# *7 Series*

## *700A11*

Geothermal Heat Pump - 50Hz

009 - 015 kW (variable speed)

WaterFurnace
*Smarter from the Ground Up™*

Submittal Data

English Language/SI Units

SD2705AN  01/15

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

***7 Series 700A11***
**009 - 015 kW 50Hz**

WaterFurnace® Smarter from the Ground Up™

# Model Nomenclature

| 1 | 2-3 | 4 | 5-7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N | VK | V | 012 | * | 6 | 1 | 1 | C | T | L | 0 | J | N |

**Model Type**
N – 7 Series Water-to-Air

**Compressor Type**
VK – Variable Speed

**Cabinet Configuration**
V – Vertical
H - Horizontal

**Unit Capacity (kW)**
009, 012, 015

**Vintage**
* - Factory Use Only

**Voltage**
6 – 220-240/50/1

**Hot Water Generation**
0 – No Hot Water Generation
1 – Hot Water Generation with Factory Installed Pump

**Blower Options**
1 – Variable Speed ECM
2 – High Static Variable Speed ECM (009 Only)

**Future Option**
N - None

**Control Option**
J – Aurora™ Variable Speed Control
K – Aurora Variable Speed Control with Performance Monitoring

**Filter Option**
0 – 5.08cm MERV11 Filter
1 – AlpinePure 411 (Vertical Only)

**Return Air Configuration**
L – Left
R – Right

**Discharge Air Configuration**
T – Top (Vertical)
B – Bottom (Vertical)
R – Rear (Vertical)
S – Side (Horizontal)
E – End (Horizontal)

**Water Coil Option**
C – Copper
N – CuproNickel

**Rev.:** 17 July 2013D

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____



# EN 14511 Performance Ratings

7 Series - 50 Hz - EN 14511 Data
Variable Speed ECM & X13 ECM Motors

| | | | | | Cooling Tower | | Water-to Brine | | Control Cabinet | | Close Control | | Water | | Brine | | Water Loop | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Capacity Modulation | Flow Rate | | | Cooling EWT 30°C | | Cooling EWT 10°C | | Cooling EWT 15°C | | Cooling EWT 30°C | | Heating EWT 10°C | | Heating EWT 0°C | | Heating EWT 20°C | |
| | | Water, l/s | Air, l/s | | Capacity Output, kW | EER (W/W) | Capacity Output, kW | EER (W/W) | Capacity Output, kW | EER (W/W) | Capacity Output, kW | EER (W/W) | Capacity Output, kW | COP | Capacity Output, kW | COP | Capacity Output, kW | COP |
| | | | clg | htg | | | | | | | | | | | | | | |
| **009** | **Full** | 0.76 | 614 | 708 | 9.34 | 4.7 | 11.03 | 9.1 | 13.43 | 10.5 | 10.03 | 5.1 | 12.79 | 4.2 | 10.19 | 3.5 | 15.53 | 5.0 |
| | **Part** | 0.44 | | | 3.33 | 5.4 | 3.86 | 10.0 | 4.46 | 11.9 | 3.65 | 6.2 | 4.26 | 5.7 | 3.23 | 4.2 | 5.41 | 7.4 |
| **012** | **Full** | 0.88 | 708 | 850 | 10.74 | 4.4 | 14.45 | 9.5 | 16.17 | 9.4 | 11.32 | 4.4 | 16.30 | 4.0 | 13.08 | 3.3 | 19.98 | 4.6 |
| | **Part** | 0.47 | | | 4.57 | 6.2 | 5.49 | 10.6 | 5.29 | 13.5 | 4.64 | 5.7 | 5.63 | 5.9 | 4.26 | 4.2 | 7.23 | 7.8 |
| **015** | **Full** | 1.01 | 850 | 1038 | 14.75 | 4.2 | 17.81 | 8.5 | 20.03 | 8.4 | 13.84 | 4.0 | 19.49 | 4.0 | 15.45 | 3.3 | 23.84 | 4.6 |
| | **Part** | 0.60 | | | 5.54 | 5.2 | 6.77 | 9.4 | 6.52 | 11.0 | 5.31 | 4.5 | 6.42 | 4.9 | 5.03 | 4.0 | 8.03 | 5.9 |

9/5/2014

Cooling capacities based upon 27°C DB, 19°C WB entering air temperature for cooling tower and water to brine, 35°C DB and 24°C WB for control cabinet, and 24°C DB and 17°C WB for close control.
Heating capacities based upon 20°C DB, 15°C WB entering air temperature

