

⚠ WARNING

Please follow all instructions to properly install and maintain the equipment. Failure to follow proper instructions can lead to explosions, fire and chemical adulteration leading to possible property damage and/or personal injury or death.

Improper installation or maintenance of this equipment may result in dangerous conditions leading to property damage and/or personnel injury or death. These dangerous conditions include but are not limited to fire, explosion and/or chemical leakage. All instructions must be followed to properly install and maintain this equipment.

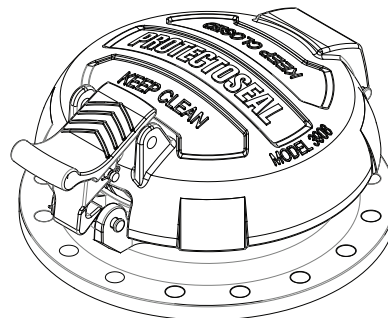


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⚠ CAUTION

This instruction manual must be made available to all personnel working on this equipment. In addition all personnel performing installation or maintenance must be technically qualified and competent, have read and understand this document and use proper PPE (Personal Protection Equipment) at all times.

If any questions arise concerning the proper installation or maintenance of our products, please contact Protectoseal or one of our Authorized Representatives.

When installing or maintaining any Protectoseal device, the legal, corporate and advisory safety regulations and procedures appropriate for the specific installation site must be fully understood and followed. Tank vapor space pressure or vacuum should be relieved before any installation or maintenance operations are undertaken.

INTRODUCTION:

Scope: This manual provides information on the proper installation and maintenance of the Protectoseal 3908 Pressure and Vacuum Relief Thief Hatch. Information regarding replacement parts can be found at the back of this manual.

Function: The Protectoseal 3908 Pressure and Vacuum Relief Thief Hatch functions to provide both pressure venting and vacuum relief for steel and fiberglass tanks. The device protects tanks against excessive pressure or vacuum conditions due to pumping in / out and temperature changes. The thief hatch opens at specific set points to relieve excess pressure and excess vacuum. The settings are dictated by the specific springs which are assembled into the units. The pressure and vacuum pallets open and close as needed to relieve the set pressures which are determined by the specific springs. When handling the springs, please make sure you have proper PPE (Personal Protective Equipment) as the springs can store significant potential energy which released can cause injury.

Springs are utilized to determine both pressure and vacuum set points. The device closes after venting to provide a tight seal preventing vapor leakage.

The function of the 3908 Pressure and Vacuum Thief Hatch is dependent upon proper installation and maintenance. This maintenance includes periodic inspection and cleaning, as well as replacement of damaged springs and/or diaphragms.

INSTALLATION:

1. Install the device on an API flange bolt circle (16 bolts on a 10 3/4" circle) with an 8" opening.
2. When installing the device directly to a tank, please make sure to have the proper gasket on the bottom side of the device and placed and matched up to the tank's roof with all holes lined up. Place the proper sized bolts (16 of them) through the mating nuts on the other side of the bolt, by attaching each nut to the bolt from the outside. Make sure all nuts are tight by tightening them in a circular fashion. Make sure the device is securely fastened. Make sure the gasket is fully and properly seated.
3. Press down on cover latch to release (Fig. 1).
4. Check to make sure gaskets are in good shape (no tears, cracks, debris, etc.).

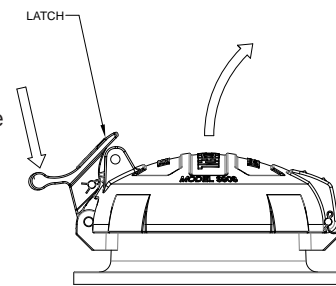


Fig. 1

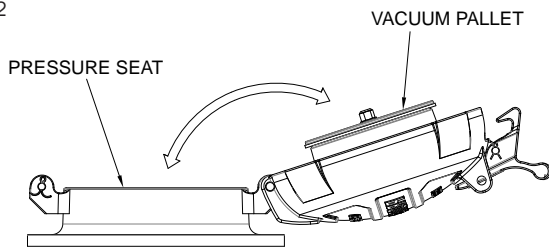
For best performance, the vent should be mounted level so that the seating surfaces are no more than 1° off horizontal.

