

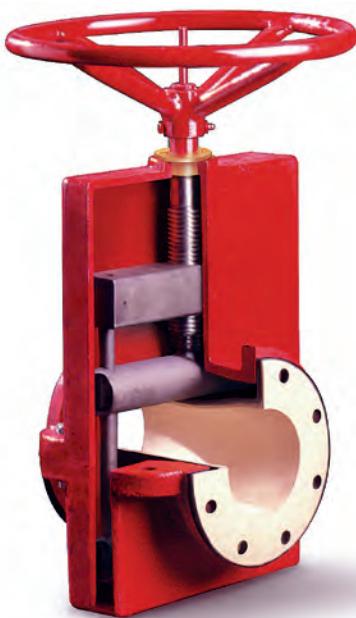
Red Valve

Valve Selection Guide for the Power Industry



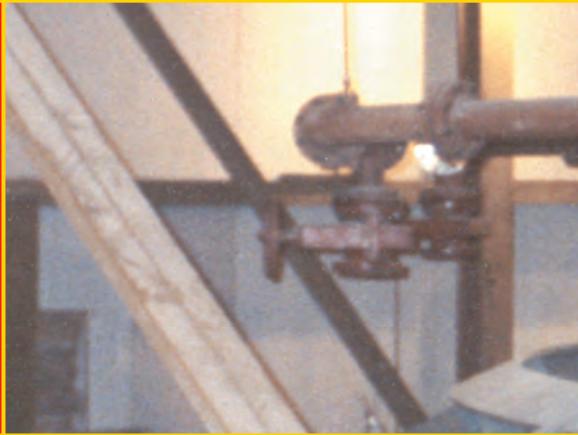
Red Valve: for the toughest

Series 75 Pinch Valve



- ▶ Reliable design provides years of trouble-free service
- ▶ Full-port opening allows maximum flow without clogging
- ▶ Self-cleaning pinch sleeve breaks up dewatered material
- ▶ Elastomer technology outlasts metal on abrasive applications
- ▶ Smooth centerline closure results in drop-tight sealing

Red Valve products are ideal for use throughout coal-fired power plants. With a high demand for long-term, reliable performance and low maintenance requirements, the power industry has looked to Red Valve for its slurry control products since the company's founding in 1953. Red Valve products have become the standard in power plants worldwide because they are the only valves that provide dependable, lasting service on tough applications like coal feed, ash, lime and slurry control.



Pinch Valves

Red Valve's Series 70 Manual Pinch Valve is an ideal replacement for plug and ball valves. The valve's full-ported sleeve is the only wetted part, eliminating packing replacement.



Flexgate Valves

Providing a bi-directional shutoff, Red Valve's Flexgate valve is designed with a stainless steel gate and two heavy-duty elastomer cartridge seats – ideal for difficult abrasive slurry applications.



Redflex® Expansion Joints

Red Valve's complete line of Redflex® rubber products includes ducting joints, expansion joints and rubber fittings in a variety of styles and materials.

t applications in the power industry

Red Valve Products Are Ideal for:

- ▶ SO₂ removal systems
- ▶ Raw-water intake
- ▶ Coal handling
- ▶ Bottom ash
- ▶ Fly ash
- ▶ Condenser box feed
- ▶ Water treatment/deionized water
- ▶ Lime feed
- ▶ Absorber towers



Series 75 Manual Pinch Valves on lime slurry feed lines

Pressure Sensors

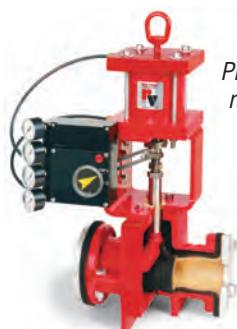
Providing a full 360° pressure reading,

Red Valve pressure sensors are the industry standard for protecting instrumentation and ensuring accurate, dependable pressure measurement.



Series G Knife Gates

Red Valve's Series G Knife Gate is fully 316-lined and available in sizes to 144". A resilient, elastomer seat is available for abrasive applications.



Control Valves

The Series 5200 Control Pinch Valve provides accurate, repeatable control on slurries. An elastomer sleeve is the only wetted part, for long-term throttling even on abrasive or corrosive material.

