Enardo 2100 Series Emergency Pressure Relief Vent and Manhole Cover (ATEX Approved)

Table of Contents

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.

Fisher™ emergency pressure relief vent 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 emergency pressure relief vent.

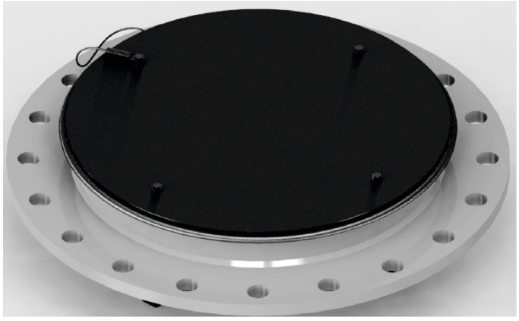


Figure 1. *Enardo 2100 Series*

Introduction

Scope of the Manual

This Instruction Manual provides instructions for installation, maintenance and parts ordering information for the Enardo 2100 Series Emergency Pressure Relief Vent.

Product Description

The Enardo 2100 Series Emergency Pressure Relief Vent is designed to provide simple, reliable operation as an emergency vent, while providing efficient access to your tank and maintaining the industry leading sealing standards (1 SCFH at 90% set point). It also provides trouble free operation with a minimum maintenance. There are two available configurations for Enardo 2100 Series: tethered and restrained (see Figure 3).

Specifications

The Specifications section lists the specifications for the Enardo 2100 Series. The following information are stamped on the nameplate attached to the relief vent: model number, connection size, date of manufacture, serial number, pressure setting and flow rate.

Connection Sizes Available

16, 20 and 24 in. / 387, 489 and 591 mm

Pressure Ranges[1]

0.7 to 8.0 oz./sq. in. and 1.2 to 14.0 in. w.c.

Construction Materials

Base: Carbon steel, 304 Stainless steel and 316 Stainless steel

Lid and Seal Support: Aluminum, 304 Stainless steel and 316 Stainless steel

Construction Materials (continued)

Seal: Buna-N, FEP Teflon® and Viton®

Certification

EN IEC 60079-0:2018
EN IEC 60079-11:2012
EN ISO 80079-36:2016
EN ISO 80079-37:2016

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

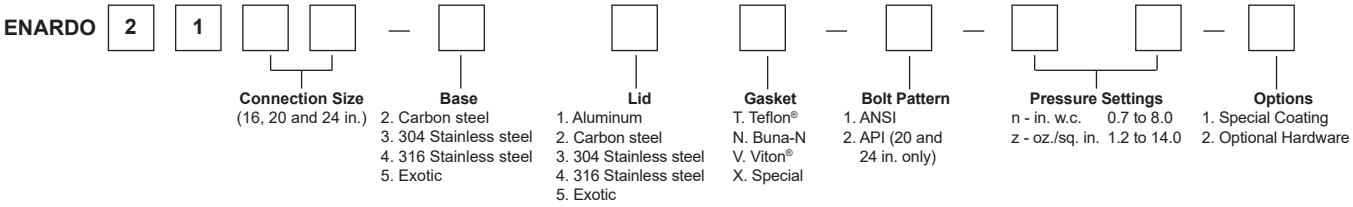
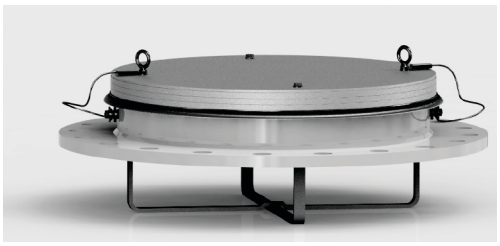


