

April 2020

ES-805 and ES-905 Series Vent Valves

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WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion, fire and/or chemical contamination causing property damage and personal injury or death.

Enardo™ vent valves must be installed, operated and maintained in accordance with federal, state and local codes, rules and regulations and Emerson Process Management Regulator Technologies Tulsa, LLC instructions.

Failure to correct trouble could result in a hazardous condition. Call a qualified service person to service the unit. Installation, operation and maintenance procedures performed by unqualified person may result in improper adjustment and unsafe operation. Either condition may result in equipment damage or personal injury. Only a qualified person shall install or service the vent valves.

Introduction

Scope of the Manual

This Instruction Manual provides instructions for installation, maintenance and parts ordering guide for the ES-805 and ES-905 Series vent valves.

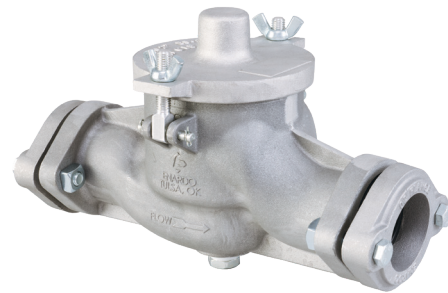


Figure 1. Typical ES-805 Series In-Line Vent Valve



Figure 2. Typical ES-905 Series End-of-Line Vent Valve



WARNING

The ES-805 and ES-905 Series vent valves are not necessarily grounded when installed on fiberglass reinforced plastic tanks unless the base is electrically bonded to the tank.

To avoid personal injury or property damage resulting from the effects of a static electricity discharge from hatch components in a hazardous atmosphere or where the process fluid is combustible, electrically bond the base to the tank with grounding strap.

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ES-805 and ES-905 Series

Specifications

The Specifications section on this page provides specifications for the ES-805 and ES-905 Series vent valves. Specifications such as model number, connection size, date of manufacture, valve type, seal materials and pressure/vacuum settings are stamped on the nameplate attached to the vent valve. Weights are keyed to the pallet stem. Every weight is stamped with the setting (oz.), the valve size and the part number.

Available Construction

See Figure 3

Available Sizes

2 through 4 in. / 50 through 100 mm

Set Pressure/Vacuum⁽¹⁾

See Table 1

Construction Materials

See Table 2

Approximate Weight

ES-805 Series Vent Valve

2 In. / 50 mm body: 12 lbs. / 5 kg

3 In. / 80 mm body: 17 lbs. / 8 kg

4 In. / 100 mm body: 23 lbs. / 10 kg

ES-905 Series Vent Valve

2 In. / 50 mm body: 11 lbs. / 5 kg

3 In. / 80 mm body: 15 lbs. / 7 kg

4 In. / 100 mm body: 19 lbs. / 9 kg

1. The pressure limits in this Instruction Manual and any applicable standard or code limitation should not be exceeded.

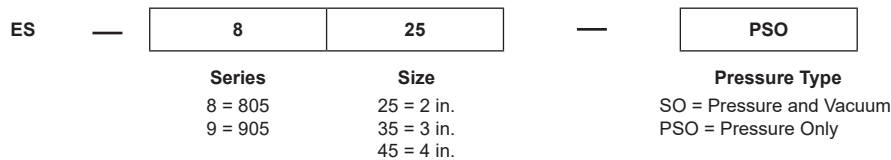


Figure 3. Model Number Identification

Product Description

ES-805 and ES-905 Series vent valves represent the latest development in high-performance, tight-sealing tank venting products and complement Enardo™'s industry-leading ES-665 Series thief hatch product line. With a leakage rate of no more than 0.1 SCFH at 90% of set point, the ES-805 and ES-905 Series offers unparalleled vent valve performance.

Model ES-805-SO - is an In-line vent valve. It is installed directly into the vent line exhaust. The Model ES-805-SO has both pressure and vacuum relief capability.

Model ES-805-PSO - is a pressure only vent valve designed to relieve pressure only through the vent line. It is designed the same as the Model ES-805-SO pressure/vacuum except they omit the vacuum side of the valve that eliminates the possibility of two way flow.

Model ES-905-SO - is an end-of-line vent valve. The end-of-line vent valve is installed directly on the end of the vent line exhaust. The Model ES-905-SO has both pressure and vacuum relief capability.

