



Valve Concepts, Inc.
ISO Registered Company

Model 2199

Pressure Vacuum Thief Hatch & Combo. Gauge Hatch

SECTION I

I. DESIGN AND FUNCTION

The Model 2199 is an inexpensive, multi-function unit. This low-profile hatch is designed to provide easy access into storage tanks for gauge reading and obtaining samples. It can also provide additional pressure relief as a supplement for normal venting. Furthermore, this unit is designed to be used as a spring operated conservation vent and tank hatch with a superior vapor-tight seal.

SECTION II

II. INSPECTION AND STORAGE:

The thief/gauge hatch is carefully packaged to prevent damage or contamination during shipping. Inspect the equipment when it is received and report any damage to the carrier immediately. The thief/gauge hatch should be stored with all protective covers in place.

SECTION III

III. INSTALLATION

	WARNING
<p>The gauge hatch must be installed in a horizontal position. The tank nozzle on which the hatch is mounted should have the same nominal diameter as the gauge hatch. It is recommended that the tank nozzle flange face be within 1 degree of horizontal.</p>	

The Model 2199 Gauge Hatch is designed with ANSI 150# FF or API 12D/12F/12P 8" bolt pattern.

Before installing the 2199 Gauge Hatch, remove all packing materials.

Inspect the gasket seating surface of the tank nozzle flange. It must be clean, free of scratches, corrosion, tool marks and flat.

Gauge hatches are furnished with flat faced flanges. It is recommended that they be installed on mating flat face flanges with a full faced gasket. If the flat face of

the hatch is sealing against a raised face steel flange, a spacer or filler ring must be used to fill the annular space of the raised face steel flange.

Make sure the gasket is suitable for the application and is in good condition. For full face gaskets, we recommend the use of an 1/8-inch rubber gasket.

Center the gasket within the bolt circle of the tank flange and carefully set the gauge hatch on the flange nozzle and align the bolt holes.

All stud threads must be lubricated to obtain proper torque results. A washer should be used under each stud nut.

Install the studs, washers and nuts and tighten nuts hand-tight. Check proper alignment of flange faces. Misalignment of flange faces will cause bending stresses at the flange and flange joint and damage may result. Correct any misalignment prior to applying torque to nuts. Recommended torque is approximately 5 ft.lbs with the use of lockwashers. Check torque after 5-10 minutes to ensure relaxation has not occurred.

SECTION IV

IV. MAINTENANCE -

Maintenance procedures hereinafter are based upon removal of the gauge hatch from the tank flange.

Owner should refer to owner's procedures for removal, handling and cleaning of nonreusable parts; i.e. gaskets, suitable solvents, ect.

Cashco recommends a scheduled maintenance be performed every three months and more frequently in adverse environmental conditions; such as, corrosive, dusty or freezing atmospheres.



CAUTION

DO NOT attempt to remove a locked gauge hatch from a tank or process vessel without first bleeding all pressure from the system.



CAUTION

SPRING UNDER COMPRESSION. Exercise caution during disassembly.

A. Vacuum O-ring and Vacuum Spring Replacement: *Note: Applies to Pressure - Vacuum units only.*

1. Remove cap (20) by rotating CCW.
2. Rotate nut (13) CCW to remove nut (13), washer (22), and vacuum spring (21).
3. Vacuum pallet assembly (18) will then slide through the threaded guide (12).
4. Remove vacuum o-ring (19). Examine groove in vacuum pallet (18), clear debris and any imperfections that may damage new o-ring.
5. Replace with new vacuum o-ring (19). **NOTE:** *Lightly condition the new o-ring before replacing. Prevent excessive grease build up.*
6. Slide shoulder bolt (4) up through center of the threaded guide (12).
7. Replace vacuum spring (21). Reinstall washer (22), and nut (13). Torque nut to 4 ft-lbs.
8. Lock with closing cap (20). Tighten hand tight and lock with thread sealant. Reinstall set screw (30). Apply Loctite to threads.

This maintenance is to assure proper sealing. Inspect the pressure o-ring (2) and vacuum o-ring (19) for any debris, excess grease or contaminants and scratches on the mating surface.

Annually replace the pressure o-ring (2). Refer to figures 1 & 2.

Annually replace the pressure o-ring (2), vacuum o-ring (19) and vacuum spring (21). Refer to figure 3.