Take Control of Lime Slurry in Your Plant

Series 75 Manual Pinch Valves on scrubber system



Series 5200 Control Valves with cone sleeve trim on lime slurry; Pleasants Gypsum Plant



Pinch valves are the ideal choice for handling the abrasive and corrosive slurries created in Flue Gas Desulfurization (FGD) systems. Pinch valves are used on lime feed lines because they have an unparalleled ability to throttle lime slurry without plugging or scaling buildup.

Pinch valves also provide a positive, drop-tight shut-off, often eliminating the need for a second isolation valve.

With a pinch valve, all of the process is contained within the sleeve, preventing hardening or scale buildup of the lime slurry from hindering valve operation. Further, lime has a tendency to dewater and plug pipelines. The flexing action of a pinch valve will break up dewatered lime and prevent plugging.

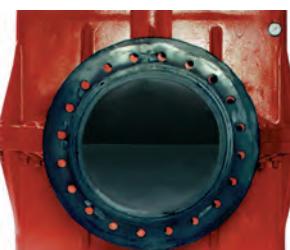
Manual pinch valves are commonly used on lime feed, hydrocyclone bypass lines and pump isolation. Manual pinch valves outlast stellite metal valves and trims 15:1 in absorber reagent, recycling and sump discharge applications.



Full-port opening



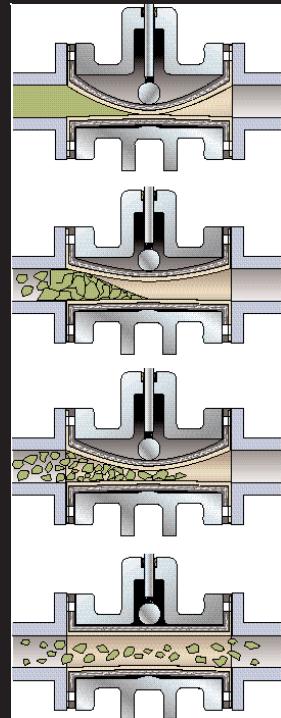
Centerline closure



Drop-tight seal

Red Valves Self-Clean

The pinch valve sleeve's flexing action breaks away any solid or dewatered slurry buildup. The full round port sleeve has no pockets for slurry to plug or erode.



The flexing action of the sleeve self-cleans, breaking up even dewatered lime.



Series 5200 Control Valve on recirculated lime

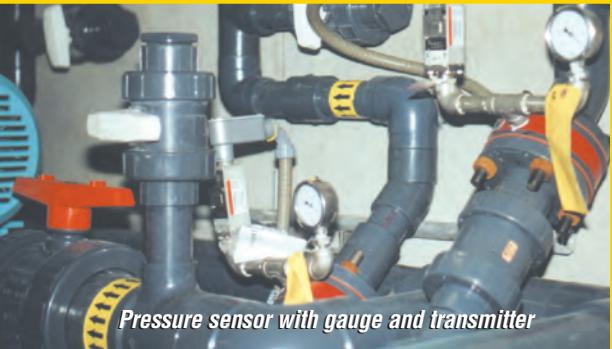
Our Flue Gas Desulfurization System



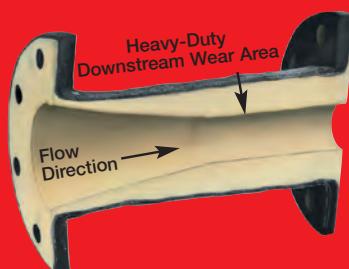
Control pinch valves incorporate Red Valve's patented cone sleeve trim to control the flow rate of lime slurry into the FGD system and on recirculation loops.

Where diaphragm or weir type valves last just a few months, Red Valve Pinch Valves with properly sized cone sleeves last for years. With additional wear rubber on the downstream side, Red Valve's cone sleeve provides optimal service life with minimized recovery inside the sleeve.

Red Valve manual and control pinch valves are also widely used on calcium sulfate, a byproduct of an FGD system. Calcium sulfate is then used as a synthetic gypsum for wallboard manufacturing. The process of dewatering scrubber sludge and adding fly ash or chemical drying agents is ideal for Red Valve pinch valves because of its accurate throttling ability.

