



Leading the way in pressure relief technology.

Anderson Greenwood, Crosby & Varel Pressure Relief Valves

The premier option for pressure relief valves, providing advanced, reliable and efficient overpressure protection.





PRESSURE RELIEF VALVES

OVERVIEW

**THE WORLD'S MOST
COMPREHENSIVE PRODUCT LINE.
WITH THE LARGEST AND MOST
SOPHISTICATED FACILITIES FOR
STEAM, AIR, GAS AND LIQUID.**

GLOBAL PERFORMANCE

Emerson is an industry leader in pressure relief valve technology. As a single point provider, we offer an extensive product line for reliable performance with lower valve life-cycle costs. Our unmatched engineering and technical expertise provides you with the pressure management products, application solutions and services that will positively impact your business.

TEST FACILITIES

Our Texas and Massachusetts combined testing and development facilities have been the catalyst in continuing our 135 years of product development and industry leadership.

The engineering teams of Anderson Greenwood, Crosby and Varec have designed testing equipment and procedures that assure optimum valve performance under all service conditions. These facilities are used for experimentation, testing and emissions on relief devices. Our Texas facility also features cryogenic testing capabilities down to -320°F [-196°C]. A recent upgrade to our Texas facility included a 11,000 gallon liquid nitrogen storage tank, high pressure gas vessels, full liquid testing capabilities and a large test laboratory. It has also been approved by ASME as a test facility to conduct certified flow testing.

CONTENTS

Direct Spring Pressure Relief Valves	4 - 6
Safety Valves	7 - 8
High Pilot Operated Pressure Relief Valves	8 - 10
Low Pilot Operated Pressure Relief Valves	11 - 12
Tank Protection	12 - 15
Flame Arrestment	15 - 16
Blanketing Systems	17
Tank Accessories	17 - 18
Specialty Valves	18 - 19
Certifications	20
Nuclear Products	20
Sizing Software and Service	21
Selection Matrix	22 - 23



ANDERSON GREENWOOD SERIES 60 PRESSURE RELIEF VALVE

Types 61 and 63B designed for low and medium set pressure gas, vapor and liquid or gas thermal relief applications. Brass construction.

TECHNICAL DATA

Sizes:

1/2" x 1" to 3/4" x 1"

Orifices:

0.077 to 0.150 in² [0.497 to 0.968 cm²]

Connections:

NPT

Temperature Range:

-320 to 400°F [-196 to +205°C]

Set Pressures:

30 to 531 psig [2.07 to 36.6 barg]

Code:

ASME VIII

Request data sheet: VCTDS-00544



ANDERSON GREENWOOD SERIES 80 PRESSURE RELIEF VALVE

Types 81, 83 and 86 soft seat design for premium seat tightness provides repeatable leak-tight performance before and after each relief cycle. Full lift design with external adjustable blowdown and replaceable soft seats and seals. Allows higher operating pressure. Gas, vapor and steam service.

TECHNICAL DATA

Sizes:

1/2" x 3/4" to 2" x 3"

Orifices:

0.049 to 1.287 in² [0.316 to 8.303 cm²]

Connections:

NPT, Flanged

Temperature Range:

-423 to +550°F [-253 to +288°C]

Set Pressures:

20 to 10,000 psig [1.40 to 689.5 barg]

Code:

ASME VIII

Request data sheet: VCTDS-00544



ANDERSON GREENWOOD SERIES 80 PRESSURE RELIEF VALVE (LIQUID)

Type 81P soft seat design for liquid service to ensure stability with no chatter. The trim is fully back pressure balanced without the use of a bellows. Replaceable soft seats and seals.

TECHNICAL DATA

Sizes:

1/2" x 3/4" to 2" x 3"

Orifices:

0.049 to 1.287 in² [0.316 to 8.303 cm²]

Connections:

NPT, Flanged

Temperature Range:

-65 to +400°F [-54 to +205°C]

Set Pressures:

50 to 6000 psig [3.45 to 413.7 barg]

Code:

ASME VIII

Request data sheet: VCTDS-00544



CROSBY STYLES JOS-E AND JBS-E PRESSURE RELIEF VALVES

Conventional and Balanced Bellows Spring loaded pressure relief valves built in accordance with API Standards 526 and 527 for air, gas, steam and vapor. Styles JLT-JOS-E and JLTJBS-E for liquid service and two phase applications.

TECHNICAL DATA

Sizes:

1" x 2" to 12" x 16"

Orifices:

0.110 to 60.75 in² [0.710 to 391.96 cm²]

Inlet Ratings:

ANSI Class 150 to 2500

Temperature Range:

-450 to +1000°F [-268 to +538°C]

Set Pressures:

5 to 6000 psig [0.34 to 413 barg]

Code:

ASME VIII [15 psig and above]

Request data sheet: VCTDS-00597



CROSBY STYLE JB-TD ("OVER T") PRESSURE RELIEF VALVE

Large orifice pressure relief valve product line is an extension of API Standard 526 designs for air, gas, steam and vapor applications. The broad JB-TD product offering represents an alternative to multiple, smaller orifice relief valves.

TECHNICAL DATA

Sizes:

10" x 14" to 20" x 24"

Orifices:

42.19 to 185.0 in² [272.19 to 1193.55 cm²]

Inlet Ratings:

ANSI Class 300

Temperature Range:

-20 to +450°F [-29 to +232°C]

Set Pressures:

25 to 300 psig [1.72 to 20.69 barg]

Code:

ASME VIII

Request data sheet: VCTDS-00290



CROSBY SERIES 900 OMNI-TRIM® PRESSURE RELIEF VALVE

Single trim design, fixed blowdown design for medium flow of air, gas, steam, vapor, liquid and two phase applications. Full nozzle design. Available with metal or O-ring seat construction.