Model ES-905-PSO - is an end-of-line vent valve. The end-of-line vent valve is installed directly on the end of the vent line exhaust. The Model ES-905-PSO only has pressure relief capability.

Principle of Operation

ES-805 and ES-905 Series vent valves are designed to prevent the escape of light ends of crude by maintaining pressure in the storage tank.

The vent valve opens when the system pressure or vacuum exceeds the set pressure of the valve. When over pressure occurs, the pallet lifts, breaking the seal between the seat and pallet, allowing vapors to pass through the valve orifice

and relieving the pressure or vacuum buildup. The valve closes once the tank pressure goes below the set pressure.

Model Identification

Tagging Information

For ES-805 Series, the nameplate is located on the unit's lid and for ES-905 Series, the nameplate is located on the unit's hood. Actual layout of nameplate may vary.

Installation

WARNING

Wear protective gloves and clothing to prevent skin contact when handling lead weights. Wear eye protection. Avoid breathing dust/fumes/mist/vapors/spray. Do not eat, drink or smoke while using the product. Avoid release to the environment. Wash hands with soap and water after handling. Keep away from excessive heat and open flames.

WARNING

The valve and its pallet assembly are shipped separately. The pallet assembly may be heavy and can cause personal injury or damage to the unit if not handled with care.

All wing-nuts shall be hand tightened only. Tools are not to be used.

Prior to installation, remove the unit from its packaging and discard any protective coverings. Below is a list of instructions that are recommended for the installation of an Enardo vent valve.

ES-805 and ES-905 Series



ES-905 SERIES NAMEPLATE LOCATION



ES-805 SERIES NAMEPLATE LOCATION

Figure 4. Nameplate Location



Figure 5. ES-805 and ES-905 Series Weights

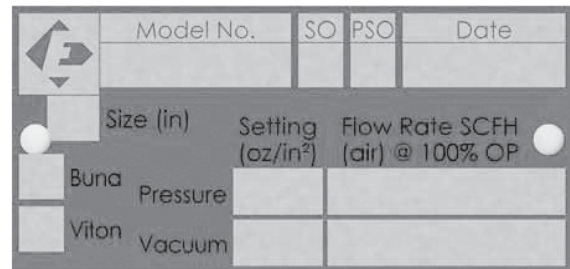


Figure 6. Nameplate Example

Table 1. Vent Setting Range

MODEL	SIZE	PRESSURE	VACUUM
ES-805-SO	2 through 4 in. / 50 through 100 mm	1.0 to 16.0 oz./sq.in. / 4.3 to 6.90 mbar (0.5 oz./sq.in. / 2 mbar increments)	0.4 oz./sq.in. / 1.7 mbar
ES-805-PSO			N/A
ES-905-SO			0.4 oz./sq.in. / 1.7 mbar
ES-905-PSO			N/A

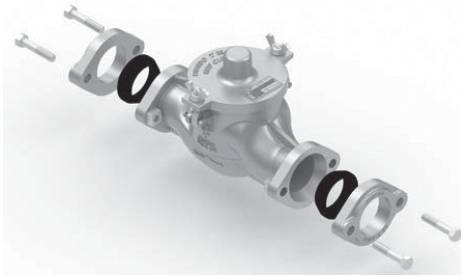
Table 2. Construction Materials

MODEL	HOUSING	PALLET	V-RING SEAL	HARDWARE	WEIGHTS	GASKETS
ES-805-SO	Cast Aluminum	Aluminum	Nitrile (NBR) or Fluorocarbon (FKM)	Zinc-plated carbon steel	Zinc-plated carbon steel (to 12 oz./sq.in.) or Lead	Nitrile (NBR) or Fluorocarbon (FKM)
ES-805-PSO						
ES-905-SO						
ES-905-PSO						

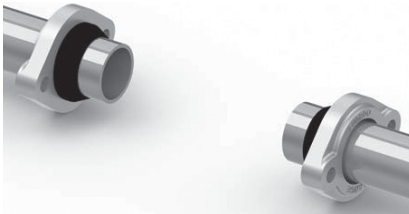
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ES-805 and ES-905 Series

