of air, oxygen, butane, propane and other fuels.

What's your opportunity?

- Modernize and future-proof your system for the addition of Industrial Internet of Things
- Create energy efficiencies by collecting and processing real-time data about your combustion system
- Lower costs of materials and installation with precision (and control) over your system

Let Emerson help you ensure safety while maximizing fuel usage for your combustion system applications.

Increasing your cost savings by reducing fuel waste, and system downtime for unscheduled maintenance is paramount to continued success. With our integrated Plantweb™ solutions that are scalable and modular, Emerson can provide you with a single point of responsibility for products, documentation, and support. All of our products and solutions meet rigorous certifications and standards. For more information regarding specific product certifications for your region, our experts can help. Let's connect.

Services offered...

- Custom process control software to make sure we are the right fit for your process
- Integrated enclosure solutions – dedicated teams to help design, develop and deliver integrated solutions
- Patented technology to ensure tight control on fuel usage

Featured Products

ASCO Series 290 Proportional, Motorized or Pressure Operated Valves

Robust angle bodied piston valve provides proportional control and high-flow capability for a variety of applications including industrial heating equipment.

- Precise control of air, inert gas, light oil, aggressive liquids and gasses
- Motorized or pressure operated
- Compact and lightweight design, works silently
- Easy to use and install. Motorized version features auto-adjustment and auto-initialization when powered up

Fisher easy-e ET Globe Valve with 657/667 Pneumatic Actuators and DVC6200 Digital Valve Controller

High-performance, reliable and versatile control valve that is suitable for the majority of globe valve applications. Spring-opposed 657 & 667 diagram actuators provide dependable on/off or throttling operation of control valves. The 657 actuator is direct-acting, 667 is reverse-acting. Fieldvue DVC6200 digital valve controller ensures accurate flow regulation.

- More than 2.4 million easy-e valves installed in the field verify industry-wide acceptance of reliability and performance
- Application versatility reduces the complexity of parts inventory, training and service
- Provides quick responsiveness to large step changes and precise control for small setpoint changes

Bettis™ SCE300 Electric Actuator

Compact and lightweight intelligent all-in-one electric actuator for maintaining effective control of low-torque, quarter-turn valves and dampers.

- Highly configurable with variable speed and torque settings
- 35Nm to 2,000Nm output torque
- PROFIBUS and DeviceNet communications
- IECEx, IP66/68 or NEMA 4/4X/6 certifications

Keystone Series V30/V32 Butterfly Valves

High-performance butterfly valves provide effective, bi-directional sealing across a wide spectrum of service conditions.

- Factory testing of every valve at full shut-off rating insures tight shut-off
- Suitable for marine applications, third-party type approved by various major shipping class
- Long life durability due to double offset disc that minimizes seat wear

Pressure Regulation

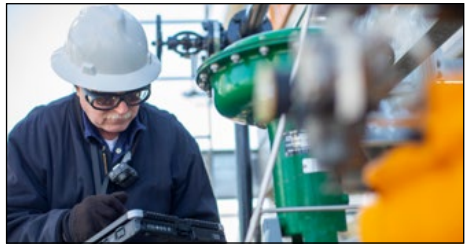
Monitoring and regulating pressure is critical to maintaining safe burner operation across a range of upstream fuel train pressures. Fuel gas regulators and pressure relief valves are positioned upstream of the safety shut-off valve. Emerson's Fisher 133 and 1098 regulators are utilized through a variety of industrial and district heating applications to deliver consistent, reliable pressure regulation.

What's your opportunity?

- Utilize products with compact footprints for tight space applications
- Maintain boiler efficiency and reduce downtime with advisory diagnostics and optimal accuracy

Let Emerson help you modernize your combustion systems

When it comes to valves – control, shut-off, pilot, pneumatic, motorized and more – and actuators, Emerson's range of products and solutions helps you meet the requirements of today's most challenging combustion system applications.



Services offered...

- An extensive distribution channel network that reaches around the globe
- Comprehensive, 24/7 on-demand technical support
- A one-stop shop for complete combustion system solutions

Featured Products

Fisher 133 Pressure Reducing Regulators

Direct-operated regulators ideal for industrial and commercial applications supplying gas to furnaces, burners, and other appliances. A balancing system enables the regulator to control gas pressure accurately for maximum combustion efficiency despite varying inlet pressures.

- Wide pressure range capability with single regulator
- Excellent shock characteristics and fast speed of response
- Bubble-tight shut-off, spring and diaphragm effects minimized

Fisher 99 Pressure Reducing Regulator

Gas regulator provides controlled pressure ranges and capacities for distribution, industrial and commercial applications.

- High accuracy and excellent low flow control
- High-capacity pressure control, up to 1000 psig/69.0 bar inlet pressures
- Tight shut-off and no atmospheric bleed
- Fast speed of response with quick dump bleed pilot

Fisher CS804 Pressure Reducing Regulator with Overpressure Protection

Direct-operated, spring-loaded pressure-reducing regulator with integral slam-shut provides safe and reliable solutions in a broad range of commercial and industrial applications.

