CN Series

Condensing Units

Engineering Catalog

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Features and Benefits

Flexibility of Design
With model sizes ranging from 55 to 140 tons the AAON CN Series condensing unit can suit any application.

Convenience and Serviceability
The AAON CN Series condensing unit is designed with convenient installation and ease of service in mind. The CN Series condensing unit is delivered to the jobsite ready for installation and startup. AAON offers a wide variety of standard and optional features such as modulating hot gas reheat and variable capacity scroll compressors. All models feature full length hinged access panels with lockable, zinc cast handles for easy access to the isolated controls and compressor compartment. All components are piped and ready for easy field connection to a paired air handling unit. With an optional lighted controls section, there is full access to the factory labeled and wired electrical components. All electrical components are connected with color coded wiring to match the wiring diagram.

Reliability
The cabinet's composite construction, galvanized G-90 sheet steel paneling surrounding polyurethane insulating foam, provides strength, rigidity, and excellent thermal characteristics. Corrosion resistant external polyurethane paint surpasses a 2,500 hour salt spray test. The air-cooled condenser sections have a modular design that increases serviceability and structural integrity of the cabinet. Coil corrosion protection is offered with optional polymer e-coating that surpasses a 10,000 hour salt spray test. The latest scroll compressor technology is available in CN Series condensing units. Every CN Series condensing unit is factory inspected and leak checked prior to leaving the factory.

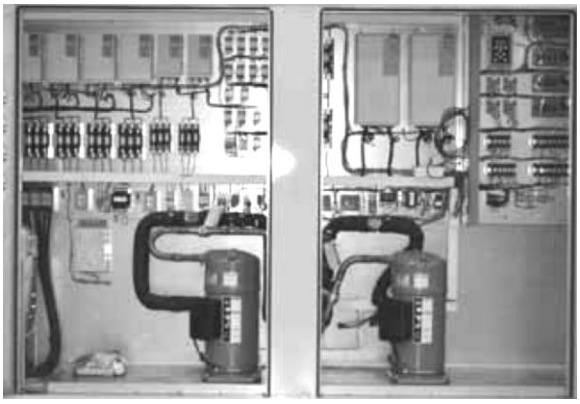

Figure 1 - Compressor and Controls Compartment

Quiet Operation
In addition to being reliable, the hermetic scroll compressors included in each CN Series condensing unit offer quiet operation. Each compressor is placed on raised structural decks and rubber isolation mounts minimizing vibration. The condensing unit cabinet construction, composite paneling with 2" thick foam insulation, not only provides good thermal insulation, but also minimizes exterior sound levels. A standard feature on all AAON condensing units is axial flow condenser fans providing maximum air flow with minimal sound levels. For quieter condenser section operation, Variable Frequency Drives (VFDs) are available to reduce condenser fan energy consumption and air flow sound at part load operation. The low sound ECM condenser fans offer the best sound as they are specifically designed for reduced and redirected sound emission.

Efficiency
All condenser fans utilize direct drive motors for maximum efficiency. VFDs are available on all condenser fans for efficient

operation at part load conditions. The use of scroll compressors, while being both reliable and quiet, also boasts reduced frictional losses and outstanding efficiency. Variable capacity VFD controlled scroll compressors also provide load matching cooling capacity, with quiet, energy efficient operation. When paired with an AAON air handling unit, the CN Series condensing unit maintains control on the supply air setpoint by varying compressor capacity at part load conditions, maintaining efficient operation across the entire range of operation.

Electrical Data

When a particular unit is selected, the amp draw of the primary electrical components is added to the standard electrical data. This will increase the minimum circuit ampacity and the maximum fuse size. Consult AAON ECat or the Electrical Service Sizing Data section of this catalog for electrical sizing information.

Dimensional Drawings

Equipment dimensions vary based on unit capacity. AAON ECat should be used with all the job application information in order to receive an accurate drawing for a specific model and feature set.

CN Series Feature String Nomenclature

Model Options : Unit Feature Options

GEN	MJREV	SIZE	SERIES	MNREV	VLT	A1	A2	A3	A4	A5	1	2A	2B	3A	3B	4	5	6A	6B	6C	7	8A	8B	8C	8D	9	10	11	12	13	14	15	16	17	18	19	20	21	22
CN	A	055	A	0	3	C	A	0	0	E	0	00	00	B	0	0	0	0	D	N	0	0	0	0	0	0	0	0	0	J	0	0	0	0	0	0	0	D	B

MODEL OPTIONS

Series and Generation
CN

Major Revision
A

Unit Size
055 = 55 ton Capacity
065 = 65 ton Capacity
075 = 75 ton Capacity
090 = 90 ton Capacity
105 = 105 ton Capacity
120 = 120 ton Capacity
130 = 130 ton Capacity
140 = 140 ton Capacity

Series
A = 55-75 ton units
B = 90-105 ton units
C = 120-140 ton units

Minor Revision
0

Voltage
2 = 230V/3Φ/60Hz
3 = 460V/3Φ/60Hz
4 = 575V/3Φ/60Hz
8 = 208V/3Φ/60Hz

A1: Compressor Style
C = R-410A VFD Compatible Scroll Compressor

A2: Condenser Style
A = Air-Cooled Microchannel Condenser

A3: Configuration
0 = Standard

A4: Coating
0 = Standard
E = Polymer E-Coated Condenser Coil

A5: Staging
A = 1 Variable Capacity Comp + 1 On/Off Comp
B = 2 Variable Capacity Comp + 2 On/Off Comp
E = All Variable Capacity Compressors
J = 2 On/Off Refrigeration Systems
K= 1 Variable Capacity Refrigeration Systems + 1 On/Off Refrigeration System
L= 2 Variable Capacity Refrigeration Systems

UNIT FEATURE OPTIONS

1: Unit Orientation
0 = Vertical Condenser Discharge with End Control Panel

2A: Refrigeration Control
0 = Standard
B = Fan Cycling
C = Adjustable Fan Cycling
D = Adjustable Compressor Lockout
K = Options B + D
M = Options C + D

2B: Blank
0 = Standard

3A: Refrigeration Options
0 = Standard
D = Hot Gas Bypass Non-Variable Compressors [HGBNV]