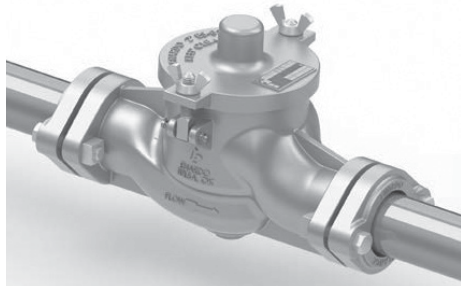
ES-805 Series In-Line Vent Valve



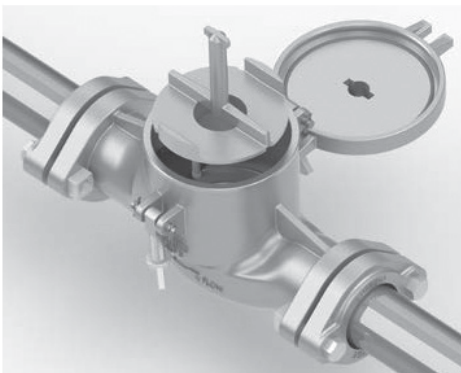
1. Unbolt and remove the flanges from the body.



2. Slide the flange onto the receiving pipe. Then slide the slip-on gasket onto the pipe. The tapered section of the gasket points away from the flange and towards the valve. Repeat on the other pipe using the second flange.



3. Reinstall the flange bolts and nuts, one on each side. Tighten bolts until flanges are flushed against the body.

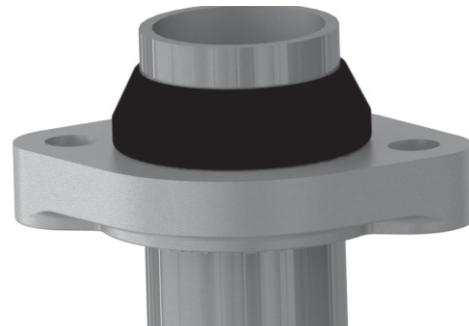


4. Install the pallet assembly. The center rib of the pallet should be in-line with the rib on the body. Then close the lid and hand tighten the wing-nuts on both sides. Tools are not to be used to tighten wing-nuts. Check for proper alignment between the lid and pallet stem. If the pallet is not installed correctly, the lid would not close.

ES-905 Series End-of-Line Vent Valve



1. Unbolt and remove the flanges from the body.

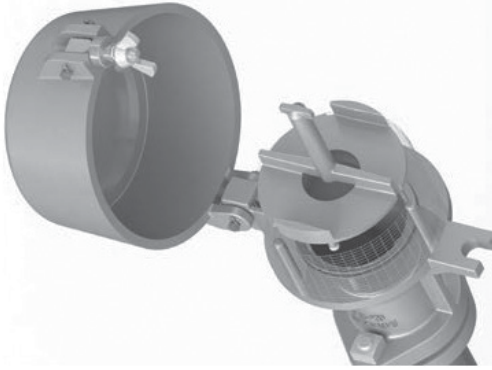


2. Slide the flange onto the receiving pipe. Then slide the slip-on gasket onto the pipe. The tapered section of the gasket points away from the flange and towards the valve (up).



3. Reinstall the flange bolts and nuts, one on each side of the flange. Tighten bolts until flange is flushed against the body.

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4. Install the pallet assembly. The notch in the center rib of the pallet should be in-line with the front guide rod. Check for proper alignment between the lid and pallet stem. Then close the hood and hand tighten the wing-nut. Tools are not to be used to tighten wing-nuts. If the pallet is not installed correctly, the hood would not close.

Maintenance

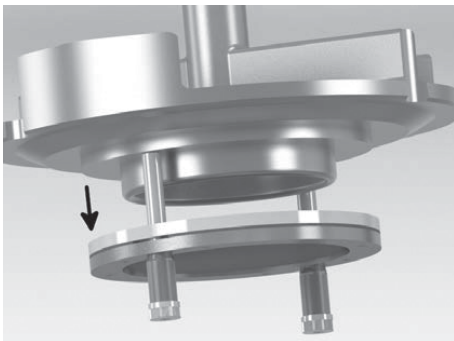
WARNING

Ensure the tank is at atmospheric pressure before opening. A pressure build-up inside the tank can cause a spray to be emitted from the vent valve if opened under pressure.

