



# INSTALLATION INSTRUCTIONS

## Explosion Relief Door Type ERD-FC Series

### 1) WARNING

- a) Read the complete instructions before attempting to install the assembly or replace the Fracture clips.
- b) It is the user's responsibility for the design of adequate venting. When size is specified, ZOOK Enterprises, LLC, ZOOK Europe Ltd. or ZOOK Canada Inc. assumes that adequate provisions have been made by the purchaser and/or user for proper venting of a system to relieve the specific hazard. Locate the Explosion Relief Door where people or property will not be exposed to the discharge in the event of an explosion or unplanned opening.
- c) It is the user's responsibility to specify the  $P_{STAT}$  (static activation pressure) rating of the Explosion Relief Door and the normal operating conditions the door will be exposed to. Exposure to extreme temperatures, positive pressure, negative pressure, or corrosive atmospheres could cause premature failure of the Explosion Relief Door.
- d) Particles may discharge when the Explosion Relief Door activates. These particles may be part of the Explosion Relief Door itself, or other environmental matter in the system. It is the user's responsibility to ensure that the particles are directed to a safe area to prevent personnel injury or property damage.
- e) ZOOK Explosion Relief Doors, when installed correctly, will provide a very good seal for most gases or vapors. However, ZOOK Enterprises, LLC, ZOOK Europe Ltd., or ZOOK Canada Inc. cannot guarantee the leakage rate without prior knowledge of the requirement and installation details. Consult ZOOK Enterprises, LLC, ZOOK Europe Ltd., or ZOOK Canada Inc. for guidance if leakage is critical to the installation.
- f) The customer and/or the installer shall be responsible for the proper installation of the Explosion Relief Door to the enclosure. **Proper installation and fit up of the mounting frame to the enclosure is essential for a successful installation.**
- g) Customer and/or its installers shall be responsible for improper installation and physical damage resulting there from, including, but not limited to, damage resulting from leakage, warpage, and/or failure to follow installation instructions.
- h) ZOOK Enterprises, LLC, ZOOK Europe Ltd. or ZOOK Canada Inc. standard Terms and Conditions of Sale apply unless otherwise stated in writing by the manufacturer.

### 2) DESCRIPTION

#### Theory of Operation

- a) Type ERD-FC explosion relief doors are true blowout type assemblies designed to NFPA-68 recommendations. These include a lightweight (less than 2.5 pounds per square foot) door panel, a reliable release system, and a means to restrain the panel after blowout.
- b) The release system consists of a number of Fracture clips, as designed for the application, attached to the frame around the door panel perimeter. The Fracture clips are mechanical fuses in a leaf spring form. For a certain percentage of their rating and deflection, they act as a "leaf spring clip" holding the door panel assembly tightly in place with good seal contact between the panel and housing. If there is an explosion, the overload breaks the Clips, instantly freeing the panel. A change in the release rating only requires a change of the Fracture clips, which are available over a wide range. The fixed rating and no moving parts avoids calibration and maintenance concerns.
- c) If the door is blown out, short cable tethers restrain it. These can be arranged to hinge the movement of the panel in the most advantageous direction for the application.

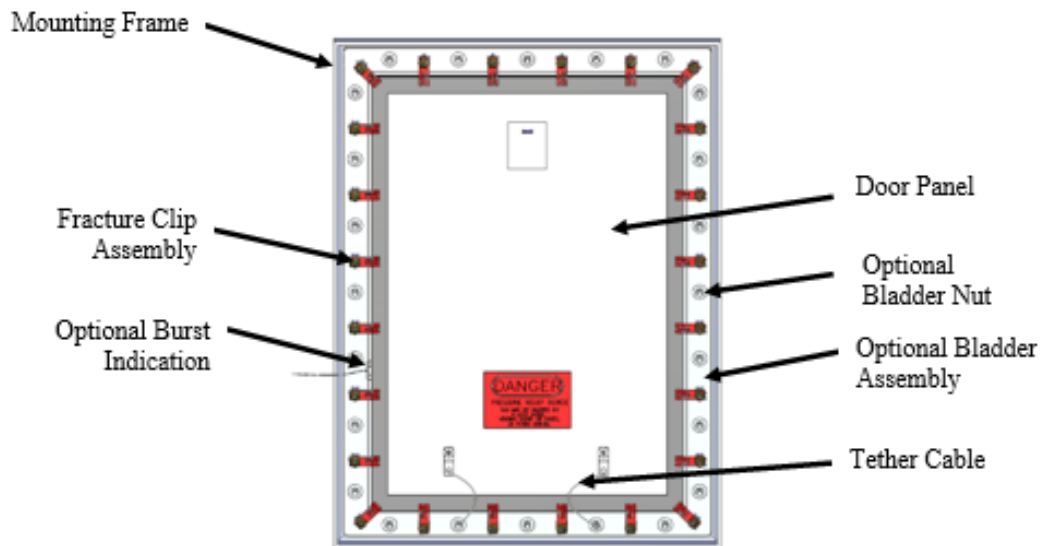
[www.zookdisk.com](http://www.zookdisk.com)