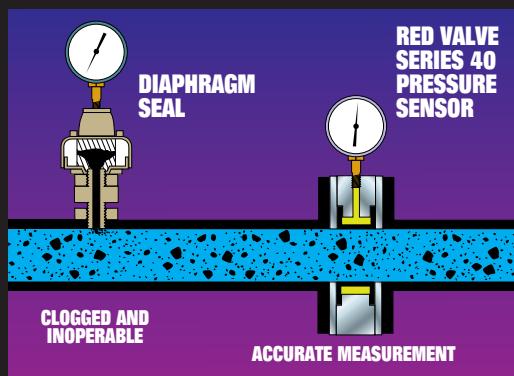


Cone Sleeve



Ideal for throttling control, Red Valve's cone sleeve trim creates a pressure drop designed to match the flow rate of the application. With additional wear rubber on the downstream side, Red Valve's cone sleeve provides optimal service life with minimized recovery inside the sleeve.

Pressure Sensors



Red Valve pressure sensors are non-clogging due to their full-port design. Pressure is measured along the entire inside diameter of the sensor, for accuracy under extreme conditions. The reliability of the Red Valve sensor makes it a popular choice for protecting expensive capital equipment.

Knife Gates on Fly and Bottom Ash



Hydraulically actuated Flexgate valve used for fly ash hopper isolation



Flexgates on bottom ash



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Series G

With cast iron body
lined with 316 stainless
steel, for high-tempera-
ture applications

Ash is the most abrasive application within a power plant. Red Valve pinch valves and knife gate valves are regularly used in fly ash service. Piston-actuated knife gate valves are used on transfer lines and for hopper isolation once the ash is shaken out into the precipitators.

The Series G Knife Gate has an economical cast-iron body with a stainless steel lining and gate that provide the performance of an all-stainless valve at a fraction of the cost. The Series G is available with a metal or resilient seat and can be operated manually, pneumatically or electrically.

Bottom ash systems most often use Red Valve's Flexgate Slurry Knife Gate. The Flexgate uses two elastomer seats to provide excellent wear resistance and bi-directional sealing. The replaceable seats act as a wiper to clean the gate during operation, thereby reducing packing wear.

Flexgates are often used in sluicing and slurry transfer lines to lagoons, and, when ash is used as an additive to cement, knife gates are used on dense phase conveying systems. Both knife gate styles are available in large-diameter sizes.