TECHNICAL DATA

Sizes:

½" x 1" to 2" x 2"

Orifices:

0.074 to 0.503 in² [0.477 to 3.25 cm²]

Connections:

NPT, Flanged, Socket Weld

Temperature Range:

-450 to +750°F [-268 to +399°C]

Set Pressures:

5 to 5000 psig [0.34 to 344.83 barg]

Code:

ASME VIII [15 psig and above]

Request data sheet: VCTDS-00594



CROSBY SERIES 800 PRESSURE RELIEF VALVE

Adjustable blowdown design for medium flow of air, gas, vapor and steam applications. External precise blowdown adjustment provides shorter blowdown than the Series 900. Full nozzle design. Available with metal or O-ring seat.

TECHNICAL DATA

Sizes:

3/4" x 1" to 2" x 2"

Orifices:

0.110 to 0.503 in² [0.71 to 3.25 cm²]

Connections:

NPT, Flanged, Socket Weld

Temperature Range:

-450 to +750°F [-268 to +399°C]

Set Pressures:

15 to 1500 psig [1.03 to 103.42 barg]

Code:

ASME VIII

Request data sheet: VCTDS-00594



CROSBY SERIES BP OMNI-TRIM® PRESSURE RELIEF VALVE

Balanced piston, single trim design for gas, vapor and liquid applications involving variable back pressure. Full nozzle design with O-ring seat as standard.

TECHNICAL DATA

Sizes:

3/4" x 1" and 1" x 1"

Orifices:

0.074 and 0.110 in² [0.477 and 0.71 cm²]

Connections:

NPT, Flanged

Temperature Range:

-20 to +400°F [-28 to +204°C]

Set Pressures:

50 to 1500 psig [3.45 to 103.44 barg]

Code:

ASME VIII

Request data sheet: VCTDS-00594



CROSBY SERIES 82 PRESSURE RELIEF VALVE

Designed to provide premium performance in the natural gas market. The Series 82 has a rugged construction designed specifically for high pressure multi stage natural gas compressors. The Series 82 valve is designed to provide superior seating performance using a Viton® o-ring seat. The 2-piece body design with replaceable seat and seals reduce downtime and maintenance costs over the life of the valve.

TECHNICAL DATA

Sizes:

3/4" x 1" to 1" x 1"

Orifices:

D 0.127 in² [0.819 cm²]

E 0.221 in² [1.423 cm²]

Connections:

MNPT x FNPT

Temperature Range:

-15°F to 400°F [-26°C to 204°C]

Set Pressures:

15 to 1500 psig [1.03 to 103 barg]

Code:

ASME VIII

Request data sheet: VCTDS-00806



CROSBY STYLE HE ISOFLEX® SAFETY VALVE (STEAM)

High capacity safety valve for drum service, saturated steam applications. Two ring control and back pressure-assist close design are standard. ISOFLEX® seat design provides seat tightness up to 95% of set pressure.

TECHNICAL DATA

Sizes:

2½" x 6" to 4" x 8"

Orifices:

1.840 to 7.070 in² [11.87 to 45.61 cm²]

Connections:

ANSI Flanged or Butt Weld Inlet and ANSI Flanged Outlet

Maximum Temperature:

Saturated steam

Maximum Set Pressure:

3000 psig [207 barg]

Code:

ASME I

Request data sheet: VCTDS-00595



CROSBY STYLE HSJ SAFETY VALVE (STEAM)

Full nozzle safety valve for saturated and superheated steam service. Two ring control. Style HSJ-DOW with closed bonnet and screwed cap for Dowtherm service.

TECHNICAL DATA

Sizes:

1½" x 2" to 6" x 8"

Orifices:

0.307 to 11.045 in² [1.98 to 71.25 cm²]

Inlet Ratings:

ANSI Class 150 to 2500

Maximum Temperature:

1000°F [538°C]

Maximum Set Pressure:

2700 psig [186.2 barg]

Code:

ASME I and VIII

Request data sheet: VCTDS-00595



CROSBY STYLE HCI ISOFLEX® SAFETY VALVE (STEAM)

High capacity safety valve for saturated and superheated steam service. Two ring control and optional restricted lift feature. ISOFLEX® seat design provides seat tightness up to 95% of set pressure.

TECHNICAL DATA

Sizes:

1½" x 3" to 6" x 10"

Orifices:

0.994 to 19.29 in² [6.41 to 124.45 cm²]

Connections:

ANSI Flanged or Butt Weld Inlet and ANSI Flanged Outlet

Maximum Temperature:

1100°F [593°C]

Maximum Set Pressure:

3000 psig [207 barg]

Code:

ASME I and VIII

Request data sheet: VCTDS-00595



CROSBY STYLE HSL SAFETY VALVE (STEAM)

A full nozzle reaction type safety valve designed for saturated and superheated steam service. Two choices of inlet flange ratings and a simplicity of design to facilitate ease of maintenance.

TECHNICAL DATA

Sizes:

1¼" to 6" [Dn 32 to 150] flanged

Pressure rating:

Up to 725 psig [50 barg]

Temperature rating:

Up to 1000°F [538°C]

Inlet ratings:

ASME Classes 300 and 600

Outlet rating:

ASME Class 150

Request data sheet: VCTDS-00595



ANDERSON GREENWOOD SERIES 200 PRESSURE RELIEF VALVE

Non-flowing, pop action pilot operated design principally intended for gas, vapor and many mixed phase applications. Suitable for severe service where dirt, hydrates and high moisture levels occur in the fluid media.

TECHNICAL DATA

Sizes:

1" x 2" to 10" x 14"

Orifices:

0.110 to 63.50 in² [0.710 to 409.7 cm²]

Inlet Ratings:

ANSI Class 150 to 2500

Temperature Range:

-423 to +600°F [-253 to +315°C]

Set Pressures:

25 to over 6170 psig [1.72 to over 425.52 barg]

Code:

ASME VIII

Request data sheet: VCTDS-00543



ANDERSON GREENWOOD SERIES 400 PRESSURE RELIEF VALVE

Non-flowing, modulating action pilot operated design suitable for gas, liquid and many mixed phase applications, including dirty and/or wet applications. Modulating action eliminates destructive effects of "liquid hammer." Lifts proportionally according to demand.