B. Pressure O-ring Replacement:

1. Remove knob (8) by rotating CCW.
2. Grab the arm sub assembly (10) with hand. Lift arm/vacuum pallet (10,18) sub-assembly up and turn over so the vacuum pallet (18) (or pressure pallet (3) on pressure or gauge hatch only units) is upwards.
3. Remove pressure o-ring (2) from groove in flange base (1). Examine groove in base (1), clear debris and any imperfections that could cause damage to new o-ring.
4. Replace with new pressure o-ring (2). **NOTE:** *Lightly condition the new o-ring before replacing. Prevent excessive grease build up.*
5. Flip arm/pallet (10,3) sub-assembly over and re-align on to the flange base (1).
6. Engage eye bolt (16) in the groove in hinge arm (10) and secure in place with knob (8).

C. Limit Switch Replacement:

1. Back out two small screws (33) holding switch (32) to main valve.
2. Ascertain that wire lead is not entangled around parts of arm assembly (10) before pulling switch (32) away from valve.
3. Replace with new limit switch (32). Reinstall two small screws(33). **NOTE:** *Consult factory for customer specified switches.*
4. Return to Section III for Installation.

SECTION V

V. ORDERING INFORMATION

NEW REPLACEMENT UNIT vs PARTS "KIT" FOR FIELD REPAIR

To obtain a quotation or place an order, please retrieve the Serial Number and Product Code that was stamped on the metal name plate and attached to the unit. This information can also be found on the Bill of Material ("BOM"), a parts list that was provided when unit was originally shipped. (Serial Number typically 6 digits).

NEW REPLACEMENT UNIT:

Contact your local Cashco, Inc., Sales Representative with the Serial Number, Product code and the pressure setting. With this information they can provide a quotation for a new unit including a complete description, price and availability.



CAUTION

Do not attempt to alter the original construction of any unit without assistance and approval from the factory. All purposed changes will require a new name plate with appropriate ratings and new product code to accommodate the recommended part(s) changes.

PARTS "KIT" for FIELD REPAIR:

Contact your local Cashco, Inc., Sales Representative with the Serial Number and Product code. Identify the parts and the quantity required to repair the unit from the "BOM" sheet that was provided when unit was originally shipped.

NOTE: *Those part numbers that have a quantity indicated under "Spare Parts" in column "A" reflect minimum parts required for inspection and rebuild, - "Soft Goods Kit". Those in column "B" include minimum trim replacement parts needed plus those "Soft Goods" parts from column "A".*

If the "BOM" is not available, refer to the cross-sectional drawings included in this manual for part identification and selection.

A Local Sales Representative will provide quotation for appropriate Kit Number, Price and Availability.

