

EVALUATION SUBJECT: CARRIER SPLIT UNITS

TER-16-3190.2

## REPORT HOLDER:

CARRIER ENTERPRISE OF FLORIDA  
2000 PARKS OAKS AVE  
ORLANDO, FL 33428 USA  
(954) 247-2003 | FL.CARRIERENTERPRISE.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.**

This Product Evaluation Report is being issued in accordance with the requirements of the Florida Building Code Fifth Edition (2014) per FBC Section 104.11, FMC 301.15, FBC Building Ch. 16, ASCE-7-10, FBC Existing Building sections 701.1, 706.6.1, FBC Building 1522.2, and FBC Residential M1202.1, M1301.1, FS 471.025, including Broward County Administrative Provisions 107.3.4. The product noted on 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 OF THE EVALUATING ENGINEER.**

## SUBSTANTIATING DATA:

### • Product Evaluation Documents

Substantiating documentation has been submitted to support this TER and is summarized in the sections that follow.

### • 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 unit panel wind pressure connection integrity
- Maximum allowable uplift, sliding, & overturning moment for ground and roof applications

Calculation summary for this TER is provided in the forces summary table. No 33% increase in allowable stress has been used in the design of this product. Microsoft Excel was used to carry out the calculations present in this report.

## INSTALLATION:

The product(s) listed in this report shall be installed in strict compliance with this TER & manufacturer-provided model specifications.

The product components shall be of the material specified in the manufacturer-provided product specifications. All screws must be installed in accordance with the applicable provisions & anchor manufacturer's published installation instructions.

## LIMITATIONS & CONDITIONS OF USE:

Use of this product shall be in strict accordance with this TER as noted herein. See final page for complete limitations and conditions of use.

## OPTIONS:

This evaluation is valid for all CARRIER models present in the table located on the final page.

## FINISH:

Baked enamel.

NOTE: GRAPHICAL DEPICTIONS IN THIS REPORT ARE FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL UNITS MAY DIFFER SLIGHTLY IN APPEARANCE.

## UNIT CASING MATERIAL:

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. 0.86mm galvanized steel sheet ASTM A653 for side protector louvers, secured with #10-16 sheet metal screws into top and base pan.

## INSTALLATION:

Shall follow manufacturer specifications as well as the information provided herein.

## STRUCTURAL PERFORMANCE:

Models referenced herein are subject to the following design limitations: ASCE7-10 Exposure Category C, Risk II

Up to and including 175mph (Vult) for up to 200' MRH\*\*. HVHZ\*\*\*

Up to and including 170mph (Vult) for up to 250' MRH\*\*. HVHZ\*\*\*

Up to and including 200mph (Vult) for up to 200' MRH\*\*. Non-HVHZ\*\*\*

Ground or Roof Application per installation instructions

\*\*Mean Roof Height \*\*\*High Velocity Hurricane Zone

Maximum Rated Wind Pressure:

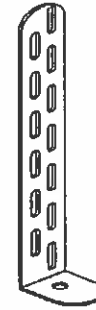
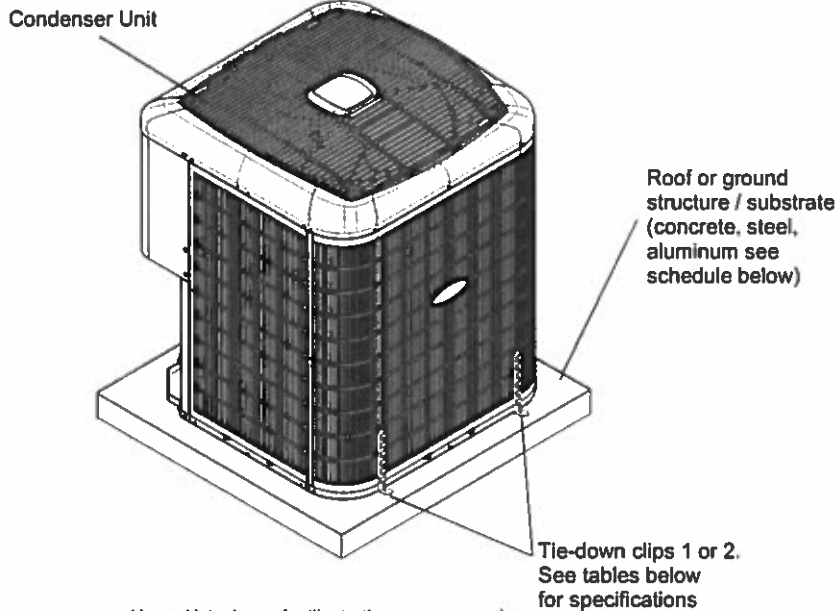
**193psf Lateral, 93psf Uplift** (less Dead Load)