3B: Blank
0 = Standard

CN Series Feature String Nomenclature

Model Options : Unit Feature Options

GEN	MJREV	SIZE	SERIES	MNREV	VLT	A1	A2	A3	A4	A5	1	2A	2B	3A	3B	**4**	**5**	**6A**	**6B**	**6C**	**7**	**8A**	**8B**	**8C**	**8D**	**9**	**10**	11	12	13	14	15	16	17	18	19	20	21	22
CN	A	-	055	-	A	-	0	-	3	-	C	A	0	0	E	:	0	-	0	0	-	0	0	-	**B**	**0**	**-**	**0**	**0**	**0**	**-**	**D**	**-**	**N**	**0**	**0**	**0**	**-**	**0**	**0**	0	0	J	0	0	0	0	0	0	0	D	B

4: Refrigeration Accessories
0 = Standard
A = Sight Glass
B = Compressor Isolation Valves
C = Options A + B
D = Flooded Condenser 0°F Low Ambient Controls - One Circuit
E = Options A + D
F = Options B + D
G = Options A + B + D
H = Flooded Condenser 0°F Low Ambient Controls - Two Circuit
J = Options A + H
K = Options B + H
L = Options A + B + H
M = Flooded Condenser 0°F Low Ambient Controls - Three Circuit
N = Options A + M
P = Options B + M
Q = Options A + B + M
R = Flooded Condenser 0°F Low Ambient Controls - Four Circuit
S = Options A + R
T = Options B + R
U = Options A + B + R

5: Blank
0 = Standard

6A: Unit Disconnect Type
0 = Standard Single Point Power Block
A = Single Point Power Non-Fused Disconnect

6B: Disconnect Size
0 = None
N = 100 amps
R = 150 amps
V = 250 amps
Z = 400 amps
3 = 600 amps
5 = 800 amps
7 = 1200 amps

6C: Blank
0 = Standard

7: Accessories
0 = Standard
B = Phase & Brown Out Protection
D = Suction Pressure Transducer All Refrigeration Circuits
L = Options B + D

8A: Control Sequence
M = Field Installed DDC Controls Furnished by Others
N = Field Installed DDC Controls Furnished by Others w/ Isolation Relays
P = Factory Installed DDC Controls Furnished by Others w/ Isolation Relays

8B: Control Supplier
0 = AAON Refrigeration System Supervisory Controls

8C: Control Supplier Options
0 = Standard

8D: BMS Connection and Diagnostics
0 = Standard

9: Blank
0 = Standard

10: Blank
0 = Standard

CN Series Feature String Nomenclature

Model Options : Unit Feature Options

GEN	MJREV		SIZE		SERIES	MNREV	VLT	A1	A2	A3	A4	A5	:	1	2A	2B	3A	3B	4	5	6A	6B	6C	7	8A	8B	8C	8D	9	10	**11**	**12**	**13**	**14**	**15**
CN	A	-	055	-	A	-	0	-	3	-	C	A	0	0	E	:	0	-	0	0	-	0	0	-	B	0	-	0	0	0	-	D	-	N	0	0	0	-	0	0	**0**	**0**	**J**	**0**	**0**
																																		0	**0**	**0**	**0**	**0**	**D**	**B**
																															16	**17**	**18**	**19**	**20**	**21**	**22**						

11: Maintenance Accessories
0 = Standard
A = 115VAC Convenience Outlet - Factory Wired
B = 115VAC Convenience Outlet - Field Wired
C = Service Access Lights
E = Remote Unit Start/Stop Terminals
F = Options A + C
H = Options A + E
J = Options B + C
L = Options B + E
N = Options C + E
R = Options A + C + E
U = Options B + C + E

12: Code Options
0 = Standard ETL US Listing
A = Chicago Code
B = ETL US + Canada Listing

13: Air-Cooled Condenser
J = Condenser Coil Guards + 3Ø Condenser Fan Motor + VFD Controlled Condenser Fans - Head Pressure Control (35°F Ambient)
S = Condenser Coil Guards + Low Sound ECM Cond. Fans - Head Pressure Control (35°F Ambient)

14: Blank
0 = Standard

15: Blank
0 = Standard

16: Electrical Options
0 = Standard

17: Blank
0 = Standard

18: Blank
0 = Standard

19: Blank
0 = Standard

20: Cabinet Material
0 = Double Wall Galvanized Steel Cabinet + R-13 Foam Insulation

21: Warranty
0 = Standard Warranty
D = Extended Compressor Warranty - Years 2-5

22: Paint and SPAs
B = Premium AAON Gray Paint Exterior
E = Premium AAON Gray Paint Exterior + Shrink Wrap
X = SPA + Option B
1 = SPA + Option E
4 = SPA + Special Exterior Paint Color
7 = SPA + Special Exterior Paint Color + Shrink Wrap

Model Options

Unit Series, Major Revision, Unit Size, Series, and Minor Revision

Example: **CNA-055-A-0**-3-CA00E:0-00-00-B0-000-D-N000-0000J00-00000DB

The first number of the model string designates nominal tons of cooling capacity at AHRI conditions. Actual capacities will vary with conditions. Refer to the AAON ECat software for performance and cooling capacities at design conditions.

Table 1 - Unit Series, Major Revision, Sizes, Series, and Minor Revision

Series	Major Revision	Unit Size	Series	Minor Revision
CN	A	055	A Cabinet	0
		065		
		075		
		090	B Cabinet	
		105		
		120	C Cabinet	
		130		
		140		

Model Option

Voltage

Example: CNA-055-A-0-**3**-CA00E:0-00-00-B0-000-D-N000-0000J00-00000DB

All units have single point power blocks with grounding lugs and 24 VAC control circuits.

2 = *230V/3Φ/60Hz*
3 = *460V/3Φ/60Hz*
4 = *575V/3Φ/60Hz*
8 = *208V/3Φ/60Hz*

Model Option
Model Option A1 - Compressor Style

Example: CNA-055-A-0-3-**C**A00E:0-00-00-B0-000-D-N000-0000J00-00000DB

C = *R-410A VFD Compatible Scroll Compressor* - VFD compatible R-410A scroll compressors. See Model Option A5 for selection of modulation options.
F= *R-410A VFD Compatible Tandem Scroll Compressors* - Compressorized DX cooling with R-410A using VFD compatible tandem scroll compressors. See Model Option A5 for selection of modulation options.

Model Option
Model Option A2 - Condenser Style

Example: CNA-055-A-0-3-C**A**00E:0-00-00-B0-000-D-N000-0000J00-00000DB

A = *Air-Cooled Microchannel Condenser* - Air-cooled condenser with aluminum microchannel coils.