Contractor: _____ P.O.: _____

Engineer: _____

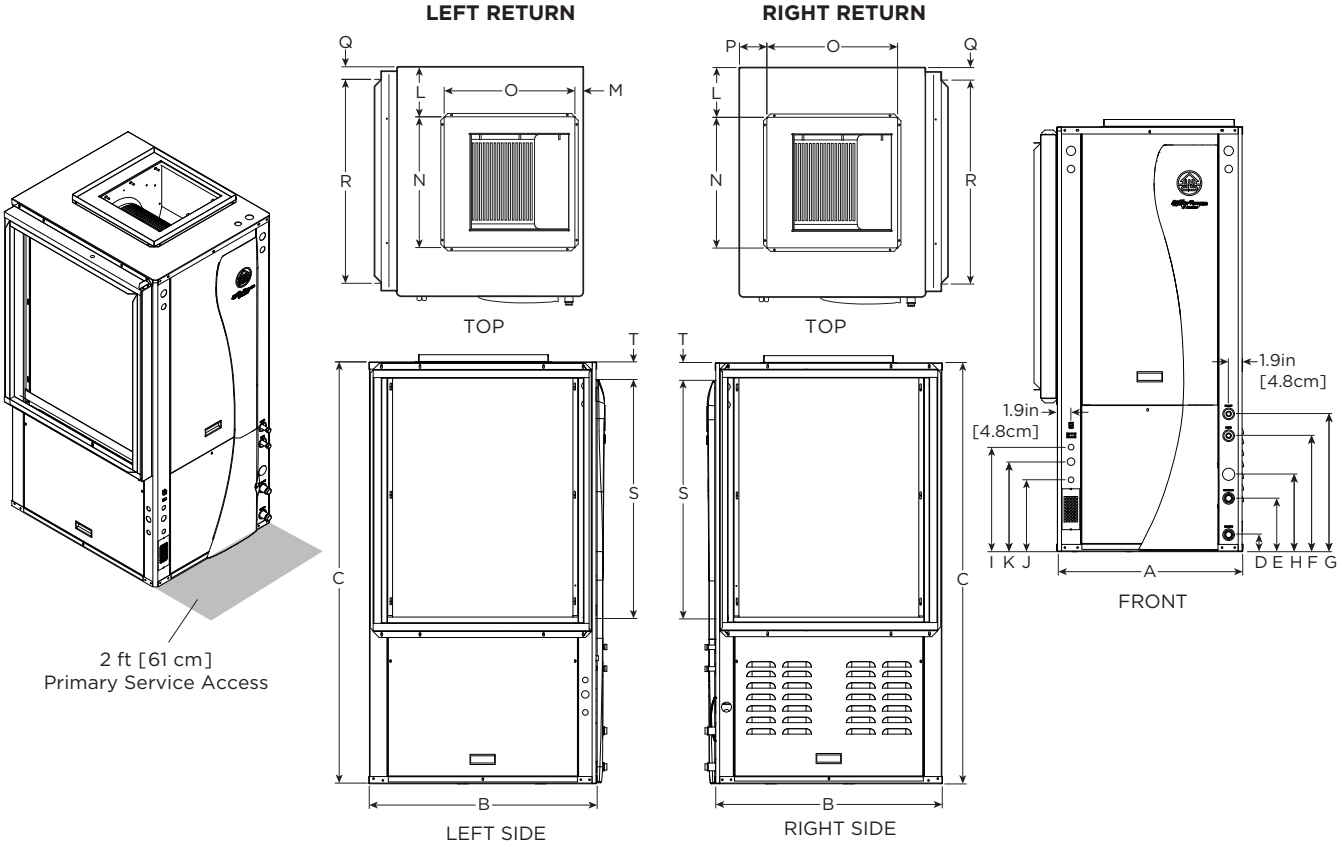
Project Name: _____ Unit Tag: _____

***7 Series 700A11***
**009 - 015 kW 50Hz**

WaterFurnace® Smarter from the Ground Up™

# Vertical Dimensional Data

## Top Air Discharge




| Vertical Top Flow Model | | Overall Cabinet | | | Water Connections | | | | | | | Electrical Connections | | | Discharge Connection duct flange installed (± 2.54mm) | | | | | Return Connection using std deluxe filter rack (± 2.54mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A Width | B Depth | C Height | D Loop In | E Loop Out | F HWG In | G HWG Out | H Cond-ensate | Loop Water FPT | HWG Sweat (I.D.) | I 12.7mm cond Low Voltage | J 12.7mm cond Ext Pump | K 19.05mm cond Power Supply | L | M | N Supply Width | O Supply Depth | P | Q | R Return Depth | S Return Height | T |
| **009** | cm. | 65.0 | 80.3 | 138.2 | 5.8 | 18.5 | 40.4 | 48.0 | 26.9 | 25.4mm Swivel | 12.7mm Female | 36.3 | 24.9 | 31.2 | 17.5 | 2.8 | 45.7 | 45.7 | 9.7 | 4.3 | 71.4 | 76.2 | 4.3 |
| **012** | cm. | 65.0 | 80.3 | 138.2 | 5.8 | 18.5 | 40.4 | 48.0 | 26.9 | | | 36.3 | 24.9 | 31.2 | 17.5 | 2.8 | 45.7 | 45.7 | 9.7 | 4.3 | 71.4 | 76.2 | 4.3 |
| **015** | cm. | 65.0 | 80.3 | 148.3 | 5.8 | 18.5 | 40.4 | 48.0 | 26.9 | | | 36.3 | 24.9 | 31.2 | 17.5 | 2.8 | 45.7 | 45.7 | 9.7 | 4.3 | 71.4 | 86.4 | 4.3 |

Condensate is 19.05mm PVC female glue socket and is switchable from side to front 5/22/13
Unit shipped with deluxe 5.08cm. (field adjustable to 2.54cm) duct collar/filter rack extending from unit 8.255cm and is suitable for duct connection.
Discharge flange is field installed and extends 2.54cm from cabinet
Decorative molding and/or water connections extend 30.5mm beyond front of cabinet.
Louvered vents in the compressor section right side access panel extend 12.7 mm from side of cabinet. Allow clearance for venting.