Site specific wind analysis may produce alternate limitations provided maximum rated wind pressure is not exceeded.

ORIGINAL SIGNATURE AND RAISED SEAL  
REQUIRED TO BE VALID PER CODE:

September 12<sup>th</sup> 2016  
NS-46549  
Frank L. Bernard, P.E., SECB  
ENGINEERING EXPRESS®  
PE #0046549 CS #9885

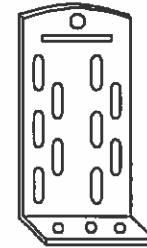
## SECTION 2 PRODUCT INSTALLATION



Note: 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 CLIP (1) (GROUND AND ROOF APPLICATION)

Miami Tech CUTD 1" wide ASTM A653 galvanized steel 0.07" thick of varying length (FL19731.2) or *equivalent* for all cabinets tied down to a roof structure or ground structure; fasten clip to structure using anchor from Anchor Schedule to Host Structure Table and (2) #10 SS 410 self-drilling screw to fasten clip to unit base pan. Install in unit with quantities shown in Tie-down Strap & Clip Schedule. Locate clips at 3" min away from the appropriate corner using four clips per side (two at each corner) and four clips opposite side in the same configuration. Miami Tech kit # CBCUTD4KG for ground & kit # CBCUTD4KR for roof application.



#### TIE-DOWN CLIP (2) (GROUND AND ROOF APPLICATION)

BMP Clips 2" wide ASTM A283 (Grade D) steel 0.113" thick of varying length for all cabinets tied down to a roof structure or ground structure or *equivalent* clips; fasten clip to structure using (2) anchor from Anchor Schedule to Host Structure Table and (4) #12 SAE Grade 5 sheet metal screw to fasten clip to unit base pan. Install in unit with quantities shown in Tie-down Strap & Clip Schedule. Locate clips at 3" from the appropriate corner. BMP part number TD-042.

#### Tie-down Strap & Clip: (for roof applications)

- Minimum edge distance 3" from the unit corners.
- Use a minimum of tie-down straps per side equally spaced.
- Clip height shall be adequate to fit SMS within base pan height. Verify height on site.
- Place an adjacent (1) #10 SMS to avoid the straps slip off.

#### Anchor Types to Host Structure:

A. - 1/4" ELCO ULTRACON SS4 Anchor embedded 1 3/4" in 3,000 psi concrete. 2 1/2" from edge minimum. NOA No. 13-1205.05

B. - 1/4" -20 UNC SAE Grade 5 bolt min. 1/2" from edges with nut and washer OD 1"

NA. - No anchors apply.

#### TIE-DOWN STRAP & CLIP SCHEDULE

Cabinet <sup>+</sup>	Ground or Roof Height*	Tie-down Strap on unit	Tie-down Clips (1)	Tie-down Clips (2)
Mini Small	Ground	NA	8	4
			8	4
Medium Large	Up to 200' (250')	2	8	4
			8	4

\*The value shown in parentheses indicates the allowable roof height in 170mph conditions. i.e. 60' (80') indicates an allowable roof height of 60' for 175mph or 80' for 170mph Vult.

+ See tables on last page for cabinet classification and model numbers.

#### Note:

Straps shall be wrapped as shown in details on section 4. The straps shall be tightened to a snug fit around the unit. Straps shall be 1" width and 22ga galvanized metal. For Non-HVHZ, use (2) metal straps, up to 200' MRH. Values shown in table are minimum specified. Using stronger straps per each height is allowed at installer's discretion.