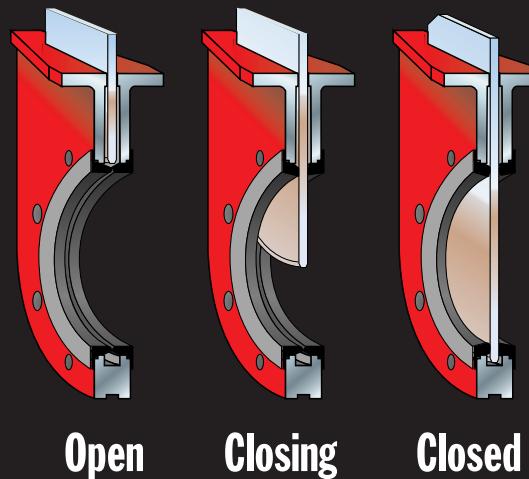
Flexgate

With bi-directional
elastomer seats



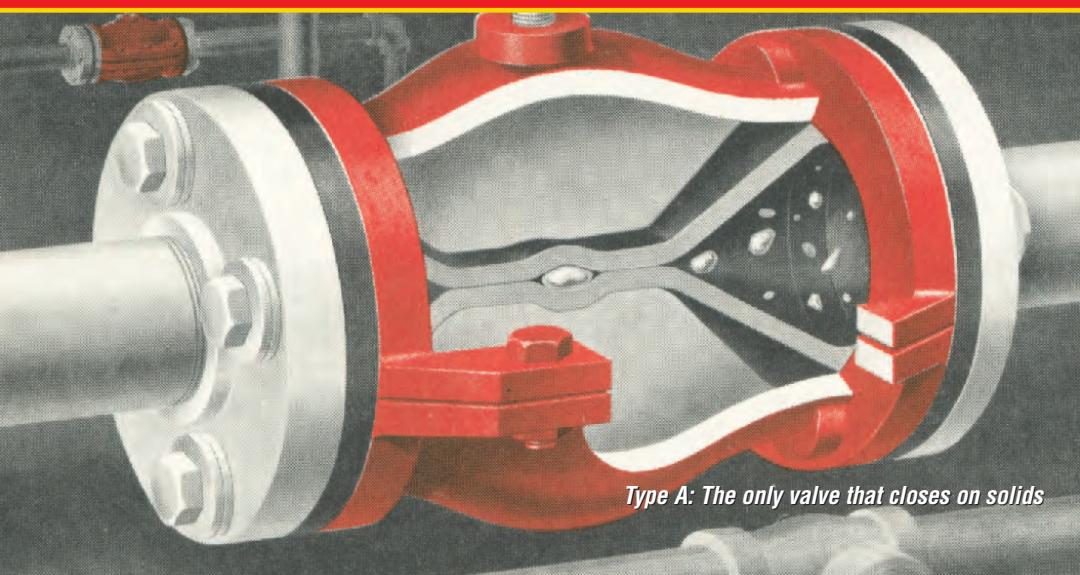
Limit switches indicate full-open
and full-closed.

Closing Action of the Flexgate Knife Gate Valve



A stainless steel gate passes through two heavy-duty reinforced rubber slurry sleeves. These sleeves provide a compression fit resulting in a drop-tight seal. When the valve is in the open position, the gate is completely removed from the flow path, eliminating any obstructions. In the closed position, the valve provides a bi-directional seal.

Coal Feed and Washing



Type A: The only valve that closes on solids

Red Valve Type A pinch valves are regularly specified for the conveying and injection of coal. The advantages of the Type A air-operated pinch valve are its full-port opening and abrasion-resistant pinch sleeve. The Type A was introduced in 1953 for use on the world's first coal slurry pipeline.



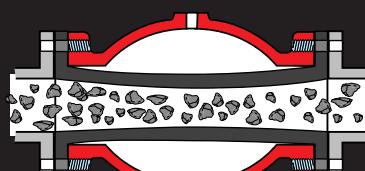
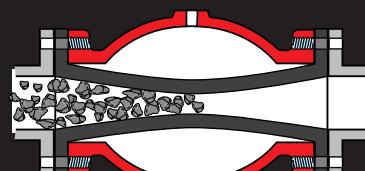
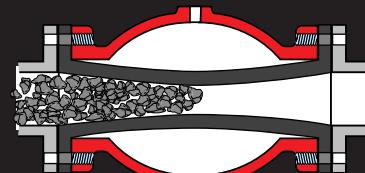
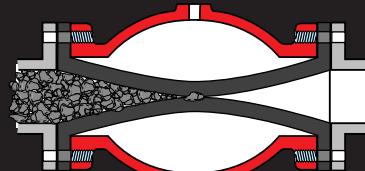
Type A controlling flow of bottom ash to settling ponds

Even at high velocities, the Type A Pinch Valve will outlast a metal-seated valve due to the durability of its elastomer sleeve. The resiliency of the sleeve reduces wear and allows the Type A to seal drop-tight on coal that is trapped in the sealing area.

The operation of the Type A is simple and reliable. The body functions as a built-in actuator, eliminating the need for pneumatic, hydraulic or electric actuators. Varying the pressure within the annular space between the body and the sleeve can open, throttle or close the valve. There are no sliding or rotating parts and no dead spaces where material can collect.

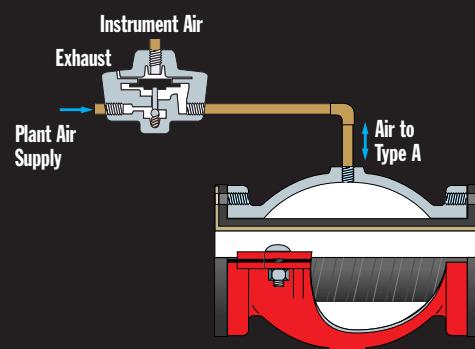
The Type A can also be used for open-loop control in non-critical, low-pressure-drop applications. With the addition of a proportional relay, the Type A Pinch Valve is an economical slurry control valve.