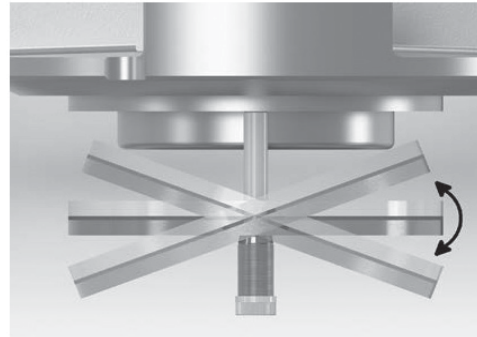
All wing-nuts shall be hand tightened only. Tools are not to be used.

Do not use greases or oils on guide rods. These will not allow the vacuum assembly to work properly.

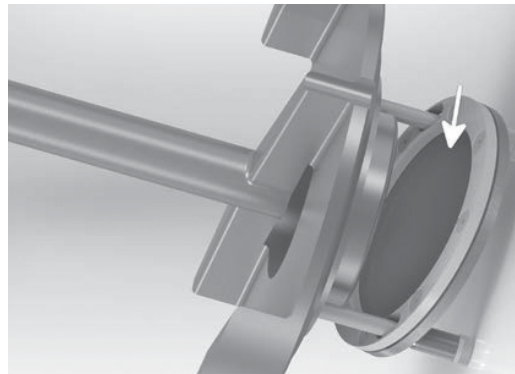
Perform a scheduled maintenance every three (3) months or more often if needed. Units in corrosive or dusty atmospheres may require more frequent inspections and maintenance. Always inspect the pressure and vacuum gaskets and all sealing surfaces when performing maintenance.



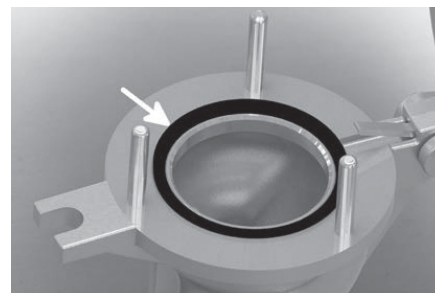
1. Remove the pallet assembly from the valve. Pull the vacuum disk down until it stops and release it. If the vacuum disk does not return to the closed position, clean the rods with a mild solvent and apply a graphite lubricant. If cleaning does not fix the problem, replace the pallet assembly immediately.



2. Check the vacuum disk for proper opening. Pull the vacuum disk down until it stops and then rotate the disk in both directions. If the vacuum disk does not rotate freely, replace the pallet assembly immediately.



3. Inspect the vacuum gasket. Remove any debris on this gasket. If there are any tears or holes in the gasket, replace the pallet assembly immediately.



4. Inspect the pressure seal. Remove any debris on this seal. If there are any tears or cracks in the seal, replace the pressure seal immediately.

ES-805 and ES-905 Series

Table 3. Pallet Assembly Options

MODEL	MATERIAL	2 IN. / 50 mm	3 IN. / 80 mm	4 IN. / 100 mm
ES-805-SO or ES-905-SO	Nitrile (NBR)	ERAA43150A0	ERAA43150A2	ERAA43150A4
	Fluorocarbon (FKM)	ERAA43150A1	ERAA43150A3	ERAA43150A5
ES-805-PSO or ES-905-PSO	----	3514268	3514294	3514333

Table 4. V-ring Seal - Pressure Seal Options

MATERIAL	2 IN. / 50 mm	3 IN. / 80 mm	4 IN. / 100 mm
Nitrile (NBR)	3514286	3514316	3514323
Fluorocarbon (FKM)	3514313	3514317	3514324

Table 5. Retrofit Kits

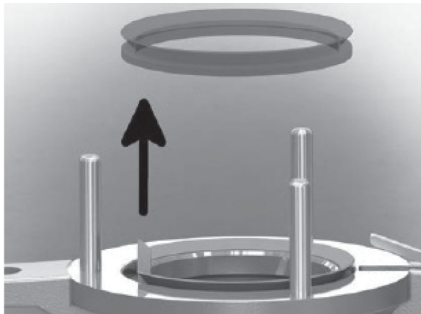
SERIES		SIZE	MATERIAL	PART NUMBER
Convert from	Convert to			
ES-820/ES-920	ES-825/ES-925	2 in. / 50 mm	Nitrile (NBR) (Buna)	3514826
			Fluorocarbon (FKM) (Viton®)	3514832
ES-830/ES-930	ES-835/ES-935	3 in. / 80 mm	Nitrile (NBR) (Buna)	3514828
			Fluorocarbon (FKM) (Viton®)	3514829
ES-840/ES-940	ES-845/ES-945	4 in. / 100 mm	Nitrile (NBR) (Buna)	3514830
			Fluorocarbon (FKM) (Viton®)	3514831

Note: Convert existing ES-800 and ES-900 Series valves by installing these parts. Kit includes ES-805/ES-905 Series pallet assembly, new V-ring pressure seal and new ES-805/ES-905 Series nameplate.

