Leading the way in pressure relief technology.

Anderson Greenwood, Crosby & Varec 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. 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.

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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: ½” x 1” to ¾” 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: ½” x ¾” 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: ½” x ¾” 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

DIRECT SPRING OPERATED
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: ¾” x 1” to 2” x 2”
Orifices: 0.110 to 0.503 in² [0.71 to 3.25 cm²]
Connections: NPT, Flanged
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 82 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: ¾” 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

DIRECT SPRING OPERATED

CROSBY SERIES 820 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: ¾” 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

DIRECT SPRING OPERATED
**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

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**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

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**CROSBY STYLE HCl 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]
- **Inlet Ratings:** 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
OVERVIEW

HIGH PRESSURE PILOT OPERATED

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. 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:  
25 to 2200 psig [1.72 to 151.72 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
OVERVIEW

LOW PRESSURE PILOT OPERATED

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

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

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

TANK PROTECTION
**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

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**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

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**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
TANK PROTECTION

**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

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**ANDERSON GREENWOOD TYPE 96A**
**WEIGHT LOADED VACUUM BREAKER**

The 96A is a weight-loaded vacuum breaker designed to complement 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

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**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

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**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

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**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: VCTDS-00161

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
OVERVIEW

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 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
OVERVIEW

ANDERSON GREENWOOD SSV SAFETY SELECTOR VALVE
Developed to provide a safe and efficient method of switching from an active pressure relief valve to a standby 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

SPECIALTY VALVES
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, J0, JB, JWR-J0, 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.

CERTIFICATIONS
- 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

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<th>ASME Section III</th>
<th>Adjustable Blowdown</th>
<th>Metal Seats</th>
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22 | VALVES & CONTROLS
## Selection Matrix

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<th>Pressure/Vacuum Relief Valves</th>
<th>Weight Loaded Pressure Relief</th>
<th>Weight Loaded Pressure &amp; Vacuum Relief</th>
<th>Spring Loaded Pressure Relief</th>
<th>Spring Loaded Pressure &amp; Vacuum Relief</th>
<th>Spring Loaded Vacuum Relief</th>
<th>Atmospheric Tank Venting</th>
<th>Atmo. Vacuum Relief Manway Cover</th>
<th>Emergency Vacuum Relief Manway Cover</th>
<th>Flame Arrester Vertical Installation</th>
<th>Flame Arrester Horizontal Installation</th>
<th>Roof Manway Cover</th>
<th>Sampling &amp; Gauging Hatch Cover</th>
<th>Upstream Control Regulator</th>
<th>Downstream Control Regulator</th>
<th>Direct Spring Style Pilot Operated</th>
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Pressure relief valves, providing advanced, reliable and efficient overpressure protection.