**Serving America, Central & South America**  
16809 Park Circle Drive, Chagrin Falls,  
Ohio 44022 USA  
Toll Free: +1 800 543 1043  
Phone: +1 440 543 1010  
E-mail: [sales@zookdisk.com](mailto:sales@zookdisk.com)

**Serving Europe, Middle East & Africa**  
Navigation House, Bridge Street  
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S21 1AL UK  
Phone: +44 (0) 1909 560999  
E-mail: [sales.europe@zookdisk.com](mailto:sales.europe@zookdisk.com)

**Serving Canada**  
4400 South Service Rd,  
Burlington, Ontario L7L 5R8 CA  
Toll Free: +1 800 370 6057  
Phone: +1 905 681 2885  
E-mail: [sales.canada@zookdisk.com](mailto:sales.canada@zookdisk.com)

**Serving Asia Pacific**  
Unit No.23A-05, Menara Landmark, No.12,  
Jalan Ngee Heng  
80000 Johor Bahru, Johor, Malaysia  
Phone: +60 (7) 2910099  
E-mail: [sales.asia@zookdisk.com](mailto:sales.asia@zookdisk.com)



### 3) INSTALLATION OF THE MOUNTING FRAME TO THE ENCLOSURE

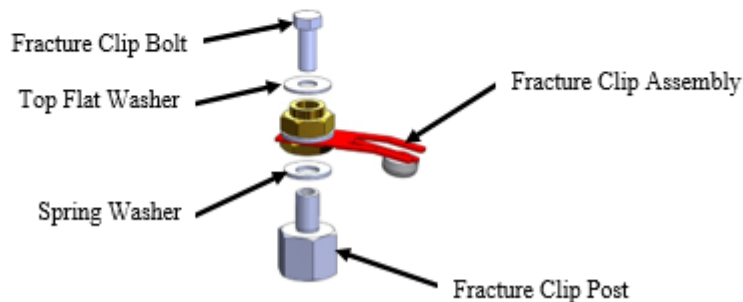
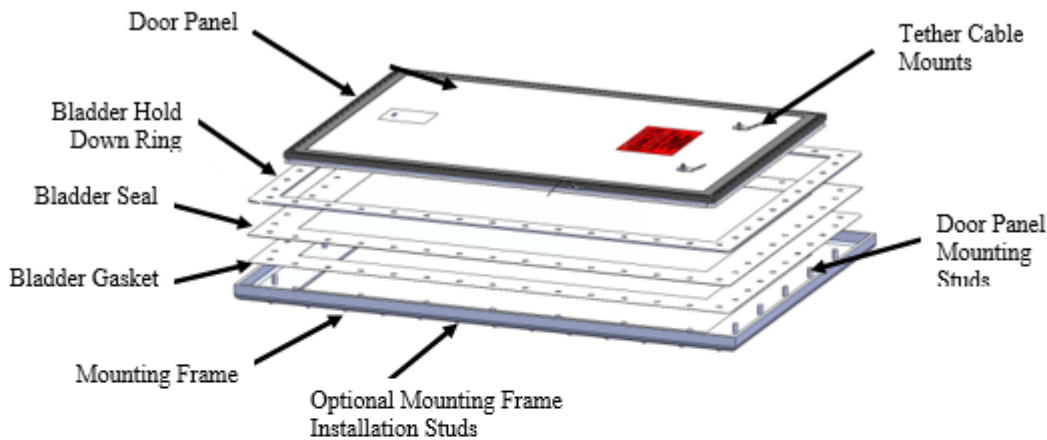
- a) Remove the door panel from the mounting frame
  - 1) The assembly is shipped assembled with the door panel and all options mounted to the angle iron mounting frame with the required number of fracture clips installed and engaged.
  - 2) Carefully unpack the Explosion Relief Door and remove all packaging used to secure the door during transportation. Inspect the door thoroughly for any damage. **DO NOT USE** if any damage is suspected, contact ZOOK immediately for instructions.
  - 3) The assembly must not be modified in any way without prior written approval from ZOOK.
  - 4) Loosen the top nut of each Fracture Clip Release to disengaging and turn the clip 90 degrees.
  - 5) **DO NOT DISMANTLE THE FRACTURE CLIP ASSEMBLY OR REPLACE COMPONENTS, AS ITS MAKEUP IS CRITICAL TO ITS OPERATION.**
  - 6) Unscrew the tether cables and the door is completely free to remove.
- b) Additional requirements for installations having a Bladder Seal
  - 1) After completing steps 3.a.1 thru 3.a.6, remove all the fracture clip assemblies and place in a safe location taking care not to misplace the components.
  - 2) Remove all the bladdernuts.
  - 3) Remove the bladder hold down ring.
  - 4) Remove the Teflon bladder assembly and bladder gasket
- c) Verify the flatness of the mounting frame
  - 1) Using atmospheric side of the door panel as a gauge clamp 1 corner to the mounting frame.
  - 2) Measure the gap between the door panel and frame at the other three corners.
  - 3) For best results, the gap should be no more than 1/64".
- d) Preparation of the enclosure