Note: The tank nozzle bore must be at least the same nominal dimension as the relief valve inlet body.

Note: The hatch should be positioned so that the cover is free to open fully without interfering with surrounding equipment or structures.

- Verify that the thief hatch cover moves freely from closed to full open position (Fig. 2).

Fig. 2



- With cover open, verify that the center assembly is free to move up and down against the setting force of the pressure spring (Fig. 3). Lift up on vacuum pallet to ensure vacuum pallet is free to move through range of motion against setting force of the vacuum spring (Fig. 4).

Fig. 3

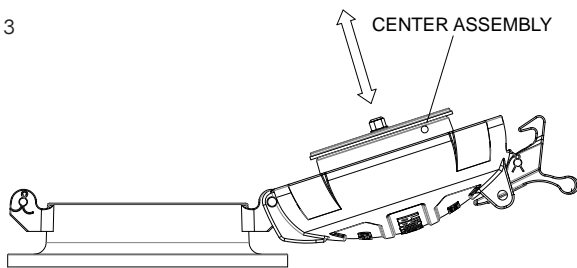
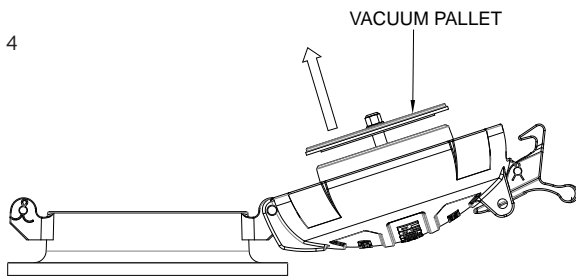


Fig. 4



- Close cover and press down to secure latch. Press down on cover and allow to “spring” back up ensuring proper motion of thief hatch.

MAINTENANCE:

Protectoseal recommends that our products should be inspected and maintained according to the normal maintenance schedule of the facility. At a minimum, maintenance should be conducted quarterly. More frequent maintenance may be required, and should be scheduled, for unusual service conditions such as corrosive or dusty atmospheres. Protectoseal recommends that service performed on thief hatch relief valves is performed by Protectoseal for proper and accurate settings and leakage rate verification.

⚠ WARNING

Tank vapor space pressure or vacuum must be relieved before any maintenance operations are undertaken.

⚠ CAUTION

When maintaining any Protectoseal device, the legal, corporate and advisory safety regulations and procedures appropriate for the specific installation site must be fully understood and followed.

Proper PPE (Personal Protection Equipment) must be worn at all times by all personnel performing maintenance on this equipment.

Overview: During maintenance the pressure and vacuum gaskets are to be inspected for cracks, debris, damage or deterioration. Any compromised gasket must be replaced with the proper OEM Protectoseal replacement part. It is advised that both the pressure and vacuum gasket be replaced quarterly or sooner for the effective and efficient operation of the unit. The base gasket should only be replaced if leakage is detected or if the device is removed.

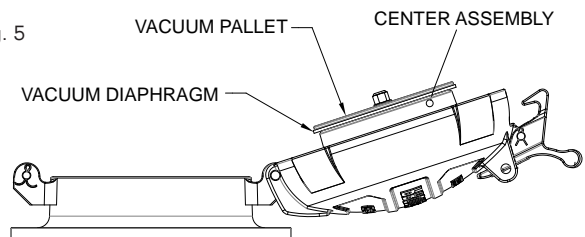
Inspect both the pressure and vacuum machined seating surfaces. The seats should be free of nicks, mars or accumulations of foreign material. Clean with a suitable cleaning fluid. Also inspect pressure and vacuum pallets for corrosion damage or buildup. Clean with suitable cleaning fluid or replace parts if necessary. Inspect cover locking system for product build up.

Inspect the springs and ensure they are not broken, damaged or compromised. If the springs require replacement they should be replaced with OEM Protectoseal replacement parts. Note that springs are color coded conveying the settings of the unit.