TECHNICAL DATA

Sizes:

1" x 2" to 10" x 14"

Orifices:

0.110 to 63.50 in² [0.710 to 409.7 cm²]

Inlet Ratings:

ANSI Class 150 to 600

Temperature Range:

-65 to +600°F [-54 to +315°C]

Set Pressures:

15 to 1480 psig [1.03 to 102.0 barg]

Code:

ASME VIII

Request data sheet: VCTDS-00543



ANDERSON GREENWOOD SERIES 400 ISO-DOME PRESSURE RELIEF VALVE

Iso-Dome accessory for the Series 400 pilot provides protection of critical pilot internals from highly viscous process media.

TECHNICAL DATA

Sizes:

1" x 2" to 10" x 14"

Orifices:

0.110 to 63.50 in² [0.710 to 409.7 cm²]

Inlet Ratings:

ANSI Class 150 to 900

Temperature Range:

-65 to +600°F [-54 to +260°C]

Set Pressures:

15 to 1480 psig [1.03 to 102.0 barg]

Code:

ASME VIII

Request data sheet: VCTDS-00543



ANDERSON GREENWOOD SERIES 500 PRESSURE RELIEF VALVE

Unique, modulating action pilot operated relief valve with soft seats having the ability to handle hot water, steam, hot hydrocarbon vapors or liquids, using inert plastic soft goods.

TECHNICAL DATA

Sizes:

1½" x 2" to 10" x 14"

Orifices:

0.110 to 63.50 in² [0.710 to 409.7 cm²]

Inlet Ratings:

ANSI Class 150 to 600

Temperature Range:

-65 to +515°F [-54 to +268°C]

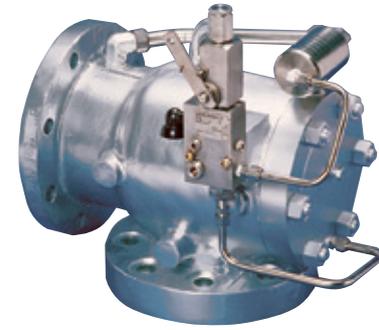
Set Pressures:

15 to 720 psig [1.03 to 49.6 barg]

Code:

ASME VIII

Request data sheet: VCTDS-00543



ANDERSON GREENWOOD TYPE 727 PRESSURE RELIEF VALVE

Pop action pilot safety valve with metal seated pilot valve and main valve extends the use of pilot technology to 1000°F [538°C]. Suitable for steam or gas service.

TECHNICAL DATA

Sizes:

2" x 3" to 8" x 10"

Orifices:

0.503 to 26.0 in² [3.245 to 167.7 cm²]

Inlet Ratings:

ANSI Class 150 to 600

Temperature Range:

Up to 1000°F [538°C]

Code:

ASME VIII

Request data sheet: VCTDS-00543



ANDERSON GREENWOOD SERIES 800 PRESSURE RELIEF VALVE

High set pressure capability, non-flowing, modulating pilot operated pressure relief valve design for pressures up to 6170 psig [425.52 barg]. Suitable for gas, liquid or mixed phase lading fluids, including dirty and/or wet services.

TECHNICAL DATA

Sizes:

1" x 2" to 4" x 6"

Orifices:

0.110 to 9.489 in² [0.710 to 61.21 cm²]

Inlet Ratings:

ANSI Class 900 to 2500

Temperature Range:

-65 to +600°F [-54 to +315°C]

Set Pressures:

1481 to 6170 psig [102.13 to 425.52 barg]

Code:

ASME VIII

Request data sheet: VCTDS-00543



ANDERSON GREENWOOD SERIES 5200 PRESSURE RELIEF VALVE

Developed specifically to serve economizer applications requiring pressure relief under the stringent requirements of ASME Section I. This unique and challenging application requires premium performance on a valve that must have ASME Section I certified capacities for both steam and water. A modulating pilot operated pressure relief valve is the ideal solution to this difficult application.

TECHNICAL DATA

Sizes:

1½" x 2" to 4" x 6"

Orifices:

F 0.307 in² [1.98 cm²] thru P 6.38 in² [41.16 cm²]

Inlet Ratings:

ANSI Class 150 to 2500

Temperature Range:

Up to 1000°F [+538°C]

Set Pressures:

15 to 6250 psig [1.03 to 431 barg]

Code:

ASME I and VIII

Request data sheet: VCTDS-00803



ANDERSON GREENWOOD SERIES LCP PRESSURE RELIEF VALVE

Full bore, non-flowing pilot design for gas and vapor service. Integral field test connection and back flow preventer are standard accessories in a compact assembly.

TECHNICAL DATA

Sizes:

1" x 2" to 3" x 4"

Orifices:

0.785 to 7.069 in² [5.065 to 45.6 cm²]

Inlet Ratings:

ANSI Class 150 to 900

Temperature Range:

-20 to +400°F [-29 to +205°C]

Set Pressure Range:

25 to 2200 psig [1.72 to 151.72 barg]

Request data sheet: VCTDS-00254



ANDERSON GREENWOOD TYPE 9300 PRESSURE AND VACUUM RELIEF VALVE

The Type 9300 design is a full body valve to pipe away the discharge if necessary and is balanced against back pressure. This design can be used in the pilot operated pressure relief mode and also provide pilot operated vacuum relief.