Figure 2. *Enardo 2100 Series Model Number Identification*

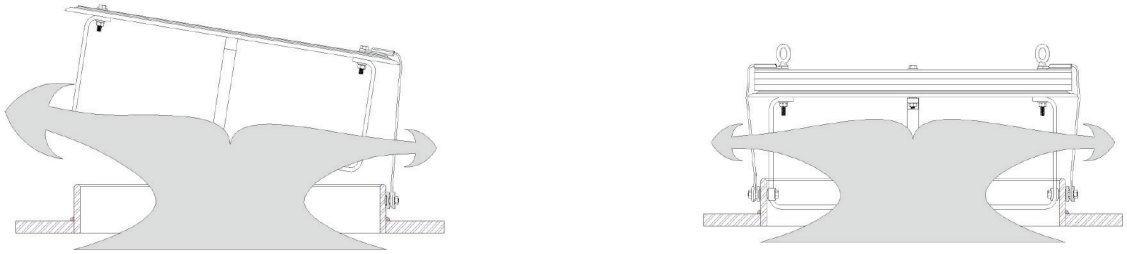
TETHERED



RESTRAINED

Figure 3. *Enardo 2100 Series Product Configurations*

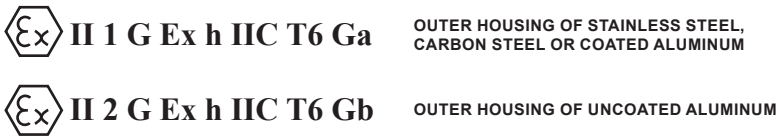
Teflon® and Viton® are marks owned by E. I. du Pont de Nemours and Co.

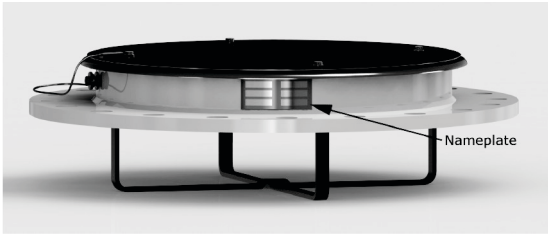


TETHERED CONFIGURATION

RESTRAINED CONFIGURATION

Figure 4. *Operational Schematics*





NAMEPLATE LOCATION

Figure 5. *Product Identification and Marking*

Product Identification and Marking

Hazardous Locations

Fisher™ Emergency Pressure Relief Vents are available with outer housings of Carbon steel, stainless steel or aluminum, as indicated in Figure 5.

Tagging Information

The nameplate is located on the unit's base, above the connection flange (see Figure 5).

Nameplate Information

A nameplate is attached to the vent and contains the following information:

- **Model Number –** Ex. 2124-24T-1
- **Connection Flange Size –** 24 in. / 610 mm
- **Serial Number**
- **Tag Number (Optional)**
- **Notified Body Number –** Ex. 2460
- **Cat. No. (Category Number)**
  - Category 1 – Stainless steel, Carbon steel or Coated Aluminum vents
  - Category 2 – Uncoated Aluminum vents
- **Date –** Date of Manufacture
- **Certificate –** Ex. PRESAFE 17 ATEX 10273X
- **Pressure Setting and Flow Rate**
  - Setting – Ex. Z4.0
  - Flow Rate SCFH (Air) – Ex. 00000

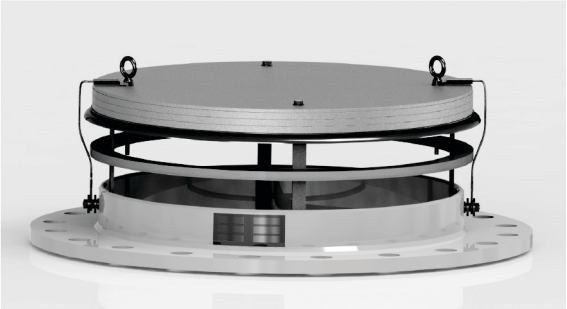


Figure 6. *Recommended Seal Protection*

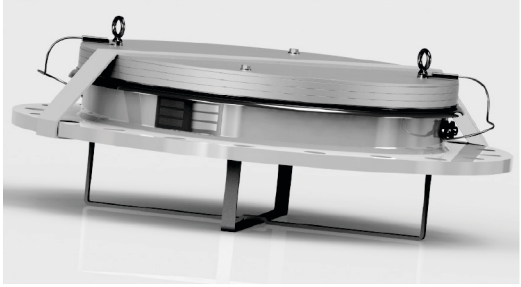


Figure 7. *Recommended Lifting Configuration*

⚠ WARNING

Wear protective gloves and clothing to prevent skin contact when handling lead weights. Wear eye protection. Avoid breathing dust, fumes, mist, vapors and 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

Make sure line is free of hazardous vapors before installing or servicing the valve.

Principle of Operation

The Enardo 2100 Series maintains a tight seal until system pressure exceeds the set pressure of the vent. To adjust the set pressure, a series of weights may be stacked onto the lid assembly. When excessive overpressure occurs the weighted lid assembly lifts, breaking the seal between the seat and seal portion of the lid assembly. This allows vapors to pass through the vent orifice and relieve pressure buildup. The vent reseals upon relief and remains sealed; tethered lids may blow completely off in a catastrophic pressure event (see Figure 4).