Contractor: _____ P.O.: _____

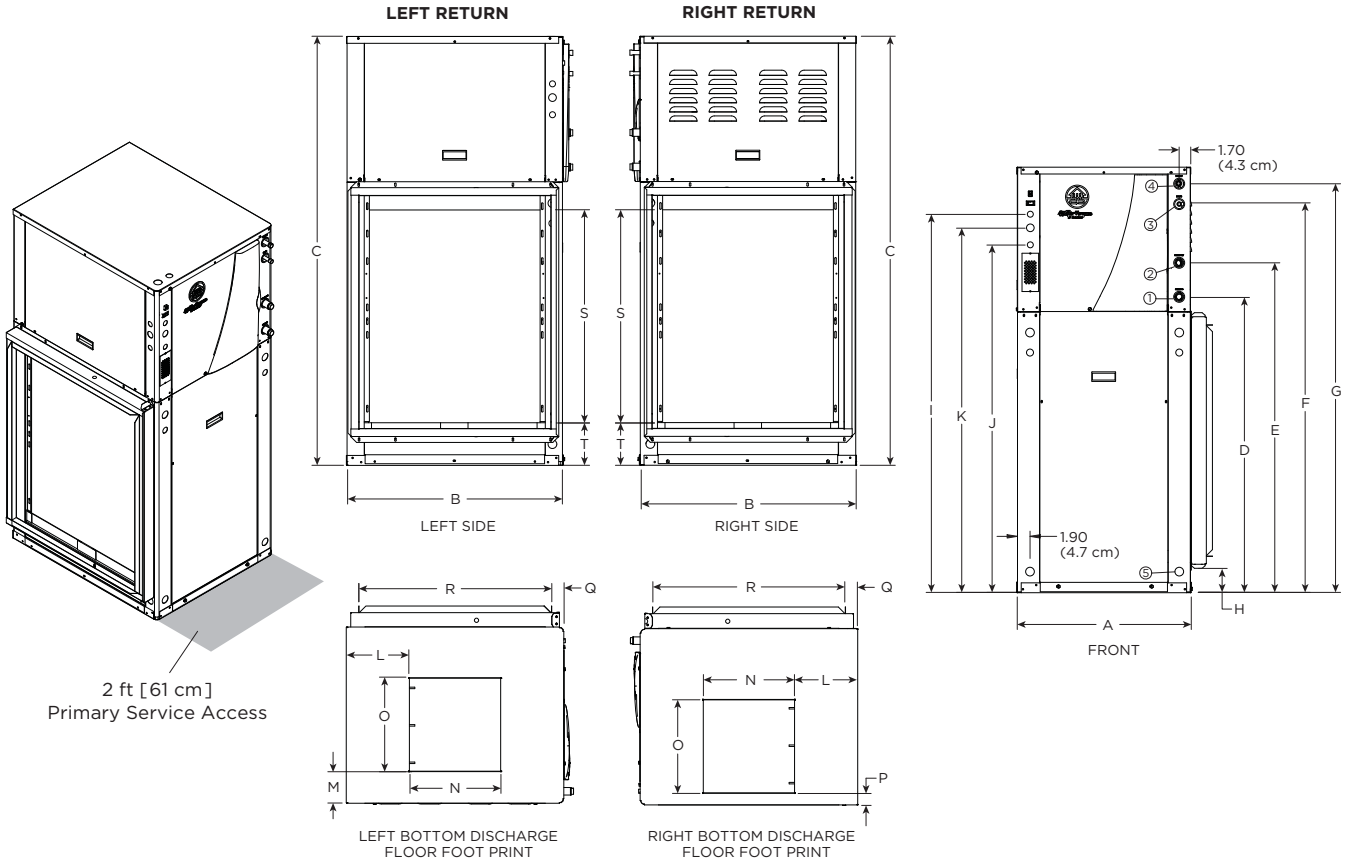
Engineer: _____

Project Name: _____ Unit Tag: _____



# Vertical Dimensional Data cont.

## Bottom Air Discharge




| Bottomflow Models | | Overall Cabinet | | | Water Connections | | | | | | | Electrical Knockouts | | | Discharge Connection duct flange installed (± 2.54mm) | | | | | Return Connection using std deluxe filter rack (± 2.54mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1 | 2 | 3 | 4 | 5 | | | I 12.7mm cond | J 12.7mm cond | K 19.05mm cond | | | | | | | | | |
| | | A Width | B Depth | C Height | D In | E Out | F HWG In | G HWG Out | H Condensate | Loop Water FPT | HWG Sweat (I.D.) | Low Voltage | Ext Pump | Power Supply | L | M | N Supply Width | O Supply Depth | P | Q | R Return Depth | S Return Height | T |
| 009-015 | cm. | 64.8 | 80.0 | 158.8 | 110.2 | 122.9 | 144.8 | 152.4 | 7.9 | 25.4mm Swivel | 12.7mm Female | 129.8 | 141.2 | 136.1 | 23.1 | 12.2 | 34.0 | 34.5 | 4.3 | 4.6 | 71.4 | 86.4 | 14.2 |

Condensate is 19.05mm PVC female glue socket and is switchable from side to front 5/29/13
Unit shipped with deluxe 5.08cm (field adjustable to 2.54cm) duct collar/filter rack extending from unit 8.255cm and is suitable for duct connection.
Decorative molding and/or water connections extend 30.5mm beyond front of cabinet.
Louvered vents in the compressor section right side access panel extend 12.7mm from side of cabinet. Allow clearance for venting.