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MODEL 2199

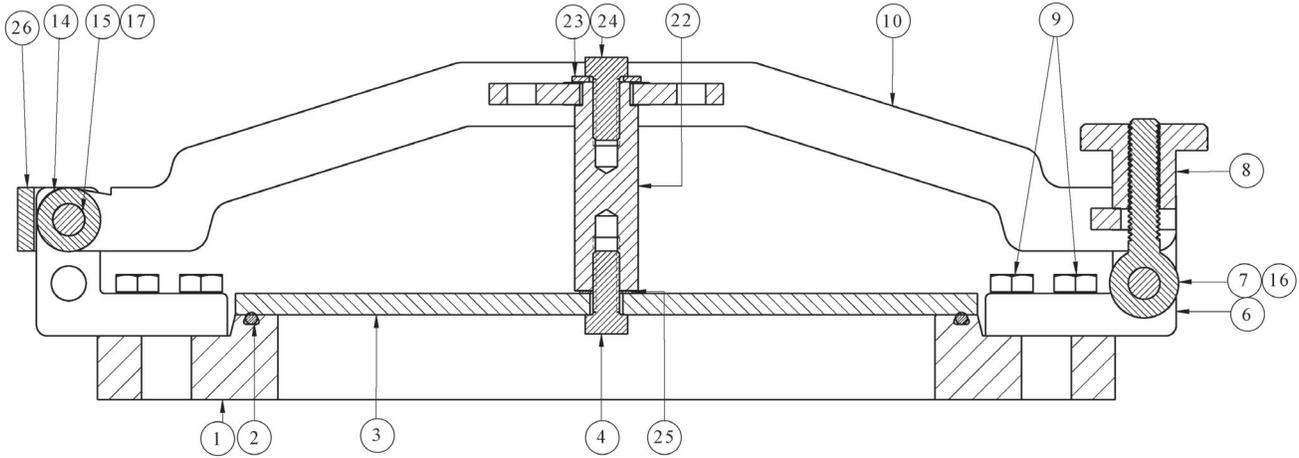


Figure 1: Gauge Hatch Model

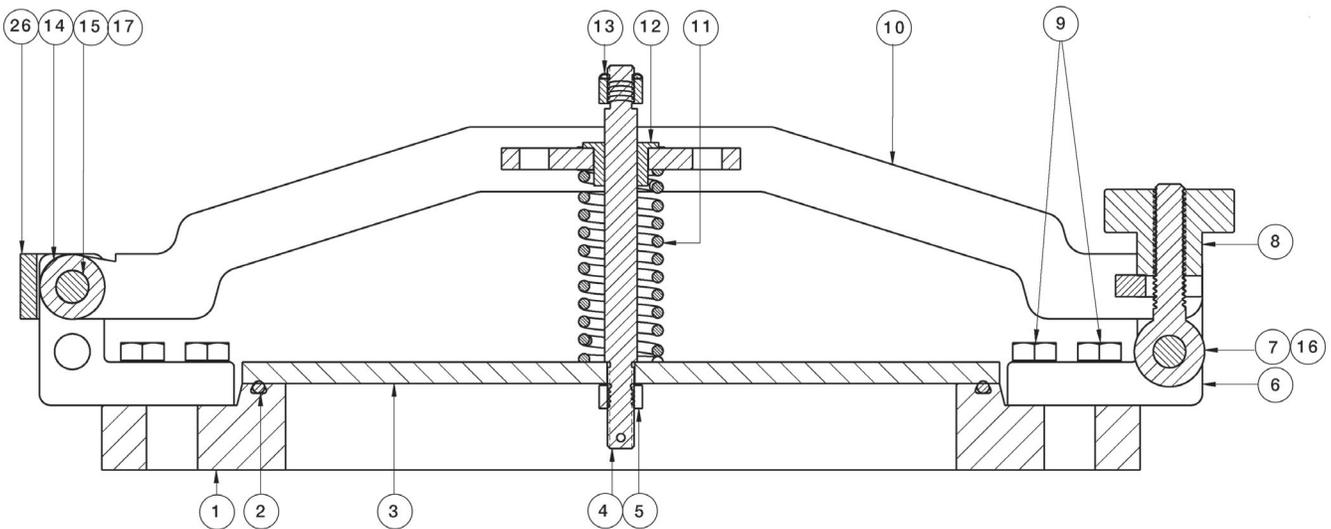


Figure 2: Pressure Model

PART LIST					
ITEM NO.	Description	ITEM NO.	Description	ITEM NO.	Description
1	Base	10	Arm Sub-Assembly	23	Washer
2	O-Ring ‡	11	Pressure Spring	24	Bolt
3	Pressure Pallet	12	Guide Bushing	25	Bolt Gasket ‡
4	Threaded Stem/ Bolt	13	Nut	26	Stop Bracket
5	Self-Sealing Nut	14	Spacer	32 *	Limit Switch
6	"L" Bracket	15	Bolts	33 *	Limit Switch Screw
7	Rod End	16	Spacer (Rod End)	34 *	Cotter Pin
8	Knob	17	Nut		
9	Bolt	22	Stem		

‡ Recommended replacement parts.

