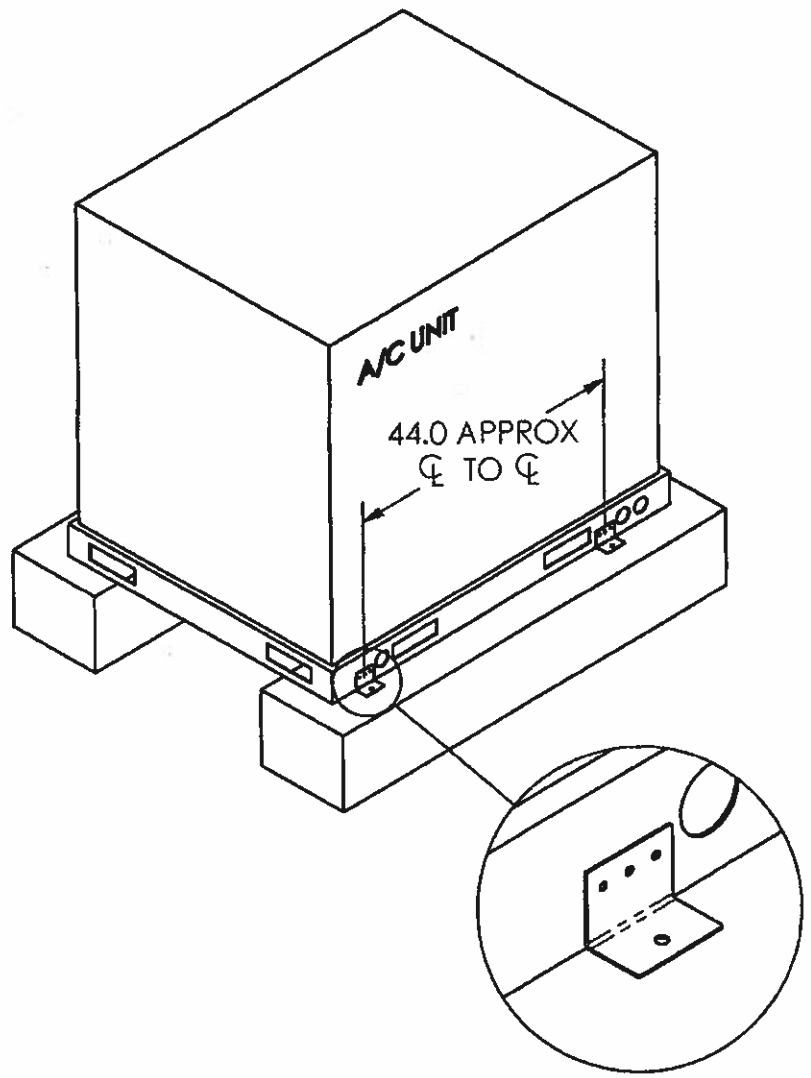
Mounting to Concrete or Stand



DETAIL A
SCALE 1 : 5

QTY. 2 - 1/4" SDSM
SCREWS AND WASHERS
PER BRACKET, (4) BRACKETS

QTY. 1 - 3/8" SAE GR5 bolt, nut and washer per bracket into properly designed Metal Stand (by others)
or
QTY. 1 - 3/8" Powers Wedge-Bolt+ anchor per bracket into minimum 2000psi concrete (by others), as follows:
- 2-1/8" min embed
- 2-3/4" edge distance
- 2-1/2" min spacing

CARRIER Chassis 3 & 4:

Models: 38AUD size 12 (min) through 14 (max)
38AUZ and 38AUQ size 07 (min) through 14 (max)

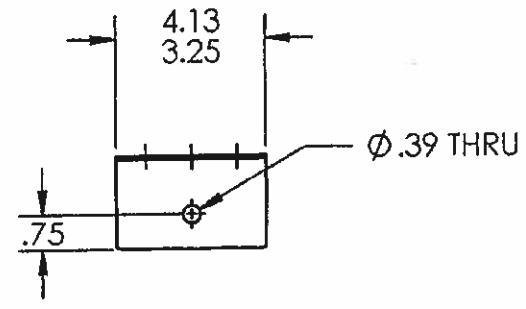
Each condenser unit listed above conforms to the Florida Building Code 6th Edition (2017) requirements for installation including High Velocity Hurricane Zone (HVHZ), Risk Category III/IV (V = 186 MPH), exposure category "D", and installation height up to and including 65 feet above grade.

