

EVALUATION SUBJECT: **SAMSUNG RESIDENTIAL AIR CONDITIONING MODELS**

TER-16-3131.2

REPORT HOLDER:

SAMSUNG HVAC
776 HENRIETTA CREEK RD, SUITE 100
ROANOKE, TEXAS 76262
888-699-6067 SAMSUNGHVAC.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) with 2016 supplement 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 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 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. NOTE: No 33% increase in allowable stress has been used in the design of this product.

INSTALLATION:

The product(s) listed above 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.

INSTALLATION:

Shall follow manufacturer specifications as well as information provided herein.

FINISH:

Baked enamel, casing color white ivory.

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

UNIT CASING MATERIAL:

23ga galv. sheet steel equivalent to ASTM A653 CS Cold Rolled Steels. Removable top & side covers secured with M4 SAE 1016 SMS screws (see Panel Integrity Table for screw minimum quantity to reinforce panels). Knockouts provided for utility & control connections.

OPTIONS:

This evaluation is valid for all SAMSUNG models that appear in the table located on the final page of this report.

STRUCTURAL PERFORMANCE:

Models referenced herein are subject to the following design limitations: ASCE-710 Exposure Categories C

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 (ASD)

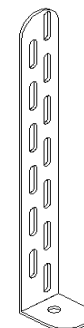
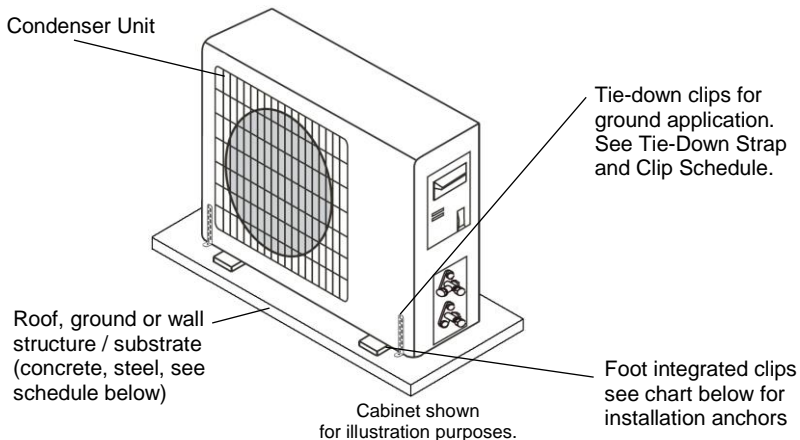
Site specific wind analysis may produce alternate limitations provided maximum rated wind pressure is not exceeded.

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

May 10, 2017

Frank L. Bennardo, P.E., SECB
ENGINEERING EXPRESS®
PE #0046549 CA #9885

SECTION 2 PRODUCT INSTALLATION



TIE-DOWN CLIP (GROUND APPLICATION)

Miami Tech CUTD 1" ASTM A653 galvanized steel 0.07" thick (FL19731.2) or **equivalent** for all cabinets tied down at ground. Fasten clip to host structure using anchor from Anchor Schedule to Host Structure Table and (4) #10 SS 410 self-drilling screw to fasten clip to unit. Install at unit corners with quantities shown in Tie-down strap and clip schedule table, additional clips spaced evenly through the side.

UNIT INTEGRATED FOOT

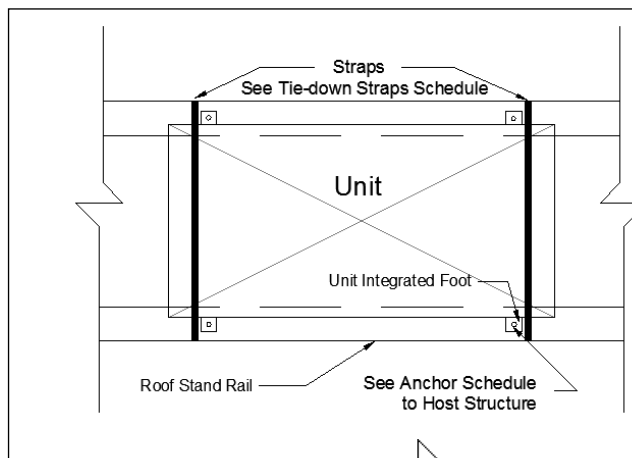
ASTM A653 **equivalent** galvanized cold rolled steel 0.0418" thick for small cabinet and 0.0538" for tall cabinet; fasten cabinet using anchor from Anchor Schedule to Host Structure Table and SAE GR5 ASTM-A449 OD 1" washer & nut to secure anchor to supporting structure.