* = Item not shown

MODEL 2199

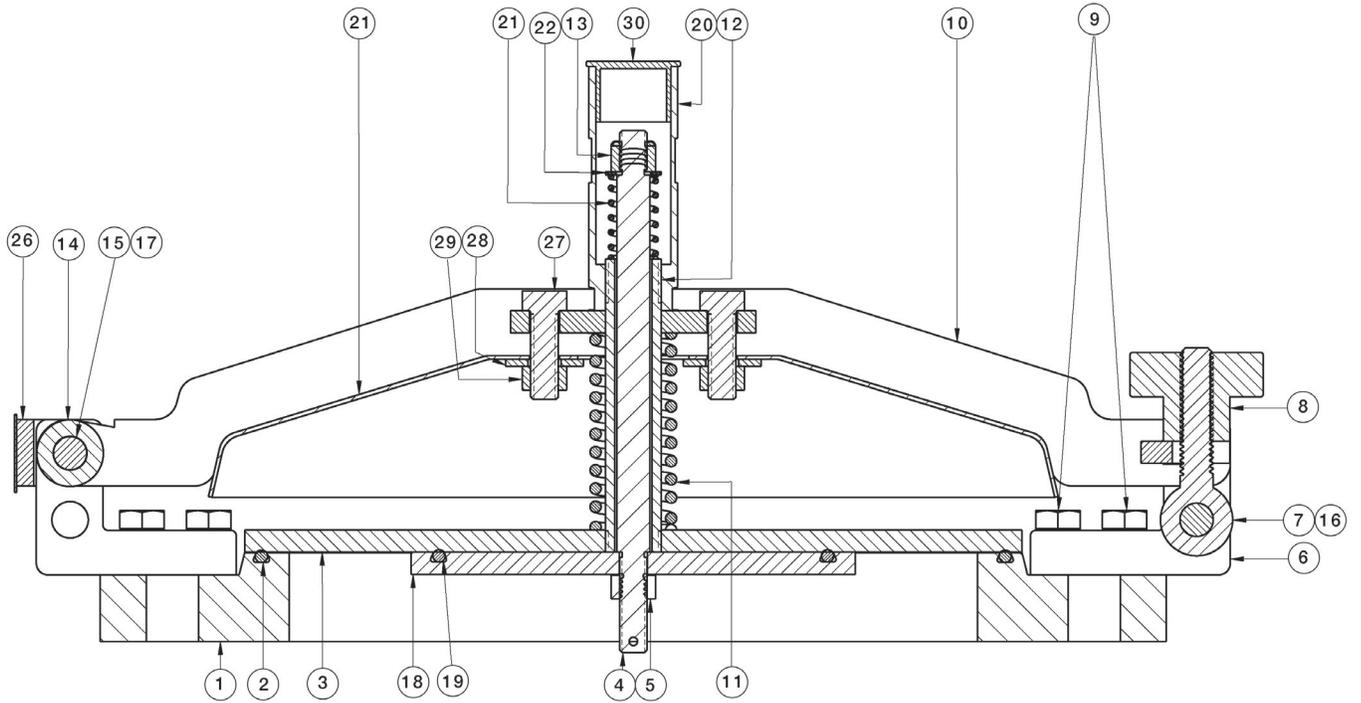


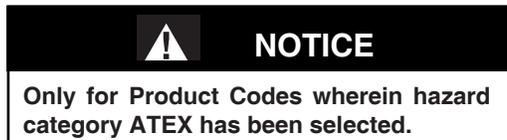
Figure 3: Pressure - Vacuum Model

PART LIST							
ITEM NO.	Description	ITEM NO.	Description	ITEM NO.	Description	ITEM NO.	Description
1	Base	10	Arm Sub-Assembly	19	O-ring ‡	31	Weatherhood
2	O-Ring ‡	11	Pressure Spring	20	Cap	32 *	Limit Switch
3	Pressure Pallet	12	Threaded Guide	21	Vacuum Spring ‡	33 *	Screws
4	Threaded Stud	13	Nut	22	Washer		
5	Self-Sealing Nut	14	Spacer	26	Stop Bracket		
6	"L" Bracket	15	Bolts	27	Cap Screw		
7	Rod End	16	Spacer (Rod End)	28	Washer		
8	Knob	17	Nut	29	Nut		
9	Bolt	18	Vacuum Pallet	30	Plug		

* = Item not shown

‡ Recommended replacement parts.

ATEX 94/9/EC: Explosive Atmospheres and Cashco Inc. Regulators



These valves satisfy the safety conditions according to EN 13463-1 and EN 13463-5 for equipment group IIG 2 c.

Caution: Because the actual maximum temperature depends not on the equipment itself, but upon the fluid temperature, a single temperature class or temperature cannot be marked by the manufacturer.

Specific Precaution to Installer: Electrical grounding of valve must occur to minimize risk of effective electrical discharges.

Specific Precaution to Installer: Atmosphere vent holes should be plugged to further minimize the risk of explosion.

Specific Precaution to Maintenance: The Valve Body/ Housing must be regularly cleaned to prevent buildup of dust deposits.

Specific Precaution to Maintenance: Conduct periodic Continuity Check between Valve Body/ Housing and Tank to minimize risk of electrical discharges.

Attention: When repairing or altering explosion-protected equipment, national regulations must be adhered to. For maintenance and repairs involving parts, use only manufacturer's original parts.

ATEX requires that all components and equipment be evaluated. Cashco pressure regulators are considered components. Based on the ATEX Directive, Cashco considers the location where the pressure regulators are installed to be classified Equipment-group II, Category 3 because flammable gases would only be present for a short period of time in the event of a leak. It is possible that the location could be classified Equipment-group II, Category 2 if a leak is likely to occur. Please note that the system owner, not Cashco, is responsible for determining the classification of a particular installation.

Product Assessment

Cashco performed a conformity assessment and risk analysis of its pressure regulator and control valve models and their common options, with respect to the Essential Health and Safety Requirements in Annex II of the ATEX directive. The details of the assessment in terms of the individual Essential Health and Safety Requirements, are listed in Table 1. Table 2 lists all of the models and options that were evaluated and along with their evaluation.