Refer to the parts list and diagram at the end of this manual for part identification and ordering of replacement.

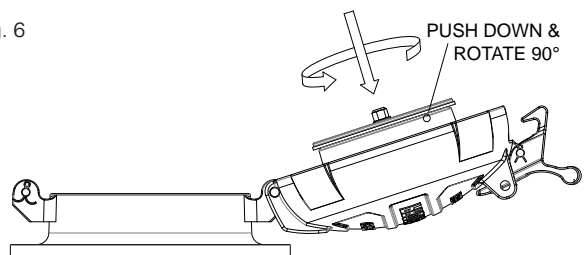
Vacuum Components Maintenance: The vacuum pallet assembly mounts on the center assembly. The vacuum gasket is sandwiched between the vacuum pallet and machined vacuum seat on the center assembly (Fig. 5). Follow the steps below to inspect and perform maintenance on the vacuum assembly.

Fig. 5



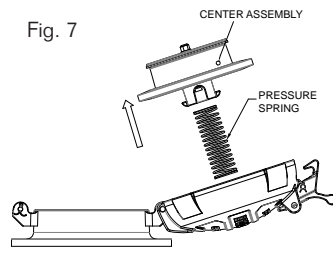
- Lift the thief hatch cover to its full open position. Remove any loose dirt or foreign material from the pressure seat area of the thief hatch and from around the center assembly / inside the hatch cover.
- Remove the center assembly from the cover. Press down on the center assembly. Rotate left or right 90° to disengage from cover (Fig. 6).

Fig. 6



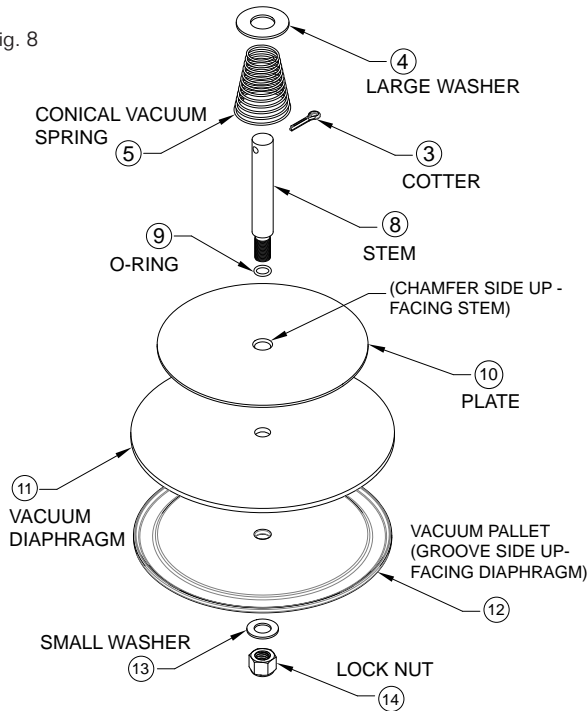
2. continued -

Remove center assembly and pressure spring and set aside (Fig. 7). Note, there is a potentially large force on the pallet assembly due to the springs. Please slowly rotate the pallet assembly and remove it by cushioning (reduce in slow manner) the spring force as the pallet is removed. The pallet can pop out with large forces if not handled properly. Large forces can cause personal injury if not handled properly. The same precaution should be taken when reassembling the pressure pallet.



3. With the center assembly removed, proceed to remove the cotter pin, washer and conical vacuum spring from the vacuum stem (Fig. 8). The vacuum pallet assembly can now be removed from the center assembly. Note that large forces can be present from the force of the spring. Make sure to wear appropriate PPE and cushion the spring force as components are slowly removed.

Fig. 8



4. Loosen lock nut on vacuum pallet assembly. Remove nut and washer from vacuum stem, set aside. Remove pallet, diaphragm and plate from stem (Fig. 8). Note that the pallet has a flat side and a grooved side. The grooved side faces towards the diaphragm. Handle FEP diaphragm with care to avoid bending, kinks, scratches or dents that can affect its performance and sealing capability.

