

Florida Statewide Product Approval (FSA) # FL 28906.1 & 28906.2
Engineering Express Project # 23-68484
THIS DOCUMENT CONTAINS (5) PAGES.**EVALUATION SUBJECT: 180-300REOZJ SOUND ALUMINUM ENCLOSURES****FL# 28906.1 & 28906.2****REPORT HOLDER:**DISCOVERY ENERGY, LLC.
200 TWIN OAKS ROAD
KOHLER, WI 53044, USA**KOHLER®****SCOPE OF EVALUATION (compliance with the following codes):**

THIS IS A STRUCTURAL (WIND) PERFORMANCE EVALUATION ONLY. NO ELECTRICAL OR TEMPERATURE PERFORMANCE RATINGS OR CERTIFICATIONS ARE OFFERED OR IMPLIED HEREIN. UNDER NO CIRCUMSTANCE DOES THIS PERFORMANCE EVALUATION GUARANTEE, IMPLY, OR STATE PERFORMANCE OF THE UNIT IS MAINTAINED DURING OR AFTER A DESIGN EVENT.

This Performance Evaluation is being issued in accordance with the requirements of the **Florida Building Code Eighth Edition (2023)** per ASCE 7, FBC Building Ch. 16, FBC Building Sections 104.11, 453.25.5 & 1522.2, FBC Existing Building Sections 707.1 & 707.2, FBC Mechanical 301.15, FBC Residential M1202.1 & M1301.1, FS 471.025. The product noted in this report has been tested and/or evaluated as summarized herein.

This Performance Evaluation Report is also in accordance with the requirements of the Florida Department of Business and Professional Regulation (Florida Building Commission) Rule Chapter 61G20-3.005 F.A.C., for statewide acceptance per Method 1 (d). Re-evaluation of the product shall be required following the pertinent Florida Building Code or ASCE Standard modifications or revisions. The product noted in this report has been tested and/or evaluated as summarized herein.

SUBSTANTIATING DATA:**• Product Evaluation Documents**

Substantiating documentation has been submitted to provide this performance evaluation and is summarized in the sections below.

• Structural Engineering Calculations

Structural engineering calculations have been prepared which evaluate the product based on comparative and/or rational analysis to qualify the following design criteria:

- Maximum allowable lateral & uplift wind pressures certified herein.
- Structural component connection integrity, verified by a unity check between tension and shear.
- Unit integrity via Finite Element Analysis on unit framing/housing.

Calculation summary is included in this performance evaluation and appears herein.

LIMITATIONS & CONDITIONS OF USE:

Use of the product(s) listed herein shall be in strict accordance with this performance evaluation as noted herein and manufacturer-provided model specifications. Installation shall conform to the minimum standards stated in the referenced building code(s) in addition to the specifications and limitations stated herein. See herein for complete limitations & conditions of use.

OPTIONS:

This evaluation is valid for models described herein. This evaluation includes standard products only. Contact Kohler for Engineering Special (ES) orders. Any structural changes outside of the design as described herein would void this certification.

UNIT CASING MATERIALS:

1/8" Al 5052-H32 top panel. 1/8" Al 5052-H32 for side panels and 3/16" steel ASTM A1011 for bottom skids, secured with 3/16" rivets grade 51, and M8-M12 bolts class 8.8 (see dimensional drawing for specific locations). Contact Report Holder for further unit construction information.

TERMINOLOGY:

See herein for definitions of terms and abbreviations used in this evaluation.

NOTE: THE GRAPHICAL DEPICTIONS IN THIS EVALUATION ARE FOR ILLUSTRATIVE PURPOSES ONLY AND MAY DIFFER IN APPEARANCE.

