Valve Closure Systems
for Plug-Type Angle Valves
or Ball-Type Angle Valves

UniPro™ Pneumatic Valve Closure System

UniPro™ R Pneumatic Valve Closure System

UniPro™ LT Pneumatic Valve Closure System

UniPro™ QT Pneumatic Valve Closure System
Powell Valve Closure Systems for plug-type angle valves or ball-type angle valves

The UniPro™ Valve Closure System from Powell is today’s best available technology to prevent catastrophic releases during bulk transfer of chemicals. It is the only system on the market with the flexibility to accommodate dome sizes ranging from 20-ton bullet tanks to 90-ton railcars, along with the versatility to close virtually any plug-type or ball type angle valve.

The UniPro™ Valve Closure System operates even if AC power and air pressure are lost. With appropriate components in place, the system can be configured to close valves within 10 seconds in the event of a gas leak, car movement, security breach, fire alarm, seismic event or numerous other circumstances, effectively stopping the leak well before escaping gas becomes a hazard to those on-site or in the surrounding community.

The UniPro™ Valve Closure System is designed to stand alone as a complete system or to integrate or interface with unloading system components that may already be in place at the site. The basic system incorporates several components, each of which has been engineered, designed, and pre-assembled by Powell to ensure proper system performance and reduced installation time, labor, and material cost. Components of the system include:

- UniPro™ Pneumatic Actuator, available in standard and manual reversible versions for plug-type angle valves, as well as a unit for use on ball-type angle valves. The newest UniPro™ actuator is designed exclusively for use on low torque valves.

- A variety of valve adapters for high torque and low torque plug-type valves and various ball-type valves.

- A basic control panel to activate the UniPro™ System. Powell can also supply custom panels to control the automatic and pad gas valves, fume detectors, and a variety of other platform components.

- A Motion Detector Cable Reel with switch to trigger the UniPro™ Pneumatic Actuator to close the railcar valves in the event of rail car movement.

- A Hose Reel Assembly with 70 feet of hose and a spring-driven rewind reel with latching mechanism to maintain air supply to the railcar in the event of car movement.

- An Air Control Unit designed to supply the proper amount of clean, pressurized air or nitrogen to the hose reel.

- An Air Receiver Assembly to allow the UniPro™ System to function even if power or air pressure are lost. The unit can be designed to accommodate up to two railcars per assembly.
UniPro™ Valve Closure Complete System

The UniPro™ Valve Closure System is designed to stand alone as a complete system or to integrate and/or interface with unloading system components that may already be used at the site. Factors specific to the site such as the number of railcars, the number of loading and/or unloading stations, or type and amount of equipment currently installed will determine the final design of the engineered package. The components that would be used in a typical installation are described following. The number and type of components will vary for each application.
Standard UniPro™ Pneumatic Actuator for Plug Type Angle Valves

The Standard UniPro™ Pneumatic Actuator can accommodate plug-type angle valves on virtually any pressurized gas container with a dome size between 24 and 42 inches. The pneumatic actuator consists of a non-reversible multi-vane air motor. Which develops the power to close even the most stubborn valve in less than 10 seconds.

UniPro™ R Pneumatic Actuator for Plug Type Angle Valves

The UniPro™ Pneumatic Actuator is available in a reversible model that can be used to manually open and close plug-type valves. The actuator can also be left in place for automatic emergency closure.
UniPro™ LT Pneumatic Actuator for Plug Type Angle Valves

The UniPro™ LT Pneumatic Actuator is designed to operate low torque, plug-type angle valves found on top loading/unloading pressurized railcars and tankers. These low torque valves are manufactured by Descote, Beltech, Rego, Eagle America, Midland and others, and are often marked with warnings to operate by hand only. The UniPro™ Pneumatic Actuator is not intended for use on ACF valves - commonly referred to as “high torque” valves - or any other valves that require the use of tools in order to close and seat completely.

The UniPro™ LT Pneumatic Actuator uses the same system components as the standard UniPro™ and the UniPro™ Reversible Actuators. The UniPro™ LT has a total weight of 14 lbs making it a lightweight alternative to the standard UniPro™ Systems.

UniPro™ QT Pneumatic Actuator for Ball-Type Angle Valves

The new UniPro™ QT Actuator is designed to close 1/4-turn ball-type valves commonly found on top loading pressurized tank cars carrying various chemicals. The actuator is lightweight and small enough to fit in the operator’s hand. Several valve adapters are available for use with common valves. The UniPro™ QT Actuator uses the same system components as the standard UniPro™ and the UniPro™ Reversible Actuators.
UniPro™ Valve Adapters for Plug-Type Angle Valves

UniPro™ Torque Limiting non-sparking 4-spoke Valve Adapter.

