



ANDERSON GREENWOOD PILOT OPERATED SAFETY RELIEF VALVES

OPERATING AND SAFETY INSTRUCTIONS

Before installation, these instructions must be carefully read and understood.



periodically tested and reconditioned to ensure correct function.

- *For further information including adjustment, maintenance, cleaning lapping and detail illustrations obtain the appropriate Operation and Maintenance Manual from the table on page 4. These manuals may be requested from the factory or are available at Emerson.com/FinalControl*

WARNING

- *If a gagging device is provided with the valve it must be removed before the valve is put into service.*
- *Removal of the seal wires in an attempt to adjust and/or repair this product by unauthorized or unqualified persons voids the product warranty and may cause damage to equipment and serious injury or death to persons.*
- *This product is a safety related component intended for use in critical applications. The improper application, installation or maintenance of the valve or the use of parts or components not manufactured by Emerson may result in a failure of the valve.*
- *Any obstruction due to polymerization, solidification or solid deposit will affect the safety performance of this valve. Methods to reduce such risk should be taken.*
- *A safety valve should be used only to protect a system from overpressure during a pressure upset. It should not be used as a control valve that is required to operate continuously or as a block valve to isolate portions of the system. It should not be used as a pipe fitting or transition piece in a piping system.*
- *Any installation, maintenance, adjustment, repair or test, performed on the safety valve must be done in accordance with the requirements of all applicable Emerson Procedures and Instructions as well as applicable National and International Codes and Standards.*
- *The information, specifications and technical data (the 'Specifications') contained in this document are subject to change without notice. Emerson does not warrant that the Specifications are current and assumes no responsibility for the use or misuse thereof. The Purchaser should verify that there have been no changes to the Specifications prior to use.*

Service technicians are available to assist with your installation or other field problems. Call your nearest Emerson representative.

1 GENERAL

The intent of these instructions is to acquaint the user with the storage, installation and operation of this product.

This safety valve should only be used in accordance with the applicable operating instructions and within the application specifications of the purchase order. These valves have been tested and adjusted at the factory. Contact the factory or a Emerson authorized representative before making any changes to the settings.

TABLE OF CONTENTS

1. General.....	1
2. Storage and handling.....	2
3. Installation.....	2
4. Inlet piping.....	2
5. Discharge piping.....	2
6. Remote pressure pick-up.....	3
7. Set pressure verification testing.....	4

SAFETY PRECAUTIONS

- *When the safety valve is under pressure never place any part of your body near the outlet of the valve.*
- *The valve outlet and any separate drains should be piped or vented to a safe location.*
- *Always wear proper safety gear to protect hands, head, eyes, ears, etc. anytime you are near pressurized valves.*
- *Never attempt to remove the safety valve from a system that is pressurized.*
- *Never make adjustments to or perform maintenance on the safety valve while in service unless the valve is isolated from the system pressure. If not properly isolated from the system pressure, the safety valve may inadvertently open resulting in serious injury.*
- *Remove the safety valve prior to performing any pressure testing of the system.*
- *The safety of lives and property often depends on the proper operation of the safety valve. The valve must be maintained according to appropriate instructions and must be*

ANDERSON GREENWOOD PILOT OPERATED SAFETY RELIEF VALVES

OPERATING AND SAFETY INSTRUCTIONS

2 STORAGE AND HANDLING

Because cleanliness is essential to the satisfactory operation and tightness of a safety valve, precautions should be taken during storage to keep out all foreign materials. Inlet and outlet protectors should remain in place until the valve is ready to be installed in the system. Take care to keep the valve inlet absolutely clean. It is recommended that the valve be stored indoors in the original shipping container away from dirt and other forms of contamination.

Safety valves must be handled carefully and never subjected to shocks. Rough handling may alter the pressure setting, deform valve parts and adversely affect seat tightness and valve performance.

The valve should never be lifted or handled using the tubing, piping, pilot or pilot brackets. When it is necessary to use a hoist, use the lifting eye(s) on the main valve body. If there are no lifting eyes a chain or sling should be placed around the main valve body in a manner that will ensure that the valve is in a vertical position to facilitate installation.