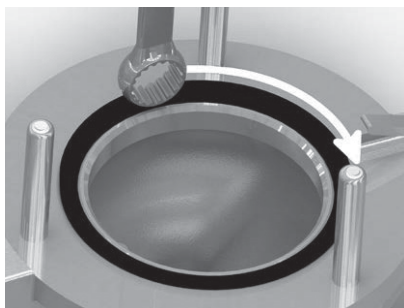
V-ring Replacement

WARNING

Ensure the tank is at atmospheric pressure before opening. A pressure build-up inside the tank can cause a spray to be emitted from the vent valve if opened under pressure.



1. Remove the pallet assembly. Grasp the pressure seal firmly by the lip and pull out.



2. Insert the new seal. Use a finger, wrench or other smooth edge to apply a firm pressure while sliding around the entire seal several times. When the seal is completely seated, there will be no humps or waves in the lip.

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Retrofit ES-805 and ES-905 Series Pallet Assembly

WARNING

Ensure the tank is at atmospheric pressure before opening. A pressure build-up inside the tank can cause a spray to be emitted from the vent valve if opened under pressure.

The legacy ES-800/ES-900 Series valve can be upgraded to an ES-805/ES-905 Series by replacing the existing pallet assembly with the new ES-805/ES-905 Series pallet assembly.

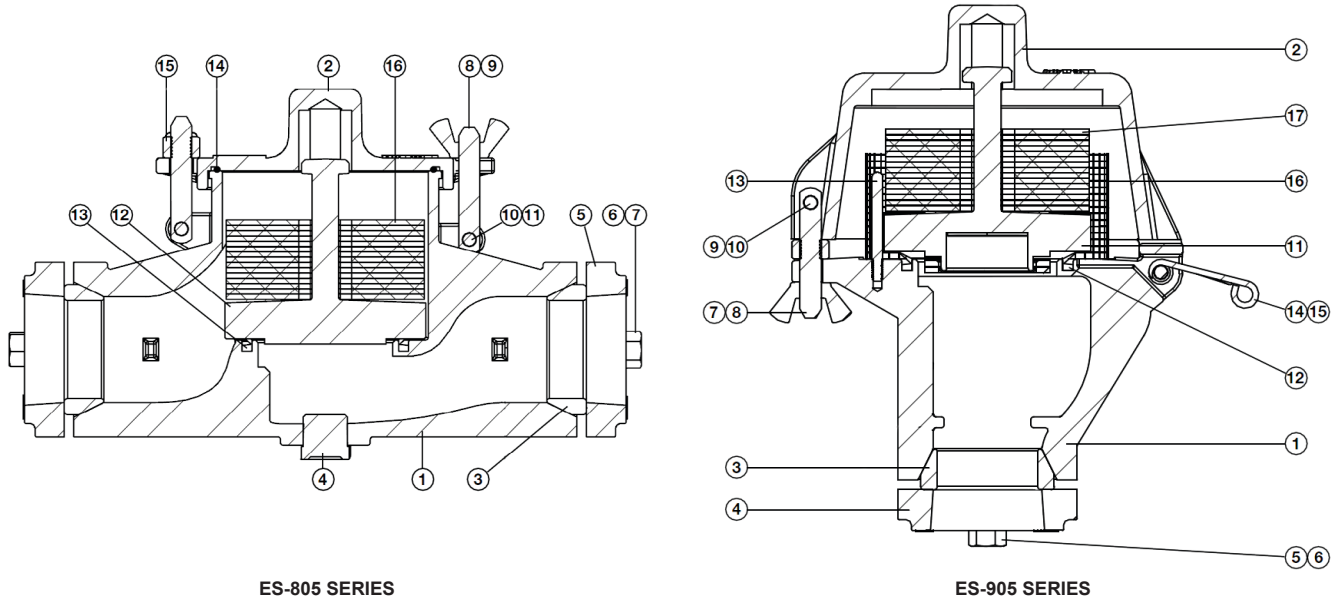
Retrofit kits that include a new ES-805/ES-905 Series pallet assembly, V-ring seal and nameplate are available. Follow the instructions outlined in the Maintenance section of this manual for removal and replacement of pallet assembly and V-ring seal. Part numbers for ES-805/ES-905 Series retrofit kits can be found in Table 5.