#### ANCHOR TO HOST STRUCTURE SCHEDULE

Cabinet <sup>+</sup>	Ground or Roof Height*	Anchor Type		
		Concrete 3,000 Psi	1/8" Min A36 Steel	1/8" Min 6061-T6 Aluminum
Mini Small	Ground	A	NA	NA
	Up to 200' (250')	NA	B	B

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.

## SECTION 3 SUPPORTING CALCULATIONS &amp; SUMMARY

## FORCES SUMMARY

Cabinet*	Ground or Roof Height*	Lateral Pressure (Psf)	Uplift Pressure (Psf)	Large Side Force (lbs)	Large Side Overturn (lbs-in)	Large Side Tension (lbs)	Short Side Force (lbs)	Short Side Overturn (lbs-in)	Short Side Tension (lbs)	Uplift Force (lbs)
Mini	Ground	44.1	0	272.0	5236.0	226.5	272.0	5236.0	226.5	0.0
	Up to 200' (250')	193.0	93.4	1191.0	26897.0	1163.1	1191.0	26897.0	1163.1	347.0
Small	Ground	44.1	0	235.8	3383.3	131.1	227.0	3257.0	121.5	0.0
	Up to 200' (250')	193.0	93.4	1030.9	14793.2	573.4	992.4	14241.3	531.4	421.6
Medium Large	Ground	44.1	0	498.0	11818.0	337.7	498.0	11818.0	337.7	0.0
	Up to 200' (250')	193.0	93.4	2225.0	66678.2	1905.1	2225.0	66678.2	1905.1	794.0

Calculations performed according to the information provided by the client. Cabinets were assumed solid (0% porosity) for shear and tension calculation purposes.

## PANEL INTEGRITY SUMMARY

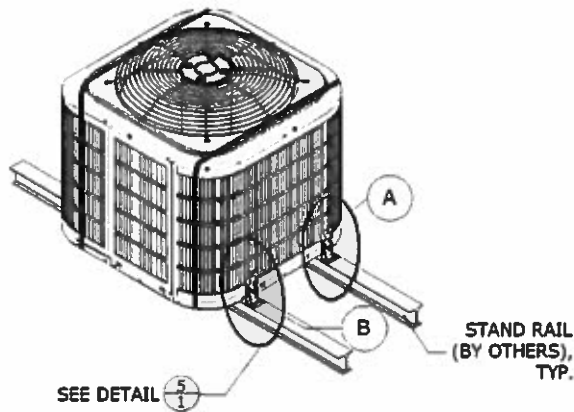
Cabinet*	Ground or Roof Height*	Panel Name	Required Wind Pressure (lb/ft²)	Force on Panel (lbs)	Additional Screw Qty Needed (pcs)	Additional reinforcement required beyond original manufacturing
Mini	Ground	TOP PANEL	0.0	0.0	-	No
		LOUVER 1	44.1	240.1	-	
		LOUVER 2	44.1	178.3	-	
		CONTROL COVER	44.1	63.5	-	
	Up to 200' (250')	TOP PANEL	93.4	346.5	-	No
		LOUVER 1	193.0	1049.9	-	
		LOUVER 2	193.0	779.7	-	
		CONTROL COVER	193.0	277.4	-	
Small	Ground	TOP PANEL	0.0	0.0	-	No
		LOUVER 1	44.1	235.3	-	
		LOUVER 2	44.1	197.9	-	
		LOUVER 3	44.1	184.7	-	
		CONTROL COVER	44.1	63.5	-	
	Up to 200' (250')	TOP PANEL	93.4	421.6	0	Yes
		LOUVER 1	193.0	1029.0	2	
		LOUVER 2	193.0	865.5	2	
		LOUVER 3	193.0	807.8	2	
		CONTROL COVER	193.0	277.4	0	
Medium Large	Ground	TOP PANEL	0.0	0.0	-	No
		LOUVER 1	44.1	436.6	-	
		LOUVER 2	44.1	362.7	-	
		LOUVER 3	44.1	212.6	-	
		LOUVER 4	44.1	243.9	-	
		CONTROL COVER	44.1	63.5	-	
	Up to 200' (250')	TOP PANEL	93.4	794.5	0	Yes
		LOUVER 1	193.0	1909.0	2	
		LOUVER 2	193.0	1585.8	2	
		LOUVER 3	193.0	929.6	3	
		LOUVER 4	193.0	1066.3	3	
		CONTROL COVER	193.0	277.4	0	

\*The value shown in parentheses indicates the allowable roof height in 170mph conditions. i.e. 60' (80') indicates an allowable roof height of 60' for 175mph or 80' for 170mph Vult.