STRUCTURAL PERFORMANCE:

Models referenced herein are subject to the following design limitations:

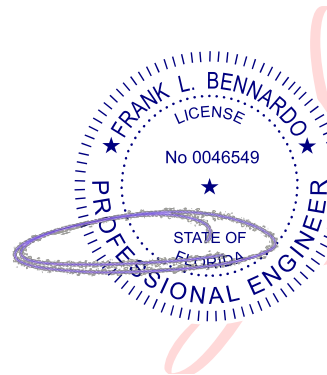
Maximum-Rated ASD Wind Pressures*:
± 65 psf Lateral, 65 psf Uplift

Maximum pressure rating determined based on the design parameters of:
Vult = 186 mph, Exposure D, flat terrain, at-grade.

- Required design wind pressures shall be determined on a site-specific basis in accordance with ASCE 7 and applicable sections of the building code(s) being referenced in accordance with ASD methodology.
- Required design wind pressures shall be less than or equal to the maximum pressures listed herein.
- *Maximum-Rated ASD Wind Pressures indicate the maximum pressures that all units listed herein are approved for. Valid for at-grade applications. See limitations herein.
- Valid for use inside and outside the High-Velocity Hurricane Zone (HVHZ).
- Site-specific wind analysis may produce alternate limitations provided that the maximum-rated wind pressures stated herein are not exceeded.

VISIT [ECALC.IO/KOHLER](https://ecalculator.kohler.com)

FOR MORE INFORMATION AND
DEVIATIONS TO THIS EVALUATION OR
SCAN THE QR CODE TO THE RIGHT >

**Engineer Signature & Seal:**

Digitally signed
by Frank
Bennardo
Date:
2024.07.02
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July 1, 2024

Frank Bennardo, P.E.
ENGINEERING EXPRESS®
FL PE #0046549 FLCA #9885

EVALUATION SUMMARY

Engineering Express has reviewed the design requirements per the Florida Building Code Eighth Edition (2023) and ASCE 7 for the structural integrity of the above-referenced Kohler sound aluminum housing unit with steel skid to withstand the maximum uniform static wind pressures stated herein. The analysis forming the basis of this certification includes the unit framing and housing only and requires that a permanent near-grade (non-rooftop) attachment to a concrete, metal, or wood host structure as certified/verified by others. Steel skid tie-down anchor locations shall conform to those illustrated on page 3 of this performance evaluation. Additionally, the unit shall not be installed in a location susceptible to channeling effects from upwind obstacles. It shall be the installer's responsibility to ensure: the criteria for the unit housing integrity, as listed above, is applicable for use at the location of installation, the mounting method meets or exceeds the requirements of the local code, and is approved by the appropriate local authority before installation.

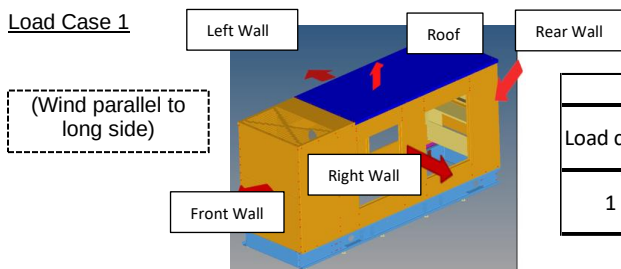
This certification is intended to certify the structural capacity and integrity of the structural framing members, wall and roof sheet metal skins, generator skid and internal structural connections only for the sound aluminum enclosure listed herein to resist the stated maximum uniform static wind pressures. Design of the generator itself, mechanical designs, energy/electrical criteria, generator slab support, anchorage and tie-down method accompanying components and all non-structural items shall be verified by others and are outside the scope of this certification. Upon analysis of the aluminum housing unit vs. the critical design loads illustrated below and supplemental FEA provided to this office and described below, this engineer has concluded that the aluminum housing enclosure provides adequate resistance to the to the stated maximum uniform static wind pressures.

