

GREE MULTI PRO OUTDOOR CONDENSING UNITS
WALL MOUNT CONFIGURATION AND ANCHOR SELECTION - WIND LOAD EXAMINATION

CODE: FMC and FBC 7th Ed. (2020) BLDG, ASCE 7-16
MIAMI-DADE WIND SPEED = 195 MPH (Risk Cat. IV)
For Heights <= 60 ft. (Wood stud walls only <= 15')

ENGINEERING CONFORMANCE ANALYSIS:
THE TABLE SHOWS WALL MOUNT BRACKET AND ANCHOR TYPES FOR VARIOUS MODELS OF HVAC OUTDOOR EQUIPMENT UP TO 5 TONS THAT MEET THE FOLLOWING ANALYSIS: • OVERTURN • SLIDING • ANCHOR PULLOUT AND SHEAR STRENGTH • EQUIPMENT INTEGRITY.

TABLE A-2

GREE Multi PRO Series Model No.	Weight (lbs)	Length C (in.)	Width B (in.)	Height A (in.)	Mount E (in.)	Mount F (in.)
GMV-24WL/C-T(U)	176	38.6	14.2	31.1	15.6	25.6
GMV-28WL/C-T(U)	176	38.6	14.2	31.1	15.6	25.6
GMV-36WL/B-T(U)	296	35.4	13.4	53.0	14.9	22.5
GMV-36WL/C-T(U)	246	35.4	13.4	53.0	14.9	22.5
GMV-48WL/B-T(U)	296	35.4	13.4	53.0	14.9	22.5
GMV-48WL/C-T(U)	246	35.4	13.4	53.0	14.9	22.5
GMV-60WL/C-T(U)	273	37.0	12.6	56.3	13.8	24.9

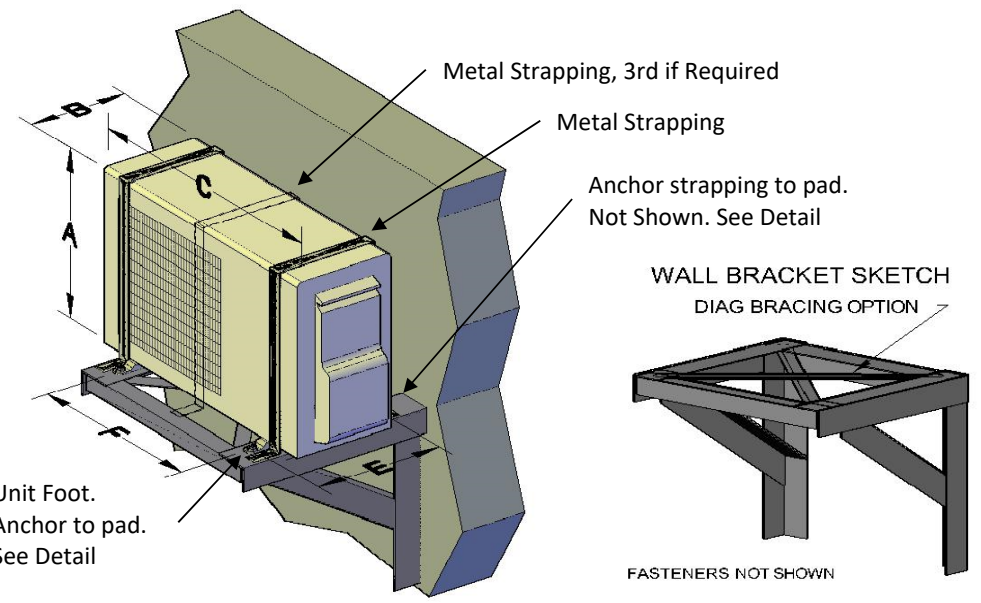
Installation Requirements

Unit Anchor	Wall Bracket						Type and number of Straps
	T, in.	L, in.	U, in.	V, #	X, #	Y, #	
A-4	31	25	16	2	2	3	S-1, 2
A-4	31	25	24	3	2	3	S-1, 2
A-5	28	24	24	3	2	3	S-2, 3
A-5	28	24	24	3	2	4	S-2, 3
A-5	28	24	24	3	2	4	S-2, 3
A-5	28	24	24	3	2	4	S-2, 3
A-5	30	24	24	3	3	4	S-2, 3

Design Check:
Nom/Reqd ≥ 1.00 = OK

Unit Foot Anchor	Wall Anchor Check	Strap Strength
2.11	9.06	1.47
2.11	4.00	1.47
1.50	5.58	1.27
1.49	5.38	1.27
1.50	5.58	1.27
1.49	5.38	1.27
1.23	3.63	1.01

Note: For wood stud walls all models require X=3.



Bri-Ko Engineering, Inc., Structural Analysis
Spreadsheet designed by: B. Schwartz, PE
Date data input: 4-Oct-22

Calc Sht: EC-1 Mechanical Equipment on Wall Mount Bracket Calc
Description: Structural Analysis of wall mounted mechanical equipment to resist wind forces.
Code: FBC 7th Ed. (2020) and ASCE 7-16.