Models and options not listed in Table 2 should be assumed to not have been evaluated and therefore should not be selected for use in a potentially explosive environment until they have been evaluated.

Standard default options for each listed model were evaluated even if they were not explicitly listed as a separate option in the table. Not all options listed in the tables are available to all models listed in the tables. Individual TB's must be referenced for actual options.

When specifying a regulator that is to be used in a potentially explosive environment one must review the evaluations in Table 1 and 2 for the specific model and each and every option that is being specified, in order to determine the complete assessment for the unit.

A summary of the models and options found to have an impact on ATEX assessment due to potential ignition sources or other concerns from the ATEX Essential Health and Safety Requirements, are listed below.

1. The plastic knob used as standard on some models, (P1, P2, P3, P4, P5, P7, 3381, 4381, 1171, and 2171) is a potential ignition source due to static electricity. To demonstrate otherwise, the knob must be tested to determine if a transferred charge is below the acceptable values in IEC 60079-0 Section 26.14 (See items 25, 27, and 28 in Appendix A). Until the plastic knob has been shown to be acceptable, then either the metal knob option, or a preset outlet pressure option is required to eliminate this ignition source (See items 45 and 64 in Tables).
2. The pressure gauges offered as options on a few of the regulator models (DA's, P1-7, D, 764, 521), use a plastic polycarbonate window that is a potential ignition source due to static electricity. To demonstrate that the gauges are not a potential source of ignition, the gauges would need to be tested to determine if a transferred charge is below

indicating the gauge is compliant with the ATEX Directive (See items 26, 27, and 28 in Appendix A). Until compliance is determined, regulators should not be ordered with pressure gauges for use in potentially explosive environments.

3. Tied diaphragm regulators with outlet ranges greater than 100 psig should be preset to minimize the risk that improper operation might lead to an outboard leak and a potentially explosive atmosphere (See item 6 in Table 1).
4. Regulators must be ordered with the non-relieving option (instead of the self-relieving option) if the process gas they are to be used with is hazardous (flammable, toxic, etc.). The self-relieving option vents process gas through the regulator cap directly into the atmosphere while the non-relieving option does not. Using regulator with the self-relieving option in a flammable gas system could create an explosive atmosphere in the vicinity of the regulator.
5. Regulators with customer supplied parts are to be assumed to not have been evaluated with regard to ATEX and thus are not to be used in a potentially explosive environment unless a documented evaluation for the specific customer supplied parts in question has been made. Refer to Table 1 for all models and options that have been evaluated.

Product Usage

A summary of ATEX related usage issues that were found in the assessment are listed below.

1. Pressure regulators and control valves must be grounded (earthed) to prevent static charge build-up due to the flowing media. The regulator can be grounded through any mounting holes on the body with metal to metal contact or the system piping can be grounded and electrical continuity verified through the body metal seal connections. Grounding of the regulator should follow the same requirements for the piping system. Also see item 30 in Table 1.
2. The system designer and users must take precautions to prevent rapid system pressurization which may raise surface temperatures of system components and tubing due to adiabatic compression of the system gas.
3. Heating systems installed by the user could possibly increase the surface temperature and must be evaluated by the user for compliance with the ATEX Directive. User installation of heating systems applied to the regulator body or system piping that affects the surface temperature of the pressure regulator is outside the scope of this declaration and is the responsibility of the user.
4. The Joule-Thomson effect may cause process gases to rise in temperature as they expand going through a regulator. This could raise the external surface temperature of the regulator body and downstream piping creating a potential source of ignition. Whether the Joule-Thomson effect leads to heating or cooling of the process gas depends on the process gas and the inlet and outlet pressures. The system designer is responsible for determining whether the process gas temperature may rise under any operating conditions. If a process gas temperature rise is possible under operating conditions, then the system designer must investigate whether the regulator body and downstream piping may increase in temperature enough to create a potential source of ignition.

The process gas expansion is typically modeled as a constant enthalpy throttling process for determining the temperature change. A Mollier diagram (Pressure – Enthalpy diagram with constant temperature, density, & entropy contours) or a Temperature – Entropy diagram with constant enthalpy lines, for the process gas, can be used to determine the temperature change. Helium and hydrogen are two gases that typically increase in temperature when expanding across a regulator. Other gases may increase in temperature at sufficiently high pressures.

Product Declaration

If the above issues are addressed by selecting options that do not have potential sources of ignition, avoiding options that have not been assessed, and by taking the proper usage issue precautions, then Cashco regulators can be considered to be a mechanical device that does not have its own source of ignition and thus falls outside the scope of the ATEX directive.

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