Note that the retaining plate has a chamfered ID that faces towards the stem allowing the O-ring to seat in the chamfer when assembled.

5. Inspect the vacuum diaphragm. The diaphragm must be clean, flat, smooth and free of any tears or other damage. Clean the diaphragm with a clean, non-abrasive lint-free

cloth to remove and prevent accumulation of residue which can negatively affect sealing performance. If the diaphragm is damaged or deteriorated, it must be replaced.

6. Inspect the conical vacuum spring. The spring must not be deformed or damaged in any manner. The spring must be free from accumulation of foreign material, clean if necessary. If any spring is deteriorated in any way it must be replaced.

7. Inspect the vacuum seating surface on the center assembly. The seat should be free of nicks, mars or accumulations of foreign material. Clean machined seat with suitable cleaning fluid.

CAUTION

Do not use a file or other sharp tool to clean the seating surface.

Note: See parts list on page 4 and 5 for detailed part information. After the gasket and other possible components have been replaced, re-assemble the vacuum assembly in the reverse order of removal of the assembly.

Pressure Components Maintenance: The ring shaped pressure diaphragm stretches onto the pressure pallet, located on the center assembly. The center assembly mounts into the hatch cover which when closed creates a pressure tight seal with the pressure seat, located on the thief hatch base (Fig. 9).

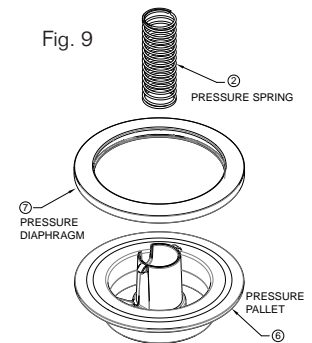
1. Begin inspection and maintenance of the pressure components by completing the disassembly steps (1) and (2) in the proceeding section (Vacuum Components Maintenance).

2. Stretch the ring shaped pressure diaphragm to remove from the center assembly and inspect. The diaphragm must be clean, flat, smooth and free of any tears or other damage. Clean the diaphragm with a clean, non-abrasive lint-free cloth to remove and prevent accumulation of residue which can negatively affect sealing performance. If the diaphragm is damaged or deteriorated, it must be replaced. Note when installing new gasket, make certain the new gasket fits squarely and evenly around the circumference of the pressure pallet.

3. Inspect the pressure spring. The spring must not be deformed or damaged in any manner. The spring must be free from accumulations of foreign material, clean if necessary. If any spring is deteriorated in any way it must be replaced.

4. Inspect the pressure seating surface on the hatch base. The seat should be free of nicks, mars or accumulations of foreign material. Clean machined seat with suitable cleaning fluid.

Fig. 9



CAUTION

Do not use a file or other sharp tool to clean the seating surface.

5. Inspect the thief hatch cover. If the cover is damaged the gauge hatch should be replaced.
6. Re-assemble the thief hatch in the reverse order. Please slowly rotate the pallet assembly by cushioning (reduce in slow manner) the spring force as the pallet is removed. The pallet can pop out with large forces if not handled properly. Large forces can cause personal injury if not handled properly. All fasteners must be tightened securely. Make sure that the thief hatch cover is free to move through its entire range of motion. Make sure the center assembly is free to move up and down through its entire range of motion. Make sure the vacuum pallet is free to open through its entire range of motion. Make sure to follow the precautions in regards to spring forces and handle accordingly as mentioned in the Vacuum Components Maintenance section.
7. Close cover and secure with latch. Press down on cover and allow to "spring" back up ensuring proper motion of thief hatch.

