

# Red Valve

Pressure Sensors and Diaphragm Seals



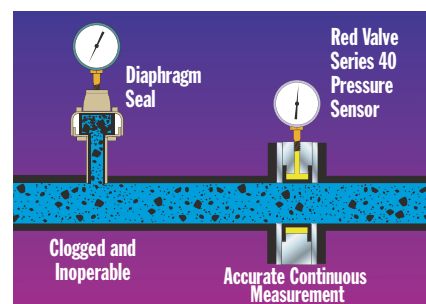
# Pressure Sensors

- ▶ **Protect and Isolate Instrumentation from Process Line**
- ▶ **Ensures Accurate, Reliable Pressure Readings**
- ▶ **Self-cleaning, Flexing Action**
- ▶ **Won't Clog Like Traditional Diaphragm Seals**
- ▶ **Excellent for Filter Systems and Pump Protection**



Red Valve's complete line of pressure sensors and diaphragm seals isolate and protect instrumentation from the process line and provide accurate, repeatable pressure measurement of slurries and corrosive fluids.

Reliable, accurate pressure readings are often difficult, or even impossible to obtain on pipelines carrying slurries, solids or chemical process slurries. For example, slurries and chemicals can clog and foul conventional bourdon tubes in gauges, preventing effective pressure sensing.



**The Series 40 Pressure Sensor won't clog on slurries like traditional diaphragm seals.**



Red Valve's complete line of pressure sensors are factory filled and calibrated with various customer-specified instrumentation including transmitters, pressure switches, gauges, vacuum gauges and capillary tubing in all domestic and international units of measure.



# Series 40

- ▶ **Protects and isolates instrumentation**
- ▶ **Full 360° pressure reading**
- ▶ **Self-cleaning, flexing action**
- ▶ **Won't clog like traditional diaphragm seals**
- ▶ **Excellent pump protection**



## Materials of Construction

- ▶ **Body (non-wetted) available in Carbon Steel or 316 Stainless Steel**
- ▶ **ANSI B16.5 class 150 flanges in Carbon Steel, 316 Stainless Steel, Teflon®-coated Carbon Steel**
- ▶ **Sleeves available in Pure Gum Rubber, Neoprene, Chlorobutyl, Buna-N, Hypalon®, Viton®, EPDM, white food-grade elastomers, Teflon®-coated Buna-N or Teflon®-coated Viton®**
- ▶ **Fill fluid: silicone oil (400° F), water (200° F), vegetable oil (230° F)**

## DIMENSIONS SERIES 40

Size D	Outside Diameter A	Length F to F	100° F Working Pressure (psi)**	Weight (lbs)
1"	4-1/2"	1-7/8"	275	6
1-1/2"	5"	1-7/8"	275	8
2"	6"	1-7/8"	275	12
2-1/2"	7"	1-7/8"	275	16
3"	7-1/2"	1-7/8"	275	18
4"	9"	2-1/8"	275	27
5"	10"	2-1/4"	275	32
6"	11"	2-1/4"	275	37
8" *	13-1/2"	2-1/2"	275	58

\*Larger sizes up to 36" available.

\*\*Higher working pressures available.

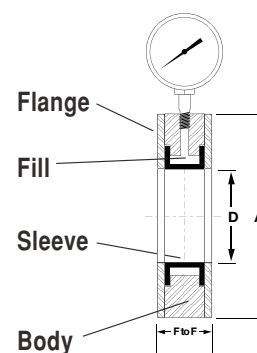
Red Valve Series 40 Pressure Sensors are the industry standard for protecting instrumentation and ensuring accurate, dependable pressure measurement of slurry and corrosive fluids.

The line pressure is sensed 360° through the flexible rubber sleeve. The captive fluid is displaced through the pressure sensor body to the instrument's Bourdon tube. All instruments are isolated and protected from the process, assuring positive and accurate readings.

The full-faced, thru-bolted Series 40 installs directly inline. Costly installation and maintenance of pipe stands and saddle welds, which are required when installing antiquated diaphragm seals, are eliminated.

The thru-bolted Series 40 can be mounted in any flow direction, submerged in a tank or mounted with a blind flange as a dead end to monitor tank levels. Thru-bolt holes allow positive alignment.