- Highly configurable, fast-acting regulator that minimizes cost of ownership by providing a long service life and easy maintenance
- Integrated slam-shut protection shuts the gas supply off if there is an overpressure or underpressure condition, maintaining a safe system pressure and minimizing gas emissions
- Flexibility provided by numerous body sizes and end connections, outlet pressure settings and orifice sizes

Fisher 1098-EGR and 1098H-EGR Pressure Reducing Regulators

Providing economical and accurate pressure control in a wide variety of applications; natural gas distribution systems; fuel gas supply to industrial boilers, furnaces, ovens, and mixers; and large commercial/industrial establishments such as shopping centers and schools.

- Accurate control at pressure differentials as low as 1 psid / 70 mbar d
- Stable and accurate downstream pressure control regardless of load changes or inlet pressure variations
- Whisper Trim™ Cage option reduces noise by up to 30 dBa
- Top entry design enables easier maintenance. Trim parts can be inspected, cleaned and replaced without removing the body from pipeline

Burner controls

Burner controls are required to run burner management cycles, ensure a safe ignition process and fuel train start-up and shut-down. They also must run programmable modules to regulate supplied fuel and air flow, control damper and variable frequency drives in order to improve combustion efficiency and reduce emissions to the environment, as mandated by governments. Users can monitor metrics such as flame status, flow rates, pressure, oxygen level and shutoff valve position. ASCO™ 122 burner control system has high functionality and works reliably under harsh and hazardous environment.

What's your opportunity?

- Attain superior safety, reliability and efficiency for combustion
- Achieve quick installations and maintenance with pre-assembled, leak-tested, and calibrated solutions

Let Emerson help you optimize system performance, lower costs, and keep your systems safe.

When you build and ship your solutions all over the world, global approval helps simplify and streamline your manufacturing process. And fast delivery time is also essential. Whether your need a competitive total cost, high level of safety, or a single-source supplier Emerson can help—we're committed to the combustion category.

Services offered...

- Solving your toughest combustion system applications with a single solution for the entire fuel train
- Increase combustion efficiency and reduce emissions
- Modernize and automate your applications for higher performance and efficiency

Featured Products

ASCO™ P122AFL FlameLogic

FlameLogic is a compact, microprocessor-based primary flame safeguard control system designed to provide the proper burner sequencing, ignition and flame monitoring.

- Integrated with VPS (valve proving system) and POC (proof of closure) functions
- Supports Modbus-RTU communications via RJ45
- Allows operator to pause the program sequence in different positions
- Continuous flame monitoring with flame rod
- UV (ultraviolet) scanner and flame rod amplifiers are built into FlameLogic

ASCO™ P122AFM FlameManager

FlameManager is a linkageless controller with integrated flame safeguard for all types of liquid or gaseous fuel fired combustion systems.

- Configurable with 4 fuel profiles, 24 positions setpoints and 10 precise motors
- Real-time clock function to allow scheduled energy saving mode during off peak period
- Maintain a consistent fuel/air ratio
- Supports wide variety of flame scanner types
- Two independent VFD control channels with encoder inputs
- Cold start thermal shock protection limits mechanical stress

ASCO™ P122AFSAF Flame Scanner

Flame Scanner contains various infrared (IR) and ultraviolet (UV) scanners. All scanners can work with ASCO FlameLogic and FlameManager to create a complete combustion control system providing greater safety and reliability.

- High sensitivity IR and UV scanners
- Optional front or lateral (90°) fire viewing and different cable installation modes
- Optional microprocessor-based, full self-diagnostics and electronic self-checking integrated Ex flame scanners with LEDs status display

ASCO™ P122AFSA2 Oxygen Probe

P122AFSA2 oxygen probe is designed to be used with FlameManager and provides continuous oxygen concentration readings, allowing the FlameManager to trim the air or fuel motor to obtain optimum combustion efficiency.

- Continuous oxygen concentration probe
- Modbus-RTU communications

ASCO™ P122AFMAM Motor

P122AFMAM motors are precision actuators designed to be applied for fuel valves and air damper control on industrial burners.

- Accurate position control (0.1°)
- Modbus communication
- IP65 protection
- Suitable for use in Class I Division 2 hazardous location

ASCO™ P122AFMAD Touch Screen Display

P122AFMAD user interface provides the means to setup, monitor and display information from the P122AFMAN series controller and connected accessories. It provides screen interface for viewing and configuration of options parameters, including system commissioning.

- High resolution and user friendly HMI
- Available in Chinese language version
- Optional IP67 protection

A complete offering backed by the global leader in gas train solutions

Emerson's combustion systems allow you to handle greater burner efficiencies and higher flows in a wider variety of applications and solutions, regardless of geographic location. Our combustion systems are comprised of the best products in combustion – ASCO valves, actuators, Fisher regulators, DeltaV control systems, among others – with each solution focusing on innovation, safety, flexibility, and reliability.

Our ASCO automation solutions help maximize your efficiencies, while optimizing your applications. Our Fisher products offer highly reliable flow control technologies so you can regulate and isolate your processes with certainty. And as part of Emerson's Plantweb digital ecosystem, our DeltaV solutions help automate your systems with a modern solution – providing decision integrity in all of your combustion applications.