ANCHOR SCHEDULE TO HOST STRUCTURE

Cabinet	Ground or Roof Height*	Anchor Type		
		Concrete 3,500 Psi	1/8" Min A36 Steel	1/8" Min 6061-T6 Aluminum
Group I	Ground	A or B	NA	NA
	60' (80')	NA	C	C
	120' (150')	NA	C	C
	200' (250')	NA	C	C
Group II	Ground	A or B	NA	NA
	60' (80')	NA	C	C
	120' (150')	NA	C	C
	200' (250')	NA	C	C
Group III Group IV	Ground	B	NA	NA
	60' (80')	NA	C	C
	120' (150')	NA	C	C
	200' (250')	NA	C	C

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 for tie-down clip at ground.
- B. - 1/4" CRETE-FLEX SS4 embedded 2" in 3,550 psi concrete minimum, 2 1/2" minimum from edge. NOA 15-0226.09 for tie-down clip at ground.
- C. - 3/8" -16 UNC SAE Grade 5 screw minimum 1/2" from edges with nut and washer specified, for integrated foot installed at roof.
- NA. - NOT APPLICABLE



TIE-DOWN STRAP AND CLIP SCHEDULE

Cabinet	Ground or Roof Height	Number of Straps	Minimum WLL (Lbs)	Tie-down Clips per long side
Group I	Ground	NA	NA	2
	60' (80')	2	300	NA
	120' (150')	2	300	NA
	200' (250')	2	500	NA
Group II	Ground	NA	NA	2
	60' (80')	2	800	NA
	120' (150')	2	900	NA
	200' (250')	2	1000	NA
Group III Group IV	Ground	NA	NA	3
	60' (80')	2	1000	NA
	120' (150')	2	1500	NA
	200' (250')	2	1500	NA

*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.

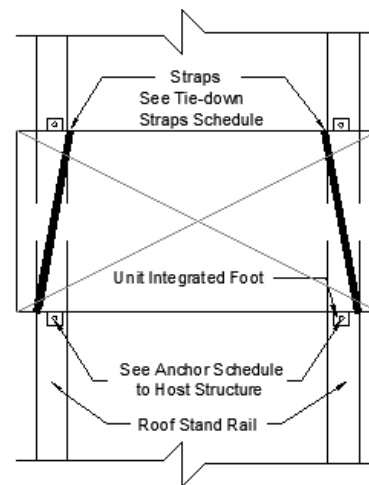
Note:
Tie-down straps shall be wrapped around unit and roof stand rail and shall be tightened to a snug fit using a turnbuckle. Provide two straps per unit. Strap material shall be high strength webbing and shall be compliant for exterior grade use if they contain plastic components, per FBC chapter 26. Select strap from table based on WLL requirements

Tie-down Strap Type:

(for roof applications)
Working Load Limit (WLL) is for the strap manufacturer - specified per strap, strap length shall be verified on site for all cabinets.

NA. - No straps required

Cables are permitted, as long as tension capacities are equal or greater than the straps. Cables shall be tightened to a snug fit using a turnbuckle that meet or exceed strap working load limit.



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 & SUMMARY

FORCES SUMMARY

Cabinet	Ground or Roof Height*	Lateral Pressure (Psf)	Uplift Pressure (Psf)	Max Large Side Force (lbs)	Max Large Side Overturn (lbs-in)	Max Large Side Tension (lbs)	Max Short Side Force (lbs)	Max Short Side Overturn (lbs-in)	Max Short Side Tension (lbs)	Max Uplift Force (lbs)
Group I	Ground	43.5	0	202.8	2187.0	194.4	73.3	790.0	25.4	0.0
	60' (80')	151.2	73.2	704.7	8598.5	740.9	254.7	5514.9	153.8	177.9
	120' (150')	173.1	84.1	810.0	9883.1	855.1	292.8	5619.5	180.3	204.5
	200' (250')	193.0	93.4	899.5	10975.2	952.2	325.1	6310.9	202.8	227.1
Group II	Ground	43.5	0	327.0	5109.0	417.0	116.0	1808.0	52.2	0.0
	60' (80')	151.2	73.2	1136.2	18642.8	1521.9	402.0	8796.4	254.0	215.5
	120' (150')	173.1	84.1	1305.9	21492.4	1754.5	462.0	10292.2	297.2	247.7
	200' (250')	193.0	93.4	1450.2	24344.7	1952.2	513.1	11563.8	334.0	275.1
Group III	Ground	43.5	0	509.0	11666.0	790.9	204.0	4690.0	127.8	0.0
	60' (80')	151.2	73.2	1767.3	41639.6	2823.0	710.5	19040.8	519.0	274.9
Group IV	120' (150')	173.1	84.1	2031.3	47998.8	3254.2	816.7	22229.2	605.9	316.0
	200' (250')	193.0	93.4	2255.8	53404.7	3620.7	906.9	24939.6	679.8	350.9