Structural Engineering Calculations

Structural engineering calculations have been prepared which evaluate the aluminum unit housing based on rational and comparative analysis using Finite Element Analysis to qualify the following design criteria:

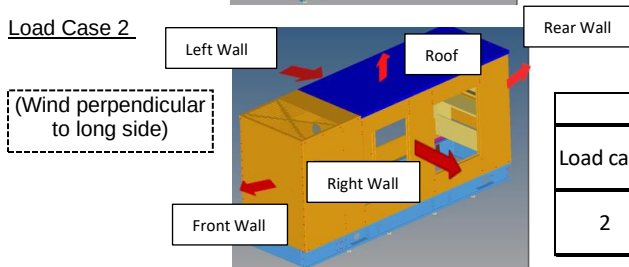
1. Maximum allowable (ASD) design pressure as a result of the aforementioned design criteria:

Load Case 1



Pressure in PSF						
Load case	Wind Direction	Rear Wall	Front Wall	Left Wall	Right Wall	Roof
1	Longitudinal Direction (psf)	58.01	-46.26	-46.26	-44.79	-91.78

Load Case 2

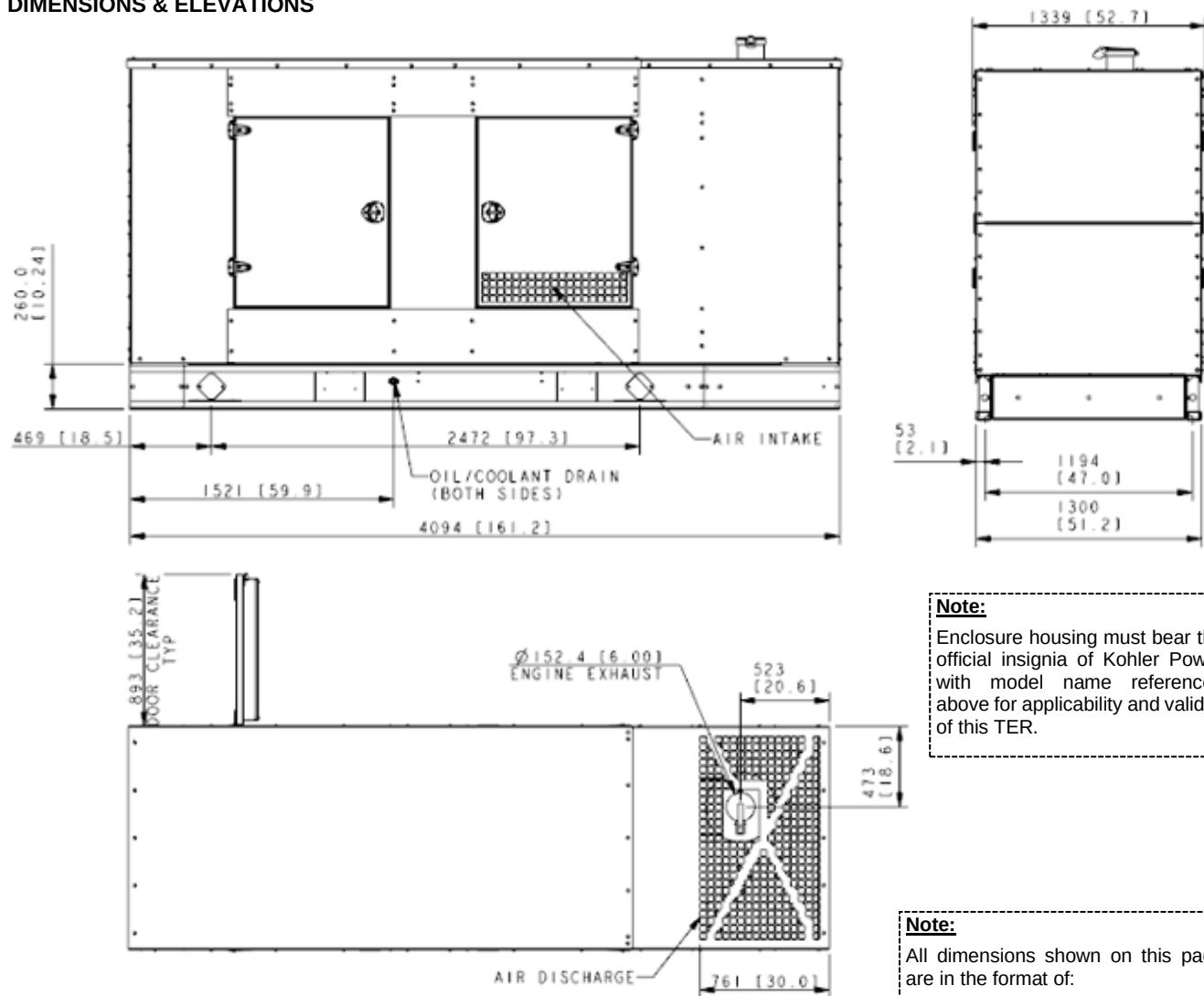


Pressure in PSF						
Load case	Wind Direction	Rear Wall	Front Wall	Left Wall	Right Wall	Roof
2	Transverse Direction (psf)	-46.26	-46.26	58.01	-44.79	-91.78

1. Maximum housing unit dimensions: 162.30" L x 52.70" W x 79.64" H.
2. Enclosure materials have been analyzed for yield and ultimate stresses using Von Mises stress criteria in accordance with the current editions of the Aluminum Design Manual & AISC Steel Construction Manual. For both load cases, Von Mises Stress stood below ultimate strength; therefore, the sound aluminum enclosure will provide adequate structural capacity to resist wind pressures shown. In addition, supplemental