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# Technical Evaluation Report

DIVISION: 23 08 00 – COMMISSIONING OF HVAC

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(Subject to Renew January 1, 2026 or next code cycle)

EVALUATION SUBJECT: **ICP SPLIT UNITS**

TER-24-71520

**REPORT HOLDER:**

INTERNATIONAL COMFORT PRODUCTS  
2000 PARKS OAKS AVE  
ORLANDO, FL 33428 USA  
(954) 247-2003 | WWW.ICPUSA.COM



**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 Product Evaluation Report is being issued in accordance with the requirements of the **Florida Building Code Seventh Edition (2020) & Eighth Edition (2023)** per ASCE 7, FBC Building Ch. 16, FBC Building Sections 104.11 & 1522.2, FBC Existing Building Sections 707.1 & 707.2, FBC Mechanical 301.15, FBC Residential M1202.1 & M1301.1, FS 471.025, and Broward County Administrative Provisions 107.3.4. This report is also in accordance with the **International Building & Residential Codes (2012, 2015, 2018, & 2021)**. The product noted in this report has been tested and/or evaluated as summarized herein.

**IN ACCORDANCE WITH THESE CODES EACH OF THESE REPORTS MUST BEAR THE ORIGINAL SIGNATURE & RAISED SEAL OR DIGITAL SEAL OF THE EVALUATING ENGINEER.**

**SUBSTANTIATING DATA:**

• **Product Evaluation Documents**

Substantiating documentation has been submitted to provide this TER 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:

- Max. allowable lateral & uplift wind pressures certified herein
- Max. allowable sliding forces, uplift forces, & overturning moments (see Unit Reactions from Wind Guide on last page)
- Tie-down configuration and anchor capacity for concrete, aluminum, and steel host substrates (host by others).
- Unit panel wind pressure connection integrity

Calculation summary is included in this TER and appears herein.

**LIMITATIONS & CONDITIONS OF USE:**

Use of the product(s) listed herein shall be in strict accordance with this TER 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 the models described herein. The critical unit designs have been determined and used in this evaluation. Any structural changes outside of the design as described herein would void this certification.

**UNIT CASING MATERIALS:**

0.86mm galvanized sheet steel ASTM A653 EDDS cold rolled steel for removable top panel. 1.14mm galvanized sheet steel ASTM A653 EDDS cold rolled steel for base pan. Side protector steel grille ASTM A510 Ø2.03mm vertical wire and Ø2.68mm horizontal wire, secured with #10-16 sheet metal screws into top and base pan. Contact Report Holder for further unit construction information.

**NOTE: THE GRAPHICAL DEPICTIONS IN THIS REPORT 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\*:  
± 119 psf Lateral, 94 psf Uplift**

- Required design wind pressures shall be determined according to the guide provided in the Appendix (see last page of this report) or 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 and rooftop 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.

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January 30, 2024

Richard Neet, P.E.

ENGINEERING EXPRESS®

FL PE #86488 FLCA #9885

If Checked,

Certifying Engineer

PE# & CA# Appear Above

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MODEL INFORMATION (CONTINUED ON FOLLOWING PAGE)

Unit model	Unit dimensions (in)		
	Width	Depth	Height
N4A330GHC	23 1/8	23 1/8	28 11/16
N4A336GHB	25 3/4	25 3/4	31 13/16
N4A336GLB	25 3/4	25 3/4	31 13/16
N4A336GSB	25 3/4	25 3/4	31 13/16
N4A342GHA	31 3/16	31 3/16	32 5/16
N4A342GLA	31 3/16	31 3/16	32 5/16
N4A348GHB	31 3/16	31 3/16	35 3/4
N4A348GLB	31 3/16	31 3/16	35 3/4
N4A348GSB	31 3/16	31 3/16	35 3/4
N4A360GHC	31 3/16	31 3/16	28 15/16
N4A360GLC	31 3/16	31 3/16	28 15/16
N4A360GSC	31 3/16	31 3/16	28 15/16
N4A5S18*K*WA	25 3/4	25 3/4	28 11/16
N4A5S24*K*WA	25 3/4	25 3/4	35 1/2
N4A5S30*K*WA	31 3/16	31 3/16	35 1/2
N4A5S36*K*WA	31 3/16	31 3/16	38 7/8
N4A5S42*K*WA	31 3/16	31 3/16	32 1/16
N4A5S48*K*WA	31 3/16	31 3/16	32 1/16
N4A5S60*K*WA	31 3/16	31 3/16	38 7/8
N4A724GKA	31.19	31.19	32.5
N4A736GKA	31.19	31.19	32.5
N4A748GKA	35	35	38.88
N4A760GKA	35	35	38.88
N4A7T24*K*WA	31 3/16	31 3/16	35 1/2
N4A7T36*K*WA	35	35	32 1/16
N4A7T48*K*WA	35	35	38 7/8
N4A7T60*K*WA	35	35	38 7/8
N4H418	23.13	23.13	35.25
N4H418	23.13	23.13	35.25
N4H424	25.75	25.75	38.5
N4H424	25.75	25.75	38.5
N4H430	31.19	31.19	31.81
N4H430	31.19	31.19	31.81
N4H436	31.19	31.19	28.44
N4H436	31.19	31.19	28.44
N4H442	31.19	31.19	39.13
N4H442	31.19	31.19	39.13
N4H448	31.19	31.19	28.44
N4H448	31.19	31.19	28.44
N4H460	31.19	31.19	31.81