- 1) An opening equal to the inside dimensions of the mounting frame must be cut into the enclosure. ZOOK recommends that the opening be made by drilling at the corners and sawing the cutout to avoid warpage caused by flame cutting.
  - 2) A flat surface at the edge of the enclosure opening is required to make a gas tight seal between the mounting frame and the enclosure.
  - 3) Clamp the mounting frame to the enclosure aligning the cutout in the enclosure with the inside of the mounting frame.
  - 4) The mounting frame is supplied with bolt holes used to attach the assembly to the enclosure. Using the mounting frame as a template, drill the mounting holes in the enclosure wall.
- e) Mounting the frame to the enclosure
- 1) Bolt the mounting frame to the enclosure with a gasket or some sealant applied between the two components.
  - 2) We do not recommend welding the frame although it can be done, as bolting is faster, avoids possible warping, and saves refinishing the frame.
  - 3) A stud welder can be used in place of thru holes, which makes the installation go very fast, and the welded studs avoid holes in the enclosure.
  - 4) Tighten the mounting studs only enough to seal the frame to the enclosure. **Excessive tightening can warp the frame resulting in unwanted leakage and premature release of effected fracture clips.**
- f) Re-check the Flatness of the mounting frame
- 1) Using atmospheric side of the door panel as a gauge clamp 1 corner to the mounting frame.
  - 2) Measure the gap between the door panel and frame at the other three corners.
  - 3) Adjust the torque of each mounting stud to maintain flatness.
  - 4) For best results, the gap should be no more than 1/64".

#### 4) INSTALLATION OF THE DOOR PANEL AND BLADDER SEAL INTO THE MOUNTING FRAME

- a) Install the Bladder Seal (if applicable)
- 1) Place the Bladder Seal Gasket over the mounting studs.
  - 2) Place the Teflon Bladder over the mounting studs.
  - 3) Install and hand tighten all the bladdernuts on every other stud.
  - 4) Torque all bladdernuts to 100 in/lbs.
  - 5) Install all the lock washers onto the mounting studs and hand tighten.
  - 6) Install all the fracture clip posts onto the mounting studs and hand tighten.
  - 7) Torque all fracture clip posts to 250 in/lbs.
  - 8) Install the two spring washers making sure they are "back-to-back" over the fracture clip post.
  - 9) Slip the fracture clip assembly over the fracture clip post in the disengaged position 90° to the opening.
  - 10) Slip the top flat washer over the over the fracture clip post.
  - 11) Thread the fracture clip bolt into the top of the fracture clip post.
- b) Install the Door Panel - Install the door panel into the mounting frame using the supplied gravity stops to position the panel evenly in the opening.
- c) Engage the Fracture Clip Assemblies
- 1) Engage the four (4) corner fracture clips by turning them 90 degrees onto the door panel and hand tighten the fracture clip bolts.
  - 2) **Tighten the four (4) corner fracture clip bolts to 50 in/lbs in no particular order.**

- 3) Engage the balance of the fracture clips by turning them 90 degrees onto the door panel and hand tighten the fracture clip bolts.
  - 4) **Step torque all fracture clip bolts in a crisscross pattern in 50 in/lbs increments to 250 in/lbs.**
  - 5) Once all the fracture clip bolts are tightened, they hold the door panel tightly against the opening.
- d) Attach the tether cables using the provided hardware.



## 5) INSPECTION AND MAINTENANCE

- a) There is no routine maintenance required for type ERD-FC vents, except for an occasional inspection to determine that all parts are in place. The vent functions even if one or more of the fracture clips are broken (but at a lower opening pressure) so any replacement can be scheduled.