On valves supplied with eyebolts for lifting, follow the instructions below:

1. Prior to installing the valve, ensure that the eyebolt and its threaded hole in the Main valve cap are clean and free of rust or debris.
2. Install eyebolt such that it fully engages in the Cap (or body, as applicable). For Caps with a thru-hole for the eyebolt, make sure not to extend past the cap and push on the body. This will cause the cap to push away from the body.
3. Be careful to avoid contact between the lifting straps or other lifting equipment and valve components such as tubing and fittings, accessories, etc. in order to avoid damaging them.
4. Use company safety standards when lifting the valve. If company safety standards do not exist, use the current version of "DOE-STD-1090 Hoisting and Rigging" standard.
5. Never lift more than the Relief Valve with the eyebolt. Other equipment attached to the valve will cause the weight to exceed the load rating of the eyebolt / threaded hole.
6. Once the valve is installed, remove the eyebolt and store in a safe place for future use.
7. Apply grease or other suitable rust preventative product in the threaded hole in place of the eyebolt, protecting the entirety of the threaded hole. Additionally, a suitable plug may be used to keep out water, or environmental chemicals if present.

NOTE

For valves factory-supplied with two (or more) eyebolts: the instructions for valves with one eyebolt apply. Additionally, use appropriate lifting techniques such as spreader bars to account for lifting with multiple eyebolts.

3 INSTALLATION

Many valves are damaged when first placed in service because of failure to clean the connection properly when installed. Before installation flange faces or threaded connections on both the valve inlet and the vessel and/or line on which the valve is mounted must be thoroughly cleaned of all dirt and foreign material.

Because foreign materials that pass into and through safety valves can damage the valve, the systems on which the valves are tested and finally installed must also be inspected and cleaned. New systems in particular are prone to contain foreign objects that inadvertently get trapped during construction and will destroy the seating surface when the valve opens. The system should be thoroughly cleaned before the safety valve is installed.

Foam padding is sometimes used to protect the main valve seat during shipping. Check for any foam padding inside the main valve and remove before installation.

The gaskets used must be dimensionally correct for the specific flanges. The inside diameters must fully clear the safety valve inlet and outlet openings so that the gasket does not restrict flow.

For flanged valves, draw down all connection studs or bolts evenly to avoid possible distortion of the valve body.

The maximum torque for flange bolting for valves with aluminum bodies should not exceed the values shown in the following table.

Threaded valves have flats on the body inlet neck to aid in installation. Use a back-up wrench on the body outlet neck during the installation of discharge piping.

Safety valves are intended to open and close within a narrow pressure range. Valve installations require accurate design both as to inlet and discharge piping. Refer to International, National and Industry Standards for guidelines.

4 INLET PIPING

Connect this valve as direct and close as possible to the vessel being protected.

The valve should be mounted vertically in an upright position either directly on a nozzle from the pressure vessel or on a short connection fitting that provides a direct, unobstructed flow between the vessel and the valve. Installing a safety valve in other than this recommended position will adversely affect its operation.

The valve should never be installed on a fitting having a smaller inside diameter than the inlet connection of the valve.

5 DISCHARGE PIPING

Discharge piping should be simple and direct.

A 'broken' connection near the valve outlet is preferred wherever possible. All discharge piping should be run as direct as is practicable to the point of final release for disposal. The valve must discharge to a safe disposal area.

The pilot exhaust is often vented to the atmosphere under operating conditions, since the discharge during operation is small.

When pilot discharge to the atmosphere is not permissible, the pilot exhaust should be connected either to the discharge piping or through a supplementary piping system to a safe location. When discharge piping is designed, avoid the possibility of back pressure on the pilot unless the pilot is a balanced design.

Discharge piping must be drained properly to prevent the accumulation of liquids on the downstream side of the main valve or pilot. The weight of the discharge piping should be carried by a separate support and be properly braced to withstand reactive thrust forces when the valve relieves. The valve should also be supported to withstand any swaying or system vibrations.

If the pilot valve is discharging into a pressurized system be sure the valve is a 'balanced' design. Pressure on the discharge of an 'unbalanced' design will adversely affect the valve performance and set pressure.

Fittings or pipe having a smaller inside diameter than the valve outlet connections must not be used.

	ft-lb	Nm
2 x 3	18	24
3 x 4	18	24
4 x 6	18	24
6 x 8	32	43
8 x 10	32	43
10 x 12	51	69
12 x 16	51	69

ANDERSON GREENWOOD PILOT OPERATED SAFETY RELIEF VALVES

OPERATING AND SAFETY INSTRUCTIONS

6 REMOTE PRESSURE PICK-UP

When remote pressure sensing is specified, the valve will have a red plastic plug with a warning tag installed in the pilot pressure sensing port. The tag reads 'WARNING: THIS VALVE IS EQUIPPED FOR INSTALLATION WITH REMOTE PRESSURE PICK-UP'. Remove the plug and connect the remote sense line to this port. Remote pressure pick-up piping must be installed in accordance with the following requirements:

For Series 200, 400, 800, 5100 and 5200 valves

Remote pressure pick-up piping up to 100 feet (30 m) in length must have an inside diameter not less than 0.245" (6 mm), the inside diameter of 3/8" x 0.065" wall (10 mm x 2 mm wall) seamless tubing. For lengths greater than 100 feet (30 m), larger tubing or pipe should be used.