Model Option
Model Option A3 - Configuration

Example: CNA-055-A-0-3-CA**0**0E:0-00-00-B0-000-D-N000-0000J00-00000DB

0 = *Standard*

Model Option
Model Option A4 - Coating

Example: CNA-055-A-0-3-CA0**0**E: 0-00-00-B0-000-D-N000-0000J00-00000DB

0 = *Standard*
E = Polymer e-coating applied to condenser coils. Complete coil and casing are coated. Coating capable of withstanding at least 10,000 hours of salt spray per ASTM B117, yet is only 0.8-1.2 mils thick and has excellent flexibility. Option is intended for use in coastal saltwater conditions under the stress of heat, salt, sand and wind and is applicable to all corrosive environments where a polymer e-coating is acceptable. Coating includes a 5 year warranty, from the date of original equipment shipment from the factory. Instructions coil cleaning, maintenance, and recording keeping must be followed. Refer to the unit Installation, Operation and Maintenance Manual.

Model Option
Model Option A5 - Staging

Example: CNA-055-A-0-3-CA00**E**: 0-00-00-B0-000-D-N000-0000J00-00000DB

A = *1 Variable Capacity Compressor and 1 On/Off Compressor* - Lead compressor will be variable capacity with VFD speed control, and lag compressor will have on/off capacity control. Available on 55-105 ton units.
B = *2 Variable Capacity Compressors and 2 On/Off Compressors* - Two lead compressors will be variable capacity with VFD speed control, and two lag compressors will have on/off capacity control. Available on 120-140 ton units.
E = *All Variable Capacity Compressors* - All compressors will be variable capacity with VFD speed control.
J = *2 On/Off Refrigeration Systems* - Two refrigeration circuits with on/off capacity control. Unit will include four on/off controlled scroll compressors. Unit will be wired for 4 stage cooling.
K = *1 Variable Refrigeration System + 1 On/Off Refrigeration System* - Lead refrigeration circuit with variable capacity control and lag refrigeration circuit with on/off capacity control. Unit will include three on/off controlled scroll compressors and one VFD controlled variable speed scroll compressor with factory provided VFD.
L = *2 Variable Refrigeration Systems* - Two refrigeration circuits with variable capacity control. Unit will include two on/off controlled scroll compressors and two VFD controlled variable speed scroll compressors with two factory provided VFDs.

Unit Feature 1

Unit Feature 1 - Unit Orientation

Example: CNA-055-A-0-3-CA00E:**0**-00-00-B0-000-D-N000-0000J00-00000DB

0 = *Vertical Condenser Discharge with End Control Panel* - Condenser fans will discharge air vertically from the unit. Dual front end doors with full length stainless steel piano hinges and quarter turn, lockable handles provide service access to compressor and controls compartment.

Unit Feature 2

Unit Feature 2A - Refrigeration Control

Example: CNA-055-A-0-3-CA00E:0-**0**0-00-B0-000-D-N000-0000J00-00000DB

0 = *Standard*
B = *Fan Cycling* - Device that cycles the condenser fans to maintain refrigerant circuit head pressures at acceptable levels during cooling operation down to 35°F ambient. An adjustable compressor lockout (-10 to 70°F) for the first refrigeration circuit is included with this selection.
C = *Adjustable Fan Cycling* - Device that cycles the condenser fans to maintain refrigerant circuit head pressures at acceptable levels during cooling operation down to 35°F ambient. The head pressure control setpoint (116-610 psi) and pressure differential (58-200 psi) is field adjustable. And adjustable compressor lockout (-10 to 70°F) for the first refrigeration circuit is included with this selection.
D = *Adjustable Compressor Lockout* - Adjustable compressor lockouts (-10 to 70°F) on each refrigeration circuit. Hot gas bypass is strongly recommended on systems without all variable capacity compressors. Option is recommended if cooling operation is required at less than 55°F ambient.
K = *Fan Cycling + Adjustable Compressor Lockout* - Options B + D.
M = *Adjustable Fan Cycling + Adjustable Compressor Lockout* - Options C + D.

Unit Feature 2

Unit Feature 2B - Blank

Example: CNA-055-A-0-3-CA00E:0-0**0**-00-B0-000-D-N000-0000J00-00000DB

0 = *Standard*

Unit Feature 3

Unit Feature 3A - Refrigeration Options

Example: CNA-055-A-0-3-CA00E:0-00-**0**0-B0-000-D-N000-0000J00-00000DB

0 = *Standard*
D = *Hot Gas Bypass Non-Variable Compressors [HGBNV]* - Field adjustable pressure activated bypass valves on the non-variable capacity compressor cooling circuits. Valve is factory setup to divert hot compressor discharge gas to the evaporator coil if pressure on the evaporator sided of the valve drops below 105 psi for R-410A (34°F at sea level). The bypass valve is at full capacity after six degrees of differential (28°F at sea level). This option helps prevent coil freezing during periods of low air flow or cold entering coil conditions. This option is used for refrigerant system protection only and cannot be used for cooling capacity modulation. **Hot gas bypass is required on all Variable Air Volume (VAV) and Makeup Air (MUA) units without VFD controlled variable speed scroll compressors. Hot gas bypass on the lag circuits is recommended on all VAV and MUA units with VFD controlled variable speed scroll compressors on only the lead circuits.** This option will only have HGB on refrigeration circuits that do not have variable capacity compressors.
E = *Modulating Hot Gas Reheat [MHGR]* - Option is available with selection of matching air handler with the modulating hot gas reheat option and is factory installed on the lead refrigeration circuit. Modulating reheat controls provide the unit with a dehumidification mode of operation when the cooling load has been satisfied. Option includes modulating condenser control valve, modulating reheat control valve, and receiver tanks. Requires additional field piped hot gas line, with drip line, from the condensing unit to the air handler. Field installed suction line accumulator/subcooler is recommended.
L = *HGBNV* + *MHGR* - Options D + E.