The Red Valve standard gauge is bottom mounted, with a 2-1/2" diameter steel case; accuracy of this gauge is  $\pm 1\%$  of the installed instrument. A 0-100 psi gauge is furnished as standard unless otherwise specified. Other ranges are available at no extra cost. All Red Valve pressure sensors and gauges are tested and calibrated through the mid-range to assure the highest level of accuracy. Pressure gauges, transmitters, transducers, recorders, differential pressure or vacuum switches are factory filled and mounted to the Series 40.



# Series 48

- ▶ **Wafer design reduces costs**
- ▶ **Protects and isolates instrumentation**
- ▶ **Fits ANSI 150 and 300 flanges**
- ▶ **Lightweight design**



Red Valve's Series 48 Pressure Sensor protects and isolates instrumentation, eliminating plugging and fouling that can occur in slurry and hard-to-gauge liquid applications. The economical Series 48 is designed to fit inside the bolt pattern of the pipe flanges, allowing for ease of installation and reducing the size of the unit. Series 48 Pressure Sensors are designed to fit Class 150 and 300 flange drilling, DIN or BS NP10 piping systems.

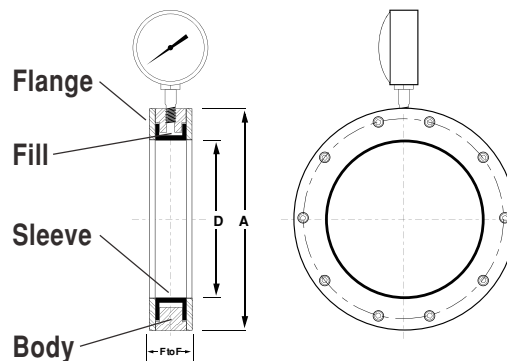
Reliable, accurate instrument ratings are often difficult or even impossible to obtain in pipelines carrying slurry, solids or chemical process. Standard diaphragm seals are vulnerable to plugging by debris or deposits and only give a pressure reading from one small area. With the Series 48, these problems are eliminated.

The principle of operation is that line pressure is sensed through a flexible rubber sleeve which is a full 360° circumference of the pipe I.D. The captive fluid is displaced through the Series 48 Pressure Sensor body to the instrument's bourdon tube. All instrumentation is protected from the process, which ensures accurate, repeatable readings.

4

## Materials of Construction

- ▶ **Carbon Steel, 316 Stainless Steel body**
- ▶ **Flanges: Carbon Steel, 316 Stainless Steel, Teflon®-coated Carbon Steel**
- ▶ **Sleeves available in Pure Gum Rubber, Neoprene, Chlorobutyl, Buna-N, Hypalon®, Viton®, EPDM, white food-grade elastomers, Teflon®-coated Buna-N or Teflon®-coated Viton®**
- ▶ **Fill fluid: silicone oil - consult factory for other fluid options**



## DIMENSIONS SERIES 48

Size D	Outside Diameter A	Length F to F	100°F Working Pressure (psi)*	Weight (lbs)
2"	4"	1 <sup>7</sup> / <sub>8</sub> "	720	3
2 <sup>1</sup> / <sub>2</sub> "	4 <sup>3</sup> / <sub>4</sub> "	1 <sup>7</sup> / <sub>8</sub> "	720	5
3"	5 <sup>1</sup> / <sub>4</sub> "	1 <sup>7</sup> / <sub>8</sub> "	720	6
4"	6 <sup>3</sup> / <sub>4</sub> "	2 <sup>1</sup> / <sub>8</sub> "	720	9
6"	8 <sup>5</sup> / <sub>8</sub> "	2 <sup>1</sup> / <sub>4</sub> "	720	12
8"	10 <sup>7</sup> / <sub>8</sub> "	2 <sup>1</sup> / <sub>2</sub> "	720	16
10"	13 <sup>1</sup> / <sub>4</sub> "	2 <sup>3</sup> / <sub>4</sub> "	720	22
12"	16"	3"	720	25
14"	17 <sup>5</sup> / <sub>8</sub> "	3"	720	50
16"	20"	3"	720	60
18"	21 <sup>1</sup> / <sub>2</sub> "	3"	720	70
20"	23 <sup>3</sup> / <sub>4</sub> "	3"	720	80
24"	28 <sup>1</sup> / <sub>8</sub> "	3"	720	115
30"	34 <sup>5</sup> / <sub>8</sub> "	3"	720	150
36"	41 <sup>1</sup> / <sub>8</sub> "	4"	720	248
42"	47 <sup>1</sup> / <sub>8</sub> "	4"	720	319
48"	54 <sup>3</sup> / <sub>8</sub> "	4"	720	392

\* Higher working pressures available.