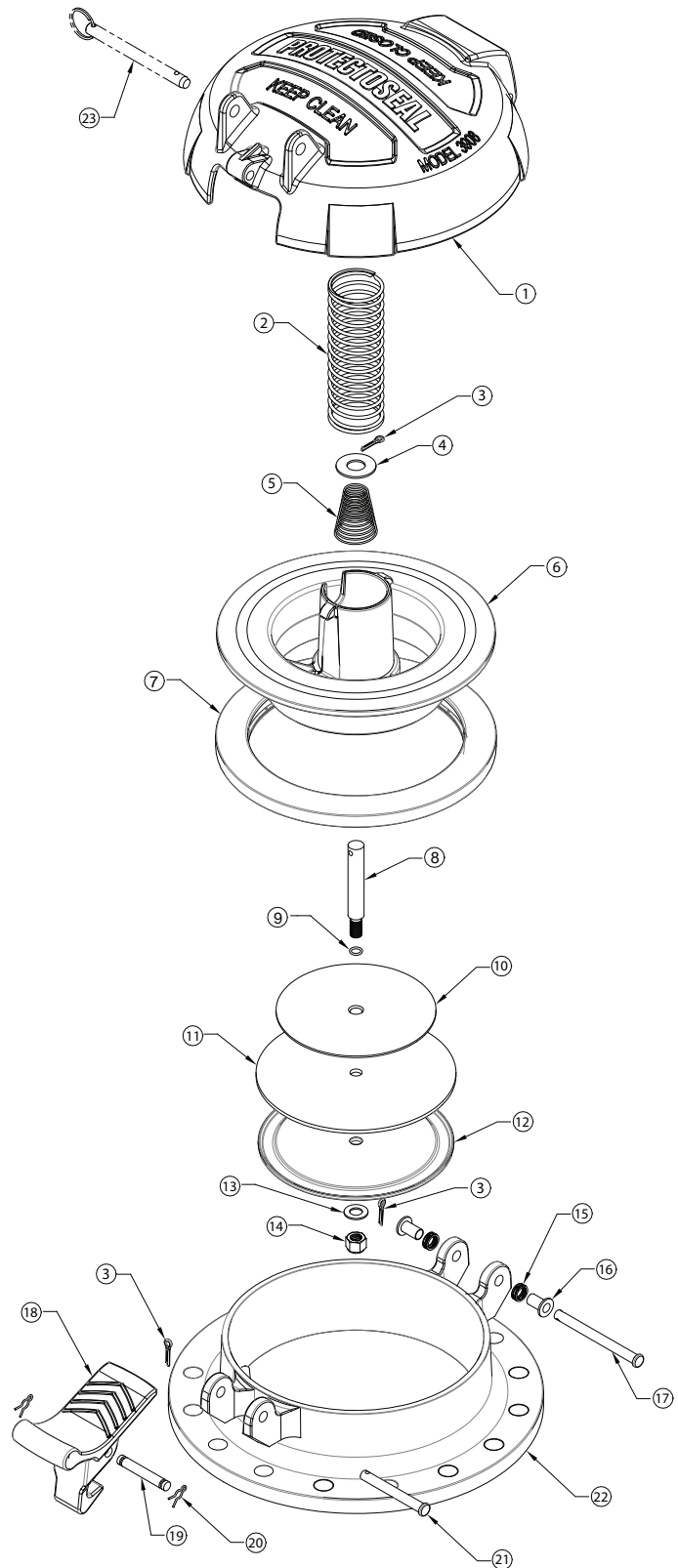
Ordering Replacement Parts: (Fig 10.)

Call your Protectoseal representative to order OEM Protectoseal replacement parts. Reference the unit's model number located on the label affixed to the thief hatch cover. Please refer to the tables on page 5.