Design Methodology and Load Combinations:

Design Method: LFRD $\Phi = 0.90$
Load Combos: FBC Eqn. 16-6 0.9 D + 1.0 W
Wind Forces: Based on ASCE 7-16, 30.3, Fig 30.3-1, C&C Walls < 60ft.

Ultimate Design Wind Speed, Vult (3-sec gust):	195 mph	Miami Dade
Nominal Design Wind Speed, Vasd:	151 mph	
Risk Category:	IV	Dir., Topo., Gust Effect: 0.85 1.00 N/A
Height, h:	60 ft	Exp. Cat.: C Vel. Pres. Exp Coef., Kz: 1.137
Enclosure Cat:	N/A	$G_{cp} = 0$
Velocity Pressure $q_h = 0.00256 K_z K_{zt} K_d V^2$ (lb/ft ²)	94.0 psf	
$p = q_h(G_{cp} - G_{ci})$ (GC _p) = (1.0 ver., 1.4 lat.)	94.0 psf, 131.7 psf	

Limit States: for illustration purposes only:

Select Unit Type: **MULTI** Select Model #: **GMV-48WL/C-T(U)**
Number of Vert Brkts is 2 Total number of anchors is 8

Loads, (lbs):	P1= 1715	P2= 310	P3= 648	PD= 246
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Resistance to shear -unit feet:
Reqd. Shear/leg = **458 lbs** Nominal Shear per leg: **2000 lbs** CHECKS OK

Resistance to tension -unit feet:
Reqd Sher/anc: **1547 lbs** Nom Shear per bolt: **3500 lbs** CHECKS OK

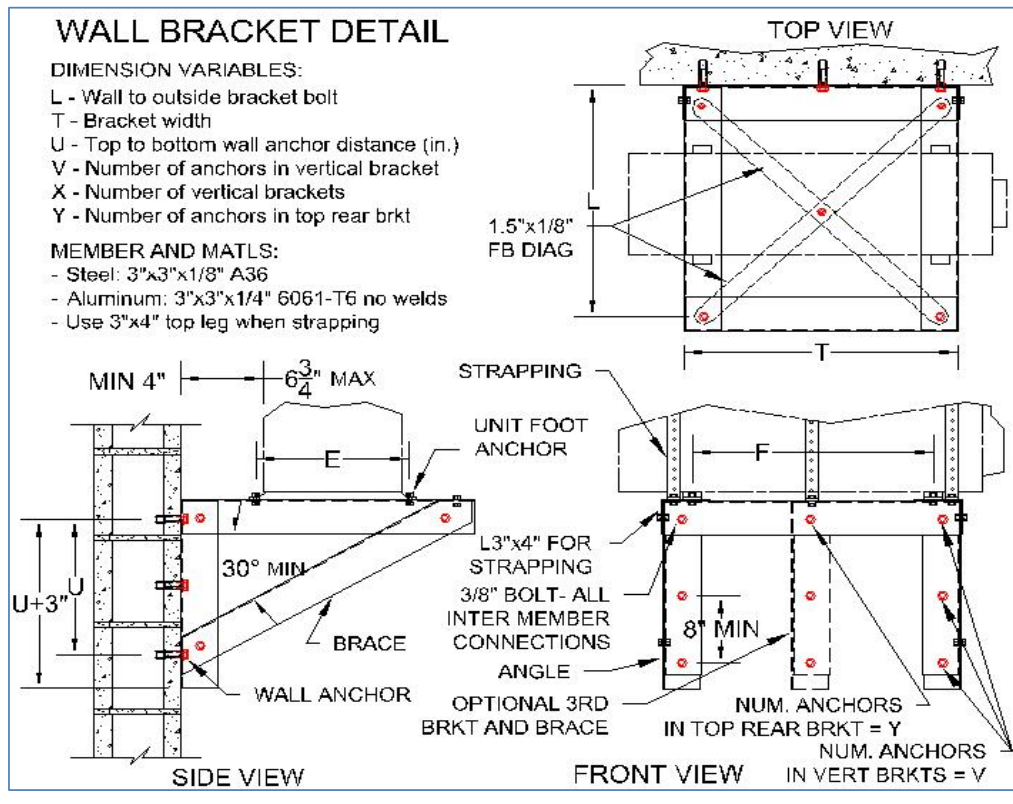
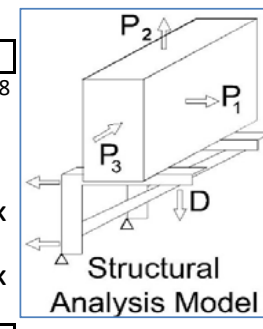
Resistance to Moment and Uplift: Use Load Combo: **0.90 D + 1.00 W**

Overturn M at brkt bottom: **99.4 k-in** for concrete and block at max 60' ht.
Concrete Wall: Nom Mom resist from all anchors: **203.8 k-in** CHECKS OK
Block Wall: Nom Mom resist from all anchors: **156.2 k-in** CHECKS OK

Overturn M at brkt bottom: **78.9 k-in** for wood at max 15' ht.
Wood Wall: Nom Mom resist from all anchors: **99.4 k-in** CHECKS OK

Unit Integrity: If Required. Only if manufacturer does not state design wind pressure.