Unit Feature 3

Unit Feature 3B - Blank

Example: CNA-055-A-0-3-CA00E:0-00-0**0**-B0-000-D-N000-0000J00-00000DB

0 = *Standard*

Unit Feature 4

Unit Features 4 - Refrigeration Accessories

Example: CNA-055-A-0-3-CA00E:0-00-00-**B**0-000-D-N000-0000J00-00000DB

0 = *Standard*
A = *Sight Glass* - Moisture indication sight glass attached to the refrigeration circuit liquid lines. The moisture indicator shows a green color when refrigerant is dry, a chartreuse color (green with a yellow tint or bright green) indicates caution, and a yellow color indicates a wet condition. The sight glass is not a charge indicator.
B = *Compressor Isolation Valves* - Ball type service valves mounted on the refrigeration circuit discharge and suction lines permitting isolation of the compressor for service or replacement. The valves are located close to the compressors and work through a quarter turn from open to closed. Teflon seals and gaskets are used with a nylon cap gasket to prevent accidental refrigerant loss. This option reduces the amount of refrigerant that must be recovered during compressor service or replacement.
C = *Sight Glass + Compressor Isolation Valves* - Options A + B.
D = *Single Circuit Flooded Condenser Low Ambient Controls* - Factory installed, flooded condenser, head pressure control option which allows cooling operation down to 0°F ambient, on one refrigerant circuit. When the ambient temperature drops, the condensing temperature drops. A three-way pressure activated valve then allows discharge gas to bypass around the condenser. Mixing of the discharge gas with liquid creates a high pressure at the condenser outlet, reducing the flow and causing liquid to back up into the condenser. Flooding the condenser reduces the area available for condensing, resulting in a rise in condensing pressure.
E = *Sight Glass + Single Circuit Flooded Condenser Low Ambient Controls* - Options A + D.
F = *Compressor Isolation Valves + Single Circuit Flooded Condenser Low Ambient Controls* - Options B + D.
G = *Sight Glass + Compressor Isolation Valves + Single Circuit Flooded Condenser Low Ambient Controls* - Options A + B + D.
H = *Two Circuit Flooded Condenser Low Ambient Controls* - Factory installed, flooded condenser, head pressure control option which allows cooling operation down to 0°F ambient, on two refrigerant circuits. When the ambient temperature drops, the condensing temperature drops. A three-way pressure activated valve then allows discharge gas to bypass around the condenser. Mixing of the discharge gas with liquid creates a high pressure at the condenser outlet, reducing the flow and causing liquid to back up into the condenser. Flooding the condenser reduces the area available for condensing, resulting in a rise in condensing pressure.
J = *Sight Glass + Two Circuit Flooded Condenser Low Ambient Controls* - Options A + H.
K = *Compressor Isolation Valves + Two Circuit Flooded Condenser Low Ambient Controls* - Options B + H.
L = *Sight Glass + Compressor Isolation Valves + Two Circuit Flooded Condenser Low Ambient Controls* - Options A + B + H.

Unit Feature 4 - Refrigeration Accessories Continued

Example: CNA-055-A-0-3-CA00E:0-00-00-**B**0-000-D-N000-0000J00-00000DB

M = *Three Circuit Flooded Condenser Low Ambient Controls* - Factory installed, flooded condenser, head pressure control option which allows cooling operation down to 0°F ambient, on three refrigerant circuits. When the ambient temperature drops, the condensing temperature drops. A three-way pressure activated valve then allows discharge gas to bypass around the condenser. Mixing of the discharge gas with liquid creates a high pressure at the condenser outlet, reducing the flow and causing liquid to back up into the condenser. Flooding the condenser reduces the area available for condensing, resulting in a rise in condensing pressure.
N = *Sight Glass + Three Circuit Flooded Condenser Low Ambient Controls* - Options A + M.
P = *Compressor Isolation Valves + Three Circuit Flooded Condenser Low Ambient Controls* - Options B + M.
Q = *Sight Glass + Compressor Isolation Valves + Three Circuit Flooded Condenser Low Ambient Controls* - Options A + B + M.
R = *Four Circuit Flooded Condenser Low Ambient Controls* - Factory installed, flooded condenser, head pressure control option which allows cooling operation down to 0°F ambient, on four refrigerant circuits. When the ambient temperature drops, the condensing temperature drops. A three-way pressure activated valve then allows discharge gas to bypass around the condenser. Mixing of the discharge gas with liquid creates a high pressure at the condenser outlet, reducing the flow and causing liquid to back up into the condenser. Flooding the condenser reduces the area available for condensing, resulting in a rise in condensing pressure.
S = *Sight Glass + Four Circuit Flooded Condenser Low Ambient Controls* - Options A + R.
T = *Compressor Isolation Valves + Four Circuit Flooded Condenser Low Ambient Controls* - Options B + R.
U = *Sight Glass + Compressor Isolation Valves + Four Circuit Flooded Condenser Low Ambient Controls* - Options A + B + R.

Table 2 - Moisture Content in the Refrigerant

Indicator Color	75° F Liquid Line Temperature
Green DRY	Below 75 ppm
Chartreuse CAUTION	75-150 ppm
Yellow WET	Above 150 ppm

Unit Feature 5

Unit Feature 5 - Blank

Example: CNA-055-A-0-3-CA00E:0-00-00-B**0**-000-D-N000-0000J00-00000DB

0 = *Standard*

Unit Feature 6

Unit Feature 6A - Unit Disconnect Type

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-**0**00-D-N000-0000J00-00000DB

0 = *Standard Single Point Power Block* - Unit power is wired into a single point power block sized in accordance to unit's MOP.
A = *Single Point Power Non-Fused Disconnect* - Unit power is wired into a single point non-fused disconnect sized in accordance to unit's MOP. Disconnect options include a molded case, non-fused disconnect switch externally mounted.

Unit Feature 6

Unit Feature 6B - Disconnect Size

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-0**0**0-D-N000-0000J00-00000DB

0 = *None*	**Z** = *400 amps*
N = *100 amps*	**3** = *600 amps*
R = *150 amps*	**5** = *800 amps*
V = *250 amps*	**7** = *1200 amps*

Individual components within the control cabinet are fused and/or internally protected. The switch is accessible from the exterior of the unit. The switch disconnects high voltage service to the unit. To add a disconnect, choose any disconnect and after all options have been selected, AAON ECat will automatically calculate the minimum allowable ampacity and choose the correct size disconnect.

Unit Feature 6

Unit Feature 6C - Blank

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-00**0**-D-N000-0000J00-00000DB

0 = *Standard*

Unit Feature 7

Unit Feature 7 - Accessories

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-**D**-N000-0000J00-00000DB

0 = *Standard*
B = *Phase and Brown Out Protection* - Voltage monitor that is used to protect motors and compressors from voltage imbalance, over/under voltage, and phase loss. Option has an automatic reset.
D = *Suction Pressure Transducer All Refrigeration Circuits* - All refrigeration circuits include a pressure transducer on the suction line used to control variable capacity compressors.
L = *Phase and Brown Out Protection + Suction Pressure Transducer All Refrigeration Circuits* - Options B + D.

