

September 2018

Models A, A-L, 110-PO and 200 Dead Weight Hatches

Table of Contents

Introduction.....	1
Specifications	2
Principle of Operation.....	2
Installation	2
Maintenance.....	3
Parts Ordering	3



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 dead weight hatch 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 dead weight hatch.

Introduction

Scope of the Manual

This Instruction Manual provides instructions for installation, maintenance and parts ordering information for Models A, A-L, 110-PO and 200 dead weight hatches.

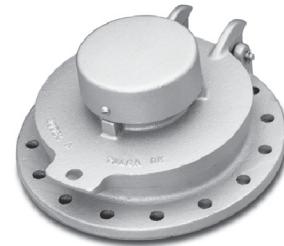


Figure 1. Model Enardo A Dead Weight Hatch

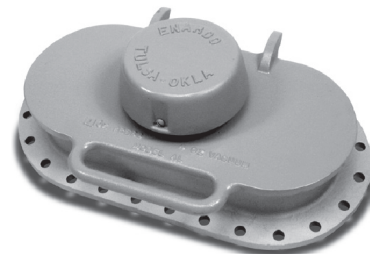


Figure 2. Model Enardo A-L Dead Weight Hatch



Figure 3. Model Enardo 110-PO Dead Weight Hatch

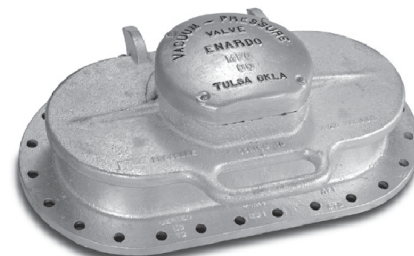


Figure 4. Model Enardo 200 Dead Weight Hatch

North America Only

Dead Weight Hatch

Specifications

The Specifications section on this page provides specifications for the Models A, A-L, 110-PO and 200 dead weight hatches. Specifications are stamped on the body.

<p>Available Sizes</p> <p>See Table 1</p> <p>Pressure Setting⁽¹⁾</p> <p>See Table 1</p> <p>Vacuum Setting⁽¹⁾</p> <p>See Table 1</p>	<p>Construction Materials</p> <p>Housing: Aluminum</p> <p>Lid: Aluminum or Ductile iron</p> <p>Pressure/Vacuum Gasket: Buna-N or Viton®</p> <p>Hardware: Zinc-plated carbon steel</p> <p>Vacuum Pallet: Aluminum</p> <p>Vacuum Spring: Zinc-plated carbon steel</p>
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1. The pressure limits in this Instruction Manual and any applicable standard or code limitation should not be exceeded.

Table 1. Valve Setting Range

MODEL	AVAILABLE SIZE, in. API	PRESSURE SETTING, oz./sq. in.	VACUUM SETTING, oz./sq. in.
A	8	2, 4 and 6	0.4
A-L	8x18	2, 3, 4 and 6	0.4
110-PO	8	1 and 2	N/A
200	8x22	1, 2, 3, 4 and 6	0.4

Product Description

Enardo dead weight hatches are generally used on low-pressure, steel and fiberglass tanks. They provide trouble free operation with minimum supervision. These hatches vary in design, but their primary function is to prevent the loss of vapors in a closed storage system and provide pressure and vacuum relief by means of dead weight. They also provide access and offer higher outflow capacities and lower pressure settings than standard spring-loaded hatches.

The Models A and 110-PO are dead weight pressure relief gauge and thief hatches with round 8 in. nominal diameter API bases. The Model A also provides vacuum relief capacity.

The Models A-L and 200 are dead weight pressure-vacuum relief gauge and thief hatches with 8x18 in. and 8x22 in. oblong American Petroleum Institute (API) bases, respectively.

Principle of Operation

When excessive pressure builds within the storage tank, the vent's hinged cover begins to open at the predetermined set pressure, relieving excess pressure. When the over pressure has dissipated, the cover reseats onto the base. The hinge mechanism prevents misalignment and provides an accurate reseal.

When excessive vacuum builds within the storage tank, the spring loaded pallet lifts, breaking the seal between the seat and pallet, allowing vapors to pass through the valve orifice relieving the vacuum buildup. The vacuum valve reseals upon relief and remains sealed.

Installation



CAUTION

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

1. Install the dead weight pressure vacuum hatch on a flat surface with a base gasket and an opening with a mating API bolt pattern of 16 - 5/8 in. bolt holes on a 10 - 3/8 in. bolt circle.
2. Place the base gasket on the top of the mating bolt pattern and align the hatch base with the gasket.
3. Insert the bolts downward into the base bolt holes through the gasket and mounting deck. Open the hatch and utilize the opening to gain access to the bottom of the bolts to attach the nuts.
4. Using a socket wrench and torque wrench, tighten the bolts in the pattern that corresponds to the pattern shown in Figure 5.
5. Close lid.