Unit model	Unit dimensions (in)		
	Width	Depth	Height
N4H460	31.19	31.19	31.81
N4H5S18*K*AA	31 3/16	31 3/16	28.6875
N4H5S24*K*AA	31 3/16	31 3/16	32 1/16
N4H5S30*K*AA	31 3/16	31 3/16	28.6875
N4H5S36*K*AA	31 3/16	31 3/16	28.6875
N4H5S42*K*AA	31 3/16	31 3/16	32 1/16
N4H5S48*K*AA	31 3/16	31 3/16	35.5
N4H5S60*K*AA	35	35	38 7/8
N4H7T24*K*AA	35	35	35 1/2
N4H7T36*K*AA	35	35	38 7/8
N4H7T48*K*AA	35	35	45 11/16
N4H7T60*K*AA	35	35	45 11/16
NXA418	23.13	23.13	24.81
NXA418	23.13	23.13	24.81
NXA424	25.75	25.75	25
NXA424	25.75	25.75	25
NXA430	31.19	31.19	31.81
NXA430	31.19	31.19	31.81
NXA436	31.19	31.19	24.81
NXA436	31.19	31.19	24.81
NXA442	31.19	31.19	39.13
NXA442	31.19	31.19	39.13
NXA448	31.19	31.19	28.44
NXA448	31.19	31.19	28.44
NXA460	31.19	31.19	31.81
NXA460	31.19	31.19	31.81
NXA618	23.13	23.13	28.69
NXA618	23.13	23.13	28.69
NXA624	31.19	31.19	28.31
NXA624	31.19	31.19	28.31
NXA630	31.19	31.19	32.31
NXA630	31.19	31.19	32.31
NXA636	35	35	28.31
NXA636	35	35	28.31
NXA642	35	35	39.13
NXA642	35	35	39.13
NXA648	35	35	32.31
NXA648	35	35	32.31
NXA649	35	35	39.13
NXA649	35	35	39.13

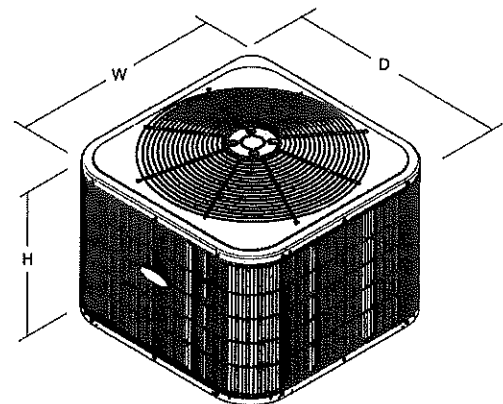
MODEL INFORMATION CONTINUED (Continued from previous page)

Unit model	Unit dimensions (in)		
	Width	Depth	Height
NXA660	35	35	45.94
NXA660	35	35	45.94
NXA661	35	35	45.94
NXA661	35	35	45.94
NXH518	31.19	31.19	28.94
NXH524	35	35	32.31
NXH530	35	35	32.31
NXH530	35	35	32.31
NXH536	35	35	35.75
NXH536	35	35	35.75
NXH542	35	35	28.94
NXH542	35	35	28.94
NXH548	35	35	28.94
NXH548	35	35	28.94
NXH560	35	35	39.13
NXH560	35	35	39.13
R4A418	23.13	23.13	24.81
R4A424	25.75	25.75	25
R4A430	31.19	31.19	31.81
R4A436	31.19	31.19	24.81
R4A442	31.19	31.19	39.13
R4A448	31.19	31.19	28.44
R4A460	31.19	31.19	31.81