It is important to know that relieving vapors near the set pressure in a continuous manner may cause the lid assembly to flutter or oscillate. This is a common occurrence in products of this type in the industry. Operating the vent with flutter or oscillation over time may cause premature vent damage or wear. Please feel free to contact your local Sales Office with any questions or for information on proper tank venting.

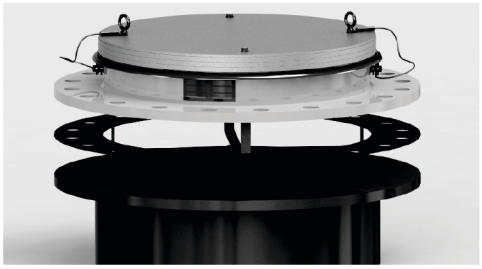


Figure 8. *Installation Configuration*

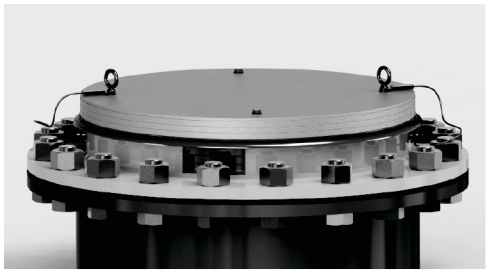


Figure 9. *Final Installation*

Installation

WARNING

The Enardo 2100 Series is shipped with its lid held partially open. The lid assembly has attached weights and is heavy. Use caution when removing the shipping blocks and metal bands to avoid injury to fingers and hands.

Prior to installation, remove the unit from its crate and discard any protective coverings. Follow the recommended instructions for the installation of the Enardo 2100 Series.

1. Carefully remove the Enardo 2100 Series from its crating.

Note

The seal portion of the vent can be damaged through improper handling, protect this surface with a padding material while transporting the unit if possible.

WARNING

Failure to use spreader bar in lifting the unit may result in personal injury, damage to the unit and damage to the equipment.

There should be no tension on the lanyards if the unit is to be hoisted in position, failure to do so may result in damage to the unit.

2. Use an appropriate spreader bar when lifting the unit by the installed eyebolts. If the complete unit is to be hoisted into position using installed eyebolts, first secure the base to the lid so that there is no tension on the lanyards. Lanyards are load-rated to 350 lbs / 160 kg each; damage to other components may occur.
3. Install the Enardo 2100 Series on flange bolt patterns that match that of the vent itself. If a matching pattern is not available, please contact your local Sales Office for an adapter. The attachment flange base must be a level surface. Use an appropriate gasket placed between the Enardo 2100 Series flange and the attachment flange, center the vent into place.
4. Insert the appropriate number of bolts and make sure the vent is fastened securely. Installed bolts should be clear of the lid assembly when it is in the full open position. Remove any spacer or seal protection and inspect the now installed unit for items that would keep it from working properly. The sealing area should be free of any debris or damage that would cause leakage.

Startup

WARNING

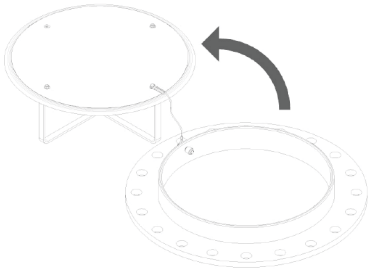
Ensure the tank is at atmospheric pressure before opening. A pressure buildup inside the tank can cause a spray to be emitted from the vent if opened under pressure.

Tethered Configuration

1. Grip lid firmly and lift straight up until the bottom of guide assembly clears the base.

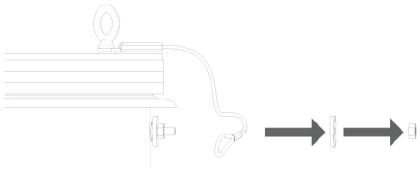
Note

Be careful to keep the guide from denting or scratching the sealing surface as this can cause leaks.