UniPro™ Torque Limiting non-sparking 5-spoke Valve Adapter.

UniPro™ High Torque non-sparking 4-spoke Valve Adapter.

UniPro™ High Torque non-sparking 5-spoke Valve Adapter.

UniPro™ High Torque Valve Adapter.
**UniPro™ QT Valve Adapters for Ball-Type Angle Valves**

Jamesbury 5RRR and the UniPro™ QT Jamesbury Valve Adapter.

Jamesbury 5RNT and the UniPro™ QT Jamesbury Valve Adapter.

The Jamesbury Split Flange Valve and the UniPro™ QT Valve Adapter.

UTC valve and the UniPro™ QT Valve Adapter.

ACF valve and the UniPro™ QT ACF Valve Adapter.
**UniPro™ System Control Panel**

A basic control panel activates the UniPro™ System in an emergency, then stops the air supply after 15 seconds to prevent large volumes of air or nitrogen from being vented after the valve has been closed. Powell can also supply custom panels to control new or existing automatic chlorine and pad gas valves and chlorine detectors.

**UniPro™ Remote Emergency Stop Pushbutton Panel**

The UniPro™ Remote Emergency Stop Pushbutton Panel (E-Stop Panel) may be installed wherever convenient for operators to reach in an emergency. The operators can use the E-Stop Panel to remotely shut the railcar valves without approaching the railcar.

**UniPro™ Motion Detector Cable Reel with Switch**

The UniPro™ Motion Detector Cable Reel with Switch triggers the UniPro™ Pneumatic Actuator to close the railcar valves in the event of railcar movement. The Motion Detector Cable Reel should be installed within 10 feet of the railcar manway in a location that allows easy operator access. The switch included is UL rated for explosion proof service.

**UniPro™ Hose Reel Assembly**

The UniPro™ Hose Reel Assembly consists of a bottom wound spring-driven rewind hose reel with latching mechanism and 70 feet of hose. The Hose Reel delivers the air supply from the platform to the railcar dome. In the event of car movement, the hose follows the railcar to maintain air flow to the actuators.

**Air Control Unit**

The UniPro™ Air Control Unit is a group of components designed to work together to supply the proper amount of clean pressurized air (nitrogen) to the system. This equipment is preassembled for simple installation. The Air Control Unit is available in two sizes for large or small applications.
UniPro™ Air Receiver Assembly
The UniPro™ Air Receiver Assembly allows the UniPro™ System to function even if power or air pressure is lost. The unit can be designed to accommodate up to two railcars per assembly. Typically, the Air Receiver Assembly is mounted out of the way under a dock stairway. The Air Receiver Assembly attaches to the Air Control Unit.

Custom Control Panels
The UniPro™ Valve Closure System is available with standard relay logic controls panels, as well as control panels with programmable logic. Either control panel is a separate stand-alone unit that can be taken offline without affecting other control panels. A communication cable links each panel. In place of pilot lights and switches, the operator interfaces with the panel via the screen display. This updated panel configuration gives the end user flexibility to adapt the control panel if the architecture of the unloading system needs to be modified.

Gas Detection Equipment
Complete gas detection systems are available for chlorine, sulfur dioxide and other gases. A typical system consists of an 8 or 16-channel controller, universal transmitters, individual gas sensors and the equipment required to calibrate the system. The controller is wall-mounted in a NEMA 4X enclosure, which can be centrally located.

Chlorine Line Equipment
Chlorine Automatic Ball Valve Assembly With Limit Switch
This valve assembly consists of a 1” threaded ball valve with carbon steel body and Monel® trim combined with a fail closed (air to open, spring to close) actuator with position indicator. Note: 80 psi instrument air required. Used in pressurized vapor chlorine and line depressurizing applications. Specify preference of actuator mounting, parallel or perpendicular to piping.

Chlorine Transfer Hoses
Chlorine transfer hose supplied by Powell in constructed in accordance with The Chlorine Institute, Inc. Pamphlet 6 guidelines and Chemical Safety Board recommendations. Available in a variety of lengths to meet specific application requirements.
**Handlebar Union**

The Powell handlebar union is a 3000# ASTM forged steel plated handlebar union with a Viton® O-ring that allows for quick attachment of chlorine transfer hoses to stub pipes from tank truck angle valves. For longer product life, lubricate threads and Viton® O-ring prior to each use.