Unit model	Unit dimensions (in)		
	Width	Depth	Height
R4A5S18*K*WA	25 3/4	25 3/4	28 11/16
R4A5S24*K*WA	25 3/4	25 3/4	35 1/2
R4A5S30*K*WA	31 3/16	31 3/16	35 1/16
R4A5S36*K*WA	31 3/16	31 3/16	38 7/16
R4A5S42*K*WA	31 3/16	31 3/16	31 11/16
R4A5S48*K*WA	31 3/16	31 3/16	31 11/16
R4A5S49*K*WA	35	35	45 11/16
R4A5S60*K*WA	31 3/16	31 3/16	38 7/16
R4A5S61*K*WA	35	35	45 11/16
R4H418	23.13	23.13	35.25
R4H424	25.75	25.75	35.25
R4H430	31.19	31.19	31.81
R4H436	31.19	31.19	28.44
R4H442	31.19	31.19	39.13
R4H448	31.19	31.19	28.44
R4H460	31.19	31.19	31.81
R4H5S18*K*AA	31 3/16	31 3/16	28.25
R4H5S24*K*AA	31 3/16	31 3/16	31 11/16
R4H5S30*K*AA	31 3/16	31 3/16	28.25
R4H5S36*K*AA	31 3/16	31 3/16	28.25
R4H5S42*K*AA	31 3/16	31 3/16	31 11/16
R4H5S48*K*AA	31 3/16	31 3/16	35 1/16
R4H5S60*K*AA	35	35	38 7/8

MODEL INFORMATION NOTES

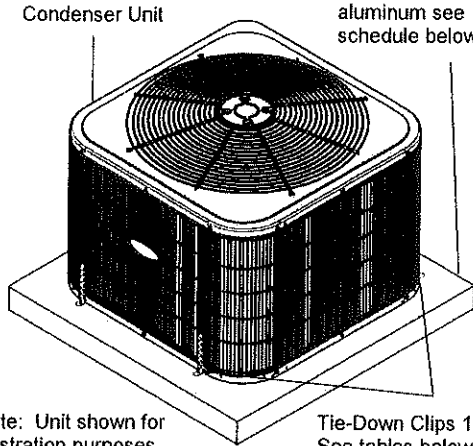
Unit dimensions listed above are unit net dimensions (as opposed to packing/shipping dimensions). Unit net weights shall be between 90 lb and 330 lb, typ. Model information listed herein is based on information provided by the client. See Detail below for definitions of unit dimensions and panel designations (related to the Panel Integrity evaluation summarized herein). In the detail, "W" is short for unit width, "D" for unit depth, and "H" for unit height. Unit appearance may vary. Please contact Report Holder for more information. Unit appearance may vary. Please contact Report Holder for more information.



Note: Image is not to scale and is for illustration purposes only. Actual units may differ slightly in appearance.

**PRODUCT INSTALLATION**

Roof or ground structure / substrate (concrete, steel, aluminum see schedule below)



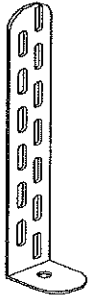
Note: Unit shown for illustration purposes only.

Tie-Down Clips 1 or 2. See tables below for specifications.

Panel Integrity Summary			
Panel	Max ASD Applied Wind Pressure	Pressure Direction	Addtl Screws Needed (pcs)
Top Panel	94 psf	Uplift	NONE
Control Cover	±119 psf	Lateral	NONE
Service Panel	±119 psf	Lateral	NONE

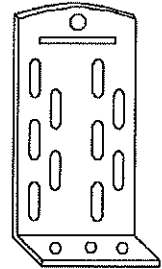
Note: Table applies to all unit models listed herein.