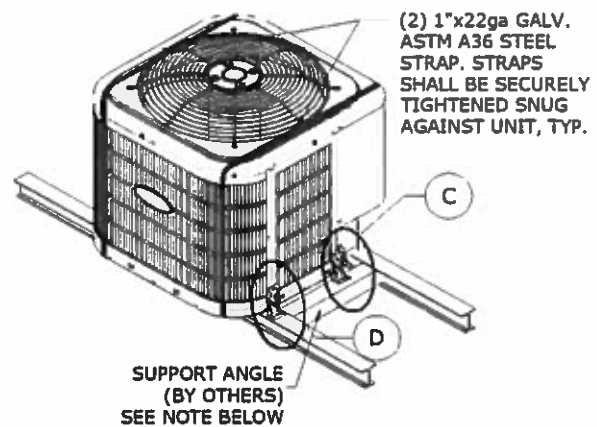
\*See tables on last page for cabinet classification and model numbers.

Note: any Louver panels **contained** by straps or clips shall **not** be reinforced, otherwise reinforce with #10 410 SS screws; amount of screws required are dictated by panel integrity table. Place screw at the bottom part of the louver, joining the louver with the base pan.

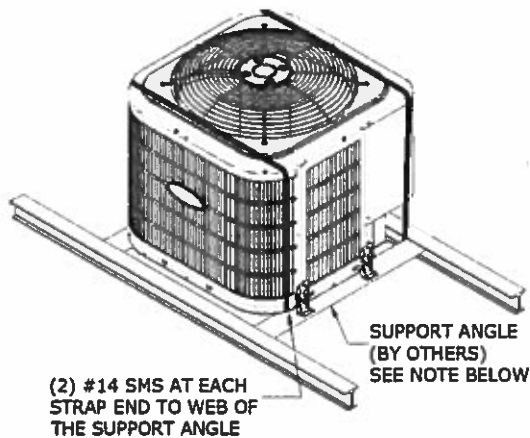
## SECTION 4 DETAILS



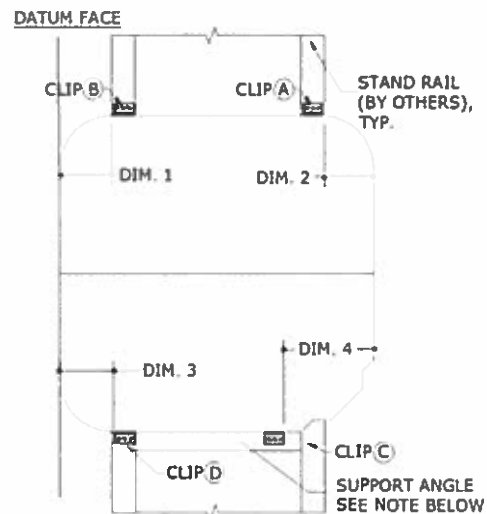
**1 MECHANICAL UNIT**  
1 N.T.S. BACK ISOMETRIC



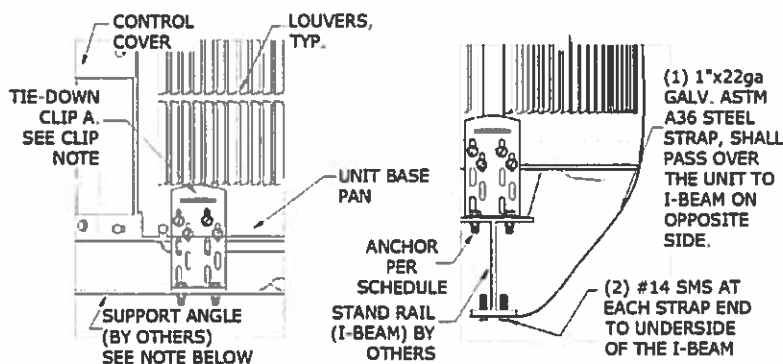
**2 MECHANICAL UNIT**  
1 N.T.S. FRONT ISOMETRIC



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



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



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

## 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

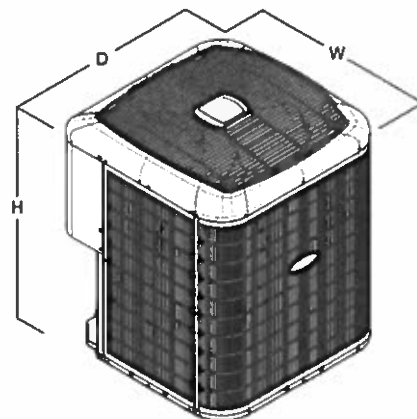
## Note:

- Miami Tech support angle part number CBCAB30K, CBCAB42K, under NOA #16-0601.01 or equivalent is permitted.
- Louver panels that are not being contained by the straps or clips shall be reinforced with #10 410 SS screws; amount of screws required are dictated by panel integrity table. Place screw at the bottom part of the louver, joining the louver with the base pan.

## CABINETS &amp; DIMENSIONS

Cabinet	Unit Model	Width (in)	Depth (in)	Height (in)
Large	25VN*024	35.00	35.00	44.00
Large	25VN*036	35.00	35.00	44.00
Large	25VN*048	35.00	35.00	44.00
Large	25VN*060	35.00	35.00	44.00