FEA has been provided to this office to evaluate the Front and Left Walls of a similar enclosure to ± 65 psf. Upon thorough review of the results, it is the opinion of this engineer that the results satisfactorily indicate via comparative analysis that the enclosure and structural components described herein remain below their respective ultimate tensile stresses and thus, provide adequate resistance to the maximum rated wind pressures stated herein.
3. All internal connection capacities, including bolted and welded components, have been checked for applicable tension and shear by applying a unity interaction equation where applicable and have been approved by this office.

All installation work shall follow the minimum requirements of the Florida Building Code Eighth Edition (2023) in addition to any additional site-specific requirements for tie-down certification which is not included in this report. Except as expressly provided herein, no additional affirmations are intended. Thank you for your attention to this matter.

DIMENSIONS & ELEVATIONS

**Note:**

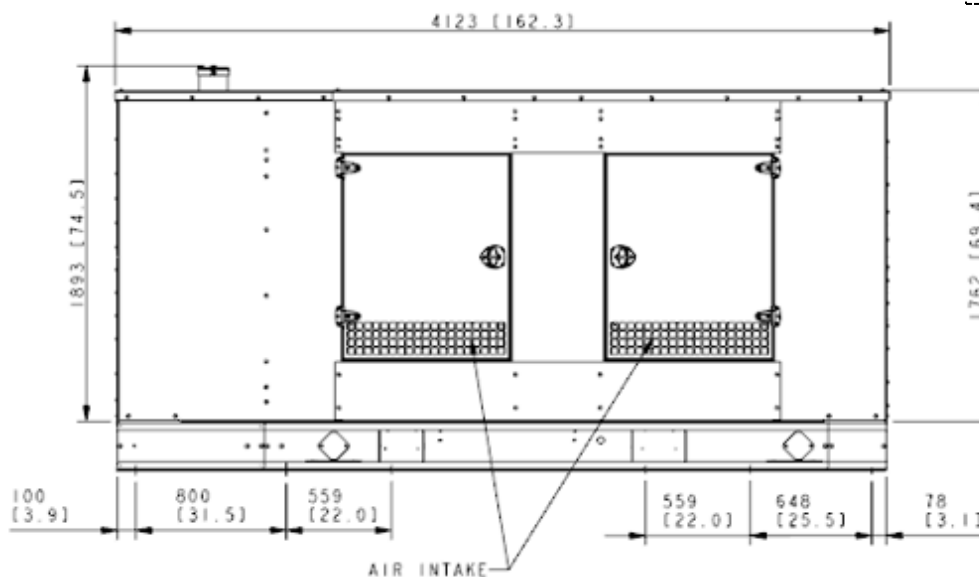
Enclosure housing must bear the official insignia of Kohler Power with model name referenced above for applicability and validity of this TER.