**TIE-DOWN CLIP (1)**  
(GROUND AND ROOF APPLICATIONS)



When using Miami Tech kit # CBCUTD4KG for ground & kit # CBCUTD4KR for roof application.; CUTD 1" wide ASTM A653 galvanized steel 0.07" (FL19731.2) thickness of varying length for all cabinets tied to a roof structure or ground structure, fasten number of clips per "Tie Down Strap Clip Schedule". Using qty. 2 anchors from Anchor Types to Host Structure table of #10 SS 410 self-drilling screw to fasten clip to unit base pan. Locate clips at 3" from the appropriate corner using and equal number of clips near corners on opposite sides.

**TIE-DOWN CLIP (2)**  
(GROUND AND ROOF APPLICATIONS)



When using BMP Clip part# TD042; 2" wide ASTM A283 (Grade D) steel 0.113" thickness of varying length for all cabinets tied to a roof structure or ground structure, fasten number of clips per "Tie Down Strap Clip Schedule". Using qty. 2 anchors from Anchor Types to Host Structure table and qty. 4 #12 SAE grade 5 sheet metal screws to fasten clip to unit base pan. Locate clips at 3" from the appropriate corner using and equal number of clips near corners on opposite sides.

**Note for Tie-Down Clips 1 & 2:** Installers must ensure that screws used to fasten the tie-down clips with the unit base pan do not touch the coil in order to prevent any damage to the coil.

Tie-Down Strap & Clip Schedule					
Max ASD Lateral Pressure	Max ASD Uplift Pressure	Strap Req'd?	Qty	Tie-Down Clip # (1) Qty	Tie-Down Clip # (2) Qty
±50 psf	39 psf	NO	N/A	4	4
±84 psf	67 psf	NO	N/A	8	4
±119 psf	94 psf	YES	2	8	4

Note: Table applies to all unit models listed herein.

**Tie-Down Clip Notes:** (Ground & Roof)  
Clips shall be positioned with a 3" minimum edge distance from the unit corners. Clip height shall be adequate to fit SMS within base pan height. Verify height on site.

**Tie-Down Strap Notes:** (Rooftop Only)  
Straps shall be wrapped as shown in the Details on the following page. The straps shall be tightened to a snug fit around the unit. Straps shall be 1" width and 22ga galvanized metal. Place an adjacent (1) #10 SMS to avoid the straps slipping off.  
Values shown in table are minimum specified. Using stronger straps is allowed at installer's discretion.

Anchor to Host Structure Schedule (to Concrete Slab or Metal Host by Others)				
Max ASD Lateral Pressure	Max ASD Uplift Pressure	Concrete 3,000 psi	1/8" Min A36 Steel	1/8" Min 6061-T6 Aluminum
±50 psf	39 psf	A	N/A	N/A
±119 psf	94 psf	N/A	B	B

Note: Table applies to all unit models listed herein.

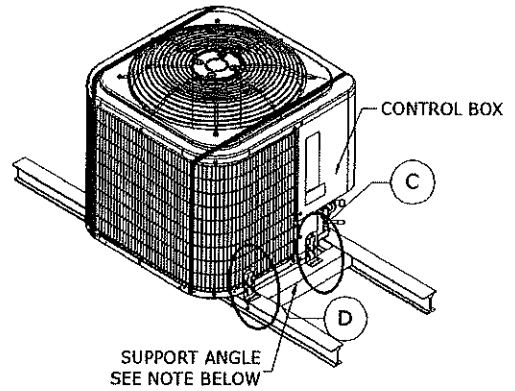
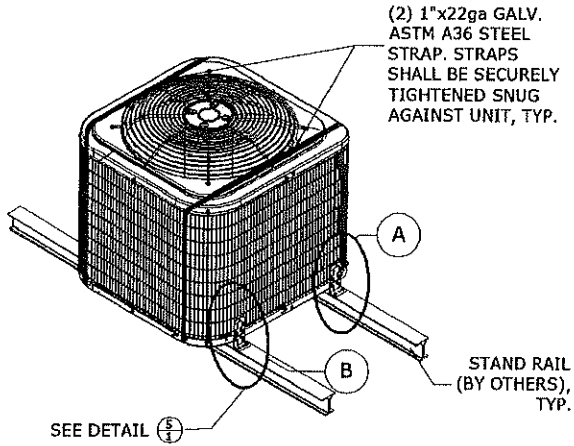
**Anchor Types to Host Structure**  
(to Concrete Slab or Metal Host):

**A (Concrete Slab).** – 1/4" DeWalt ULTRACON SS4 Anchor or equivalent embedded 1 3/4" in 3,000 psi concrete. 2 1/2" from edge minimum.