Parts Ordering

When corresponding with your local Sales Office about this equipment, always reference the equipment serial number and model number that can be found etched on the nameplate.

When ordering replacement parts, specify the complete model number and 7-character part number of each required part as found in the following parts list.

ES-805 and ES-905 Series



NOTE: TOP LID AREA IS ROTATED 90 DEGREES

Figure 7. ES-805 and ES-905 Series Assembly Drawing

Parts List

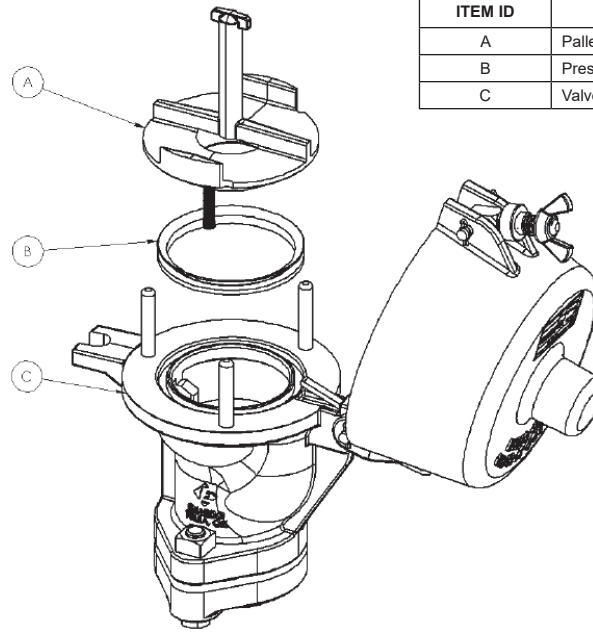
ES-805 Series In-line Vent Valve

Key	Description	Part Number
1	Valve Body 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	3514261 3514297 3514321
2	Lid 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	3514264 3514300 3514335
3	Flange Gasket 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	3505501 3505502 3505503
4	Pipe Plug	2023802
5	Slip-on Flange 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	3508901 3508902 3508903
6	Hex Bolt 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	2021203 2021200 2021200
7	Square Nut	2021901
8	Eyebolt	3505601
9	Wing Nut	2001002
10	Latch Pin	4505103
11	Latch Clip (HPC-148)	2027100
12	Pallet Assembly	See Table 3
13	V-ring Seal	See Table 4
14	Lid O-ring Nitrile (NBR) 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm Fluorocarbon (FKM) 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	3514285 3514318 3514365 3514314 3514319 3514372
15	Nylock Nut	1/2-13
16	Pressure Weight (as required)	-----

ES-905 Series In-line Vent Valve

Key	Description	Part Number
1	Valve Body 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	3514326 3514337 3514341
2	Hood 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	3514329 3514339 3514343
3	Flange Gasket 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	3505501 3505502 3505503
4	Slip-on Flange 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	3508901 3508902 3508903
5	Hex Bolt 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	2021203 2021200 2021200
6	Square Nut	2021901
7	Eyebolt	3505601
8	Wing Nut	2001002
9	Latch Pin	4505103
10	Latch Clip (HPC-148)	2027100
11	Pallet Assembly	See Table 3
12	V-ring Seal	See Table 4
13	Guide Rod 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	3514344 3514345 3514346
14	Lever	3514350
15	Lever Spring	3514351
16	Screen 2 in. / 50 mm 3 in. / 80 mm 4 in. / 100 mm	3514330 3514347 3514348
17	Pressure Weight (as required)	-----

ES-805 and ES-905 Series



ITEM ID	DESCRIPTION
A	Pallet assembly
B	Pressure seal
C	Valve body assembly

NOTE: PARTS A AND B ABOVE ARE USED IN BOTH ES-805 AND ES-905 SERIES. PART C VARIES BASED ON THE MODEL.

Figure 8. ES-905 Series Assembly Drawing

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