**Chlorine Pressure Gauge Assemblies**

The chlorine pressure gauge assembly consists of a 4½” - 30/0/300 pressure gauge mounted on a welded design diaphragm seal. Carbon steel upper housing with 1/2” NPT instrument connection tantalum diaphragm, nickel/chrome plated carbon steel lower housing on threaded seal or welded Hastelloy®C lower housing on flanged seal. Gauge face and seal is filled with halocarbon oil. Gauge assemblies are available in flanged and threaded.

**Chlorine Expansion Tank Assemblies**

Expansion tank assemblies are available in several sizes to accommodate a variety of applications. Each expansion tank is constructed from a 2000# DOT cylinder and features schedule 80 seamless carbon steel pipe with 3000# fittings. Each expansion tank assembly includes a standard 30/0/300 compound chlorine pressure gauge with threaded seal, 300# tantalum rupture disc, carbon steel rupture disc holder, companion mounting flange and all mounting hardware for installation. Designed in accordance with The Chlorine Institute, Inc. Pamphlet 6 guidelines.

**Windsock and Frame**

Orange windsock is constructed of high strength vinyl-impregnated nylon fabric. Frame has ball bearing swivel that is permanently lubricated. Dimensions are 18 inches by 5 inches long.
Recommended Spare Parts

**Handlebar Union Lubricant**

Inert grease (Chlorotrifluoroethylene) Recommended for use in chlorine service. 1-ounce tube, 1 lb. containers also available.

**Replacement Viton® O-Rings for 1” Handlebar Unions**

To extend life of O-ring, lubricate prior to use. Powell recommended lubricant is show below.

**Pipe Joint Thread Sealant and Lubricant**

Use when making any threaded pipe connection where chlorine is present. Use where oxygen, aggressive chemicals, or powerful oxidizers are present. 100-gram jar.

**Replacement Filter Element**

For regulator package filter. Replace annually or as needed.

**Filter Housing O-Ring**

For regulator package filter. Replace annually or as needed.

**Replacement Filter Housing Clamp**

For regulator package filter.

**Halocarbon Oil**

Some UniPro™ Pneumatic Actuators must be lubricated for proper operation. Halocarbon oil must be used when pneumatic actuators are operating in a chlorine environment.
Debris Screen
For use on UniPro™ Pneumatic Actuator for plug-type angle valves, located in air inlet of air motor.

Replacement 1/2” x 4’ Actuator Air Supply Hose
Connects UniPro™ Pneumatic Actuator to air supply. Includes all fittings.

3/16” x 2” Hitch Pin
To attach the valve adapter to UniPro™ Pneumatic Actuator.

Rupture Disc and Holder
Rupture disc is a 1” tantalum disc. 300 pound burst pressure. Rupture disc holder is 1” carbon steel. Mounts between two 300# flanges.
**Complete Line of Powell Equipment**

**Sodium Hypochlorite Process Systems**
- Process Systems: continuous, batch, skid-mounted batch
- Neutralization Systems: batch, continuous
- Sodium/Ammonium Bisulfite Systems: batch, continuous

**Complete Process Systems**
Complete process systems interfacing all components, including chlorine tank car unloading systems with chlorine detectors, Powell Chlorine Scrubber, Powell Chlorine Tank Car Padding System, Powell Continuous Bleach Plant, Powell Bleach Filter System, Powell Bleach Dilution System and all automatic process controls including tank level control systems. Powell Bleach Plant and Scrubber can also be integrated into the DCS system of a membrane cell plant.

**Bleach Filter Systems**
Filter Systems: 100, 200, or 300 square feet filter-aided bleach filter system, plate and frame filter press.

**Chlorine Containment & Handling Equipment**
- Emergency Scrubber: for 150-lb cylinders, 1-ton containers, and multi-ton bulk storage for a variety of pressurized gases.
- Equipment Scrubbers: stationary, portable
- Padding Systems: air, nitrogen
- Unloading Systems: tank car, tank truck

**Control Panels and Instrumentation**
- System Upgrade: for relay logic and older instrumentation and controls
- ORP Electrodes: ORP/pH control, flow, ratio, and level control
- Continuous Dilution Systems: bleach, caustic, HCl, methanol, sulfuric acid
- Gas Detectors: chlorine, sulfur dioxide, variety of other gases
Typical Platform Installation

Powell UniPro™ Valve Closure System Flow Diagram

System Flow Sheets and Diagrams
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