Item	Description	Part No.	Material	Qty.
1	Cover	3908-2-7	Cast Alum.	1
2*	Pressure Spring	Ref. Table 1	-	-
3	Cotter Pin	4197023200	Stainless Steel	3
4	Large Washer	4069300000SS	316 SS	1
5*	Vacuum Spring	Ref. Table 2	-	-
6	Pressure Pallet	3908-335H-7	Cast Alum.	1
7*	Pressure Gasket	Ref. Table 3	-	-
8	Stem	3908-236-69	316 SS	1
9	O-ring	20-R106M-118	Viton	1
10	Plate	3908-234-13	Aluminum	1
11*	Vacuum Diaphragm	Ref. Table 4	-	-
12	Vacuum Pallet	3908-335-13	Aluminum	1
13	Small Washer	4069270000SS	316 SS	1
14	Lock Nut	4359180000SS	316 SS/Plastic	1
15	Wave Spring	3908-11	Stainless Steel	2
16	Bushing	3908-18-69	316 SS	2
17	Clevis Pin, $\frac{5}{16}$ x $3\frac{1}{2}$	3908-74B-69	316 SS	1
18	Latch	3908-25-7	Cast Alum.	1
19	Clevis Pin, Grooved	3908-13-69	316 SS	1
20	Retaining Pin	4897002400	Stainless Steel	2
21	Clevis Pin, $\frac{3}{16}$ x $2\frac{3}{4}$	3908-74A-69	316 S.S.	1
22	Hatch Base	3908-1-7	Aluminum	1
23*	Locking Pin (optional)	Ref. Table 5	S.S.	-

* Replacement Parts

Fig. 10



SERIES 3908 PART NUMBERING SYSTEM

3908-

Table 1

Table 2

Table 3

Table 4

Table 5

Refer to Tables 1, 2, 3, 4 and 5 to determine pressure / vacuum spring and gasket numbers

Pressure Spring Options - Table 1

Option Code	Setting oz./in. ²	Material	Color	Replacement Spring Part No.
A	2	Steel	Black	3908P-11A-161
B	4	Steel	Green	3908P-11B-161
C	6	Steel	Brown	3908P-11C-161
D	8	Steel	Orange	3908P-11D-161
E	12	Steel	Pink	3908P-11E-161
F	16	Steel	Dark Blue	3908P-11F-161
G	24	Steel	Red	3908P-11G-161
H	32	Steel	Purple	3908P-11H-161
I	2	Inconel	Black, White, Orange	3908P-11A-56
J	4	Inconel	Dark Green, White	3908P-11B-56
K	6	Inconel	Brown, White	3908P-11C-56
L	8	Inconel	Orange, White	3908P-11D-56
M	12	Inconel	Pink, White	3908P-11E-56
N	16	Inconel	Dark Blue, White	3908P-11F-56
O	24	Inconel	Red, White, Orange	3908P-11G-56
P	32	Inconel	Purple, White	3908P-11H-56

Vacuum Spring Options - Table 2

Option Code	Setting oz./in. ²	Material	Color	Replacement Spring Part No.
Q	0.4	Steel	Light Blue	3908V-11A-161
R	0.9	Steel	Steel Grey	3908V-11B-161
S	3.5	Steel	Yellow	3908V-11C-161
T	0.4	Inconel	Blue, White	3908V-11A-56
U	0.9	Inconel	Grey, White	3908V-11B-56

Pressure Gasket Options - Table 3

Option Code	Material	Color	Replacement Gasket Part No.
V	HNBR	Black	3908P-18-102
W	Viton	Dark Blue	3908P-18-118

Vacuum Gasket Options - Table 4

Option Code	Material	Color	Replacement Gasket Part No.
X	Fluorosilicone	Blue	3908V-218-103
Y	FKM (Viton) Fluoroelastomer	Black	3908V-218-118
Z	FEP Film	Clear	3908V-218-107

Locking Pin Option - Table 5

Option Code	Option	Material	Replacement Pin Part No.
0	Not Included	-	-
1	Included	S.S.	3908-74C-69

Installation Instructions

No. 3908-74C-69 Locking Pin Option

Place the pin horizontally in the hole location shown in the diagram below. Make sure spring loaded ball is past edge of casting and visible as shown in diagram. To remove pin, pull pin straight out. Note: Remove pin to access thief hatch.