The Type A is ideal for use on slurry lines because of its full port, large sealing area and ability to break up solids.



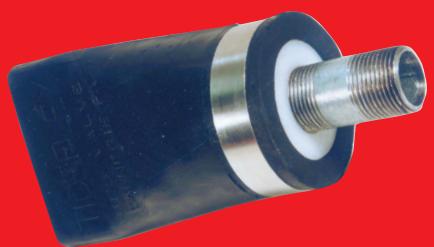
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Control Flow with a Type A

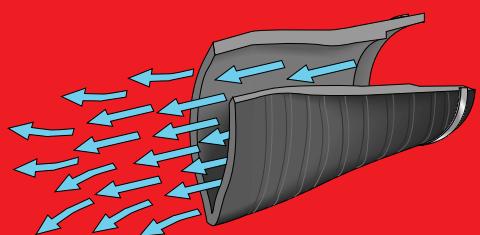


The Type A Pinch Valve makes an excellent, low-cost throttling valve. By using a booster relay, a 3-15 psi air signal can be used to modulate the valve. This arrangement eliminates both the costly external actuator and complicated positioner required by other control valves.

Wastewater Treatment and Aeration

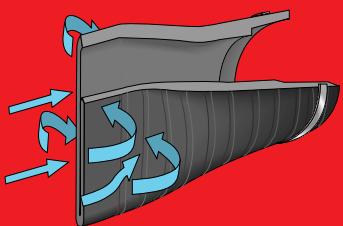


Tideflex® TF-A Coarse Bubble Diffusers feature a non-clogging Duckbill® design that provides superior mixing.



The TF-A opens with positive air pressure, and the variable-orifice design increases jet velocity of the discharged air to improve mixing.

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Reverse fluid pressure instantly seals the bill of the TF-A to prevent backflow and clogging of the air manifold.

Tideflex® Check Valve technology provides superior backflow prevention in many different areas of a power plant. For wastewater treatment, each Tideflex® air diffuser features an integral Tideflex® Check Valve and offers optimum aeration and mixing characteristics.

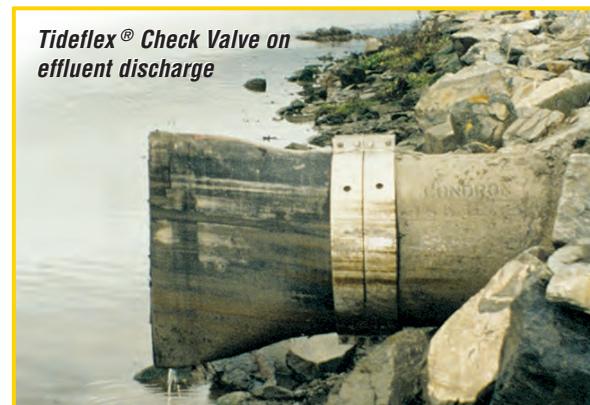
Tideflex® Coarse Bubble Diffusers are the only diffusers available on the market today that provide complete backflow prevention of sludge and slurry during zero airflow periods. The TF-A Diffuser is unique in that it can be installed in any angle and any elevation. This combination of non-clog design and flexible orientation allows for bottom installation (below the carrier pipe) against the tank floor to provide complete top-to-bottom mixing and ensure total solids suspension.

Red Valve's coarse bubble aeration systems are constructed of heavy-duty standard piping materials to withstand the high turbulence provided by the system. The systems are available in sizes 40 to 80 pvc, HDPE and stainless steel.