Mini	25VN*813	23.13	23.13	31.63
Mini	25VN*824	23.13	23.13	31.63
Mini	25VN*825	23.13	23.13	38.44
Mini	25VN*836	23.13	23.13	31.63
Medium	25VN*837	31.19	31.19	39.75
Medium	25VN*848	31.19	31.19	38.44
Medium	25VN*860	31.19	31.19	43.19
Large	25HN*924	35.00	35.00	40.63
Large	25HN*936	35.00	35.00	44.06
Large	25HN*948	35.00	35.00	47.44
Large	25HN*960	35.00	35.00	47.44
Large	25HN*624	35.00	35.00	40.63
Large	25HN*636	35.00	35.00	40.63
Large	25HN*648	35.00	35.00	40.63
Large	25HN*660	35.00	35.00	47.44
Medium	25HN*518	31.19	31.19	29.56
Large	25HN*524	35.00	35.00	33.88
Large	25HN*530	35.00	35.00	37.25
Large	25HN*536	35.00	35.00	37.25
Large	25HN*542	35.00	35.00	30.44
Large	25HN*548	35.00	35.00	33.88
Large	25HN*560	35.00	35.00	40.63
Mini	24VN*913	23.13	23.13	31.63
Mini	24VN*924	23.13	23.13	31.63
Mini	24VN*925	23.13	23.13	38.44
Mini	24VN*936	23.13	23.13	38.44
Medium	24VN*937	31.19	31.19	39.75
Medium	24VN*948	31.19	31.19	39.75
Large	24VN*949	35.00	35.00	44.00
Medium	24VN*960	31.19	31.19	43.19
Large	24AN*124	35.00	35.00	40.63
Large	24AN*136	35.00	35.00	47.44
Large	24AN*148	35.00	35.00	47.44
Large	24AN*160	35.00	35.00	47.44
Medium	24AN*724	31.19	31.19	36.38
Medium	24AN*736	31.19	31.19	36.38
Large	24AN*748	35.00	35.00	40.63
Large	24AN*760	35.00	35.00	40.63
Medium	24AN*618	31.19	31.19	29.56
Medium	24AN*624	31.19	31.19	29.05
Medium	24AN*630	31.19	31.19	32.94
Large	24AN*636	35.00	35.00	30.44
Large	24AN*642	35.00	35.00	40.63
Large	24AN*648	35.00	35.00	40.63
Large	24AN*660	35.00	35.00	47.44