**B (Metal Host).** – 1/4" -20 UNC SAE Grade 5 bolt min. 1/2" from edges with nut and washer OD 1".

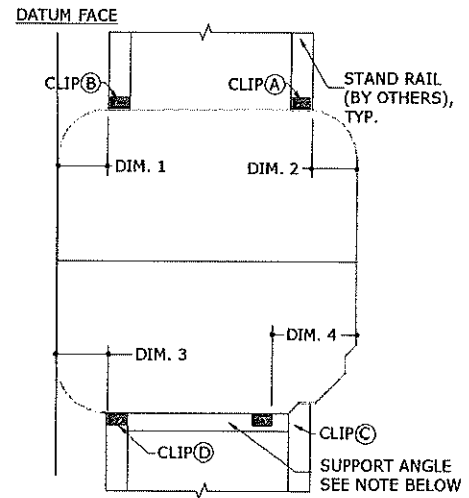
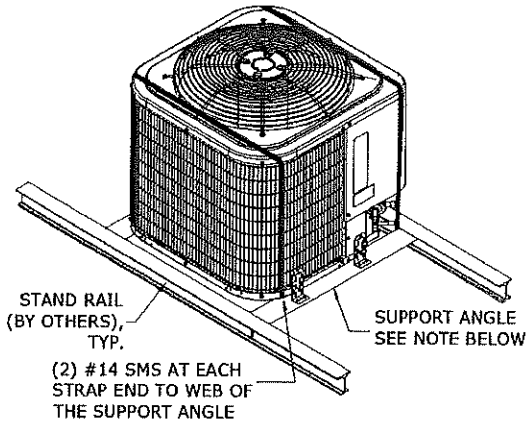
**NA.** - No anchors apply.

PRODUCT INSTALLATION DETAILS



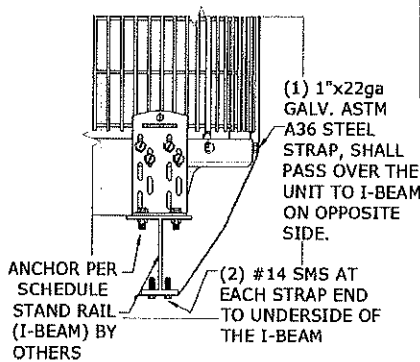
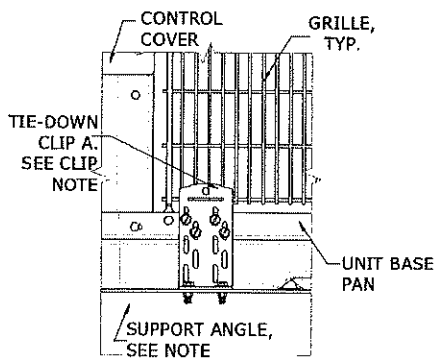
**1 MECHANICAL UNIT**  
N.T.S. FRONT ISOMETRIC

**2 MECHANICAL UNIT**  
N.T.S. BACK ISOMETRIC



**3 MECHANICAL UNIT**  
N.T.S. FRONT ISOMETRIC

**4 TIE-DOWN CLIP LAYOUT**  
N.T.S. PLAN



**TIE-DOWN CLIP OFFSETS:**

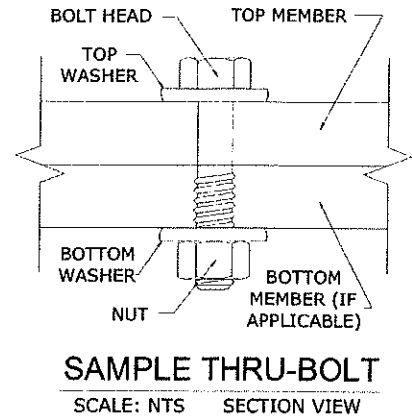
DIM. 1	5.00" MAX OFFSET FROM DATUM FACE
DIM. 2	5.00" MAX OFFSET FROM OPPOSITE FACE
DIM. 3	5.00" MAX OFFSET FROM DATUM FACE
DIM. 4	10.00" MAX OFFSET FROM OPPOSITE FACE

**Support Angle Note:**  
Miami Tech support angle part number CBCAB30K, CBCAB42K, under NOA #20-1013.03 or equivalent is permitted.