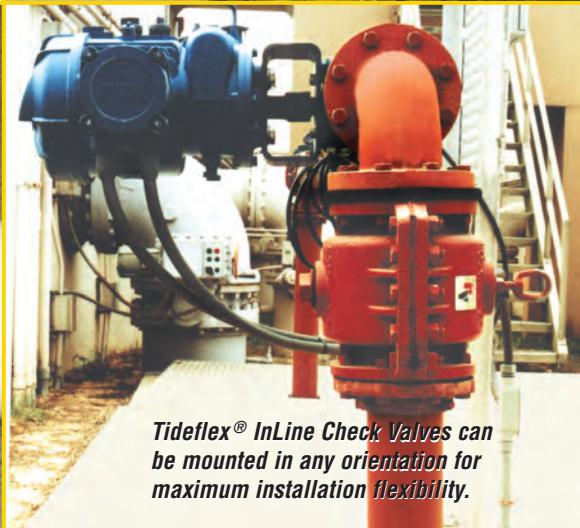
Tideflex® Check Valves are used on outfall lines, effluent discharge lines and throughout the plant in numerous pipelines to provide backflow prevention with low headloss. The 100 percent elastomer construction of the Tideflex® is resistant to abrasive wear and chemical attack. There are no levers, weights, hinges or springs to fail and nothing that requires routine maintenance or lubrication.

Tideflex® Check Valves are available in a range of sizes and a variety of styles, including end-of-pipe and inline installations. The unique Duckbill® design of the Tideflex® seals tight, even on entrapped solids, which is critical where leaves, twigs and sediment buildup can interfere with flapper-style check valves.

Tideflex® Check Valve on effluent discharge



Tideflex® coarse bubble duplex assembly with quick-connect removable saddle - octagon manifold configuration in circular digester tank



Tideflex® InLine Check Valves can be mounted in any orientation for maximum installation flexibility.

Raw-Water Intake and Discharge



The importance of a reliable raw-water intake valve has made Red Valve the manufacturer of choice for this application. Red Valve offers two styles of valves for this service: pinch valves and knife gate valves.

Series 5200 and 5400 Control Pinch Valves are ideal for raw-water intake. The resilient pinch sleeve isolates the valve body and operating mechanism from the process fluid, allowing for consistent, leak-free closure. Sticks, twigs and other objects

are present in raw water. Red Valve's full-port control valve seals drop-tight on entrapped debris. There are no seats or disks to impede valve operation.

Red Valve Series G Knife Gate Valves are used in clean and gritty water service. Constructed of carbon steel and lined with 316 stainless steel, Red Valve resilient-seated knife gate valves provide drop-tight shutoff.



Large-diameter Series G Knife Gate Valve

Cooling Water Discharge



Multi-port Tideflex® Diffuser line

Cooling water discharge is regulated in the U.S. by the NPDES and by similar regulations elsewhere. The common goal of these regulations is to minimize the environmental impact of the discharged cooling water. 8

The primary concern is how much the temperature of the discharged water will increase the temperature of the surrounding river or lake. A secondary concern is the amount of chemical additives present in the discharge water, such as those used to reduce corrosion.

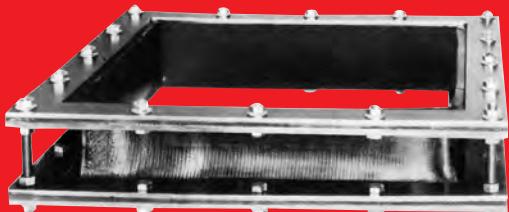
Red Valve's Diffuser Systems have been used around the world to overcome these concerns easily and economically. Diffusing the heated water over a larger area greatly reduces the thermal impact. Chemicals are also more widely dispersed and quickly carried away with the current to minimize their impact.



36" 5400E Influent Flow Control Valve

Custom-Designed Ducting and Flanged Expansion Joints

Redflex® Ducting and Expansion Joints are used throughout a power plant in a variety of applications:



Redflex® Expansion Joints are available in a variety of sizes and styles to meet any need.

- ▶ **Flue gas**
- 9 ▶ **Combustion air**
- ▶ **Aeration**
- ▶ **Intake air**
- ▶ **Gas recirculation**
- ▶ **ESP / Fly ash**
- ▶ **Primary air**

Redflex® is your single source for elastomer joints and fittings:

- ▶ **Ducting joints**
- ▶ **Expansion joints**
- ▶ **Elbows**
- ▶ **Rubber pipe**
- ▶ **Vibration pipe**
- ▶ **Reducers**

Red Valve's Redflex® division offers a complete line of square, rectangular, circular and custom ducting joints. We offer a choice of arch styles to match the movement requirements of each particular installation. Custom back-up rings in galvanized or stainless steel are available, or, the joints can be supplied with a slip-on connection and stainless-steel mounting clamps.