TECHNICAL DATA

Sizes:

2" x 3" to 12" x 16"

Orifices:

3.35 to 113.0 in² [21.61 to 729.03 cm²]

Temperature Range:

-320 to +200°F [-196 to +93°C]

Pressure Range:

4" wc to 50 psig [10 mbarg to 3.45 barg]

Vacuum Range:

-1 oz [-4.3 mbarg] full open weight loaded

Vacuum Range:

-2 in wc to -5 psig pilot operated [-5 mbarg to -0.345 barg]

Code:

ASME VIII [15 psig and above]

Request data sheet: VCTDS-00551



ANDERSON GREENWOOD TYPE 9200 PRESSURE AND VACUUM VENT

The Type 9200 design can be used in the pilot operated pressure relief mode and also provide weight loaded or pilot operated vacuum relief. The 9200 vents directly to atmosphere and has no provision to pipe away the discharge.

TECHNICAL DATA

Sizes:

2" x 3" to 12" x 16"

Orifices:

3.35 to 113.0 in² [21.61 to 729.03 cm²]

Temperature Range:

-320 to +200°F [-196 to +93°C]

Pressure Range:

4" wc to 5 psig [-5.0 mbarg to 0.345 barg]

Vacuum Range:

-1 oz [-4.3 mbarg] full open weight loaded

Vacuum Range:

-2 in wc to -5 psig pilot operated [-5.0 mbarg to -0.345 barg]

Request data sheet: VCTDS-00551



ANDERSON GREENWOOD TYPE 93 PRESSURE RELIEF VALVE

Introduced in 1968, this pilot operated pressure relief valve is designed with elastomer seats and seals for gas piping and chemical tank applications.

TECHNICAL DATA

Sizes:

2" x 3" to 12" x 16"

Orifices:

2.29 to 84.0 in² [14.77 to 541.93 cm²]

Temperature Range:

-260 to +300°F [-162 to +149°C]

Set Pressures:

3" wc to 50 psig [7.5 mbarg to 3.45 barg]

Code:

ASME VIII [15 psig and above]

Request data sheet: VCTDS-00551



**ANDERSON GREENWOOD
SERIES MLCP
PRESSURE RELIEF VALVE**

Modulating Large Capacity Pilot Valve designed for gas and vapor service. Internally sensed pilot operated pressure relief valve in a simple, high performance, cost effective design.

TECHNICAL DATA

Sizes:

2" x 3" to 6" x 8"

Orifices:

3.14 to 28.27 in² [20.26 to 182.41 cm²]

Inlet Ratings:

ANSI Class 150

Temperature Range:

-20 to +400°F [-29 to +204°C]

Set Pressure Range:

3 to 14.99 psig [0.207 to 1.03 barg]

Request data sheet: VCTDS-00257



**VAREC 2010B/2020B SERIES
WEIGHT LOADED PRESSURE AND
VACUUM RELIEF VALVE**

Protects tanks from damage or deformation, minimizes emissions to the environment, as well as loss of product due to evaporation. Designed for use on atmospheric and low pressure storage tanks. Vent to atmosphere or pipe away models.

TECHNICAL DATA

Sizes:

2010B/2011B 2" to 12"
2020B/2021B 2" x 3" to 12" x 14"

Connections:

ANSI Class 125 Flat Face Drilling (Aluminum),
ANSI Class 150 Raised or Flat Face Drilling (Carbon Steel and Stainless Steel)

Temperature Range:

-65 to +350°F [-54 to +177°C]
Pressure/Vacuum

Setting Range:

0.3 oz/in² to 2 psig [1.29 mbarg to 0.14 barg]

Request data sheet: VCTDS-00318



**VAREC 3500B/3600B/3650B SERIES
WEIGHT LOADED VACUUM RELIEF
VALVE**

Designed to protect liquid storage vessels, vapor recovery systems and process systems from excessive vacuum. Designs available for tank top mounting, side mounting as well as for "in-line" applications.

TECHNICAL DATA

Sizes:

3500B/3600B 2" to 12"
3650B 2" x 3" to 12" x 14"

Connections:

ANSI Class 125 Flat Face Drilling (Aluminum)
ANSI Class 150 Raised or Flat Face Drilling (Carbon Steel and Stainless Steel)

Temperature Range:

-65 to +350°F [-54 to +177°C]

Vacuum Setting Range:

0.3 oz/in² to 2 psig [1.29 mbarg to 0.14 barg]

Request data sheet: VCTDS-00300



VAREC 7100B SERIES WEIGHT LOADED PRESSURE RELIEF VENT

Pressure relief valve designed to protect atmospheric and low pressure storage tanks from being overpressured. Air cushion seating design keeps the valve tightly sealed until the pressure inside the tank approaches the valve setting. Vent to atmosphere design.

TECHNICAL DATA

Sizes:

2" to 12"

Connections:

ANSI Class 125 Flat Face Drilling (Aluminum),

ANSI Class 150 Raised or Flat Face Drilling (Carbon Steel and Stainless Steel)

Temperature Range:

-65 to +350°F [-54 to +177°C]

Pressure Setting Range:

0.3 oz/in² to 2 psig [1.29 mbarg to 0.14 barg]

Request data sheet: VCTDS-00301



VAREC 2440/2450 SERIES SPRING LOADED PRESSURE AND VACUUM RELIEF VALVE

Designed for use on liquid storage tanks, vessels and vapor recovery systems where excess pressure or vacuum may cause damage or permanent deformation and leakage of product must be minimized. Vent to atmosphere or pipe away models.

TECHNICAL DATA

Sizes:

2440 2" to 12"

2450 2" x 2" to 12" x 12"

Connections:

ANSI Class 125 Flat Face Drilling (Aluminum)

ANSI Class 150 Raised Face Drilling (Carbon Steel and Stainless Steel)

Pressure Setting Range:

1 to 50 psig [0.07 to 3.5 barg]

Vacuum Setting Range:

0.7 to 14 oz/in² [3.0 to 60 mbarg]

Request data sheet: VCTDS-00314



VAREC 4110A/3610/3660 SERIES SPRING LOADED VACUUM RELIEF VALVE

Designed to protect tanks and vessels from damage or deformation caused by changes in process pressure and vacuum conditions. Withstand the pressure of the stored product under normal operating conditions. Designs

available for tank top mounting, side mounting and "in-line" applications.