Contractor: _____ P.O.: _____

Engineer: _____

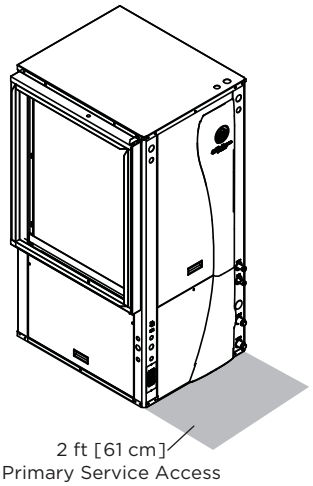
Project Name: _____ Unit Tag: _____

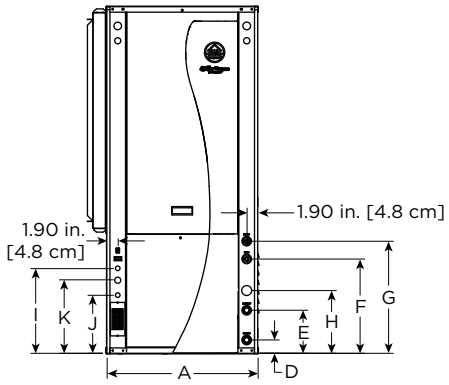
***7 Series 700A11***
**009 - 015 kW 50Hz**

WaterFurnace® Smarter from the Ground Up™

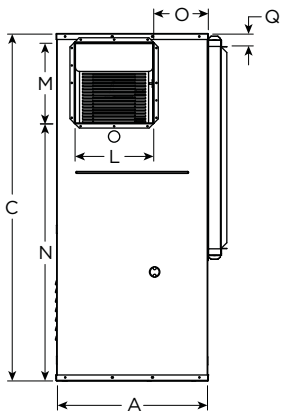
# Vertical Dimensional Data cont.

## Rear Air Discharge

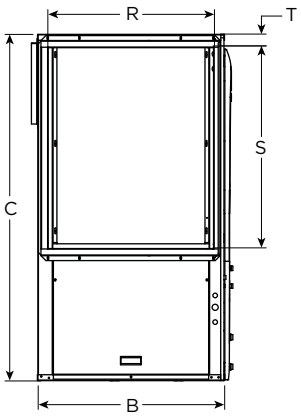


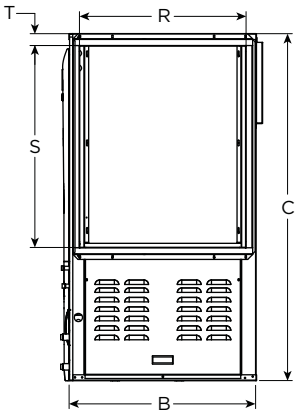

**FRONT**



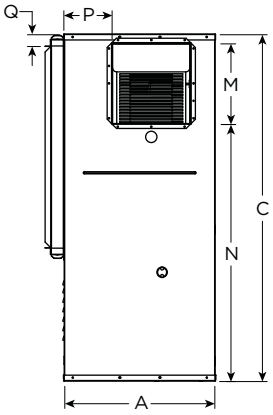

**REAR VIEW**
**LEFT RETURN**




**SIDE VIEW**
**LEFT RETURN**




**SIDE VIEW**
**RIGHT RETURN**




**REAR VIEW**
**RIGHT RETURN**

| Vertical Rear Discharge Model | | Overall Cabinet | | | Water Connections | | | | | | | Electrical Connections | | | Discharge Connection duct flange installed (± 2.54mm) | | | | | Return Connection using std deluxe filter rack (± 2.54mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A Width | B Depth | C Height | D Loop In | E Loop Out | F HWG In | G HWG Out | H Cond-ensate | Loop Water FPT | HWG Sweat (I.D.) | I 12.7mm cond Low Voltage | J 12.7mm cond Ext Pump | K 19.05mm cond Power Supply | L Supply Width | M Supply Depth | N | O | P | Q | R Return Depth | S Return Height | T |
| **009** | cm. | 65.0 | 80.3 | 138.2 | 5.8 | 18.5 | 40.4 | 48.0 | 26.9 | 25.4mm Swivel | 12.7mm Female | 36.3 | 24.9 | 31.2 | 33.8 | 34.5 | 100.1 | 23.1 | 20.6 | 4.3 | 71.4 | 76.2 | 4.3 |
| **012** | cm. | 65.0 | 80.3 | 138.2 | 5.8 | 18.5 | 40.4 | 48.0 | 26.9 | | | 36.3 | 24.9 | 31.2 | 33.8 | 34.5 | 100.1 | 23.1 | 20.6 | 4.3 | 71.4 | 76.2 | 4.3 |
| **015** | cm. | 65.0 | 80.3 | 148.3 | 5.8 | 18.5 | 40.4 | 48.0 | 26.9 | | | 36.3 | 24.9 | 31.2 | 33.8 | 34.5 | 110.2 | 23.1 | 20.6 | 4.3 | 71.4 | 86.4 | 4.3 |

Condensate is 19.05mm PVC female glue socket and is switchable from side to front 5/29/13
Unit shipped with deluxe 5.08cm (field adjustable to 2.54cm) duct collar/filter rack extending from unit 8.255cm and is suitable for duct connection.
Discharge flange is field installed and extends 25.4mm from cabinet
Decorative molding and/or water connections extend 30.5mm beyond front of cabinet.
Louvered vents in the compressor section right side access panel extend 12.7 mm from side of cabinet. Allow clearance for venting.

