



Red Valve Company, Inc.®

REDFLEX® Smart Expansion Joints

Installation, Operation, and Maintenance Manual



The Red Valve Smart Expansion Joint uses a unique construction to electronically sense when the expansion joint has worn to the point where it needs to be replaced. An associated alarm module monitors the condition of the expansion joint and provides visual indication of expansion joint status. A green light indicates the alarm module is energized and the expansion joint is good. A red light indicates the alarm module is energized and the expansion joint has worn through to the point that it should be replaced. A test button on the alarm module is used to check all wiring and connections to the expansion joint in addition to the alarm module circuitry. The process fluid must be an electrical conductor for proper operation. Water, water-based slurries, and many other liquids are suitable conductors.

The Redflex® product line is used in applications such as Wastewater treatment facilities, Power plants, Mining, Chemical plants, and Pulp and Paper mills. Redflex® Expansion Joints and rubber fittings are manufactured in sizes up to 108".

IMPORTANT

Please take a moment to **review this manual. Before performing any maintenance on this product be sure the pipeline has been de-pressurized.** The improper installation or use of this product may result in personal injury, product failure, or reduced product life. Red Valve Co., Inc. can accept NO liability resulting from the improper use or installation of this product. If you have any questions or problems, please call the customer service department at (412) 279-0044. We appreciate your comments. And thank you for choosing Red Valve.

GENERAL DESCRIPTION



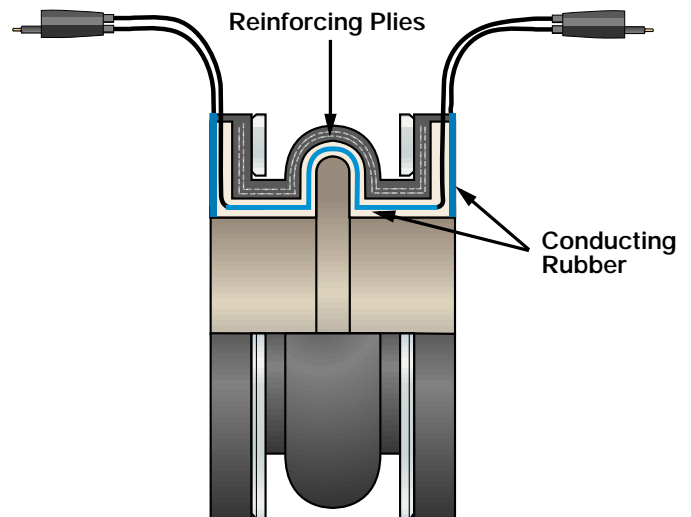
The Red Valve Smart Expansion Joint uses a unique construction to electronically sense when the expansion joint has worn to the point where it needs to be replaced. An associated alarm module monitors the condition of the expansion joint and provides visual indication of expansion joint status. A green light indicates the alarm module is energized and the expansion joint is good. A red light indicates the alarm module is energized and the expansion joint has worn through to the point that it should be replaced. A test button on the alarm module is used to check all wiring and connections to the expansion joint in addition to the alarm module circuitry. The process fluid must be an electrical conductor for proper operation. Water, water-based slurries, and many other liquids are suitable conductors.

INSPECTION OF PRODUCT

Inspect the Expansion Joint and Alarm Module for damage. Pay particular attention to be sure the lead wires and connectors on the expansion joint are not damaged and the connectors are not contaminated with oil, dirt, grease, etc. The Alarm Module circuit detects the leakage resistance in the joint when the process fluid contacts the conducting rubber through a damaged joint. External contamination at the connector(s) can cause false indication of sleeve failure.

EXPANSION JOINT CONSTRUCTION

One layer of conducting rubber is encapsulated between two layers of insulating rubber. This layer of conducting rubber is tubular in shape and extends the full length of the expansion joint and 360° around the bore but is insulated from the bore. Each flange face is also covered with a layer of conducting rubber which extends into the bore and is in direct contact with the process fluid. At each end of the expansion joint a pair of insulated, waterproof electrical lead wires connect to the conducting rubber tube and the conducting rubber flange face. If the expansion joint wears through to the tubular conducting layer, the process fluid completes an electrical path and the alarm module light changes from green to red.