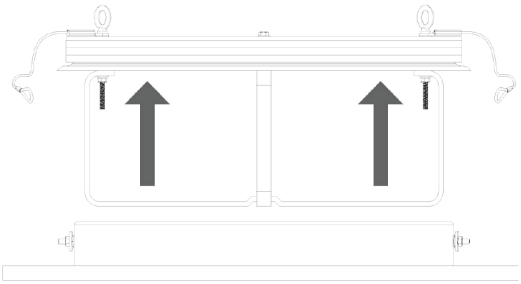


2. Move the lid away from the opening and set it down on the guide assembly. The guide assembly is designed to hold the cover assembly even at the maximum 8 oz./sq. in. setting.

Restrained Configuration



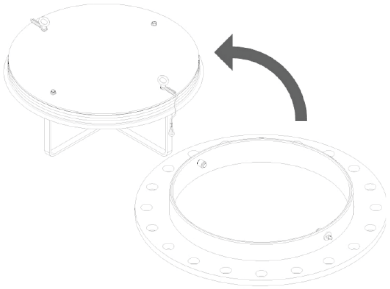
1. Remove the nylock nut and outer fender washer. The loop slides off the lanyard attachment assembly.



2. Grip lid firmly and lift straight up until the bottom of guide assembly clears the base or attach shackles to the eyebolts and use a crane or hoist to lift.

Note

Be careful to keep the guide from denting or scratching the sealing surface as this can cause leaks.



3. Move the lid away from the opening set it down. The guide assembly is designed to hold the cover assembly even at the maximum 8 oz./sq. in. setting.

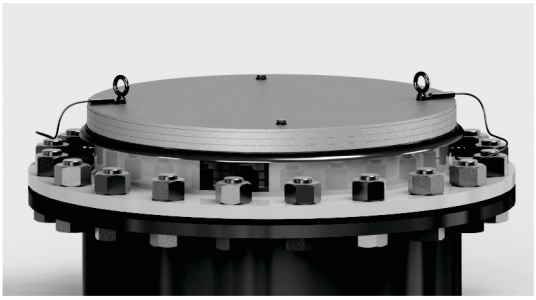


***Figure 10**. Surface Protector Installation*

***Figure 11.** Surface Protector Cross-Section*

Maintenance

Sealing Surface Protector

⚠ WARNING

The sealing surface protector must be removed before the Enardo 2100 Series is returned to service. The vent will not seal with the protector in place.

The following instructions are applicable only if the sealing surface protector was also purchased for your unit. This guard is available to prevent damage to the sealing surface when the Enardo 2100 Series is being used for tank access or for running air or weld leads into the tank.

Remove the sealing surface protector from its bag. Place one end of the protector over the machined surface with the legs pointing down and the flat side up. Firmly press the protector over the sealing surface. Move around the sealing surface making sure the protector is snugly attached.

Seal Replacement Procedure

Tools and Supplies Needed:

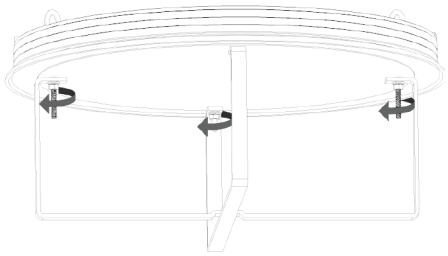
- 2 standard 7/16 in. wrenches
- Torque wrench (recommended)
- 1 screwdriver, any type (for eyebolt units only)
- Adhesive tape (recommended for eyebolt units)
- Enardo 2100 Series seal
- 4-1/4 in. stat-o-seals (recommended)

Replacement Procedure:

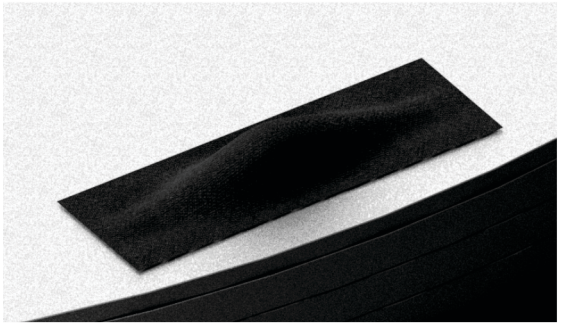
⚠ WARNING

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

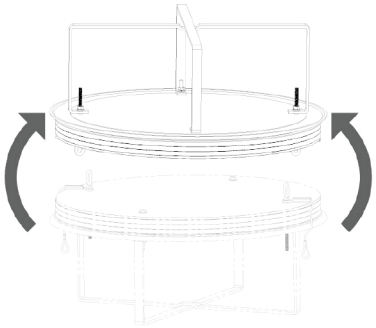
1. Remove the Nylock nut and outer fender washer. The loop slides off the lanyard attachment assembly. Remove the lid assembly from the base and place on a level surface.