Contractor: _____ P.O.: _____

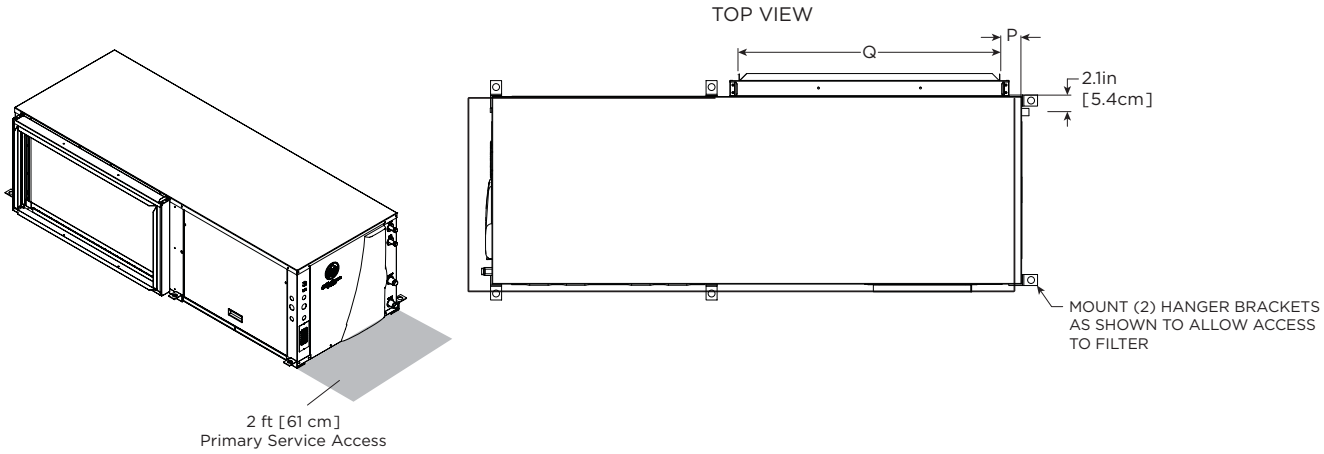
Engineer: _____

Project Name: _____ Unit Tag: _____

***7 Series 700A11***
**009 - 015 kW 50Hz**

WaterFurnace® Smarter from the Ground Up™

# Horizontal Dimensional Data




AS SHOWN LR UNIT (RR UNIT ON OPPOSITE SIDE—SAME DIMENSIONS)

| Horizontal Models | | Overall Cabinet | | | Water Connections | | | | | | | Electrical Connections | | | Discharge Connection duct flange installed (± 2.54mm) | | | | Return Connection using std deluxe filter rack (± 2.54mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | I 12.7mm cond | J 12.7mm cond | K 19.05mm cond | | | | | | | | |
| | | A Width | B Depth | C Height | D In | E Out | F HWG In | G HWG Out | H Cond-ensate | Loop Water FPT | HWG Sweat (I.D.) | Low Voltage | Ext Pump | Power Supply | L | M Supply Height | N Supply Depth | O | P | Q Return Depth | R Return Height | S |
| **009** | cm. | 65.0 | 195.6 | 54.1 | 5.8 | 18.5 | 40.4 | 48.0 | 2.0 | 25.4mm Swivel | 12.7mm Female | 36.3 | 24.9 | 31.2 | See Chart | 34.5 | 33.5 | See Chart | 7.1 | 102.6 | 48.0 | 3.3 |
| **012** | cm. | 65.0 | 195.6 | 54.1 | 5.8 | 18.5 | 40.4 | 48.0 | 2.0 | | | 36.3 | 24.9 | 31.2 | | 34.5 | 33.5 | | 7.1 | 102.6 | 48.0 | 3.3 |
| **015** | cm. | 65.0 | 208.3 | 54.1 | 5.8 | 18.5 | 40.4 | 48.0 | 2.0 | | | 36.3 | 24.9 | 31.2 | | 34.5 | 33.5 | | 7.1 | 115.3 | 48.0 | 3.3 |

Condensate is 19.05mm PVC female glue socket and is switchable from side to front 5/29/13
Unit shipped with deluxe 5.08cm (field adjustable to 2.54cm) duct collar/filter rack extending from unit 8.255cm and is suitable for duct connection.
Discharge flange is field installed and extends 25.4mm from cabinet
Decorative molding and/or water connections extend 30.5mm beyond front of cabinet.
Louvered vents in the compressor section right side access panel extend 12.7 mm from side of cabinet. Allow clearance for venting.

| Units Not Shown Above | | L | O |
|---|---|---|---|
| **Right Return End Discharge** | cm | 7.1 | 11.8 |
| **Right Return Side Discharge** | cm | 12.4 | 17.5 |
| **Left Return End Discharge** | cm | 12.4 | 19.4 |
| **Left Return Side Discharge** | cm | 7.1 | 17.5 |