TECHNICAL DATA

Sizes:

4110A/3610 2" to 12"

3660 2" x 2" to 12" x 12"

Connections:

ANSI Class 125 Flat Face Drilling (Aluminum),

ANSI Class 150 Raised Face Drilling (Carbon Steel and Stainless Steel)

Relief Settings:

Up to 50 psig [3.5 barg]

Request data sheet: VCTDS-00316



VAREC 711 SERIES SPRING LOADED PRESSURE RELIEF VENT

Protects low and medium pressure storage tanks, gas headers, process vessels and waste gas collection systems from being overpressured.

TECHNICAL DATA

Sizes:

2" to 12"

Connections:

ANSI Class 125 Flat Face Drilling
(Aluminum)

ANSI Class 150 Raised Face Drilling
(Carbon Steel and Stainless Steel)

Temperature Range:

-65 to +350°F [-54 to +177°C]

Pressure Setting Range:

0.5 to 50 psig [0.035 to 3.5 barg]

Request data sheet: VCTDS-00302



ANDERSON GREENWOOD TYPE 96A WEIGHT LOADED VACUUM BREAKER

The 96A is a weight-loaded vacuum breaker designed to compliment the pressure relief products, especially when seeing high positive operating pressures.

TECHNICAL DATA

Sizes:

4", 6", 8", 12"

Vacuum Setting:

½ oz/in² [2.2 mbarg] (standard)

1½ oz/in² [6.6 mbarg] (optional)

Maximum Allowable

Positive Pressure:

Up to 85 psig [5.86 barg]

Request data sheet: VCTDS-00551



VAREC 7000 SERIES MUSHROOM (FREE) VENT

Free vent relieves to atmosphere and commonly used to protect atmospheric tanks containing non-volatile liquids. Designed to minimize back pressure and to bolt directly to a standard flange on the tank top. May also be mounted on a flame arrester.

TECHNICAL DATA

Sizes:

2" to 12"

Maximum Differential Pressure:

1 psi [0.07 barg]

Connections:

Bolts to standard ANSI Class 125 Flat Face flange

Request data sheet: VCTDS-00307



VAREC 221 SERIES EMERGENCY PRESSURE RELIEF MANWAY COVER

Provides emergency venting of low pressure storage tanks and vessels when exposed to abnormal internal pressure or vacuum beyond capability of the breather vent. Also allows quick and easy access for tank inspection and maintenance.

TECHNICAL DATA

Sizes:

18", 20", 24"

Connections:

Drilled to API 650 dimensions, Flat Face flange standard.

Drilled to ANSI Class 150 dimensions, Flat Face flange optional.

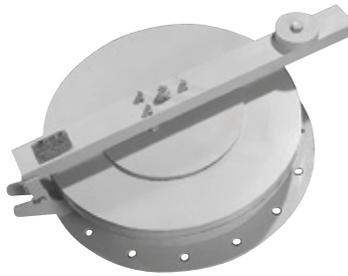
Pressure Setting Range:

0.5 to 6 oz/in² [2.15 to 25.86 mbarg]

Vacuum Setting Range:

0.5 to 1 oz/in² [2.15 to 4.31 mbarg]

Request data sheet: VCTDS-00310



VAREC 4210A SERIES EMERGENCY PRESSURE VENT AND MANWAY COVER

Designed to provide emergency venting of low pressure storage tanks and vessels. Protects the tank from rupture. Vacuum relief option provides additional vacuum protection.

TECHNICAL DATA

Sizes:

18", 20", 24"

Connections:

Drilled to ANSI Class 150 dimensions, Flat Face flange.

Drilled to API 650 dimensions, Flat Face flange.

Pressure Setting Range:

2" wc to 2 psig [5 mbarg to 0.14 barg]

Vacuum Setting Range:

-1.4" to -20" wc [-3.5 to -49 mm wc]

Request data sheet: VCTDS-00308



VAREC 5400A SERIES FLAME ARRESTER

Group "D", end-of-line flame arrester is designed to prevent propagation of flame from external sources into a storage vessel.

TECHNICAL DATA

Sizes:

2" to 12" (Vertical Installation)

Connections:

ANSI Class 125 Flat Face flange Drilling (Aluminum),

ANSI Class 150 Raised Face flange Drilling (Carbon Steel and Stainless Steel)

Pressure Rating:

Leak proof to 10 psig [0.69 barg]

Maximum Pressure

Differential:

1 psi [0.07 barg]

Approvals:

FM (Factory Mutual): all sizes, all materials. UL (Underwriters Laboratories) listed in all Aluminum construction in 2", 3", 4". Refer to product data sheet for additional information.

Request data sheet: VCTDS-00309



**VAREC 5000/5010 SERIES
FLAME ARRESTER**

Group "D" end-of-line flame arresters used in gas piping systems and petroleum storage tank roofs to prevent the propagation of a flame into the system. Extendable bank design for ease of maintenance.

TECHNICAL DATA

Sizes:

2" to 12"

Connections:

ANSI Class 125 Flat Face flange Drilling (Aluminum)

ANSI Class 150 Raised Face flange Drilling (Carbon Steel and Stainless Steel)

Pressure Rating:

Leak proof to 10 psig [0.69 barg]

Maximum Pressure Differential:

1 psi [0.07 barg]

Approvals:

5000 Series UL (Underwriters Laboratories) listed in all Aluminum construction in 2", 3", 4", 6" and 10" sizes. (Vertical Installation)

5010 Series UL listed in all Aluminum construction as above in 2", 3" and 4" sizes. (Horizontal Installation) Refer to product request data sheet: for additional information.