**5 TIE-DOWN CLIPS & STRAPS**  
N.T.S. ELEVATION

**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 [ecalx.io/glossary](http://ecalx.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").

**LIMITATIONS & CONDITIONS OF USE, CONTINUED**

Use of this product shall be in strict accordance with this TER as noted herein. 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. Host structure conditions that are not accounted for in this product's respective anchor schedule shall be designed for on a site-specific basis by a registered Professional Engineer. No evaluation is offered for the host supporting structure by use of this document. Adjustment factors noted herein and the applicable building codes must be considered, where applicable. Product components shall be of the material(s) specified in the manufacturer-provided product specifications. All supporting components which are permanently installed shall be protected against corrosion, contamination, and other such damage at all times. All fasteners and anchors shall be installed in accordance with the applicable provisions specified herein in addition to the anchor/fastener manufacturers' published installation instructions. Fasteners must penetrate the supporting members such that the full length of the threaded portion is embedded within the main member.

All of the wind-resisting exterior panels (with accompanying retrofits) individually meet or exceed their capacity to resist the design wind loads as stated in the calculations as required by the codes and standards stated herein. Due to the indeterminate nature of these units, distortion, deflection, and material deformation cannot be accurately evaluated, but with the diaphragm action of external components and internal stiffeners, the base unit (with accompanying retrofits stated herein as applicable) has the capacity to withstand the design wind loads without detaching from the unit and becoming flying debris.

**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
16-3190.7	Initial Issue	LAO	FLB	7/11/16	20-33364	Add models	MRT	EPR	12/09/22
20-33364	2020 FBC Update	CCB	RWN	12/16/20	20-33364	Add models	MRT	EPR	08/28/23
20-33364	Add models	MRT	EPR	10/04/22	24-71520	2023 FBC Update	MRT	RWN	01/24/24

APPENDIX A: DESIGN WIND PRESSURE GUIDE

Max. Ult. Wind Speed (V <sub>ult</sub> )	Max. MRH (Roof Height)	Exposure Category	Required Design Wind Pressures (ASD)	
			Lateral Pressure	Uplift Pressure
140 mph	At-Grade (0 ft)	C	± 26 psf	0* psf
		D	± 31 psf	0* psf
	100 ft	C	± 63 psf	50 psf
		D	± 71 psf	56 psf
	200 ft	C	± 72 psf	57 psf
		D	± 80 psf	63 psf
175 mph	At-Grade (0 ft)	C	± 40 psf	0* psf
		D	± 49 psf	0* psf
	100 ft	C	± 98 psf	77 psf
		D	± 111 psf	87 psf
	200 ft	C	± 113 psf	89 psf
		D	± 124 psf	98 psf
186 mph	At-Grade (0 ft)	C	± 46 psf	0* psf
		D	± 54 psf	0* psf
	100 ft	C	± 111 psf	87 psf
		D	± 125 psf	99 psf
	200 ft	C	± 127 psf	100 psf
		D	± 140 psf	111 psf

Note: Any table values with the format shown left, if present, indicate design wind pressures and site conditions that are **not approved for use** by this evaluation. Seek additional engineering or contact this firm for design solutions.

**DIRECTIVE:** This design pressure guide is for reference only and shall be approved for use by the Authority Having Jurisdiction (AHJ). If the design pressures listed in this guide are not used, required design pressures shall be calculated separately. For site-specific scenarios classified as Exposure Category B, the required design pressures stated for Exposure Category C in the above guide shall be used or design pressures shall be calculated separately. For heights and parameters beyond the parameters listed in this guide, visit our Online Calculator via the website link (<https://ecalc.io/forces>) or QR Code below, or obtain calculations separately by others.

The required ASD design pressures listed in this guide were calculated per the table's listed corresponding site conditions. The project design professional or permitting contractor shall verify that the site-specific conditions are equal to or less than the approved design parameters listed in the guide. Per the note below table: any values shown as "0\* psf", indicate wind pressures and corresponding site conditions that are **not valid for use** with this evaluation (exceeds the max. rated pressures).

\*Note: Per the codes and standards referenced herein, uplift is not required for mechanical equipment at-grade. If uplift at-grade is required by the AHJ, contact this firm for a site-specific evaluation.