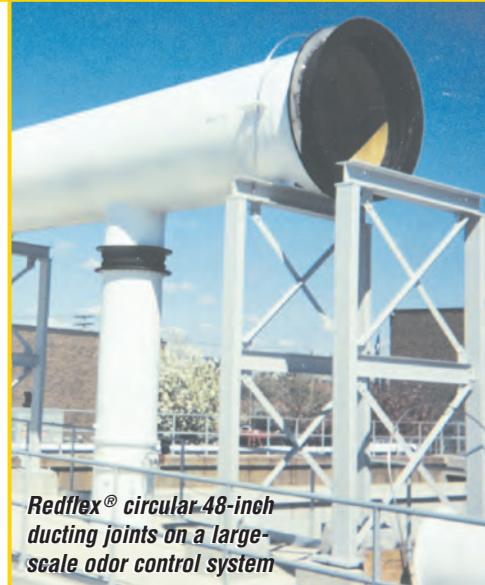
Our ducting joints are available in a variety of elastomers to match chemical and temperature requirements:

- ▶ **EPDM** (max. temp. 300°F)
- ▶ **Chlorabutyl** (max. temp. 300°F)
- ▶ **Neoprene** (max. temp. 250°F)
- ▶ **Viton®** (max. temp. 400°F)

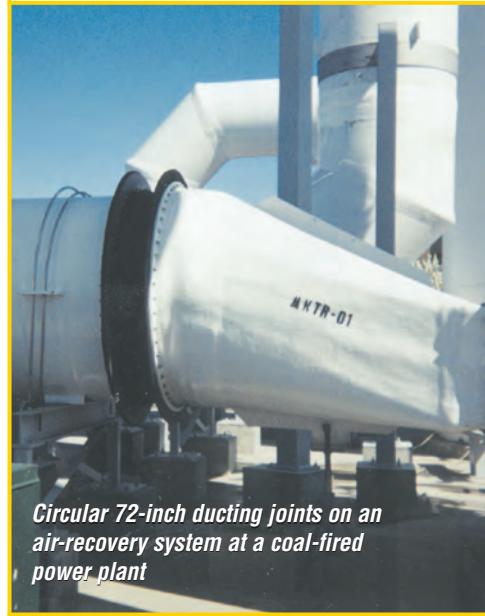
Redflex® Expansion Joints are also used throughout condenser and cooling water systems due to significant thermal expansion and contraction. Custom reducers and dimensions are available for recycle slurry pumps, absorber recycling and atomizer feed vibration reduction.

Like all Red Valve products, the Redflex® line is designed to handle the toughest dry ash and slurry-handling applications.

Redflex® Ducting Joints are a popular choice for blower systems. This gas recirculation system uses a 60-inch rectangular and a 60-inch round ducting joint.