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____



# Physical Data

| Model | | Variable Speed | | |
|---|---|---|---|---|
| | | **009** | **012** | **015** |
| Compressor (1 each) | | Variable Speed Scroll | | |
| Factory Charge R-410A, kg Vertical | | 2.69 | 3.40 | 3.96 |
| Factory Charge R-410A, kg Horizontal | | 2.69 | 3.85 | 4.19 |
| ***ECM Blower Motor & Blower*** | | | | |
| Blower Motor Type/Speeds | ECM | Variable Speed | | |
| Blower Motor - W | ECM | 373 | 746 | 746 |
| High Static Blower Motor - W | ECM | 746 | N/A | N/A |
| Blower Wheel Size (Dia x W), mm | ECM | 279 x 254 | 279 x 254 | 279 x 254 |
| High Static Blower Wheel Size - [Dia. x W], mm | ECM | 279 x 254 | N/A | N/A |
| ***Coax and Water Piping*** | | | | |
| Water Connections Size - Swivel - in [mm] | | 1 [25.4] | 1 [25.4] | 1 [25.4] |
| HWG Connection Size - Female Sweat I.D. - in [mm] | | 1/2 [12.7] | 1/2 [12.7] | 1/2 [12.7] |
| Coax & Piping Water Volume - l | | 6.1 | 6.1 | 8.7 |
| ***Vertical*** | | | | |
| Air Coil Dimensions (H x W), mm | | 813 x 635 | 813 x 635 | 914 x 635 |
| Air Coil Total Face Area, $m^2$ | | 0.570 | 0.570 | 0.641 |
| Air Coil Tube Size, mm | | 9.5 | 9.5 | 9.5 |
| Air Coil Number of rows | | 3 | 3 | 4 |
| Filter Standard - 51 mm Pleated MERV 11 Throwaway, mm | | 813 x 762 | 813 x 762 | 914 x 762 |
| Weight - Operating, kg | | 160 | 164 | 175 |
| Weight - Packaged, kg | | 169 | 173 | 184 |
| ***Horizontal*** | | | | |
| Air Coil Dimensions (H x W), mm | | 508 x 1016 | 508 x 1016 | 508 x 1143 |
| Air Coil Total Face Area, $m^2$ | | 0.570 | 0.570 | 0.641 |
| Air Coil Tube Size, mm | | 9.5 | 9.5 | 9.5 |
| Air Coil Number of rows | | 3 | 3 | 4 |
| Filter Standard - 51 mm Pleated MERV 11 Throwaway, mm | | 1 - 508 x 508<br>1 - 508 x 559 | 1 - 508 x 508<br>1 - 508 x 559 | 1 - 508 x 635<br>1 - 508 x 559 |
| Weight - Operating, kg | | 176 | 180 | 188 |
| Weight - Packaged, kg | | 189 | 193 | 202 |

5/13/13

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____



# Auxiliary Heat Ratings

| Model | kW | | Stages | Min L/s | Model Compatibility | | |
|---|---|---|---|---|---|---|---|
| | 208V | 230V | | | 009 | 012 | 015 |
| **EAL(H)10** | 7.2 | 9.6 | 2 | 519 | • | • | • |
| **EAL(H)15** | 10.8 | 14.4 | 3 | 590 | • | • | • |
| **EAL(H)20** | 14.4 | 19.2 | 4 | 708 | | • | • |

Air flow level for auxiliary heat (Aux) must be above the minimum air flow in this table 7/17/13
Order the "H" part number when installed on horizontal and vertical rear discharge units

# Auxiliary Heat Electrical Data

| Model | Supply Circuit | Heater Amps | | Min Circuit Amp | | Max Fuse (USA) | | Max Fuse (CAN) | | Max CKT BRK | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 208 V | 240 V | 208 V | 240 V | 208 V | 240 V | 208 V | 240 V | 208 V | 240 V |
| **EAL(H)10** | Single | 34.7 | 40 | 53.3 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| **EAL(H)15** | Single | 52.0 | 60 | 75 | 85 | 80 | 90 | 80 | 90 | 70 | 100 |
| | L1/L2 | 34.7 | 40 | 53.3 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| | L3/L4 | 17.3 | 20 | 21.7 | 25 | 25 | 25 | 25 | 25 | 20 | 30 |
| **EAL(H)20** | Single | 69.3 | 80 | 96.7 | 110 | 100 | 110 | 100 | 110 | 100 | 100 |
| | L1/L2 | 34.7 | 40 | 53.3 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| | L3/L4 | 34.7 | 40 | 43.3 | 50 | 45 | 50 | 45 | 50 | 40 | 50 |

All heaters rated single phase 60 cycle and include unit fan load 6/1/12
All fuses type "D" time delay (or HACR circuit breaker in USA)

# Electrical Data

| Model | Rated Voltage | Voltage Min/Max | Compressor | | Drive | | HWG Pump FLA | Ext Loop FLA | Blower Motor FLA | Total Unit FLA | Minimum Circuit Amp | Max Fuse HACR Breaker |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | LRA | CMCC | LRA | Internal Breaker | | | | | | |
| **009** | 220-240/50/1 | 198/264 | 10.2 | 18.0 | 22.0 | 30.0 | 0.4 | 5.4 | 4.0 | 31.8 | 37.3 | 40 |
| ***009** | 220-240/50/1 | 198/264 | 10.2 | 18.0 | 22.0 | 30.0 | 0.4 | 5.4 | 7.0 | 34.8 | 40.3 | 45 |
| **012** | 220-240/50/1 | 198/264 | 12.0 | 23.5 | 28.0 | 35.0 | 0.4 | 5.4 | 7.0 | 40.8 | 47.8 | 50 |
| **015** | 220-240/50/1 | 198/264 | 12.0 | 30.0 | 33.0 | 40.0 | 0.4 | 5.4 | 7.0 | 45.8 | 54.1 | 60 |