# Series 42/742 Diaphragm Seal

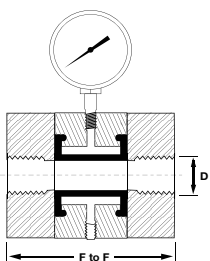
- ▶ **Series 742 can be flushed or rodded clean without removal from line or assembly**
- ▶ **Protects and isolates instrumentation from chemical or slurry plugging**
- ▶ **Lower installation and operating costs**



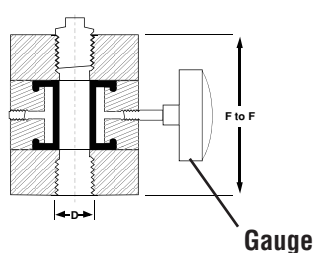
## Materials of Construction

- ▶ **Body and Flanges available in Carbon Steel, 304SS, 316SS, Carpenter 20, Kynar, Kynar-coated Steel\*\*, Titanium, Acetal Homo Polymer PVC, or CPVC**
- ▶ **Teflon®-coating is available on all metal plate materials**
- ▶ **Sleeves available in Pure Gum Rubber, Neoprene, Chlorobutyl, Buna-N, Hypalon®, Viton®, EPDM, white food-grade elastomers, Teflon®-coated Buna-N or Teflon®-coated Viton®**
- ▶ **Standard fill fluid: silicone oil (400°F)**  
Optional fill fluids: ethylene glycol & water (200°F), vegetable oil (230°F), mineral water (200°F)  
Consult factory for other fill fluid options

Series 42



Series 742



## DIMENSIONS SERIES 42/742

Size D	Length F to F	100°F Working Pressure (psi)*	Weight (lbs)
1/2"	27/8"	720	5
1"	33/8"	720	6
1 1/2"	33/8"	720	15
2"	33/8"	720	20

\* Higher working pressures available. PVC unit has working pressure of 200 psi.

\*\*All other materials available in plate can be substituted for body and flange materials.

Red Valve's Series 42 Pressure Sensor and Series 742 Diaphragm Seal isolate and provide accurate instrument reading of gauges, transmitters and pressure switches - making them ideal for use in chemical or slurry service. The Series 42 and Series 742 can be mounted in any flow direction and have threaded ends manufactured to standard NPT pipetap dimensions for smaller pipelines. The principle of operation is simple. As process pressure is sensed by the 360° elastomer sleeve, the captive fluid transfers the process pressure to the instrument, providing a consistent and accurate reading.

The Series 742 offers a significant advantage over traditional diaphragm seals. When installed perpendicular to the pipeline, the Series 742 can be isolated so that in the event of plugging, the elastomer slurry ring area which isolates the instrument, can be flushed (Figure 1) or rodded clean (Figure 2).

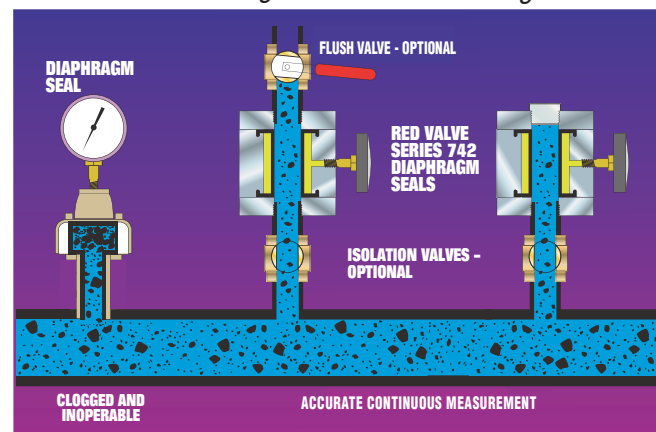
Series 42 Pressure Sensors and Series 742 Diaphragm Seals are available in sizes 1/2" through 2". The Series 42 features a top-mounted gauge, while the Series 742 is supplied with a standard back-mounted gauge. A complete Series 742 Diaphragm Seal, including optional isolation ball valve, is available for immediate delivery.