Make sure spring loaded ball is past casting edge and visible

No. 3908-74C-69



THE PROTECTOSEAL COMPANY - PRODUCT WARRANTY:

1. Protectoseal warrants to the original user and it only, that products and repair parts that it manufactures are free from defects in materials or workmanship under normal use and service until the expiration of 12 months from the date of the initial shipment from the factory. This Limited Warranty is applicable to parts that are not expendable by nature that are installed and used in accordance with Protectoseal's printed instructions and all applicable federal state and local regulations.
2. Protectoseal will, at its option, repair or replace such parts, or parts that are claimed to be defective, without charge to the user provided inspection at the factory substantiates any claimed defect.
3. No product may be returned for inspection except upon prior authorization by Protectoseal and shipment to factory with transportation costs prepaid. Any products that have been in service must be thoroughly cleaned and include Material Safety Data (SDS) Sheets on the service into which it has been installed.
4. If within 30 days after Buyer's discovery of what Buyer believes is a defect, Buyer notifies Protectoseal in writing, Protectoseal shall, at its sole option, repair or replace (F.O.B. point of manufacture) the product or component found to be defective. Failure by Buyer to give such written notice within 30 days shall be deemed an absolute and unconditional waiver of Buyer's claim for such defects.
5. The original user shall assume full responsibility for the overall effectiveness and efficiency of the operating environment in which Protectoseal equipment is to function. No representation or other affirmation of fact, including but not limited to statements regarding capacity, suitability for use or performance of the equipment or any part thereof shall be deemed to be a warranty of the Protectoseal Company for any purpose, nor give rise to any liability or obligation of the Protectoseal Company whatsoever. If Protectoseal provides technical advice to Buyer, whether or not at Buyer's request, with respect to the application, further manufacture or other use of the products and parts, Protectoseal shall not be liable for such technical advice and Buyer assumes all risks of such advice and the results thereof.
6. Protectoseal neither assumes nor authorizes any person to assume for Protectoseal any other liability in connection with the sales and/or use of said merchandise. The use by any Representative, purchaser or original user of any non-Protectoseal attachment, feature, device or modification on / or to the Protectoseal equipment, or any part thereof, manufactured or furnished by the Protectoseal Company, without the express prior written approval of the Company shall void any and all warranties made herein on behalf of the Company.
7. This warranty shall not apply to any merchandise which shall have been repaired or altered outside Protectoseal's factory in any way so as, in the judgment of Protectoseal to affect its performance, nor which has been subjected to misuse, negligence or accident, nor to any merchandise which shall have been installed or operated contrary to our instructions. The above warranty and above obligation to repair or replace are complete and exclusive and Protectoseal disclaims liability for special or consequential damages of any nature whatsoever.
8. The exclusive remedy of Buyer shall be a right of action to recover damages limited to the purchase price of the merchandise, as may be defective, less its salvage value.
9. Protectoseal shall not be liable hereunder to Buyer or others claiming through the Buyer for special or consequential damages for any reason whatsoever such cause be based on contract, negligence, strict liability, tort or otherwise. In no event shall Protectoseal be liable for loss of profits, indirect, special or consequential damages, or other similar damages.
10. Except as specifically provided herein, there are no other warranties, express or implied, including but not limited to any implied warranties of merchantability or fitness for a particular purpose with respect to the products and parts whether used alone or in combination with any other products or material.
11. The Protectoseal Company shall not be liable for any damages caused by delay in delivery, installation or furnishing of the equipment or services.
12. No representative of the Protectoseal Company has the authority to change this warranty in any manner whatsoever and no attempt to repair or promise to repair, or replace the product covered by this warranty by any representative of the Protectoseal Company shall extend this warranty in any manner whatsoever.
13. The majority of Protectoseal Products are mechanical devices the operation of which may degrade due to the wear, corrosion and aging of components. The environment and conditions of use will determine the operation, performance and safe service life of these products. Periodic inspection and maintenance are essential.
14. The above warranty and the above obligation to repair or replace are complete and exclusive and Protectoseal expressly disclaims liability for special consequential damages of any nature whatsoever.
15. This agreement shall be construed, and the rights and obligations of the parties hereto under this agreement shall be determined, in accordance with the laws of the State of Illinois.
16. Many Protectoseal products are manufactured for the storage, transport, transfer and use of toxic, flammable and dangerous liquids and gases. Such substances should be handled by experienced and trained personnel only, using accepted governmental and industrial safety procedures.

November 2017