Unit Feature 8

Unit Feature 8A - Control Sequence

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-**N**000-0000J00-00000DB

M = *Field Installed DDC Controls Furnished by Others* - Provides an expanded terminal strip to interface with controls by others. This expanded terminal strip includes terminals for Phase & Brown out. See Controls section and Field controlled Terminal sheet from AAON ECat for more information.
N = *Field Installed DDC Controls Furnished by Others with Isolation Relays* - Provides an expanded terminal strip to interface with controls by others, with factory installed isolation relays to prevent voltage drop in the controls circuit. This option is strongly recommended on applications where there is a question about the length of control wiring. This expanded terminal strip includes terminals for Phase & Brown out. See Controls section and Field controlled Terminal sheet from AAON ECat for more information.

Unit Feature 8A – Control Sequence Continued

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-**N**000-0000J00-00000DB

P = *Factory Installed DDC Controls Furnished by Others with Isolation Relays* - Factory installed controls with factory installed isolation relays to prevent a voltage drop in the controls circuit. Requires a Special Pricing Authorization (SPA) issued by the Applications Department. AAON sales representative must provide a controls parts list, cut sheets, and wiring diagrams before the SPA will be issued. Once the order is entered a completed Special Parts Request Form is sent to the sales rep with control numbers assigned. The sales rep must then forward the form to the controls supplier who must then transfer these numbers to all parts and boxes that are sent to AAON. Proper routing of customer supplied parts to units in production will be delayed if this procedure is not followed. AAON will not deal directly with the controls provider. The AAON sales rep must be the information conduit. See the "Policy Manual for Sales Representatives" for more detailed information on the proper procedure. See Field controlled Terminal sheet from AAON ECat for more information.

Unit Feature 8
Unit Feature 8B - Control Supplier

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N**0**00-0000J00-00000DB

0 = *AAON Refrigeration System Supervisory Controls* - Factory provided MCS supervisory controller for the VFD controlled compressor system.

Unit Feature 8
Unit Feature 8C - Control Supplier Option

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N0**0**0-0000J00-00000DB

0 = *Standard*

Unit Feature 8

Unit Feature 8D - BMS Connection & Diagnostics

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N00**0**-0000J00-00000DB

0 = *Standard*

Unit Feature 9

Unit Feature 9 - Blank

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-**0**000J00-00000DB

0 = *Standard*

Unit Feature 10

Unit Feature 10 - Blank

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-0**0**00J00-00000DB

0 = *Standard*

Unit Feature 11

Unit Feature 11 - Maintenance Accessories

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-00**0**0J00-00000DB

0 = *None*
A = *115VAC Convenience Outlet Factory Wired* - Factory wired 2x4 inch electrical box with ground fault interrupter receptacle located within the controls vestibule. The circuit is rated at 12 amps maximum and is factory wired to a step-down transformer, fuse block and outlet disconnect. The circuit is wired to the line side of the unit power block or power switch permitting use of the outlet while power to the unit is shut off. **Caution: When the power to the unit is disconnected with the factory installed unit power switch, the convenience outlet will remain live.**

Unit Feature 11 – Maintenance Accessories Continued

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-00**0**0J00-00000DB

B = *115VAC Convenience Outlet Field Wired* - Field wired 2x4 inch electrical box with ground fault interrupter receptacle, located within the controls vestibule. Receptacle is rated for 20 amps. The outlet must be field wired to a 115 VAC power supply.
C = *Service Access Lights* - Standard unit construction with service lights included in the controls and compressor compartment. The light circuit is wired to the line side of the unit power block, permitting use of the lights while the power to the unit is shut off.
E = *Remote Unit Start/Stop Terminals* - Remote start/stop terminals labeled ST1 and ST2. This option is normally used with a remote time clock or space type thermostat with occupied/unoccupied capability. Field supplied contact closure is needed for unit operation. When contacts are open, the low voltage circuit is broken and the unit will not operate.
F = *115VAC Convenience Outlet Factory Wired + Service Lights* - Options A + C.
H = *115VAC Convenience Outlet Factory Wired + Remote Unit Start/Stop Contacts* - Options A + E.
J = *115VAC Convenience Outlet Field Wired + Service Lights* - Options B + C.
L = *115VAC Convenience Outlet Field Wired + Remote Unit Start/Stop Contacts* - Options B + E.
N = *Service Lights + Remote Unit Start/Stop Contacts* - Options C + E.
R = *115VAC Convenience Outlet Factory Wired + Service Lights + Remote Unit Start/Stop Contacts* - Options A + C + E.
U = *115VAC Convenience Outlet Field Wired + Service Lights + Remote Unit Start/Stop Contacts* - Options B + C + E.

Unit Feature 12

Unit Feature 12 - Code Options

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-000**0**J00-00000DB

0 = *Standard ETL US Listing* - All AAON equipment is ETL listed and tested in accordance with the latest revision of UL 1995. If a Special Pricing Authorization (SPA) is applied there may be additional costs incurred to secure the ETL label.
A = *Chicago Code* - Chicago code for a unit with cooling. Chicago code states that unit wiring to the condenser fan motors must be in flexible conduit and refrigerant pressure relief valves must be supplied.
B = *ETL US and Canada Listing* - Canadian and USA listings for export. The nameplate will be in English and French.

Unit Feature 13

Unit Feature 13 - Air Cooled Condenser

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-0000**J**00-00000DB

J = *Condenser Coil Guard + Three Phase Condenser Fan Motor + VFD Condenser Fan Head Pressure Control (35°F Ambient)* - Factory provided and programmed VFDs receives inputs from pressure transducers on each refrigerant circuit and varies the fan speed based on the pressure inputs to maintain a discharge pressure. Standard pressure setpoint is 340 psi for standard air-cooled systems and 400 psi for modulating hot gas reheat air-cooled systems. With AAON unit controls, VFDs will be controlled directly by AAON Control System. Condenser coil guards fabricated from galvanized sheet metal, painted and factory installed across the condenser coil face.
S = *Condenser Coil Guard + ECM Condenser Fan Head Pressure Control + Low Sound Condenser Fan*. Condenser fans are specifically designed for reduced and redirected sound emission. The fans include optimized orifice, guide vanes, and serrated blades. These condenser fans are driven by EC motors which either speed up or slow down to adjust air flow in order to maintain the head pressure setpoint. The head pressure setpoint is field adjustable from 260-400 psi with a default setting of 340 psi with a Head Pressure Control Module. Option includes Low Sound ECM condenser fans, condenser head pressure controller and discharge pressure transducers. This option adds 9 inches of height to the standard unit. Minimum allowable ambient temperature for cooling operation is 35°F. Condenser coil guards fabricated from galvanized sheet metal, painted and factory installed across the condenser coil face.