5

**The only diaphragm seal that can be flushed without removal from the line.**

Figure 1

Figure 2



# Series 40W/Series 48W

- ▶ **No wetted metal parts**
- ▶ **No gaskets required**
- ▶ **Non-clogging, protects instrumentation**
- ▶ **Bolt through design - positive alignment, secure connection**



**6** Series 40W



Series 48W

## Materials of Construction

- ▶ **ANSI Class 125/150**
- ▶ **Body available in Carbon or Stainless Steel**
- ▶ **Sleeves available in Pure Gum Rubber, Neoprene, Chlorobutyl, Buna-N, Hypalon®, Viton®, EPDM, white food-grade elastomers, Teflon®-coated Buna-N or Teflon®-coated Viton®**

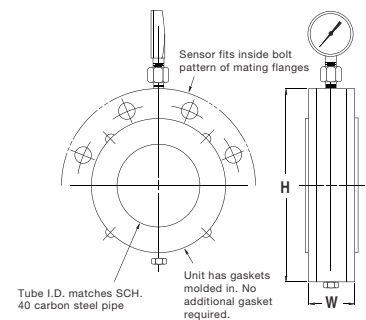
The Series 40W and 48W Pressure Sensors isolate and protect instrumentation. The full-port design eliminates clogging, ensuring accurate pressure measurement under the most difficult conditions. The elastomer sleeve senses pressure 360° around the inner circumference of the unit, overcoming problems like plugging and fouling of traditional diaphragm seals.

Combinations of elastomers and sensing fluids provide an operating range of -20° F to +400° F. Standard units are rated at 300 psi operating pressure and 450 psi surge pressure. All areas exposed to the process media are elastomer covered, therefore eliminating the need for exotic metals in some applications. Depending on the type of media being handled, elastomers can be specified to offer the best combination of chemical and abrasion resistance characteristics. The elastomer sleeve extends to the full face of the flange, eliminating the need for additional gaskets.

## DIMENSIONS SERIES 40W

Valve Size	H	W
1"	4-1/2"	1-7/8"
1-1/2"	5"	1-7/8"
2"	6"	1-7/8"
1-1/2"	7"	1-7/8"
3"	7-1/2"	1-7/8"
4"	9"	2-1/8"
6"	11"	2-1/4"
8"	13-1/2"	2-1/2"
10"	16"	2-3/4"
12" *	19"	3"

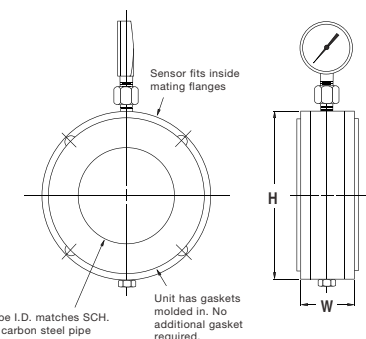
\*Larger sizes up to 36" available.



## DIMENSIONS SERIES 48W

Valve Size	H	W
1"	2-1/2"	1-7/8"
1-1/2"	3-1/4"	1-7/8"
2"	4"	1-7/8"
1-1/2"	4-3/4"	1-7/8"
3"	5-1/4"	1-7/8"
4"	6-3/4"	2-1/8"
6"	8-5/8"	2-1/4"
8"	10-7/8"	2-1/4"
10"	13-1/4"	2-13/16"
12" *	16"	3"

\*Larger sizes available upon request.



# Series 45 Tank Level Control

- ▶ Exclusively designed for storage tanks
- ▶ Ensures accurate tank level readings
- ▶ Protects and isolates instrumentation
- ▶ Won't clog like traditional diaphragm seals



## Materials of Construction

- ▶ ANSI Class 125/150
- ▶ Body available in Carbon or Stainless Steel
- ▶ Sleeves available in Pure Gum Rubber, Neoprene, Hypalon®, Chlorobutyl, Buna-N, EPDM and Viton®

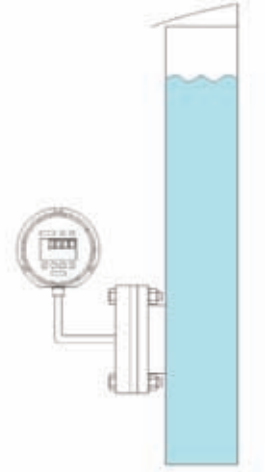
Red Valve's Series 45 Pressure Sensor with digital instrumentation is especially designed for tank level control and indication.