Request data sheet: VCTDS-00315



**VAREC 5810B/5820B
RELIEF VALVE WITH FLAME
ARRESTER**

A combination of the 2010B/2020B Series Pressure and Vacuum Relief Valve and the 5000 Series Flame Arrester. This unit combines the high flow capacity of the Relief Valve with the easy-to-maintain extensible bank Flame Arrester for maximum protection and reliable operation.

Request data sheet: VCTDS-00192



**VAREC 5910B/5920B SERIES
RELIEF VALVE WITH FLAME
ARRESTER**

A combination of the 2010B/2020B Series Pressure and Vacuum Relief Valve and the 5400A Series Flame Arrester. This unit combines the high flow capacity of the Relief Valve with the easy-to-maintain Flame Arrester for maximum protection and reliable operation.

Request data sheet: VCTDS-00161



ANDERSON GREENWOOD TANK BLANKETING REGULATORS

Tank Blanketing provides an inert gas blanket over the liquid in a liquid storage tank. The Trans-Zero Regulator is a pilot operated, dome-loaded diaphragm type regulator capable of reducing blanketing gas in a single step providing bubble-tight shut-off and low maintenance costs.

TECHNICAL DATA

Connections:

½", 1", 2" threaded (NPT) and flanged
ANSI 150, 300, 600

Temperature Range:

-20 to +300°F [-29 to +149°C]

Maximum Inlet Pressure:

200 psig [14 barg]

Blanket Pressure Range:

0.5" wc to 6 psig [12.7 mm wc to
0.4 barg]

Request data sheet: VCTDS-01042



VAREC 180 SERIES DOUBLE PORT PRESSURE REGULATOR

Provides upstream and downstream control for use on vapor recovery systems where sensitive control at low pressures is required. "Double port" design achieves a sensitivity of less than five percent.

TECHNICAL DATA

Sizes:

1" to 8"

Connections:

1": NPT threaded
2" to 8": Drilled to ASA 125 Flat Face
(Aluminum),
Drilled to ANSI Class 150
Raised Face (Carbon Steel)

Pressure Sensing Line:

180/181 2" NPT 186/187 1" NPT

Pressure Setting Range:

-0.4 to 20" wc [1 to 50 mbarg]

Request data sheet: VCTDS-00303



VAREC 42 SERIES SAMPLING AND GAUGING HATCH COVER

Designed to provide quick access to tanks for product gauging, temperature measurement and sampling.

TECHNICAL DATA

Sizes:

4", 6", 8", 10"

Connections:

ANSI Class 125 Flat Face flange
Drilling (Aluminum),
Welded Connection (Available on
standard carbon steel base only)

Working Pressure:

Up to 3 psig [0.207 barg]

Request data sheet: VCTDS-00313



VAREC 4310 SERIES SAMPLING AND GAUGING HATCH COVER

Installed on tank roofs or roof flanges to provide quick access for product gauging, temperature measurement or sampling.

TECHNICAL DATA

Sizes:

4", 8"

Connections:

ANSI Class 125 Flat Face flange Drilling

Working Pressure:

Up to 3 psig [0.207 barg]

Request data sheet: VCTDS-00311



VAREC 220 SERIES ROOF MANWAY COVER

Designed for use on tanks where quick and easy personnel access is desired.

TECHNICAL DATA

Sizes:

18", 20", 24", 30", 36"

Materials:

Cast Iron, Aluminum, Carbon Steel or 316 Stainless Steel base

Working Pressure: Up to 1 psig
[0.07 barg]

Request data sheet: VCTDS-00310



ANDERSON GREENWOOD TYPE RCRV RESERVE CAPACITY RELIEF VALVE

Designed to provide overpressure protection on low pressure, low temperature storage tanks when a large volume of vapor is generated by unusual conditions. O-ring seat provides bubble-tight performance to 95% of set pressure. Full open at set pressure – no overpressure required to achieve rated capacity.

TECHNICAL DATA

Sizes:

24" and 36"

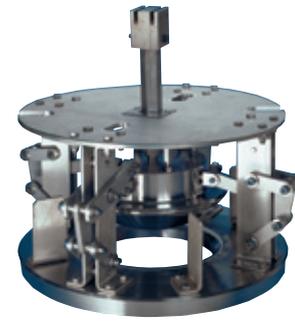
Flange Mounting:

24" = 150# Class/ANSI 16.5,
36" = 25# Class/ANSI 16.1

Set Pressure Range:

24": 1.5 to 5.0 psig [103 to 345 mbarg].
36": 1.5 to 3.0 psig [103 to 207 mbarg]

Request data sheet: VCTDS-01046



ANDERSON GREENWOOD TYPE ITV INTERNAL TANK VALVE

Liquid storage - LNG, LPG, NH₃, LOX, etc. The Internal Tank Valve is a fail-safe isolation valve for bottom and side withdrawal tanks.

Request data sheet: VCTDS-01047



ANDERSON GREENWOOD SSV SAFETY SELECTOR VALVE

Developed to provide a safe and efficient method of switching from an active pressure relief valve to a stand-by pressure relief valve. The SSV has less than 3% pressure drop to the active API 526 PRV inlet in accordance with ASME Code Section VIII and API RP 520, Part II. Tandem Safety Selector Valve systems are available which allow positive and simultaneous switching of both inlet and outlet SSV's while maintaining overpressure protection at all times.

TECHNICAL DATA

Sizes:

1" to 10"

Pressure Class:

ANSI Class 150 to 2500

Maximum Temperature:

800°F [426°C]

Request data sheet: VCTDS-00241



"BLK" BLOCKBODY PRESSURE RELIEF VALVES

Originally designed for offshore applications where set pressure requirements exceeded industry standards. Available in most Crosby and Anderson Greenwood Direct Spring Operated and Pilot Operated Pressure Relief Valve designs, the BlockBody will provide cost-effective alternatives to multiple high pressure smaller orifice relief valves. The standard forged body construction allows an extensive array of available metallurgy options.