INSTALLATION

Install the expansion joint as described in the Redflex® Rubber Expansion Joint IOM. Be careful not to damage the lead wires or connectors during the installation process. Do not remove any protective coverings on the connectors until ready to mate the connectors with the Alarm Module or an extension cable. Select a location with a solid base to mount the Alarm Module. The Alarm Module should be mounted as close as practical to the expansion joint to minimize the need for extension cables. Plug both connectors on the ends of the lead wires into the Alarm Module connectors. Either lead can go into either Alarm Module connector. The use of a food grade silicone spray on the connectors is acceptable, if necessary to reduce the insertion force. Use an absolute minimum of silicone spray. If the lead wires are not long enough to reach the Alarm Module, extension leads are available in lengths of 1-1/2, 3, 5, and 8 feet. Plug the power

cable into a 120 vac electrical outlet. After a few seconds, the green light should illuminate, indicating normal operation. Press and hold down the test button. The red light should illuminate. Release the test button. After a few seconds, the green light should illuminate again. If operation is not as described in this paragraph, refer to the troubleshooting section for assistance.

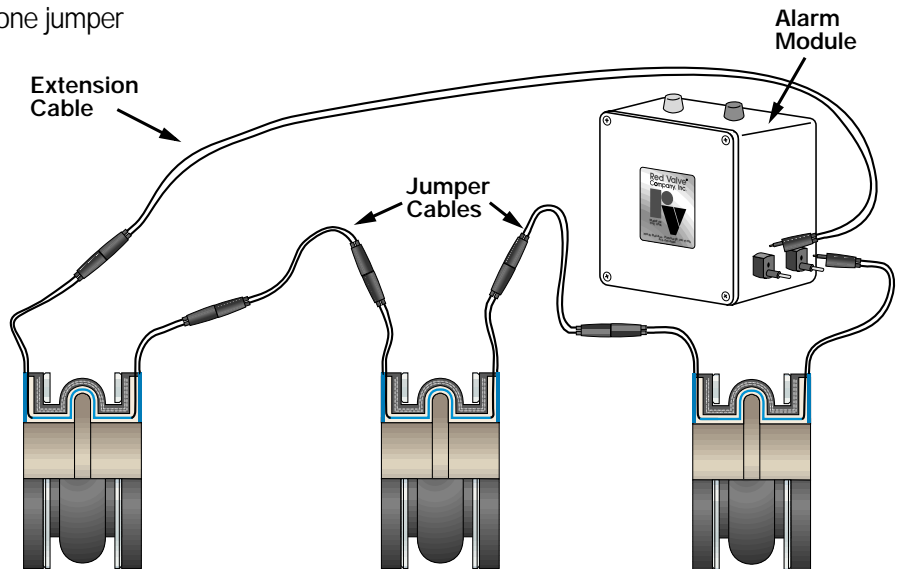
CAUTION: although they are physically interchangeable, it is extremely important that extension cables and jumper cables are not interchanged.

Plug both connectors on the ends of the lead wires into the Alarm Module connectors. Either lead can go into either Alarm Module connector. The use of a food grade silicone spray on the connectors is acceptable, if necessary, to reduce the insertion force. Use an absolute minimum of silicone spray. If the lead wires are not long enough to reach the Alarm Module, use extension leads. Plug the power cable into a 120 vac electrical outlet. After a few seconds, the green light should illuminate, indicating normal operation. Press and hold down the test button. The red light should illuminate. Release the test button. After a few seconds, the green light should illuminate again. If operation is not as described in this paragraph, refer to the troubleshooting section for assistance.