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Table 2. Torque Table for Flat Face Flange (Steel or Aluminum)

NOMINAL PIPE DIAMETER	NUMBER OF BOLTS	BOLT DIAMETER		TORQUE	
		In.	mm	Ft-lbs	N·m
1	4	0.50	12.70	14	18.98
1-1/4	4	0.50	12.70	16	21.69
1-1/2	4	0.50	12.70	18	24.41
2	4	0.63	16.00	32	43.39
2-1/2	4	0.63	16.00	43	58.30
3	4	0.63	16.00	47	63.72
3-1/2	8	0.63	16.00	26	35.25
4	8	0.63	16.00	32	43.39
6	8	0.75	19.05	49	66.44
8	8	0.75	19.05	68	92.20
10	12	0.88	22.4	69	93.55
12	12	0.88	22.4	98	132.9
14	12	1.00	25.0	138	187.1
16	16	1.00	25.0	125	169.5
18	16	1.13	28.7	142	192.5
20	20	1.13	28.7	135	183.0
24	24	1.25	31.8	156	211.5
8 API	16	0.50	12.70	20	27.12
8 x 18 API	26	0.50	12.70	20	27.12
8 x 22 API	30	0.50	12.70	20	27.12
20 API	16	0.63	16.00	75	101.7
24 API	20	0.63	16.00	75	101.7

Assumptions: Use of SAE grade 5 bolts or studs or stronger.
 No lubricant.
 Elastomer <70 Durometer Shore A

Notes: Flat faced flanges should never be mated to a raised face flange for installation.
 If lubricant is used on bolts, apply torque reduction factor listed in Lubricant Table.
 For best results hardened steel washers should be used on all cast flange bolted connections

Table 3. Torque Correction Factors for Common Lubricants Applied on Flanges

DESCRIPTION	COEFFICIENT OF FRICTION	MULTIPLY TORQUE VALUE IN TABLE BY
Machine Oil	f = 0.15	0.75
API SA2 Grease	f = 0.12	0.60
Nickel-based Lubricant	f = 0.11	0.55
Copper-based Lubricant	f = 0.10	0.50
Heavy-duty Lubricating Past	f = 0.06	0.30

Note

A temporary zip tie has been installed by the factory to secure the hatch lid during transport. REMOVE THE ZIP TIE BEFORE PUTTING TANK INTO SERVICE. Make sure there is nothing else that will prevent the lid from opening completely, as the lid is the pressure relieving device and must be allowed to open.

Maintenance

Perform scheduled maintenance every six months or more frequently in corrosive or dusty atmospheres. For normal maintenance, inspect the pressure gasket, vacuum gasket and base gasket. Under average operating conditions, replace the pressure and vacuum gaskets once a year. Replace the base gasket only when a leak is noticed on

the tank deck. Continuous relieving of the hatch means that there is a problem; closely inspect the system to determine the cause.

Note

For parts information, refer to the catalog data sheet on each model.

Gasket Replacement

To ensure efficient operation of all hatches, carefully wipe the pressure and vacuum seats and gaskets every time the hatch is opened. This prevents accumulation of residue that can deteriorate the performance of the valves. Include manual cycling of pressure and vacuum ports during normal and routine semi-annual maintenance to evaluate the condition and functionality of these relief devices during their service lives.

Dead Weight Hatch

Vacuum Gasket

1. The vacuum gasket for a dead weight hatch is located under the cap on the lid of the hatch. Remove the cap by unscrewing the attachment screws.
2. The gasket is secured to the vacuum disk with a sip fit under the retainer. Remove the gasket and replace with the new one by stretching the gasket and slipping it into the retainer.
3. Replace the vacuum disk and resecure the lid with the attachment screws.

Pressure Gasket

1. The pressure gasket is the sponge gasket in the ring groove on the underside of the lid that seats against the base lip. The old gasket can be removed by peeling it from underneath the groove. Thoroughly clean the groove and apply a small amount of rubber adhesive.
2. Fit the new gasket under the groove by slowly moving the gasket into the groove around the lid until the ends of the gasket meet. Cut in a diagonal way so that the ends do not meet at a 90 degree angle. Replace only with Enardo replacement gaskets as the gasket material is specially designed for hatch service and not commonly available.

Parts Ordering

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

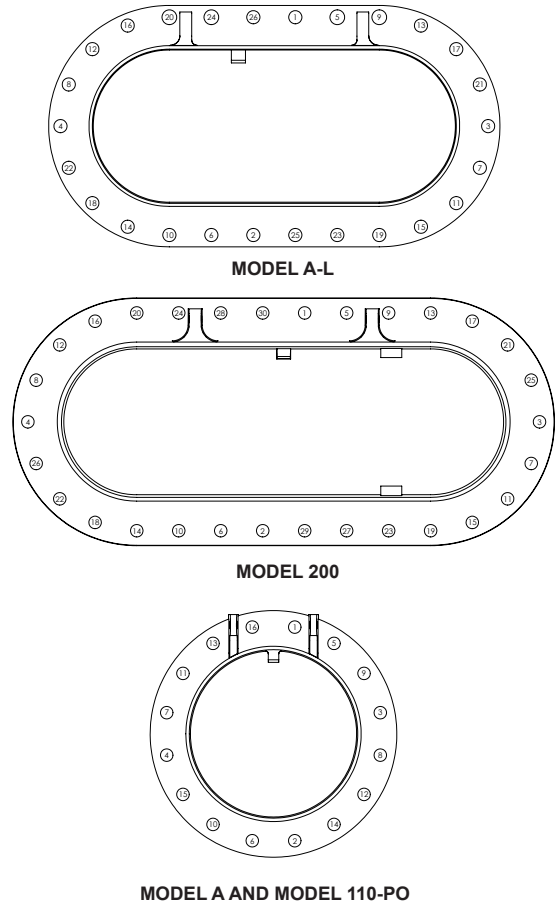


Figure 5. Dead Weight Hatch Torque Sequence

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