The Series 45 flange is available in the size of any existing blind flange outlet (2" thru 12"), making it ideal for direct mounting to existing flange outlets on storage tanks.

It is ideal for storage tanks, handling raw sewage, paper stock, oil, storm water, chemicals, etc. because it is non-clogging.

Digital instrumentation allows the operator to remotely read tank level, control pump level and fill tanks fully without spillage, thus increasing the total storage holding capacity of a tank or series of tanks.

Digital accuracy brings a new level of control for tank level, both direct and remote. It permits digital input to your PLC, computer or system controller.



# Series 44 Food Sensor

7

- ▶ 100% full-port design; no voids or crevices
- ▶ Protects and isolates instrumentation
- ▶ Accurate, dependable pressure readings
- ▶ Quick-disconnect end connections



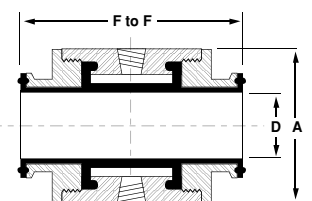
## Materials of Construction

- ▶ Type 316 stainless steel body with sanitary end connections
- ▶ Sleeves available in white food grade Buna-N, Chlorobutyl, Neoprene, Viton® and EPDM
- ▶ Fill fluid: vegetable oil (standard) or silicone oil

Reliable, accurate instrument readings are often difficult or even impossible to obtain on slurry pipelines carrying tomato skins, seeds, pharmaceutical powder, beans, etc. With the Series 44 Pressure Sensor, line pressure is sensed 360° through the flexible rubber sleeve.

With the Series 44 Food Grade Pressure Sensor, the flow media is isolated by the food grade elastomer sleeve, which extends around the tri-clamp ends. This full-length extension eliminates any plugging, pockets or voids that may occur. The standard liquid fill, vegetable oil, is kept to a minimum so that the pressure reading is not affected by the temperature.

The Series 44 is available in sizes 1/2" to 3" and allows for easy installation and disassembly for cleaning.



## DIMENSIONS SERIES 44

Size	Port D	Length F to F	Outside Diameter A	Pressure (psi)	Weight (lbs)
1/2"	0.462"	4-9/16"	2-1/2"	250	2-1/4
3/4"	0.462"	4-9/16"	2-1/2"	250	2-1/4
1"	0.875"	3-13/16"	3"	250	3-1/4
1-1/2"	1.375"	3-13/16"	3"	250	4
2"	1.890"	3-13/16"	3-1/2"	250	5
3"	2.875"	3-13/16"	4-1/2"	150	7



## Accessories

### Quick-Disconnect Instrumentation

Can be equipped with a dry disconnect fitting between the sensor body and the instrumentation, allowing gauges to be easily removed without removing the sensor or shutting down the line. New instrumentation can be snapped into place with only minimal loss of accuracy, allowing pressure sensor to be kept in service until a shutdown can be scheduled.



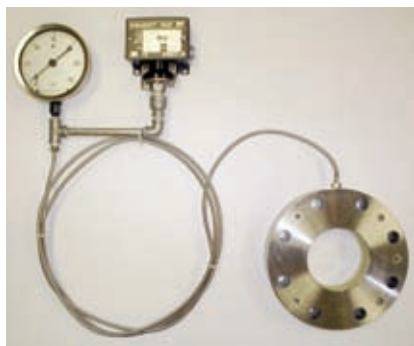
Red Valve pressure sensors can be supplied with a wide range of instrumentation - including gauges, transmitters and switches. Two different instruments can be mounted to the same gauge. Options include snubber/dampers, isolation valves and capillary tubing for remote mounting of the instrument

## Remote Reading Instrumentation

### Capillary Tubing

Red Valve pressure sensors are available with capillary tubing and any combination of instrumentation.

Capillary tubing allows remote pressure reading or switch setting.



You can mount a variety of instruments on a Red Valve pressure sensor furnished with capillary tubing - from a single gauge (2-1/2", 3-1/2", 4", 4-1/2", 6", etc.) to a SPDT switch, two SPDT switches, a transmitter or a gauge and a switch or a transmitter. Options include isolation valves, snubbers/pulsation dampeners, quick disconnects, etc.

Red Valve recommends up to a ten foot length of capillary tubing. Contact your Red Valve representative for more information.