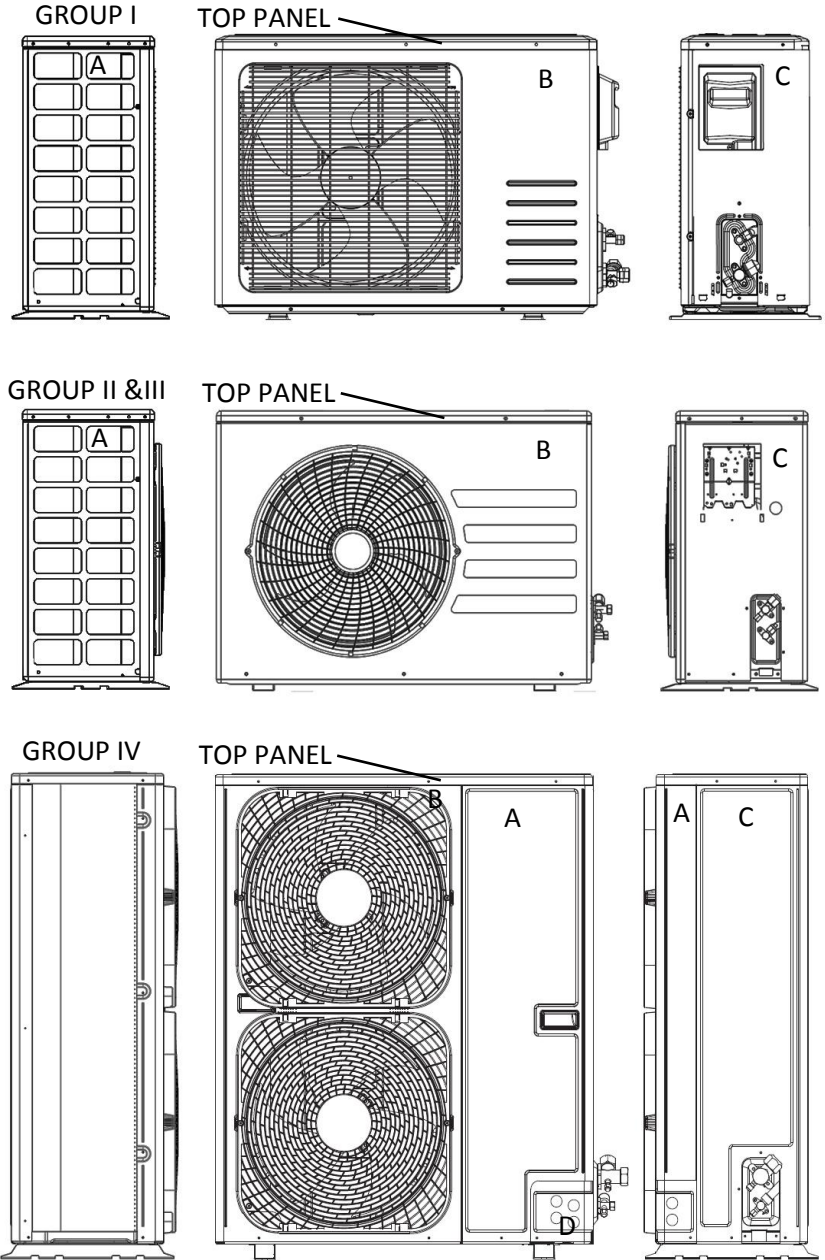
PANEL INTEGRITY SUMMARY

Cabinet	Ground or Roof Height*	Panel Name	Rqrd Wind Pressure (lb/ft²)	Force on Panel (lbs)	Add'l Screw Qty Needed (pcs)	Cabinet	Force on Panel (lbs)	Add'l Screw Qty Needed (pcs)	Additional screws required beyond original manufactured cabinet
Group I	Ground	TOP PANEL	0.0	0.0	0	Group II	0.0	0	No
		PANEL A	43.5	73.3	0		115.7	0	
		PANEL B	43.5	202.8	0		327.0	0	
		PANEL C	43.5	73.3	0		115.7	0	
	up to 60' (up to 80')	TOP PANEL	73.2	177.9	0		215.5	0	Yes
		PANEL A	151.2	254.7	0		402.0	0	
		PANEL B	151.2	704.7	2		1136.2	5	
		PANEL C	151.2	254.7	0		402.0	0	
	up to 120' (up to 150')	TOP PANEL	84.1	204.5	0		247.7	0	Yes
		PANEL A	173.1	291.6	0		460.2	0	
		PANEL B	173.1	291.6	2		1300.7	7	
		PANEL C	173.1	291.6	0		460.2	0	
up to 200' (up to 250')	TOP PANEL	93.4	157.3	0	275.1	0	Yes		
	PANEL A	193.0	325.1	0	513.1	0			
	PANEL B	193.0	325.1	3	1450.2	8			
	PANEL C	193.0	325.1	0	513.1	0			
Group III	Ground	TOP PANEL	0.0	0.0	0	Group IV	0.0	0	No
		PANEL A	43.5	136.0	0		171.2	0	
		PANEL B	43.5	271.7	0		338.3	0	
		PANEL C	43.5	100.0	0		124.8	0	
		PANEL D	43.5	11.6	0		11.6	0	
		C. POST	43.5	23.0	0		46.5	0	
	up to 60' (up to 80')	TOP PANEL	73.2	222.1	0		274.9	0	Yes
		PANEL A	151.2	472.4	3		594.9	2	
		PANEL B	151.2	944.1	0		1175.4	0	
		PANEL C	151.2	347.3	0		433.5	0	
		PANEL D	151.2	40.4	0		40.4	0	
		C. POST	151.5	80.1	0		161.7	0	
	up to 120' (up to 150')	TOP PANEL	84.1	255.3	0		316.0	0	Yes
		PANEL A	173.1	540.8	3		681.0	3	
		PANEL B	173.1	1080.7	1		1345.6	1	
		PANEL C	173.1	397.6	0		496.3	0	
		PANEL D	173.1	46.3	0		46.3	0	
		C. POST	173.1	91.5	0		184.8	0	
up to 200' (up to 250')	TOP PANEL	93.4	283.5	0	351.0	0	Yes		
	PANEL A	193.0	603.0	3	759.3	3			
	PANEL B	193.0	1205.0	2	1500.2	2			
	PANEL C	193.0	443.3	0	553.4	1			
	PANEL D	193.0	51.6	0	51.6	0			
	C. POST	193.0	102.0	0	206.1	0			