Required tension on strap= **1146 lbs**
Strap width, gauge= **1.375 in.** **18ga** min gauge thickness
Steel Strength= **50 ksi min.** Strength of strap= **1450 lbs** Checks OK



GENERAL NOTES:

- THE ANALYSIS CONFORMS TO THE REQUIREMENTS OF THE FBC 7TH ED. (HIGH VELOCITY HURRICANE ZONE) AND ASCE 7-16 DESIGN WIND LOADS - OTHER STRUCTURES SECTION 29.4.2. NOTE: WIND FORCES ARE CONSIDERED AS MOST CLOSELY CONFORMING TO THE PRESSURES FOR SOLID ATTACHED SIGNS AND ARE DESIGNATED AS PER FIG.30.4-1 IN COMPONENTS AND CLADDING.
- THE AC UNIT IS MOUNTED ON A BRACKET ON THE OUTSIDE OF A CONCRETE, BLOCK OR WOOD STUD WALL.
- ANCHORS USED TO FASTEN THE UNIT TO THE WALL BRACKET ARE A307 OR HIGHER STRENGTH STEEL BOLTS. ANCHORS USED TO FASTEN THE WALL BRACKET TO WALL AS INDICATED IN THE TABLE A-2 ANCHORS DETAILS.
- WALL BRACKET MEMBERS ARE EITHER STEEL BOLTED OR WELDED OR ALUMINUM BOLTED ONLY AS INDICATED IN THE DETAIL.
- CLEARANCES: FASTENERS IN BRACKET METAL MUST HAVE EDGE CLEARANCES OF 1-1/2 DIAMETERS. ANCHORS IN CONC BLOCK MUST BE AT LEAST 12" FROM THE EDGE OF THE WALL.
- UNIT INTEGRITY, IF NOT DESIGNATED BY THE MANUFACTURER FOR THE STATED WIND PRESSURES, IS ADDRESSED BY STRAPPING ATTACHED TO THE UNIT AND ANCHORED TO THE SUPPORT ANGLES. THIS RESISTS SHELL AND FRAME SEPARATION.

Bracket design parameters:

Distance from wall to unit: ----->	6 in.
Distance from bottom anchor to bottom of vertical bracket: ----->	3 in.
Distance from foot anchor to outside of bracket width: ----->	2.5 in.
Outside bracket angle width: -->	3 in.

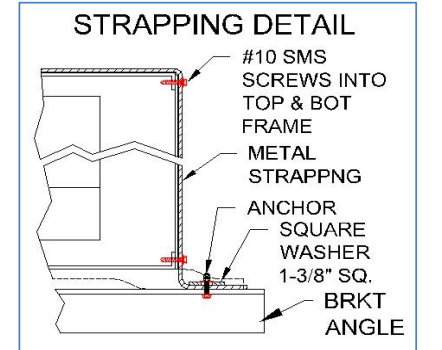


TABLE S-1 Strapping Type

SYM	Ga.	Description	Tension (lbs)
S-1	20	1-1/4"W & 1/4" holes	960
S-2	18	1-3/8"W & 1/4" holes	1450

Note: Matl is galv. and min fy=50ksi. (Permissible: Simpson Strong-Tie Coiled Straps CS20 rated at 1030 lbs, CSHP18 rated at 1450 lbs.)

TABLE A-1 ANCHOR TYPE AND ALLOWABLE STRENGTHS (LRFD)

SYM	ANCHOR DESCRIPTION & MANUFACTURER	EMBED	STRENGTH AT MIN SPACING	
			PULL OUT (LBS)	SHEAR (LBS)
C-1	3/8" SCREW BOLT+ (Powers)	2-1/2"	1415	1405
BG-1	3/8" SCREW BOLT+	3-1/4"	1085	935
W-1	3/8" LAG SCREW	2-1/2"	690	320
A-4	1/4" SS-316 Bolt	N/A	2400	1300
A-5	5/16" SS-316 Bolt	N/A	3500	2000

Anchor Notes: 1. Strengths for lag screws in wood are from NDS for wood construction 2005 for Southern Pine, Cd= 1.6, Cm= 1.0, Ceg= 1.0, Ct= 1.0, main member tm= 3.5", side member ts= 14 ga mtl. Strengths for other anchors are from manufacturer's specs with min. safety factor of 4. 2. Poured concrete wall with minimum f'c= 3000 psi. 3. BG-1 -Blocks (CMU) are medium weight and grout filled. One anchor per cell maximum. 4. Wood stud is minimum nominal 2"x4" with anchor centered in stud. 5. IMPORTANT: For Structure Type of Wood, Roof heights are limited to 15 ft maximum for all models.

Sheet: **ENG-1** BRI-KO ENGINEERING INC Cert. Of Auth.:#27622 tel: 954.648.6218

Doc: **Page 1 of 1**
Multi Pro Wall Mount

Issue Date: **1-Nov-22**
Dwn By: **B.S.**
Dwg Size: **11x 17**

This item has been digitally signed and sealed by Brian I Schwartz on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.