Unit Feature 14

Unit Feature 14 - Blank

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-0000J**0**0-00000DB

0 = *Standard*

Unit Feature 15

Unit Feature 15 - Blank

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-0000J0**0**-00000DB

0 = *Standard*

Unit Feature 16

Unit Feature 16 - Electrical Options

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-0000J00-**0**0000DB

0 = *Standard*

Unit Feature 17

Unit Feature 17 - Blank

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-0000J00-0**0**000DB

0 = *Standard*

Unit Features 18

Unit Features 18 - Blank

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-0000J00-00**0**00DB

0 = *Standard*

Unit Features 19

Unit Features 19 - Blank

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-0000J00-000**0**0DB

0 = *Standard*

Unit Features 20

Unit Features 20 - Cabinet Material

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-0000J00-0000**0**DB

0 = *Double Wall Galvanized Cabinet + R-13 Insulation* – Unit construction consists of 2 inch double wall closed cell polyurethane foam insulated composite panels with galvanized G90 sheet metal interior with painted exterior.

Unit Features 21

Unit Features 21 - Warranty

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-0000J00-00000**D**B

0 = *Standard Warranty* - Standard warranty includes a one year parts only warranty. Unit warranty coverage is 12 months from the date of equipment startup or 18 months from the date of original equipment shipment from the factory, whichever is less.
D = *Extended Compressor Warranty - Years 2-5* - Extends warranty coverage of compressors for the second to fifth years of unit operation. Warranty period begins from the date of original equipment shipment from the factory.

Unit Feature 22

Unit Feature 22 - Paint and Special Pricing Authorizations

Example: CNA-055-A-0-3-CA00E:0-00-00-B0-000-D-N000-0000J00-00000D**B**

B = *Premium AAON Gray Paint Exterior* - Cabinet exterior is primer washed then spray coated with a two part polyurethane, heat-baked exterior paint. The paint is gray in color and is capable of withstanding at least 2,500 hours, with no visible corrosive effects, when tested in a salt spray and fog atmosphere in accordance with the ASTM B 117-95 test procedure.
E = *Premium AAON Gray Paint Exterior + Shrink Wrap* - Option B + the unit is covered by a special heat shrink plastic wrap for supplemental unit protection during shipping and storage before startup.
X = *SPA + Premium AAON Gray Paint Exterior* - Option B + the Applications Department must issue a Special Pricing Authorization (SPA) to include a non-standard option.
1 = *SPA + Premium AAON Gray Paint Exterior + Shrink Wrap* - Option X + the unit is covered by a special heat shrink plastic wrap for supplemental unit protection during shipping and storage before startup.
4 = *SPA + Special Exterior Paint Color* - If a special paint color is specified, a set-up charge and price add per unit is required. The Applications Department must issue a Special Pricing Authorization (SPA) to include a non-standard option.
7 = *SPA + Special Exterior Paint Color + Shrink Wrap* - Option 4 + the unit is covered by a special heat shrink plastic wrap for supplemental unit protection during shipping and storage before startup.

General Data

Unit Information

Table 3 - 55-90 ton Units Compressor and Condenser Information

	Model			
	CN-055	CN-065	CN-075	CN-090
Single Circuited Compressor Quantity / Nominal tons				
Half Variable Speed Model Option A5 = A				
208V & 230V	1/20 & 1/20 Var.	1/25 & 1/32 Var.	1/32 & 1/32 Var.	1/35 & 1/40 Var.
460V & 575V		1/25 & 1/25 Var.	1/32 & 1/25 Var.	1/32 & 1/32 Var.
All Variable Speed Model Option A5 = E				
208V & 230V	2/20 Var.	1/32 Var. & 1/25 Var.	2/32 Var.	1/40 Var. & 1/35 Var.
460V & 575V		1/25 Var. & 1/20 Var.	2/25 Var.	2/32 Var.
Quantity of Circuits	2			
Capacity Steps	Variable Capacity			
Compressor VFD Range (Hz)				
208V & 230V	35-60			
460V & 575V	35-75			
Tandem Circuited Compressor Quantity/ Nominal tons				
4 Stage: Model Option A5=J	2/10 & 2/13	2/11 & 2/15	2/13 & 2/15	2/15 & 2/20
Half Circuits with Variable Speed: Model Option A5= K	1/10, 2/13, & 1/10 Var.	1/11, 2/15, & 1/11 Var.	1/13, 2/15, & 1/13 Var.	1/15, 2/20, & 1/15 Var.
All Circuits with Variable Speed: Model Option A5=L	2/13 & 2/10 Var.	2/15 & 2/11 Var.	2/15 & 2/13 Var.	2/20 & 2/15 Var.
Capacity Steps	4 stage or Variable Capacity			
Compressor VFD Range (Hz)	40-70			
Air-Cooled Condenser Fans				
Quantity	4			8
Type	30” Propeller Fan			
hp	1.5			

Table 4 - 105-140 tons Units Compressor and Condenser Information

	Model			
	CN-105	CN-120	CN-130	CN-140
Single Circuited Compressor Quantity / Nominal tons				
Half Variable Speed Model Option A5 = A,B				
208V & 230V	1/40 & 1/40 Var.	2/25 & 2/25 Var.	2/25 & 2/32 Var.	2/32 & 2/32 Var.
460V & 575V		2/25 & 2/20 Var.	2/25 & 2/25 Var.	
All Variable Speed Model Option A5 = E				
208V & 230V	2/40 Var.	4/25 Var.	2/32 Var. & 2/25 Var.	4/32 Var.
460V & 575V		4/20 Var.	2/25 Var. & 2/20 Var.	
Quantity of Circuits	2	4		
Capacity Steps	Variable Capacity			
Compressor VFD Range (Hz)				
208V & 230V	35-60			
460V & 575V	35-60	35-75		35-60
Tandem Circuited Compressor Quantity/ Nominal tons				
4 Stage: Model Option A5=J	2/15 & 2/25	2/25 & 2/25	2/25 & 2/32	2/32 & 2/32
Half Circuits with Variable Speed: Model Option A5= K	1/15, 2/25, & 1/15 Var.	1/25, 2/25, & 1/25 Var.	1/25, 2/32, & 1/25 Var.	1/32, 2/32, & 1/32 Var.
All Circuits with Variable Speed: Model Option A5=L	2/25 & 2/15 Var.	2/25 & 2/25 Var.	2/32 & 2/25 Var.	2/32 & 2/32 Var.
Capacity Steps	4 stage or Variable Capacity			
Compressor VFD Range (Hz)	40-70	35-60	35-65	35-60
Air-Cooled Condenser Fans				
Quantity	8			
Type	30” Propeller Fan			
hp	1.5			