TECHNICAL DATA

Sizes:

½" x ¾" to 8" x 10"

Set Pressures:

To 10,000 psig [689 barg]

Contact your PVC sales representative for more information



CROSBY STYLE PVR PRESSURE/VACUUM RELIEF VALVE

Designed for the food & beverage and pharmaceutical industries, the PVR relieves excess air or gas pressure, relieves excess liquid pressure in the absence of air or gas blanketing and prevents formation of a vacuum that could cause the vessel to buckle due to external pressure.

TECHNICAL DATA

Sizes:

3" and 4"

Inlet Connections:

Lug Union Nut, ANSI flanged, Tri-clamp

Set Pressures:

14.5 to 125 psig [1 to 8.62 barg]

Vacuum Relief (typical):

2" wc [5 mbarg]

Temperature Range:

-15 to +400°F [+5 to +204°C]

Code:

ASME VIII [15 psig and above]

Request data sheet: VCTDS-00330

PRESSURE RELIEF VALVES (NUCLEAR)

Emerson designs and manufactures pressure relief valves specifically to meet the exacting requirements of nuclear power plant applications built to ASME Code Section III. Our product portfolio includes Style HB-BP balanced design pressure relief valves used in pressurized water reactors throughout the world as well as Style HB-BP-DF dual function safety valves to meet special overpressure safety requirements of boiling water reactor primary loops. Style HA is intended for service on pressurized water reactors as the main steam safety valve. Other designs include styles JMB-WR, JO, JB, JWR-JO, JWR-JB, JMAK and JRAK-BS for balance of plant applications.

TESTING AND VERIFICATION DEVICES

SPVD – SET PRESSURE VERIFICATION DEVICE

A system for in-site testing, classified as a “calibrated assist device” per ASME Performance Test Code (PTC 25). Totally automatic – computer driven system for testing safety valves. Available in portable or permanently mounted models.

VPI – VALVE POSITION INDICATOR

Provides direct, continuous, remote indication of valve spindle position. Permits safe monitoring of pressure relief valves located in hostile environments. Transducer is qualified - Class 1E Standard system handles up to 20 Linear Variable Differential Transducers (LVDT) sensors. Qualified to IEEE-344 for in-containment service.

LISA – LIFT INDICATING SWITCH ASSEMBLY

A valve position indicating device with a movable permanent magnet attached to the valve spindle. Fixed “reed” type switches are permanently encased in epoxy in the switch housing. Two sets of switches provide redundancy, with each set consisting of three switches indicating valve closed, mid and fully-open positions. Qualified to IEEE-344.

- ASME Code Section I (V)
- ASME Code Section VIII (UV)
- Association of American Railroads
- Canadian Registration
- European Community (EC) Directive 94/9/EC
- Factory Mutual
- GGTN - GOSGORTEKHNADZOR of RUSSIA
- GOST (Russia)
- National Board of Boiler & Pressure Vessel Inspectors
- People’s Republic of China
- Pressure Equipment Directive 97/23/EC
- Type Approvals
 - ABS
 - Bureau Veritas (BV)
 - Det Norske Veritas (DNV)
 - Nippon Kaiji Kyokai (NKK)
- Underwriters Laboratory
- EN ISO-4126

EMERSON PRV²SIZE

PRESSURE RELIEF DEVICE SIZING AND SELECTION SOFTWARE



Emerson PRV²SIZE incorporates over 135 years of experience and engineering expertise for an extensive array of Anderson Greenwood, Crosby and Varec pressure relief devices and related products in one software package. With Emerson PRV²SIZE customers and engineers can address numerous applications in a single sizing and selection platform without the need to use two or more sizing programs.

EMERSON PRV²SIZE FEATURES:

- Improved user interface
 - Sizing calculations can be saved at any point
 - Multiple tags can be opened at one time
- Capability of sorting data using a variety of parameters
- Fully configured product selection
- Industry standard sizing methodologies
- Drop-down boxes allow instantaneous change of sizing methodology from API to ASME and vice versa
- Addition of 2:1 elliptical head tanks for fire sizing applications
- Catalog integration from existing product literature PDF's
- Detailed product specifications including cross sectional drawings with dimensions and weights
 - U.S. Customary System and Metric units
- Improved tools to export and import device tag numbers with the ability to mail files directly from the software program
- Combination device, reaction force and noise level calculations
- Addition of flow curves for pressure and vacuum relief valves
- Individual capsule summaries of each product including an image of the selected product

Another unique feature of Emerson PRV²SIZE is its capability to provide sizing and selection for tank protection and tank blanketing products in a single software program. This includes pad and de-pad valves, tank blanketing regulators, pressure/vacuum vents and low pressure pilot operated relief valves.

SERVICE CAPABILITIES

Delivering factory-trained teams of mobile technicians 24/7/365, our fleet of fully stocked service vehicles allows us to work anywhere you need us - from the field to our own state-of-the-art production facilities. Our pickup and delivery services assist you with your service and repair needs with minimal downtime. With a fleet of service vehicles and a trained team of expert technicians, Emerson provides a wide range of aftermarket services at customer locations. Some of the products or activities addressed onsite include:

- Boiler Safety Valves (protecting the Drum, Superheater, and Reheater)
- Boiler Level Gauges (Direct Reading)
- Pressure Relief Valves
- Control Valves
- Pump Protection Valves
- Specialty Gate, Globe, and Check Valves
- Wellheads
- Actuators and Controls
- Commissioning
- Nuclear Power Plant Services