INSTALLATION

MULTIPLE JOINTS WITH ONE ALARM MODULE

If two or more expansion joints are to be used with one Alarm Module, a jumper cable is required to connect one joint to the next joint. See figure at right. The jumper cable is necessary to maintain the correct signal polarity in the system. Jumper cables are available in lengths of 1-1/2, 3, 5, and 8 feet. Use only one jumper cable between two joints. If the jumper cable is not long enough, use extension cables to increase the length. Connect additional joints as shown in the figure at right. Jumper cables are identified by a red tag attached to the cable. Jumper cables can also be identified by using a continuity tester or ohmmeter because they are electrically wired so that the pin on one end is connected to the pin on the other end. Extension cables are wired so that the pin on one end is connected to the socket on the other end.



CABLE LENGTHS FOR SMART EXPANSION JOINTS

	Available Lengths in feet			
Extension Cables	1-1/2'	3'	5'	8'
Jumper Cables	1-1/2'	3'	5'	8'



JUMPER CABLE — PIN-TO-PIN
FOR CONNECTING MULTIPLE JOINTS



EXTENSION CABLE — PIN-TO-SOCKET
FOR CONNECTING JUMPER CABLE TO JOINT OR JOINT TO ALARM MODULE

TROUBLESHOOTING GUIDE

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Red and green lights are both off.	No power.	Insert power plug into 120 vac receptacle. Be sure 120 vac receptacle is energized.
	Alarm Module defective.	Replace Alarm Module.
Red Light is on continuously.	Expansion Joint is damaged or defective.	Replace Joint.
	Wiring and connections from Alarm Module to joint incorrect.	Check wiring, be sure jumper cables and extension cables are not interchanged.
	Alarm Module defective.	Replace Alarm Module.
Red light does not illuminate when test button is depressed.	Wiring and connections from Alarm Module to joint incorrect.	Check wiring, be sure jumper cables and extension cables are not interchanged.
	Expansion Joint is damaged or defective.	Replace Joint.
	Alarm Module defective.	Replace Alarm Module.

RED VALVE WARRANTY

WARRANTIES - REMEDIES - DISCLAIMERS - LIMITATION OF LIABILITY
Unless otherwise agreed to in writing signed by Red Valve, all Products supplied by Red Valve will be described in the specifications set forth on the face hereof.

THE WARRANTIES SET FORTH IN THIS PROVISION ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER STATUTORY, EXPRESS OR IMPLIED (INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OR TRADE).

Red Valve Products are guaranteed for a period of one year from date of shipment, against defective workmanship and material only, when properly installed, operated and serviced in accordance with Red Valve's recommendations. Replacement for items of Red Valve's manufacture will be made free of charge if proved to be defective within such year; but not claim for transportation, labor or consequential damages shall be allowed. We shall have the option of requiring the return of the defective product to our factory, with transportation charges prepaid, to establish the claim and our liability shall be limited to the repair or replacement of the defective product, F.O.B. our factory. Red Valve will not assume costs incurred to remove or install defective products nor shall we incur backcharges or liquidated damages as a result of warranty work. Red Valve does not guarantee resistance to corrosion erosion, abrasion or other sources of failure, nor does Red Valve guarantee a minimum length of service, or that the product shall be fit for any particular service. Failure of purchaser to give prompt written notice of any alleged defect under this guarantee forthwith upon its discovery, or use, and possession thereof after an attempt has been made and completed to remedy defects therein, or failure to return product or part for replacement as herein provided, or failure to install and operate said products and parts according to instructions furnished by Red Valve, or failure to pay entire contract price when due, shall be a waiver by purchaser of all rights under these representations. All orders accepted shall be deemed accepted subject to this warranty which shall be exclusive of any other or previous warranty, and shall be the only effective guarantee or warranty binding on Red Valve, anything on the contrary contained in purchaser's order, or represented by any agent or employee of Red Valve in writing or otherwise, not withstanding implied warranties. RED VALVE MAKES NO WARRANTY THAT THE PRODUCTS, AUXILIARIES AND PARTS ARE MERCHANTABILITY OR FIT FOR ANY PARTICULAR PURPOSE.



Red Valve Company, Inc.®

700 N. Bell Avenue
Carnegie, PA 15106
(412) 279-0044
FAX (412) 279-7878
www.redvalve.com