Controls
Control Options

Terminal Block

Low voltage terminal block for field wiring controls

Require Features on CN Series condensing unit
Feature 8A = M or N

Standard Terminals Labels
[R] - 24VAC control voltage
[E] - Common
[G] - Fan enable
[Y1], [Y2],…, [Y8] - Cooling stages enable
[DC1+] - Cooling command
[DC1-] - 0-5 VDC

[ST1], [ST2] - Remote start/stop contacts; must be closed for unit to operate.
[RH1] - Humidistat control signal, used with reheat coil.
[13], [14] - Alarm Contacts

Figure 2 - Low Voltage Terminal Block Example

Single Zone Variable Air Volume (Single Zone VAV) Unit Controller

Operation - Variable Air Volume Cooling and Variable Air Volume or Constant Air Volume Heating

With standard AAON Single Zone VAV controls, during the cooling mode of operation the supply fan modulates based on the space temperature, while mechanical cooling modulates based on the supply air temperature. The space temperature sensor determines whether heating or cooling is enabled. For variable air volume heating, during the heating mode of operation the supply fan modulates based on the space temperature and heating modulates based on the supply air temperature. For constant volume heating, during the heating mode of operation the supply fan provides constant airflow and heating stages based on the supply air temperature.

Factory mounted and tested supply fan VFDs or ECMs are used to vary the speed of the supply fans and thus vary the amount of supply air. Because of the reduced speed and modulating compressors, Single Zone VAV units can be very energy efficient at part load conditions. AAON Single Zone VAV units should be applied to only a single zone.

Required Features on CN Series condensing unit

Feature A1 = C - VFD Compatible Scroll Compressor
Feature 3A = Hot Gas Bypass Non-Variable Compressors - Recommended on all circuits without variable capacity scroll compressors.
Feature 13 = ECM or VFD head pressure control

Recommended Features on Matching AAON Air Handling Unit

VFD or ECM Controlled Supply Fans
Field Installed DDC Controls Furnished by Others with Isolation Relays (with SPA from Applications Engineering for Single Zone)
Modulating Heat Source
Economizer
Fully Modulating Damper Actuators
Modulating Hot Gas Reheat (this requires ECM or VFD condenser head pressure in CU)

Standard Supplied Sensors

Outside Air Temperature
Supply Air Temperature
Space Temperature with Temperature Setpoint Reset and Unoccupied Override

VAV (Variable Air Volume) Unit Controller

Operation

VAV controls are for cooling only units where the supply fan modulates to maintain a supply duct static pressure setpoint while mechanical cooling modulates based on the supply air temperature setpoint. Heating may be activated to provide morning warm up or cooling mode supply air tempering. For any other heating requirements, the field provided and installed VAV boxes are used.

Factory mounted and tested supply fan VFDs or ECMs are used to vary the speed of the supply fans and thus vary the amount of supply air. Because of the reduced speed, VAV units can be very energy efficient at part load conditions. VAV units can be used to serve multiple spaces with diverse or changing heating and cooling requirements, with only a single unit being required for multiple zones. AAON VAV units can also be applied to a single zone. Space temperature sensor included with AAON controller is used for supply air temperature setpoint reset and unoccupied override.

Required Features on CN Series condensing unit

Feature A1 = C - VFD Compatible Scroll Compressor
Feature 3A = Hot Gas Bypass Non-Variable Compressors - Recommended on all circuits without variable capacity scroll compressors.
Feature 13 = ECM or VFD head pressure control

With VFD controlled variable speed scroll compressor units, hot gas bypass is required on all circuits if the minimum load is less than 50%.

Recommended Features on Matching AAON Air Handling Unit

Modulating Gas / SCR Electric Heat
Economizer
AAONAIRE® Energy Recovery Wheel
Fully Modulating Damper Actuators
Constant Volume Outside Air - maintains a minimum volume of outside air ventilation
VFD or ECM Controlled Supply Fans
Modulating Hot Gas Reheat

Standard Supplied Sensors

Outside Air Temperature
Supply Air Temperature
Supply Air Static Pressure
Return Air Temperature
Space Temperature with Temperature Setpoint Reset and Unoccupied Override

CAV (Constant Air Volume) Unit Controller

Operation

Standard AAON Constant Volume controls for non-heat pump systems. During the cooling mode of operation the supply fan provides constant airflow and mechanical cooling modulates based on the controlling temperature. During the heating mode of operation the supply fan provides constant airflow and heating modulates based on the controlling temperature.

A Constant Volume unit can be used to serve spaces with uniform heating and cooling requirements. Multiple units may be required for multiple zones allowing for redundancy. Space or supply air temperature sensor can be used as the controlling sensor. If supply air temperature is not used as the controlling sensor it is used as a temperature lockout. If supply air temperature sensor is used as the controlling sensor, space temperature sensor is used for supply air temperature setpoint reset and unoccupied override.

Required Feature on CN Series condensing unit

Recommended Features on Matching AAON Air Handling Unit

Return Air Bypass
Modulating Gas / SCR Electric Heat
Economizer
AAONAIRE® Energy Recovery Wheel
Fully Modulating Damper Actuators
Modulating Hot Gas Reheat

Standard Supplied Sensors

Outside Air Temperature
Supply Air Temperature
Space Temperature with Temperature Setpoint Reset and Unoccupied Override

MUA (Makeup Air) Unit Controller

Operation

Standard AAON Makeup Air controls. During the cooling mode of operation the supply fan provides constant airflow and mechanical cooling modulates based on the controlling temperature. During the heating mode of operation the supply fan provides constant airflow and heating modulates based on the controlling temperature.

Make Up Air units are designed to provide 100% outside air to the system for ventilation purposes. Make Up Air units can improve indoor air quality (IAQ) and also be used to positively pressurize the space.

Required Features on CN Series condensing unit

Feature 3 = B, D, G, J, K, or L

With VFD controlled variable speed scroll compressor units, hot gas bypass is required on all circuits if the minimum load is less than 50%.

Recommended Features on Matching AAON Air Handling Unit

Modulating Gas / SCR Electric Heat
AAONAIRE® Energy Recovery Wheel
Hot Gas Bypass
Modulating Hot Gas Reheat

Standard Supplied Sensors

Outside Air Temperature
Supply Air Temperature

Control Vendors

Micro Control Systems (MCS) Supervisory Control System

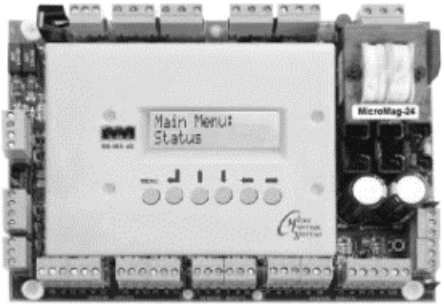

Figure 3 – MicroMag with Cover

The MCS MicroMag controller is factory provided on all AAON CN condensing units. Supervisory controller is used for the VFD controlled compressor refrigeration system.