Note:

All dimensions shown on this page are in the format of:

" X millimeters [Y inches] "

ANCHOR LOCATIONS

**Note:**

Anchors are to be calculated and certified separately. (12) mounting holes total, (6) per long side (i.e. Left/Right Walls). Mounting hole locations are per manufacturer (see respective enclosure ADV).

IN ALL CONDITIONS IT IS THE RESPONSIBILITY OF THE PERMIT HOLDER TO ENSURE THE HOST STRUCTURE IS CAPABLE OF WITHSTANDING THE RATED GRAVITY, LATERAL, AND UPLIFT FORCES BY SITE-SPECIFIC DESIGN. NO WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, IS OFFERED BY ENGINEERING EXPRESS AS TO THE INTEGRITY OF THE HOST STRUCTURE TO CARRY DESIGN FORCE LOADS INCURRED BY THIS UNIT.

POSTAL ADDRESS: 2234 NORTH FEDERAL HWY #7664, BOCA RATON, FL 33431

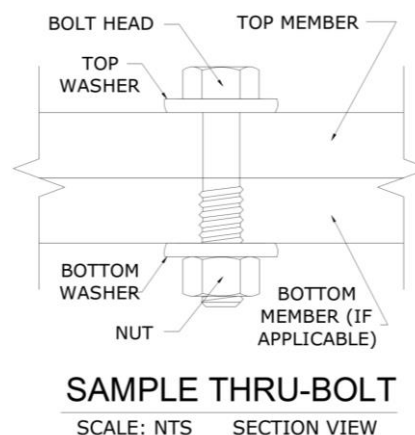
ENGINEERINGEXPRESS.COM

ENCLOSURE MODELS INCLUDED

GENERATOR	ENCLOSURE TYPE	ENCLOSURE DRAWING NUMBER	REVISION & DATE	ADV	REVISION & DATE
180REOZJG	180REOZJG/200REOZJF Sound Aluminum Enclosure	GM87411-KA6	Revision D 07/30/18	ADV-7854	Revision L 05/12/20
200REOZJF					
230REOZJE	230-275REOZJE/300REOZJ Sound Aluminum Enclosure	GM87411-KA6	Revision D 07/30/18	ADV-7644	Revision H 11/22/18
250REOZJE					
275REOZJE					
300REOZJ	230-275REOZJE/300REOZJ Sound Aluminum Enclosure	GM87411-KA6	Revision D 07/30/18	ADV-7644	Revision H 11/22/18

TERMINOLOGY

The following abbreviations may appear in this report: "Addtl." for "additional", "AHJ" for "Authority Having Jurisdiction", "alum" for "aluminum", "ASCE" for "American Society of Civil Engineers", "ASD" for "Allowable Stress Design", "ASTM" for "American Society for Testing and Materials", "EA." for "each", "E.D." for "edge distance", "EDDS" for "extra deep drawing steel", "e.g." for "exempli gratia" or "for example", "equiv." for "equivalent", "FBC" for "Florida Building Code", "FEA" for "Finite Element Analysis", "FLCA" for "Florida Certificate of Authorization", "FS" for "Florida Statutes", "Fu" for "ultimate tensile strength" or "ultimate tensile stress", "Fy" for "yield strength" or "yield stress", "GA" for "gauge", "GR." or "Gr." for "grade", "HVAC" for "heating, ventilation, and air conditioning", "HVHZ" for "High-Velocity Hurricane Zone", "i.e." for "id est" or "in other words", "in" for "inch", "lb" for "pound (force)", "max." for "maximum", "min." for "minimum", "mm" for "millimeter", "NTS" for "not to scale", "O.C." for "on center", "OD" for "outer diameter", "pcf" for "pounds (force) per cubic foot", "PE" for "Professional Engineer", "qty" for "quantity", "SAE" for "Society of Automotive Engineering", "SMS" for "sheet metal screws", "SS" for "stainless steel", "TER" for "Technical Evaluation Report", "typ." for "typical", "ult" for "ultimate loads", "U.N.O." for "unless noted otherwise", "UTS" for "ultimate tensile strength" or "ultimate tensile stress", "WLL" for "working load limit", "w/o" for "without", "YS" for "yield strength" or "yield stress", "#" for "number", "&" for "and", and "Ø" for "diameter". Please visit ecalcalc.io/glossary for additional abbreviation clarifications.