*With optional 1 hp Variable Speed ECM Motor 5/08/13
Rated Voltage of 220-240/50/1
HACR circuit breaker in USA only
All fuses Class RK-5

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____



# Blower Performance Data

## Variable Speed ECM Blower Motor

| Model | Air Flow | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Max ESP (Pa) | Speed 1 | Speed 2 | Speed 3 | Speed 4 | Speed 5 | Speed 6 | Speed 7 | Speed 8 | Speed 9 | Speed 10 | Speed 11 | Speed 12 |
| **009** | 124.50 | **135** | **179** G | **248** **L** | **319** | **385** | **463** | 519 | 576 | 628 | 680 H | 727 Aux | 743 |
| **009 w/746W*** | 186.75 | **227** | **267** G | **314** **L** | **359** | **411** | **472** | 519 | 566 | 614 | 665 H | 717 Aux | 769 |
| **012** | 186.75 | **224** | **293** G | **345** **L** | **401** | **481** | **538** | 599 | 661 | 717 | 779 H | 845 Aux | 908 |
| **015** | 186.75 | **189** | **283** G | **392** **L** | **496** | **580** | **661** | 736 | 802 | 883 | 949 H | 1010 Aux | 1069 |
| ****VS Compressor Speed** | | | | 1-2 | 3-4 | | 5-6 | 7-8 | | 9-10 | 11-12 | | |

** VS Compressor speed is given for the factory default L/s settings. When the L/s default settings are changed it will change the relationship to the compressor speed that is shown in the table. In cooling mode compressor speeds 10-12 are only available when SuperBoost mode is selected at the thermostat. 5/13/13

* Optional 746W Variable Speed ECM

Factory settings are at recommended L , H and Aux positions

“G” may be located anywhere within the airflow table

“L” setting should be located within the boldface L/s range

“H” setting MUST be located within the shaded L/s range

“Aux” setting MUST be equal to or greater than “H” setting

“Aux” setting MUST be equal to or greater than the minimum allowable L/s for the auxiliary heater kit (see auxiliary heat ratings table)

Cfm is controlled within 5% up to the maximum ESP

Max ESP includes allowance for wet coil and standard filter

# Operating Limits

| Operating Limits | Cooling (°C) | Heating (°C) |
|---|---|---|
| ***Air Limits*** | | |
| Min. Ambient Air | 7.2 | 7.2 |
| Rated Ambient Air | 26.7 | 21.1 |
| Max. Ambient Air | 37.8 | 29.4 |
| Min. Entering Air | 10.0 | 4.4 |
| Rated Entering Air db/wb | 27/19 | 20.0 |
| Max. Entering Air db/wb | 43/28.3 | 26.7 |
| ***Water Limits*** | | |
| Min. Entering Water | -1.1 | -6.7 |
| Normal Entering Water | 10-43.3 | -1.1 |
| Max. Entering Water | 48.9 | 32.2 |

**NOTE:** Minimum/maximum limits are only for startup conditions, and are meant for bringing the space up to occupancy temperature. Units are not designed to operate at the minimum/maximum conditions on a regular basis. The operating limits are dependent upon three primary factors: 1) water temperature, 2) return air temperature, and 3) ambient temperature. When any of the factors are at the minimum or maximum levels, the other two factors must be at the normal level for proper and reliable unit operation.

# Legend

**ABBREVIATIONS AND DEFINITIONS:**

COP = coefficient of performance
EER = cooling energy efficiency (TC/kW)
ELT = entering load fluid temperature
EST = entering source fluid temperature to heat pump
FLA = full load amps
FtHd = pressure drop in feet of head
gpm = US gallon per minute
HC = heating capacity in kW
HE = heat of extraction in kW
HR = heat rejected in kW
kPa = kilopascal
kW = kilowatt
L/s = liters per second
LLT = leaving load fluid temperature from heat pump
LRA = locked rotor amps (starting current)
LST = leaving source fluid temperature from heat pump
LWPD = load heat exchanger water pressure drop
MCC = maximum continuous current
PD = pressure drop
psi = pressure drop in pounds per square inch
P/T = Pressure/Temperature
RLA = run load amps
TC = total cooling capacity in kW
W = Watt

**CONVERSIONS:**

*x*°F = (*x* - 32)/1.8°C
1 bar = 100 kPa
1 gpm = 0.0631 L/s
1 US Gallon = 3.785412 L
1 Btu/h = 0.29037 W