Configuration
Standard LCD interface is included within the controls compartment for compressor status, setpoint adjustment, sensor status viewing, and unit alarm viewing. PC with free MCS-Connect software can be connected to the controller via RS-485 for unit configuration, setpoint adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling.

Network Capability
The MCS Magnum controller can be directly integrated with BACnet IP or Modbus IP protocols via Ethernet port and Modbus RTU protocols via EIA-485 port. With adapter, the controller can be integrated with BACnet MS/TP or LonTalk protocols. Optional 56K modem allows remote communication to the unit from MCS, AAON, or the customer to assist with service, diagnosis, and program updates.

Electrical Service Sizing Data

Use the following equations to correctly size the electrical service wiring and disconnect switch for the unit. Electrical data for a specific unit configuration can be found with the AAONECat software. For further assistance in determining the electrical ratings, contact the Applications Department, or consult U.L. 1995.

The Minimum Circuit Ampacity (MCA) and Maximum Overcurrent Protection (MOP) must be calculated for all modes of operation which include the cooling mode of operation, the heating mode of operation, and if the unit is a heat pump the emergency heating mode of operation and auxiliary heating mode of operation. The emergency or backup heating mode of operation is when the secondary heater is in operation and heat pump or compressor heating is not in operation. The auxiliary or supplemental heating mode of operation is when heat pump or compressor heating is in operation and the secondary heater is also in operation.

To calculate the MCA and MOP, the number of motors and other current drawing devices in operation must be known for each mode of operation. The largest MCA and MOP values calculated from all the modes operation are the correct values and are also on the unit nameplate.

For example, during the heating mode of operation of an air-cooled DX unit or an air-source heat pump the supply fans, compressors, and condenser fans are all in operation. During the heating mode of operation of an air-cooled DX unit or the emergency heating mode of operation of an air-source heat pump only the supply fans and heater are in operation. During the auxiliary heating mode of operation of an air-source heat pump the supply fans, compressors, condenser fans, and secondary heater are all in operation. In split systems, the MCA and MOP are calculated separately for each unit. In the last example, the supply fans and secondary heater will be used to calculate MCA and MOP values for the air handling unit and the condenser fans and compressor will be used to calculate the MCA and MOP values for the condensing unit.

Once it is determined what current drawing devices are operating during each mode of operation use the equations shown below to calculate the MCA and MOP.

Use Rated Load Amps (RLA) for compressors and Full Load Amps (FLA) for all other motors and electric heaters.

Load 1 = Current of the largest motor/compressor in operation
Load 2 = Sum of the currents of the remaining motors/compressors in operation
Load 3 = Current of electric heaters in operation
Load 4 = Any remaining loads greater than or equal to 1 amp

Electrical Service Sizing Data Continued

Electric Heat FLA Calculation

Single Phase

$$FLA = \frac{(Heating\ Element\ kW)\ x 1000}{Rated\ Voltage}$$

Three Phase

$$FLA = \frac{(Heating\ Element\ kW)\ x 1000}{(Rated\ Voltage)\ x \sqrt{3}}$$

Cooling Mode Equations

MCA = 1.25(Load 1) + Load 2 + Load 4
MOP = 2.25(Load 1) + Load 2 + Load 4

Heating Mode or Emergency/Backup Heating Mode without Electric Heat Equations

MCA = 1.25(Load 1) + Load 2 + Load 4
MOP = 2.25(Load 1) + Load 2 + Load 4

Heating Mode or Emergency/Backup Heating Mode with Less than 50 kW of Electric Heat Equations

MCA = 1.25(Load 1 + Load 2 + Load 3 + Load 4)
MOP = 2.25(Load 1) + Load 2 + Load 3 + Load 4

Heating Mode or Emergency/Backup Heating Mode with Greater than or Equal to 50 kW of Electric Heat Equations

MCA = 1.25(Load 1 + Load 2) + Load 3 + 1.25(Load 4)
MOP = 2.25(Load 1) + Load 2 + Load 3 + Load 4

Auxiliary/Supplemental Heating Mode without Electric Heat Equations

MCA = 1.25(Load 1) + Load 2 + Load 4
MOP = 2.25(Load 1) + Load 2 + Load 4

Auxiliary/Supplemental Heating Mode with Less than 50 kW of Electric Heat Equations

MCA = 1.25(Load 1) + Load 2 + 1.25(Load 3) + Load 4
MOP = 2.25(Load 1) + Load 2 + Load 3 + Load 4

Auxiliary/Supplemental Heating Mode with Greater than or Equal to 50 kW of Electric Heat Equations

MCA = 1.25(Load 1) + Load 2 + Load 3 + Load 4
MOP = 2.25(Load 1) + Load 2 + Load 3 + Load 4

Electrical Service Sizing Data Continued

Fuse Selection

Select a fuse rating equal to the MOP value. If the MOP does not equal a standard fuse rating select the next lower standard fuse rating. If the MOP is less than the MCA then select the fuse rating equal to or greater than the MCA.

The standard ampere ratings for fuses, from the *NEC Handbook, 240-6*, shall be considered 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250, 300, 350, 400, 450, 500, 600, 700, 800 and 1000 amperes.

Disconnect (Power) Switch Size

DSS $\geq$ MOP

Select the standard switch size equal to the calculated MOP value. If this value is not a standard size, select the next larger size.

Literature Change History

March 2014
Initial version.

April 2014
Updated feature string nomenclature.

February 2015
Updated cover photograph.

December 2015
Updated feature string nomenclature and descriptions. Updated *General Data* tables to include tandem compressor information.

November 2016
Revision of the amp rating of the factory installed convenience outlet.

June 2018
Removed JENEsys and WattMaster VCM-X. Updated AAON/WattMaster VCC-X.

November 2018
Removed references to WattMaster. Added new option in Feature 13, option **S** = *Condenser Coil Guard + ECM Condenser Fan Head Pressure Control + Low Sound Condenser Fan*. Updated terminal block labels. Added MCS to control vendors. Revised the Electrical Service Sizing Data section.

April 2019
Updated compressor information for CN-065 in Unit Information Table

June 2019
Updated e-coating description.

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