SELECTION MATRIX

	ASME Section VIII Gas/Vapor	ASME Section VIII Liquid	ASME Section VIII Steam	ASME Section I Steam	ASME Section III	Adjustable Blowdown	Fixed Blowdown	Metal Seats	Soft Seats	Pressure Relief	Vacuum Relief	Snap/Pop Action	Modulating Action
Conventional and Balanced Bellows API 526 Valves													
Crosby Style JOS-E	X		X			X		X	X	X			
Crosby Style JBS-E	X		X			X		X	X	X			
Crosby Style JOS-H-E			X			X		X		X			
Crosby Style JLT-JOS-E	X	X				X	X	X	X	X			
Crosby Style JLT-JBS-E	X	X				X	X	X	X	X			
Portable/Threaded and Flanged Valves													
Anderson Greenwood Series 60	X						X		X	X			
Anderson Greenwood Series 80	X	X	X		X	X	X		X	X			
Crosby Series 800	X		X		X	X		X	X	X			
Crosby Series 900 OMNI-TRIM®	X	X	X		X		X	X	X	X			
Crosby Series BP OMNI-TRIM®	X	X					X		X	X			
Crosby Series 82	X						X		X	X			
Safety Valves													
Crosby Style HCI			X	X		X		X		X			
Crosby Style HE			X	X		X		X		X			
Crosby Style HSJ			X	X		X		X		X			
Crosby Style HSL			X	X		X		X		X			
High Pressure Pilot Operated Valves													
Anderson Greenwood Series 200	X					X			X	X		X	
Anderson Greenwood Series 400	X	X					X		X	X			X
Anderson Greenwood Series 500	X	X	X				X		X	X			X
Anderson Greenwood Series 700	X		X			X		X		X		X	
Anderson Greenwood Series 800	X	X					X		X	X			X
Anderson Greenwood Series 5200				X			X	X	X	X			X
Low Pressure Pilot Operated Valves													
Anderson Greenwood Series 90	X					X			X	X		X	X
Anderson Greenwood Series 9000	X					X			X	X	X	X	X
Anderson Greenwood 96A (Vacuum Breaker)							X		X		X		X
Large Orifice Relief Valves													
Crosby Style JB-TD	X		X			X		X		X			

SELECTION MATRIX

	Weight Loaded Pressure Relief	Weight Loaded Pressure & Vacuum Relief	Spring Loaded Pressure & Vacuum Relief	Weight Loaded Vacuum Relief	Spring Loaded Pressure Relief	Spring Loaded Vacuum Relief	Atmospheric Tank Venting	Emergency Pressure Relief Manway Cover	Emergency Vacuum Relief Manway Cover	Low Temperature Storage	Flame Arrester (Vertical Installation)	Flame Arrester (Horizontal Installation)	Roof Manway Cover	Sampling & Gauging Hatch Cover	Upstream Control Regulator	Downstream Control Regulator	Direct Spring Tank Blanketing	Right Angle Style Pilot Operated	Y Style Pilot Operated
Pressure/Vacuum Relief Valves																			
Varec 2010B/2020B Series		X																	
Varec 3500B/3600B/3650B Series	X			X															
Varec 7100B Series	X																		
Varec 2440/2450 Series			X																
Varec 4110A/3610/3660 Series	X					X													
Varec 711 Series					X														
Varec 7000 Series							X												
Emergency Vents																			
Varec 221P Series								X											
Varec 221PV Series								X	X										
Varec 4210A Series								X	X										
Anderson Greenwood RCRV										X									
Flame Arresters																			
Varec 5400A Series											X								
Varec 5000 Series											X								
Varec 5010 Series												X							
Combination Relief Valve with Flame Arrester																			
Varec 5810B/5820B Series		X									X								
Varec 5910B/5920B Series		X									X								
Tank Accessories																			
Varec 220 Series													X						
Varec 42 Series														X					
Varec 4310 Series														X					
Tank and Equipment Blanketing Systems																			
Varec Series 180/186															X				
Varec Series 181/187																X			
Anderson Greenwood Type BV-1																		X	
Anderson Greenwood Type RA																	X		
Anderson Greenwood Type Y1																			X

Pressure relief valves, providing advanced, reliable and efficient overpressure protection.

Emerson Electric Co.
Global Headquarters
8000 West Florissant Avenue
St. Louis, Missouri, 63136
United States
T +1 314 679 8984
ContactUs@Emerson.com
Emerson.com/FinalControl

Final Control
North America

Marshalltown
301 South 1st Avenue
Marshalltown, Iowa, 50158
United States
T +1 641 754 3011

McKinney
3200 Emerson Way
McKinney, Texas, 75070
United States
T +1 800 558 5853

Houston
19200 Northwest Freeway
Houston, Texas, 77065
United States
T +1 281 477 4100

Stafford
3950 Greenbriar Drive
Stafford, Texas, 77477
United States
T +1 281 274 4400

Emerson Automation Solutions
World Area Headquarters

Asia Pacific
1 Pandan Crescent
Singapore 128461
T +65 6777 8211

Europe
Neuhofstrasse 19a P.O. Box
1046 CH 6340 Baar,
Switzerland
T +41 41 768 6111

Latin America
1300 Concord Terrace Suite 400
Sunrise, Florida 33323,
United States
T +1 954 846 5030

Middle East & Africa
Emerson FZE P.O. Box 17033,
Jebel Ali Free Zone - South 2,
Dubai, United Arab Emirates
T +971 4 8118100

 Emerson.com

 Facebook.com/EmersonAutomationSolutions

 LinkedIn.com/company/Emerson-Automation-Solutions

 Twitter.com/EMR-Automation

© 2017 Emerson Electric Co. All rights reserved.

Anderson Greenwood, Crosby & Varec are marks 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 property of their respective owners.

The contents of this publication are presented for information purposes only, and while 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 on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice. Responsibility for proper selection, use and maintenance of any product or service remains solely with the purchaser and end user.

VCPBR-00999-EN 17/07



CONSIDER IT SOLVED