Plan & Design

- Producing with Certainty and Agility
- Online product & CAD configurators

Implement & Build

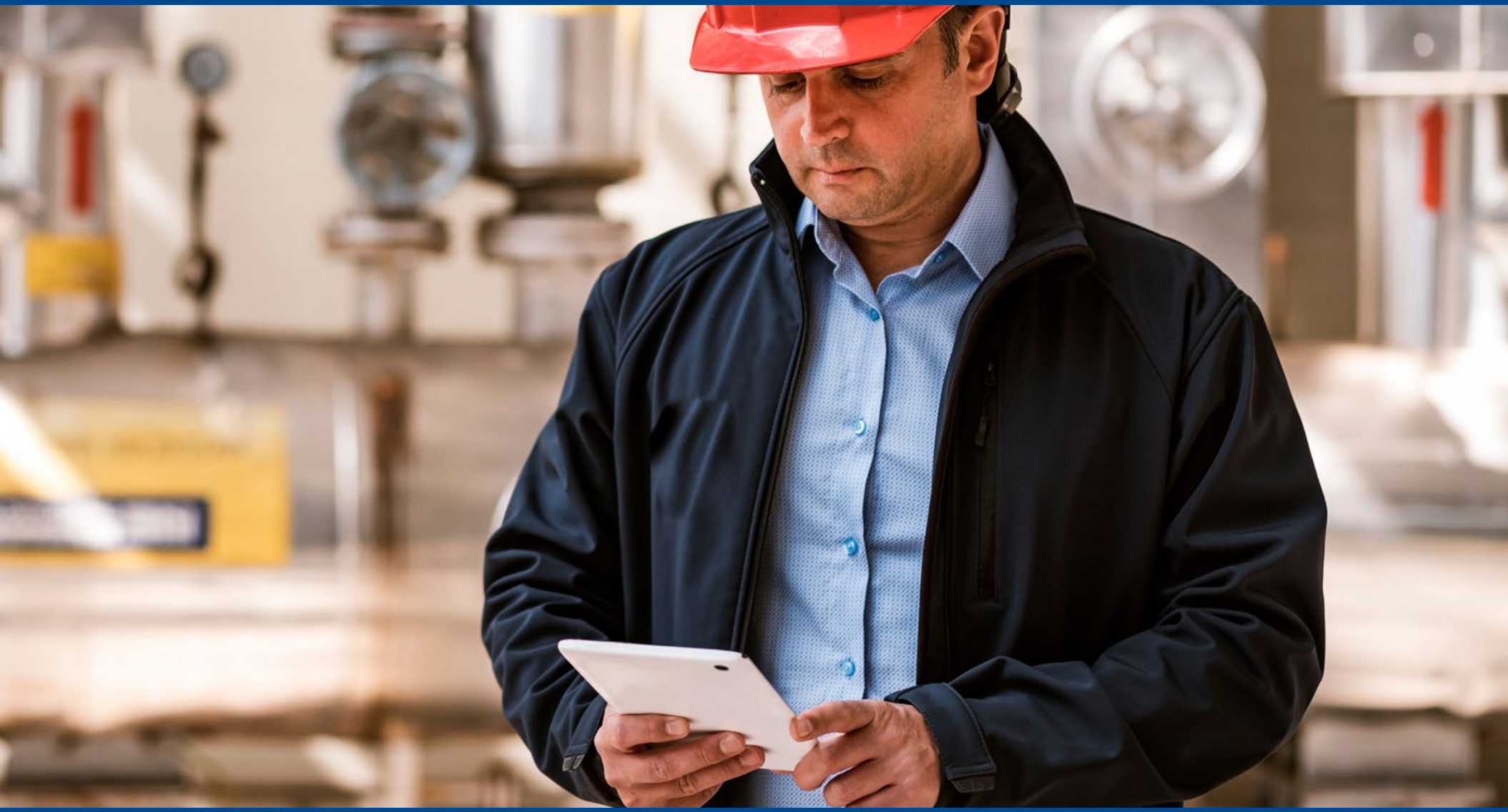
- Application-specific expert consultations
- Ready-to-install customized packages

Sales & Service Channels

- Extensive global channel network
- Technically-laden automation solutions experts

Education & Training

- Educational courses for product and technology enhancements
- Learning and training centers for workforce improvement



As a global leader in gas train solutions, we offer an exciting pipeline of innovation for even your toughest combustion system applications – whenever and wherever you need us most.

Get started

Where flow control meets pneumatics to create fluid automation solutions that maximize efficiencies, optimize applications, and enable customers to fulfill their true potential.

Our extensive product lines include a broad range of solenoid valves, angle body piston valves, valve manifolds, cylinders, filters, regulators, lubricators and accessories.

Your local contact: **Enquiries.AP@Emerson.com**

Emerson.com
Facebook.com/EmersonAutomationSolutions
LinkedIn.com/company/Emerson-Automation-Solutions
Twitter.com/EMR_Automation

WeChat Official Account:
EmersonASCO

BR000162ENUS-01_04-21

EMERSON™

CONSIDER IT SOLVED™