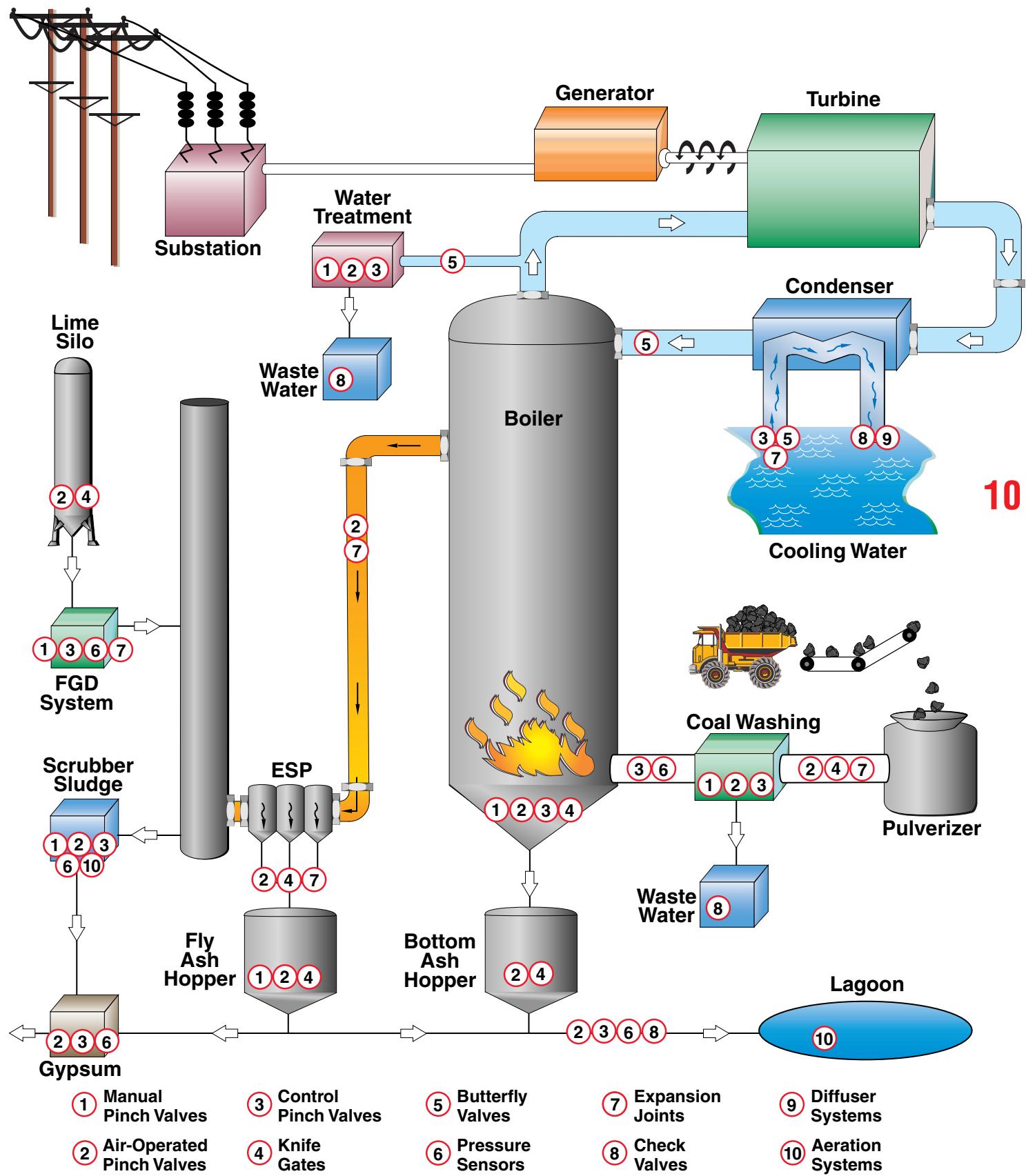
Redflex® circular 48-inch ducting joints on a large-scale odor control system



Circular 72-inch ducting joints on an air-recovery system at a coal-fired power plant



Red Valve Provides the Total Solution for the Power Industry



A Complete Line Of Quality Products . . .



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RECYCLABLE
PAPER

RVP 5/08



Expansion Joints

Manufactured to 96" in diameter, Redflex® expansion joints, reducers, rubber pipe, vibration pipe and rubber fittings are the industry standard.



Knife Gates

Red Valve's Flexgate Slurry Knife Gate is a heavy-duty, bi-directional valve engineered for operator dependability, low maintenance and excellent abrasion resistance. Red Valve's Series G Knife Gate is fully 316-lined and available in sizes to 144".



Pressure Sensors

Providing a full 360° pressure reading, Red Valve Pressure Sensors are the industry standard for protecting instrumentation and ensuring accurate, dependable pressure measurement.



Pinch Valves

Red Valve's Series 75

Manual Pinch Valve has the same face-to-face as gate, plug and ball valves. The valve's full-port sleeve is the only wetted part.



Mr. Spiros G. Raftis, founder
of Red Valve Company

Control Valves

Red Valve's large-diameter influent control valves are ideal for wastewater treatment plants. Benefits include a full-port, no hang-up design and accurate control.