Note: The term "Thru-Bolt" or through bolt, if used herein, refers to a bolt passing through the member(s) in contact and is fastened by a nut at the end opposite the screw head. Nut shall be equivalent to or exceed the strength of the bolt U.N.O. Nut shall be sized to accommodate the same nominal diameter as the bolt U.N.O. See diagram above-right for a sample thru-bolt configuration.

Note: For instances herein which list material specifications as "[material type] or stronger":

U.N.O. herein, the term "stronger" refers to a material with a UTS value equal to or greater than the UTS value of the stated material type. Consult appropriate literature for established material UTS values.

Note: Equivalent steel gauge thicknesses as used in this evaluation, U.N.O., are as follows:

22 GA (.030"), 20 GA (.036"), 18 GA (.048"), 16 GA (.060"), 14 GA (.075"), 12 GA (.098").

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LIMITATIONS & CONDITIONS OF USE, CONTINUED

Host Structure: The supporting host structure shall be designed to resist all superimposed loads as determined by others on a site-specific basis as may be required by the Authority Having Jurisdiction. No evaluation is offered for the host supporting structure by use of this document.

Production Drawings: The following drawings shall be accessible if required for a full permit application to be submitted to the Authority Having Jurisdiction in conjunction with this performance evaluation:

- Electrical schematic(s)
- Final assembly drawings and parts lists sufficient to detail primary components, operator controls, and their locations
- Complete set of mechanical drawings for all machined parts
- Complete part specifications (including manufacturer's model numbers, size, ratings, etc.) for all purchased parts
- Specification sheets for all parts/components
- Drawings showing all construction details
- Product label drawing(s) showing all required marking information. The label drawing shall show the proposed label location on the equipment and artwork showing the manufacturer's name, address, model and serial numbers, equipment ratings, warning markings.

Drawing and Change Control: The manufacturer shall establish a system of product configuration control that shall allow no unauthorized changes to the product. Changes to critical documents, identified in this product evaluation, must be reported to, and authorized by, this office prior to implementation for production.

Survivability: Evaluation reports are valid for a newly installed unit and do not include certification of the product beyond a design event or if impacted by any debris. Inspections shall be implemented annually by the end user and after every named storm. All fasteners and cabinet components are to be verified, and all damaged, loose, corroded and/or broken fasteners and cabinet components shall be replaced to ensure structural integrity against hurricane wind forces. Contact this office for any reevaluation needs or as designated by the Authority Having Jurisdiction.

Durability: Components or component assemblies shall not deteriorate, crack, fail, or lose functionality due to galvanic corrosion or weathering. All supporting components which are permanently installed shall be protected against corrosion, contamination, and other such damage at all times. Each component or component assembly shall be supported and oriented in its intended installation position. All exposed plastic components shall be certified to resist sunlight exposure as specified by ASTM B117, or ASTM G155 in Broward or Miami-Dade counties.

Extent of Certification: Certification pertains to the overall structural integrity of the unit components listed within the evaluation as required by code, subject to the limitations and criteria stated herein. Operability during or after a design event is not included in this certification. Water infiltration is outside the bounds of this certification. No other certifications are intended other than as described herein. This evaluation alone does not offer any evaluation for large missile impact debris or cyclic wind requirements unless specifically stated herein.

Proj. #	Remarks	By	Checked	Date	Proj. #	Remarks	By	Checked	Date
20-28178	Prev. Submittal (R2)	CCB	RWN	02/18/21	23-68484	Change address	MARH	ER/RN	06/21/24
23-68484	2023 FBC Update	EPR	EPR	10/23/23					