## Digital Instrumentation

### Digital Accuracy in a Multifunctional Instrument

The new digital devices offer expanded features not found on standard instruments - including full scale digital accuracy to  $\pm 0.25\%$ , several body styles with IP65 enclosures, stainless steel socket, vacuum and positive scale readings (compound), large/easy to read five-digit characters in a 4.5" display, bar graph, ten selectable measurement scales, easy programming and maximum pressure capabilities, to name only a few.



With these instruments you can choose either one or 2 SPDT switches or a transmitter to extend your options to shut down a pump or transmit pressure readings for the optimum in system control. They can be powered by loop, battery or 12-36 vdc supplies.

## Specifications

### Series 40 Pressure Sensors

The specification covers pressure sensors and gauge isolator devices designed for isolating pipeline flow media from a gauge or instrument. The sensor shall be bolted directly into ANSI flanged pipelines. Face-to-face shall be no greater than a wafer style butterfly valve. Flanged sensors shall be faced and have thru-bolt holes to ensure positive alignment to the pipeline. The outside diameter of flanged sensors shall be the same as the mating pipe flange.

The inside of the sensor shall provide uninterrupted flow. There shall be no dead spots or crevices, and flow passage shall make the sensor self cleaning. The pressure sensor shall measure pressure for 360° around the full inside circumference of the pipeline.

The sensing sleeve shall be retained by the sensor body, with no rubber exposed to the mating flanges. Pressure shall be transmitted to the gauge by a locked in and sealed fluid. The sensor shall have an auxiliary tapped and plugged port to allow filling. Pressure sensors shall be factory filled, calibrated and tested at mid range.



# Applications

## Wastewater Treatment

Red Valve pressure sensors are used for such applications as sludge, raw sewage, grit, lime and carbon. A sensor with a transmitter may be used on positive displacement pumps to shut down the pump if pressure is lost. On filtration systems, a sensor can be used to detect when a filter needs to be replaced.

## Chemical Industry



A wide range of elastomers are available to meet any chemical compatibility need, making Red Valve pressure sensors well suited for use in processing salts and other highly corrosive chemicals. Red Valve pressure sensors are also very effective on low micron particle slurries, which usually clog traditional gauges and saddle-type diaphragm seals.



## Pulp and Paper Mills

Pulp and paper mills contain numerous slurry applications. Pressure sensors are used in lines with pump liquors, fibers, carbonate slurries, digester pulp, wood chip slurries, lime and lime mud, salt cake, in soda recovery and on the discharge side of clarification pumps.

## Mining

Common mining applications for pressure sensors are mine tailing lines, lime pumping, in acid baths and on the discharge side of peristaltic pumps. The sleeve's flexing action prevents the build up of solids in the sensor, allowing accurate and repeatable readings.

To review the complete Red Valve product line, request catalogs and locate your authorized representative anywhere around the globe, visit...

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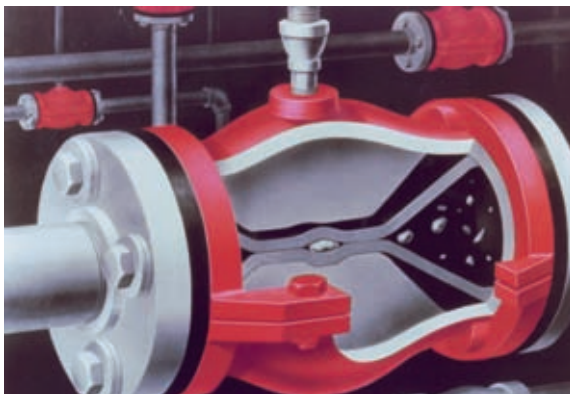
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# A Complete Line Of Quality Products . . . From Red Valve Company



First introduced by Red Valve in 1953, the Type A Pinch Valve is the most economical automatic valve on the market for handling corrosives, abrasives, slurries and other hard to handle process fluids.



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Red Valve's 5200 Control Valve - offering maximum durability with precise control.



Red Valve's Flexgate Slurry Knife Gate Valve 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".



First introduced by Red Valve, the Type A Miniflex and Megaflex Pinch Valves are the most economical large- and small-diameter automatic valves on the market today.



Redflex® expansion joints, reducers, rubber pipe, vibration pipe and rubber fittings are the industry standard.



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.



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