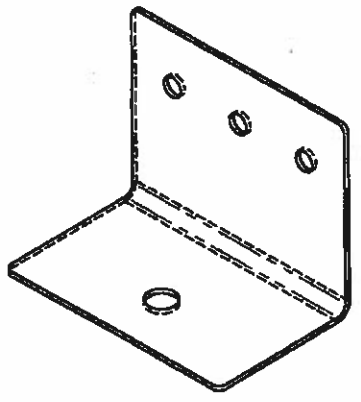
Worst case is -14 (chassis 4) 59-5/8" x 45-7/8" x 50-3/8" tall.

ALLOWABLE DESIGN PRESSURES FOR THE UNIT ITSELF:

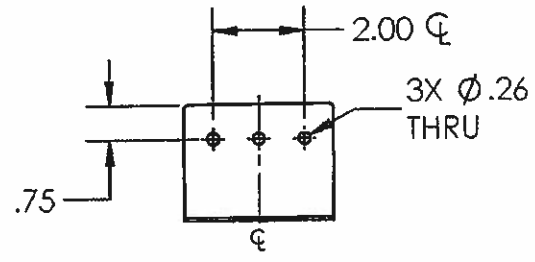
Design Lateral Pressure = 197.2 psf
Design Uplift Pressure = 95.4 psf

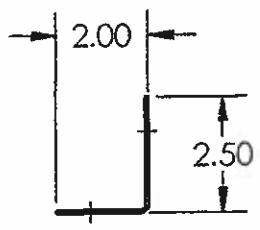
Unit itself will withstand wind loads imposed by 197.2 psf lateral and 95.4 psf uplift design pressures, provided the 16 gage galvanized base rails are fastened to a properly designed concrete slab, metal stand, curb, curb adapter, or other suitable mounting arrangement and all factory supplied assembly fasteners are in place.





ISOMETRIC
VIEW





MATERIAL: GALVANIZED STEEL OR APPROVED EQUIVALENT
DESCRIPTION: 16 GA., 90 DEG. BRACKET

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Job No: Carrier Condenser Units
Title: Model List and Details
Job No: Chassis 3 & 4
04-17-20
Created by:
S1

Rational Analysis 3A/4A: Worst case is 10-12.5 TON, Chassis 4
59-5/8" x 45-7/8" x 50-3/8"

Design Pressures complying to FBC Building 1620.6 (HVHZ):
V = 186 mph (Risk Cat. III/IV)
Exposure Category "D"
Z = 65 ft, Kz = 1.33, K_{ZT} = 1.0, K_D = 0.90
Qz = .00256 Kz K_{ZT} K_D V^2 = 106.0 psf

Lateral Wind Pressure = W_L = Qz (3.1) = 328.6 psf
Uplift Wind Pressure = U_L = Qz (1.5) = 159.0 psf
Design Lateral Pressure = W_L (0.6) = 197.2 psf
Design Uplift Pressure = U_L (0.6) = 95.4 psf

Lateral Positive Design Pressure = 121.3 psf (Worst Case Positive)
Lateral Negative Design Pressure = 75.8 psf
Sidewall Negative Design Pressure = 106.2 psf (Worst Case Negative)

22, 20, and 18 GA. panels and columns are fastened together and to 16 GA. base rails, using #10 serrated washer head self-tapping screws having 0.425" head diameter, 0.19" nominal diameter, and 0.14 minor diameter. These screws are expected to exhibit the following properties based upon ICC-ES Report ESR-2196:

Pullout Strength (22 GA.) = 306 lbs (ultimate)
Pullout Strength (20 GA.) = 351 lbs (ultimate)
Pullout Strength (18 GA. min.) = 450 lbs (ultimate)
Shear Strength (22 GA.) = 684 lbs (ultimate based on 22 GA. in-contact)
Shear Strength (20 GA.) = 684 lbs (ultimate based on 22 GA. in-contact)
Shear Strength (18 GA.) = 723 lbs (ultimate based on 22 GA. in-contact)
Shear Strength (16 GA.) = 927 lbs (ultimate based on 18 GA. in-contact)

Components and Cladding:

"Top Cover" (38AU50008):
57.7" x 44.5" draw formed 20 GA. cover, anchored at all corners with (8) cover-post screws, and along the edges with (5) cover-panel screws. The top cover also has (2) 22.4" dia. holes, reducing the total area. The overturning moment across the unit, applied to the corner post screws (2), created the highest load approximation given the uplift pressures applied to the top cover. The individual screw load calculation simplifies to dividing total uplift load by 4.