**At-Grade (0 ft MRH) Required Design Pressures:**

- o ASCE 7 "Design Wind Loads: Other Structures"
- o Structure Shape = Square, flat terrain
- o Height of structure (unit + stand or curb, if used) = 6 ft max.
- o Width of unit = 1 ft min., Depth of unit = 11 in min.

**Rooftop (>15 ft MRH) Required Design Pressures:**

- o ASCE 7 "Design Wind Loads: Other Structures: Rooftop Structures and Equipment for Buildings"
- o Structure Shape = Square, flat terrain
- o z = up to 7 ft, where z = height of stand or curb + ½ unit height
- o Lateral GC<sub>r</sub> = 1.90; Uplift GC<sub>r</sub> = 1.50

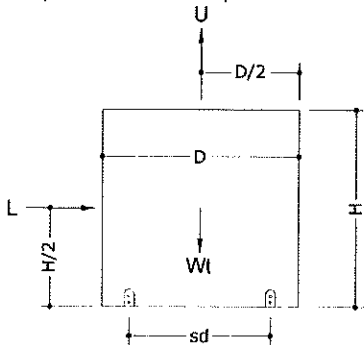
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FOR DESIGN AID CALCULATORS AND RESOURCES RELATED TO THIS TER & GUIDES HEREIN, OR SCAN THE QR CODE RIGHT >



UNIT REACTIONS FROM WIND GUIDE

**DIRECTIVE:** This guide is intended for use by a design professional. Design parameters shall abide all specifications and limitations stated in this report. Design professional shall consider all forces, including seismic and snow loads, per the governing building code. Unit reactions obtained from this guide shall be verified by a registered Professional Engineer. Reactions are applicable for unit-to-host connections only. Sample calculations are provided below.



**Design Parameters:**

- Lateral Wind Pressure, P<sub>lat</sub>
- Unit Height, H
- Unit Width, W
- Support Spacing across Depth, sd
- Uplift Wind Pressure, P<sub>up</sub>
- Unit Depth, D
- Unit Weight, Wt
- Support Spacing across Width, sw

**Unit Reaction Equations:**

**Long Side (Width x Height):**

- Sliding Force, L = P<sub>lat</sub> x W x H
- Uplift Force, U = P<sub>up</sub> x W x D
- Total Tension per Long Side = ( L x H/2 + U x sd/2 - Wt x 0.6 x sd/2 ) / sd

**Short Side (Depth x Height):**

- Sliding Force, L = P<sub>lat</sub> x D x H
- Uplift Force, U = P<sub>up</sub> x W x D
- Total Tension per Short Side = ( L x H/2 + U x sw/2 - Wt x 0.6 x sw/2 ) / sw

**Example:** A (48" W x 36" D x 42" H), 250 lb net weight unit at wind pressures of 120 psf lateral and 95 psf uplift, on a 24" wide roof stand, shall have the following unit reactions:

**Long Side (Width x Height):**

1. Sliding Force, L = P<sub>lat</sub> x W x H = (120 psf) x (48 in) x (42 in) x (1 in<sup>2</sup> / 144 ft<sup>2</sup>) = **1680 lb**
2. Uplift Force, U = P<sub>up</sub> x W x D = (95 psf) x (48 in) x (36 in) x (1 in<sup>2</sup> / 144 ft<sup>2</sup>) = **1140 lb**
3. Total Tension per Long Side = ( L x H/2 + U x sd/2 - Wt x 0.6 x sd/2 ) / sd = ( (1680 lb x 42/2 in) + (1140 lb x 24/2 in) - (250 lb x 0.6 x 24/2 in) ) / 24 in = **1965 lb**

**Short Side (Depth x Height):**

1. Sliding Force, L = P<sub>lat</sub> x D x H = (120 psf) x (36 in) x (42 in) x (1 in<sup>2</sup> / 144 ft<sup>2</sup>) = **1260 lb**
2. Uplift Force, U = P<sub>up</sub> x W x D = (95 psf) x (48 in) x (36 in) x (1 in<sup>2</sup> / 144 ft<sup>2</sup>) = **1140 lb**
3. Total Tension per Short Side = ( L x H/2 + U x sw/2 - Wt x 0.6 x sw/2 ) / sw = ( (1260 lb x 42/2 in) + (1140 lb x 48/2 in) - (250 lb x 0.6 x 48/2 in) ) / 48 in = **1046 lb**

**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.**