For Series 90, 500, and 900 valves

Remote pressure pick-up piping up to 20 feet (6 m) in length must have an inside diameter not less than 0.430" (10 mm), the inside diameter of 1/2" x 0.035" wall (12 mm x 1 mm wall) seamless tubing. For lengths greater than 20 feet (6 m), larger tubing or pipe should be used.

For Series 700 valves

Remote pressure pick-up piping up to 10 feet (3 m) in length must have an inside diameter not less than 0.245" (6 mm), the inside diameter of 3/8" x 0.065" wall (10 mm x 2 mm wall) seamless tubing. For lengths greater than 10 feet (6 m), 1" (25 mm) or larger pipe should be used. The remote sense line must be self draining and insulated to minimize condensate formation and freezing potential.

For Series 9000 valves

(Remote pressure pick-up is standard on all vacuum and combination valves.)

For 6" (150 mm) and smaller valves, remote pressure pick-up piping up to 20 feet (6 m) in length must have an inside diameter not less than 0.430" (10 mm), the inside diameter of 1/2" x 0.035" wall (12 mm x 1 mm wall) seamless tubing. For lengths greater than 20 feet (6 m), larger tubing or pipe should be used.

For 8" (200 mm) and larger valves, remote pressure pick-up piping for lengths up to 20 feet (6 m) must have an inside diameter not less than 0.824" (20.9 mm), the inside diameter of 3/4" schedule 40 pipe. For lengths greater than 20 feet (6 m), larger pipe should be used. Ensure that the pilot sensing port is within the system protected by the main valve.

A block valve for shut off in the remote pilot sense line is not recommended. A closed block valve in the remote sense line renders the safety valve inoperative. If one is used, it must be opened before pressurizing the system or opening the isolating block valve under the main valve.

ANDERSON GREENWOOD PILOT OPERATED SAFETY RELIEF VALVES

OPERATING AND SAFETY INSTRUCTIONS

7 SET PRESSURE VERIFICATION TESTING

Set pressure verification testing should be performed in accordance with instructions in the applicable Operation and Maintenance Manual.

OPERATION AND MAINTENANCE MANUALS

Valve model	Operation and maintenance manual
Series 200	05.9040.268 (VCIOM-06018)
Series 400 with diaphragm pilot	05.9040.269 (VCIOM-06019)
Series 400 with piston pilot	05.9040.270 (VCIOM-06020)
Series 500	05.9040.272 (VCIOM-06022)
Series 800	05.9040.271 (VCIOM-06021)
Series 900	05.9040.273 (VCIOM-03377)
Series 727 - steam service	05.9040.192 (VCIOM-06013)
Series 727 - air/gas service	05.9040.238 (VCIOM-03096)
Series 93 (Series 90)	05.9040.081 (VCIOM-03092)
Series 93T (Series 90)	05.9040.082 (VCIOM-03093)
Series 91/94 (Series 90)	05.9040.080 (VCIOM-06025)
Series 95 (Series 90)	05.9040.083 (VCIOM-06026)
Series 9240	05.9040.171 (VCIOM-03091)
Series 9290	05.9040.174 (VCIOM-06012)
Series 9300	05.9040.275 (VCIOM-06024)
Series 9390 (Series 9300) for chloride service	05.9040.233
LCP	05.9040.313
MLCP	05.9040.324 (VCIOM-03101)
Series 5100	05.9040.349 (VCIOM-06040)
Series 5200	05.9040.370 (VCIOM-02850)

ANGMC-6034-EN © 2011, 2022 Emerson Electric Co. All rights reserved 01/22. Anderson Greenwood is a mark owned by one of the companies in the Emerson Automation Solutions business unit of Emerson Electric Co. The Emerson logo is a trademark and service mark of Emerson Electric Co. All other marks are the property of their prospective owners.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available upon request. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.

Emerson Electric Co. does not assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use and maintenance of any Emerson Electric Co. product remains solely with the purchaser.

Emerson.com