Total Area = 17.8 – 5.5 =12.3 sq.ft.
Uplift Load = 12.3 (95.4) = 1177.1 lbs
Screw Load = 1177.1/4 = 294.8 lbs
Safety Factor = 684/294.8 = 2.3x OK for components and cladding

"Side Panel" (38AU500030):
32.8 " x 45.7" draw formed 22 GA. panel, anchored at edges with (13) screws, as follows:
(4) screws through top panel at top, perpendicular to face
(4) screws along the right vertical edge, perpendicular to face
(4) screws at 7/16 inch above bottom edge through panel into base rail, perpendicular to face
(1) screw through left flange, parallel to face
Area = 10.2 sq.ft.
Load = 10.2 (106.2) = 1078.4 lbs
Screw Load (12 screws, 1 in shear) = 1078.44/12 = 89.9 lbs
Safety Factor = 351/89.9 = 3.9x OK for components and cladding

"Outdoor Panel" (48TM501190):
45.49" x 11.55" draw formed 22 GA. panel, anchored with (8) screws, as follows:
(1) screws through top panel and into face at the top, perpendicular to face
(2) screws through right vertical edge into post, perpendicular to face
(4) screws along the left vertical edge of flange
(1) screw 7/16 inch above bottom edge through panel into base rail
Area = 3.7 sq.ft.
Load = 3.7 (106.2) = 387.4 lbs
Screw Load = 387.4/8 = 48.4 lbs
Safety Factor = 351/48.4 = 7.2x OK for components and cladding

Components and Cladding (continued):

"Access Panel" (38AU500061):
42.60" x 45.00" draw formed 22 GA. panel, trapped inside "Top Cover" (38AU50008), anchored by (2) screws along each vertical edge, perpendicular to face; and (3) screws at 7/16 inch above bottom edge through panel into base rail, perpendicular to face; of which, (5) screws subtending the lower half of the panel and will be used in the load calculation:

Area = 13.3 sq.ft.
Load = 13.3 (106.2)/2 = 706.8 lbs
Screw Load = 706.8/5 = 141.4 lbs
Safety Factor = 306/141.4 = 2.2x OK for components and cladding

Connection of upper frame and panels to base rails:

Total overturning moment applied across the width of the rails, to the (8) rail-panel screw shear capacity, 22 GA. (min) cladding into 16 GA. base rails, is the chosen load approximation to maximize design calculation variables for increased safety factor – (8) rail-post screw capacity neglected.

Connection of 22 GA. Panels to 16 GA. rails around perimeter:
Screw Load = (79,875 + 37,783)/(8)(44.5) = 331.0 lbs (shear)
Safety Factor = 927/331.0 = 2.8x OK for components and cladding

Unit itself will withstand wind loads imposed by 197.2 psf lateral and 95.4 psf uplift design pressures, provided the 16 GA. galvanized base rails are fastened to a properly designed concrete slab, metal stand, curb, curb adapter, or other suitable mounting arrangement with all factory supplied assembly fasteners at the proper torque.

Connection of unit base rails to properly designed Metal Stand or Concrete:

Metal Stand or Concrete Connection:
Using (2) brackets, 2-1/2" x 2" x 3-1/4 - 4-1/8" wide, 16 GA. (min), spaced 44" (min) on-center into base rails,
Using (3) screws per bracket, (2) brackets each long side:
Screw Load = (103,595 + 29,332)/(3)(2)(45.88) = 482.9 lbs (shear)
Safety Factor = 1389/482.9 = 2.9x OK for components and cladding
Screw Load = 4113/12 = 342.7 lbs (tension)
Safety Factor = 573/342.7 = 1.7x OK for components and cladding

Metal Stand Fasteners:
Using (2) brackets, 2-1/2" x 2" x 3-1/4 - 4-1/8" wide, 16 GA. (min), spaced 44" (min) on-center into base rails,
Using (1) 3/8" SAE GR5 bolt per bracket, (2) brackets each long side:
Bolt Load = (103,800 + 29,332)/(1)(2)(45.88) = 1448.7 lbs (tension)
Bolt Load = 4113/(4) = 1028.2 lbs (shear)
Safety Factor = 3720/1448.7 = 2.6x (tension) OK
Safety Factor = 1937/1028.2 = 1.9x (shear) OK

Concrete Fasteners:
Using (2) brackets, 2-1/2" x 2" x 3-1/4" wide, 16 GA. (min), spaced 44" (min) on-center into base rails,
Using 2000 psi (min) concrete, 4" (min) thick (by others),
Using (1) 3/8" Powers Wedge-Bolt+ anchor per bracket, (4) brackets each long side:
Anchor Load = (103,800 + 29,332)/(1)(4)(45.88) = 1448.7 lbs (tension)
Anchor Load = 4113/(4) = 1028.2 lbs (shear)
Safety Factor = 3000/1448.7 = 2.1x (tension) OK
Safety Factor = 3100/1028.2 = 3.0x (shear) OK

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S2