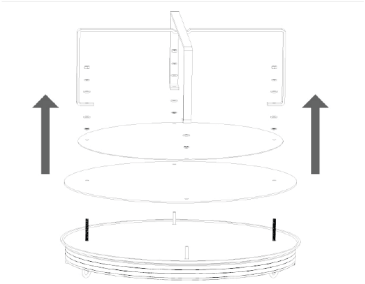
2. Loosen the 4 hex nuts on the bottom of the lid assembly. If the unit is equipped with eyebolts, insert the screwdriver through the eye to provide leverage.



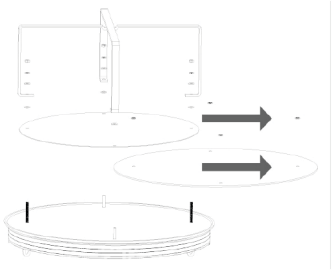
3. If the unit is equipped with eyebolts, place a piece of adhesive tape over the hex bolt heads to prevent them from falling out. This is not required, but makes seal replacement much easier.



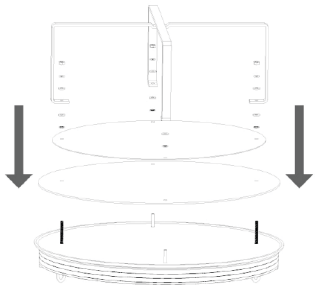
4. Flip the lid assembly over so that the guide assembly is facing up.



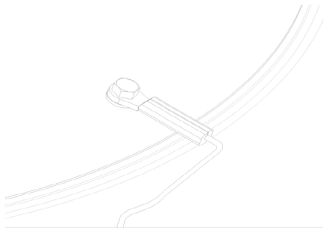
5. Remove the hex nuts, washers, guide assembly, stat-o-seals, seal support and seal. Take note of the order in which the components are removed.



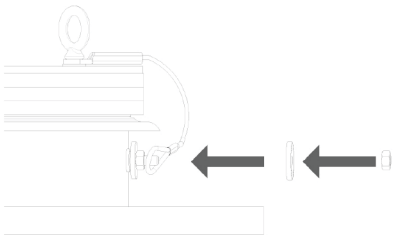
6. Discard seal. If replacement stat-o-seals were ordered, discard old stat-o-seals.



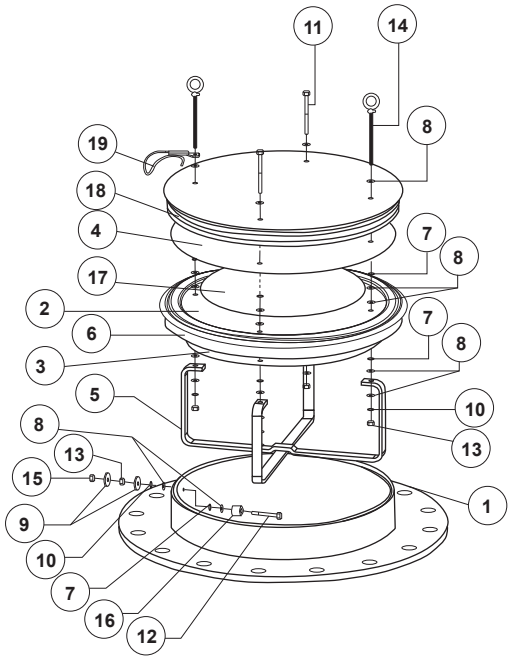
7. Reassemble the lower lid components in the reverse order of disassembly.

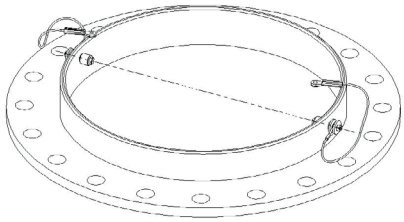


8. Before tightening hex nuts, ensure that the eyelet on the lanyard(s) is pointing **away** from the center of the lid. **Failure to do this may result in damage to the tank** by preventing the unit from opening fully in a pressure event. Tighten each nut to 1 turn after snug.