Note: Calculations are performed according to the information provided by the Client. Cabinets were assumed solid (0% porosity) for shear and tension calculation purposes. Screw quantities were checked to reinforce the unit panels as needed. Screws shall be spaced evenly at the panel bottom, validating that the screw joins the panel with the base pan. Screw sizes, quantities on panel, and panel characteristics are according to manufacturer-provided information. Screws shall have adequate corrosion protection. When reinforcing, use M4 screws, with minimum tensile strength of 94.3 ksi or 650 MPa (similar to screws existing on cabinet, installer shall verify screw length). Installer shall verify coil integrity when adding screws.

ELEVATIONS & DIMENSIONS

Cabinet	Model Number	Width (in.)	Height (in.)	Depth (in.)	Weight (lbs)
Group I	AR09KSWDHWKXCV	31.10	21.57	11.22	88.18
	AR12KSWDHWKXCV	31.10	21.57	11.22	88.18
	AR09HSFSJWKXCV	31.10	21.46	11.22	81.57
	AR12HSFSJWKXCV	31.10	21.46	11.22	81.57
Group II	AR09KSWJWKXCV	34.65	25.12	12.20	97.00
	AR12KSWJWKXCV	34.65	25.12	12.20	97.00
	AR09HSFSHWKXCV	34.65	25.12	12.20	88.18
	AR12HSFSHWKXCV	34.65	25.12	12.20	88.18
	AR09JSFDHWKXCV	34.65	25.12	12.20	88.18
	AR12JSFDHWKXCV	34.65	25.12	12.20	88.18
	AR18KSWJWKXCV	34.65	31.22	12.20	116.85
	AR18HSFSJWKXCV	34.65	31.22	12.20	116.85
Group III	AR24KSWJWKXCV	34.65	38.07	12.60	144.40
	AR24HSFSJWKXCV	34.65	37.99	12.60	157.63
	AR24HSFSHWKXCV	34.65	37.99	12.60	157.63
Group IV	AQX36VFUAGMVCV	36.69	44.41	14.76	191.80



Note: Group I, Group III and Group IV Fan units for illustration purposes.

LIMITATIONS & 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 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 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.

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 State Building Code of 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 named storm, all screws, cabinet components, clips and anchor bolts are to be verified by the A/C contractor. All damaged cabinet components, loose, corroded, broken tech screws or anchor bolts shall be replaced to ensure structural integrity for hurricane wind forces.