Cabinet	Unit Model	Width (in)	Depth (in)	Height (in)
Large	25HC*624	35.00	35.00	39.13
Large	25HC*636	35.00	35.00	39.13
Large	25HC*648	35.00	35.00	39.13
Large	25HC*660	35.00	35.00	45.94
Medium	25HC*518	31.19	31.19	28.94
Large	25HC*524	35.00	35.00	32.31
Large	25HC*530	35.00	35.00	32.31
Large	25HC*536	35.00	35.00	35.75
Large	25HC*542	35.00	35.00	28.94
Large	25HC*548	35.00	35.00	28.94
Large	25HC*560	35.00	35.00	39.13
Medium	24AC*724	31.19	31.19	35.75
Medium	24AC*736	31.19	31.19	35.75
Large	24AC*748	35.00	35.00	39.13
Large	24AC*760	35.00	35.00	45.88
Small	24AC*618	25.75	26.75	28.69
Medium	24AC*624	31.16	32.16	28.31
Medium	24AC*630	31.19	31.19	32.31
Large	24AC*636	35.00	35.00	28.31
Large	24AC*642	35.00	35.00	39.13
Large	24AC*648	35.00	35.00	32.31
Large	24AC*660	35.00	35.00	45.94

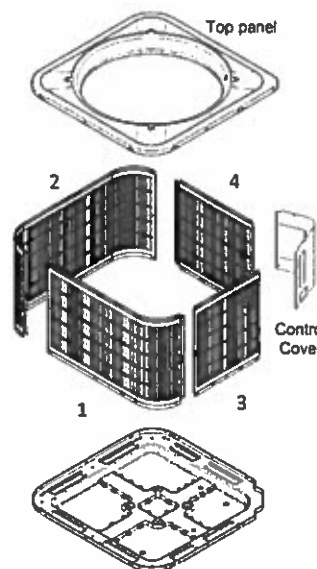
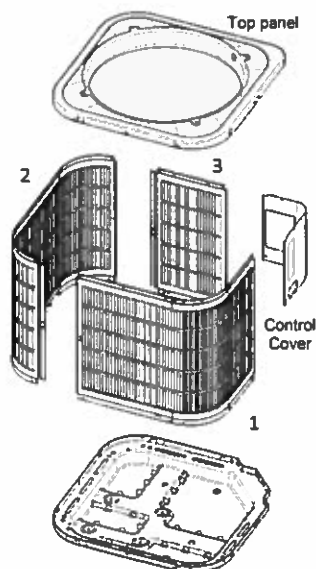
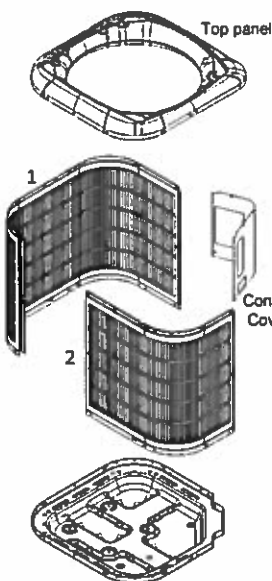


Note: Image is not to scale and is for illustration purposes only. Actual units may differ slightly in appearance.

Mini Cabinet

Small Cabinet

Medium and Large Cabinet



## LIMITATIONS &amp; CONDITIONS OF USE:

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 which are not accounted for in this product's respective anchor schedule shall be designed 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 codes must be considered, where applicable. All supporting components which are permanently installed shall be protected against corrosion, contamination, and other such damage at all times. Fasteners must penetrate the supporting members such that the full length of the threaded portion is embedded within the main member. All anchors, screws, straps, clips, and attachment part can be substituted for equivalent parts, as long as the capacities of the equivalent parts are equal or stronger.

This evaluation does not offer any evaluation to meet large missile impact debris requirements which typically are not required for this type of product.

All of the wind resisting exterior panels, individually meet or exceed their capacity to resist the design wind loads as stated in the calculations as required by the Florida Building Code Fifth Edition (2014).

Due to the indeterminate nature of these units, distortion and deflection cannot be accurately evaluated, but with diaphragm action of external components and internal stiffeners, the base unit has the capacity to withstand these forces with individual external parts being contained. Yearly inspections, during equipment maintenance or after a named storm; all screws, cabinet components, clips, anchor bolts, straps and cables are to be verified by the A/C contractor. All damaged cabinet components, loose, corroded, broken screws or anchor bolts shall be replaced to ensure structural integrity for hurricane wind forces.