9. Flip the lid assembly over so that the guide assembly is facing down. Reinsert the lid into the base and reattach the lanyard(s). Do not tighten the hex nut and the nylock nut greater than 12 ft•lbf.





RESTRAINED BASE (COVER ASSEMBLY NOT SHOWN)

Figure 12. *Enardo 2100 Series Assembly Drawing*

Parts Ordering

When corresponding with your local Sales Office about this equipment, always reference the equipment serial number stamped on the nameplate.

When ordering replacement parts, specify the complete 11-character part number found in Table 1.

Parts List

Key	Description
1	Base, Carbon steel, 304 Stainless steel and 316 Stainless steel
2	Cover, Aluminum, Zinc-plated Carbon steel, 304 Stainless steel and 316 Stainless steel
3	Seal Support, Aluminum, Zinc-plated Carbon steel, 304 Stainless steel and 316 Stainless steel
4	Shield, Aluminum, Zinc-plated Carbon steel, 304 Stainless steel and 316 Stainless steel
5	Guide, Aluminum, Zinc-plated Carbon steel, 304 Stainless steel and 316 Stainless steel
6	Seal, Buna-N, Teflon® and Viton®
7	Stat-O-Seal, 1/4 in. Fluorocarbon, Stainless steel and Viton®
8	Flat Washer, 1/4 in., 316 Stainless steel
9	Fender Washer, 1/4 x 1 in. O.D., 316 Stainless steel
10	Lock Washer, 1/4 in., 316 Stainless steel
11	Hex Bolt, 1/4 in. - 20 x 3 in., 316 Stainless steel
12	Hex Bolt, 1/4 in. - 20 x 2 in., 316 Stainless steel
13	Hex Nut, 1/4 in. - 20, 316 Stainless steel
14	Eyebolt, 1/4 in. - 20 x 3 in., 316 Stainless steel
15	Nylock Hex Nut, 1/4 in. - 20, 316 Stainless steel and Nylon
16	Roller, Zinc-plated Carbon steel, 316 Stainless steel
17	Weight, “Makes”, Zinc-plated Carbon steel
18	Weight, oz./sq. in. or in. w.c., Zinc-plated Carbon steel and 316 Stainless steel
19	Lanyard, Tether or Restraint, 316 Stainless steel

Table 1. *Enardo 2100 Series Seal Options*

MATERIAL	GASKET AND SEAL OPTIONS		
	Part Number		
	16 in.	20 in.	24 in.
Buna-N	NE3043037A0	NE3043040A0	NE3043043A0
Teflon®	NE3043038A0	NE3043041A0	NE3043044A0
Viton®	NE3043039A0	NE3043042A0	NE3043045A0

Table 2. *Torque Specifications – Raised Face Flange, Steel Only*

NOMINAL PIPE DIAMETER	NUMBER OF BOLTS	BOLT DIAMETER		TORQUE	
		in.	mm	ft-lbs	N•m
16	16	1.00	25.4	159	216
20	20	1.13	28.7	214	290
24	24	1.25	31.8	253	343

Assumptions:
Use of SAE grade 5 bolts or studs or stronger.
No lubricant.
Compressed mineral fiber material or similar

Notes:
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 Specifications – Flat Face Flange, Steel or Aluminum*

NOMINAL PIPE DIAMETER	NUMBER OF BOLTS	BOLT DIAMETER		TORQUE	
		in.	mm	ft-lbs	N•m
16	16	1.00	25.4	125	170
20	20	1.13	28.7	135	183
24	24	1.25	31.8	156	212
20 API	16	0.63	16.0	75	102
24 API	20	0.63	16.0	75	102

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 4. *Torque Reduction Factor per Lubricant*

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

Enardo 2100 Series

Outside North America Only

Webadmin.Regulators@emerson.com
Enardo.com
Facebook.com/EmersonAutomationSolutions
LinkedIn.com/company/emerson-automation-solutions
Twitter.com/emr_automation

Emerson Automation Solutions

Americas
McKinney, Texas 75070 USA
T +1 800 558 5853
+1 972 548 3574
Tulsa, OK 74146 USA
T +1 918 662 6161

Europe
Bologna 40013, Italy
T +39 051 419 0611

Asia Pacific
Singapore 128461, Singapore
T +65 6770 8337

Middle East and Africa
Dubai, United Arab Emirates
T +971 4 811 8100

EMERSON™