# Pressure Drop

| Model | L/s | Pressure Drop (kPa) | | | | |
|---|---|---|---|---|---|---|
| | | -1.1°C | 10.0°C | 21.1°C | 32.2°C | 43.3°C |
| 009 | 0.7 | 23.44 | 22.06 | 20.68 | 19.31 | 17.93 |
| | 0.6 | 18.62 | 17.93 | 16.55 | 15.17 | 14.48 |
| | 0.4 | 11.38 | 10.69 | 10.00 | 9.31 | 8.62 |
| | 0.3 | 7.58 | 6.89 | 6.21 | 5.86 | 5.17 |
| | 0.3 | 4.69 | 4.41 | 4.14 | 3.79 | 3.52 |
| 012 | 0.9 | 31.72 | 30.34 | 28.27 | 26.20 | 24.13 |
| | 0.7 | 19.99 | 18.62 | 17.24 | 15.86 | 15.17 |
| | 0.5 | 11.72 | 11.03 | 10.34 | 9.65 | 8.96 |
| | 0.4 | 8.27 | 7.58 | 6.89 | 6.62 | 6.27 |
| | 0.3 | 4.27 | 4.21 | 4.14 | 4.00 | 3.86 |
| 015 | 1.1 | 44.13 | 41.37 | 38.61 | 35.85 | 33.09 |
| | 0.9 | 28.27 | 26.20 | 24.82 | 22.75 | 21.37 |
| | 0.6 | 15.17 | 14.48 | 13.79 | 12.41 | 11.72 |
| | 0.5 | 11.72 | 11.03 | 10.34 | 9.65 | 8.96 |
| | 0.3 | 4.69 | 4.27 | 4.00 | 3.79 | 3.65 |

5/22/13

# Correction Factor Tables

## Air Flow Corrections (Compressor Speeds 1-3)

| Airflow | | Cooling | | | | Heating | | |
|---|---|---|---|---|---|---|---|---|
| L/s Per kW of Clg | % of Nominal | Total Cap | Sens Cap | Power | Heat of Rej | Htg Cap | Power | Heat of Ext |
| 32 | 60 | 0.940 | 0.740 | 0.967 | 0.951 | 0.943 | 1.106 | 0.902 |
| 37 | 69 | 0.950 | 0.783 | 0.973 | 0.959 | 0.953 | 1.088 | 0.918 |
| 40 | 75 | 0.960 | 0.827 | 0.978 | 0.967 | 0.962 | 1.070 | 0.935 |
| 44 | 81 | 0.970 | 0.870 | 0.984 | 0.975 | 0.972 | 1.053 | 0.951 |
| 47 | 88 | 0.980 | 0.913 | 0.989 | 0.984 | 0.981 | 1.035 | 0.967 |
| 50 | 94 | 0.990 | 0.957 | 0.995 | 0.992 | 0.991 | 1.018 | 0.984 |
| **54** | **100** | **1.000** | **1.000** | **1.000** | **1.000** | **1.000** | **1.000** | **1.000** |
| 57 | 106 | 1.030 | 1.022 | 1.024 | 1.026 | 1.009 | 0.982 | 1.016 |
| 61 | 113 | 1.060 | 1.045 | 1.048 | 1.051 | 1.019 | 0.965 | 1.033 |
| 64 | 119 | 1.091 | 1.067 | 1.071 | 1.077 | 1.028 | 0.947 | 1.049 |
| 67 | 125 | 1.121 | 1.089 | 1.095 | 1.103 | 1.038 | 0.930 | 1.065 |
| 70 | 130 | 1.151 | 1.111 | 1.110 | 1.129 | 1.047 | 0.912 | 1.082 |

5/29/13

## Air Flow Corrections (Compressor Speeds 4-12)

| Airflow | | Cooling | | | | Heating | | |
|---|---|---|---|---|---|---|---|---|
| L/s Per kW of Clg | % of Nominal | Total Cap | Sens Cap | Power | Heat of Rej | Htg Cap | Power | Heat of Ext |
| 32 | 60 | 0.928 | 0.747 | 0.936 | 0.929 | 0.961 | 1.097 | 0.938 |
| 37 | 69 | 0.940 | 0.789 | 0.946 | 0.941 | 0.967 | 1.081 | 0.948 |
| 40 | 75 | 0.952 | 0.831 | 0.957 | 0.953 | 0.974 | 1.064 | 0.959 |
| 44 | 81 | 0.964 | 0.873 | 0.968 | 0.965 | 0.980 | 1.048 | 0.969 |
| 47 | 88 | 0.976 | 0.916 | 0.979 | 0.976 | 0.987 | 1.032 | 0.979 |
| 50 | 94 | 0.988 | 0.958 | 0.989 | 0.988 | 0.993 | 1.016 | 0.990 |
| **54** | **100** | **1.000** | **1.000** | **1.000** | **1.000** | **1.000** | **1.000** | **1.000** |
| 57 | 106 | 1.020 | 1.023 | 1.004 | 1.018 | 1.010 | 0.966 | 1.018 |
| 61 | 113 | 1.056 | 1.042 | 1.008 | 1.035 | 1.020 | 0.932 | 1.036 |
| 64 | 119 | 1.072 | 1.079 | 1.011 | 1.053 | 1.029 | 0.898 | 1.054 |
| 67 | 125 | 1.087 | 1.095 | 1.015 | 1.070 | 1.039 | 0.865 | 1.071 |
| 70 | 130 | 1.099 | 1.113 | 1.019 | 1.088 | 1.049 | 0.831 | 1.089 |

5/29/13

## Cooling Capacity Corrections

| Entering Air WB °C | Total Clg Cap | Sensible Cooling Capacity Multipliers - Entering DB °C | | | | | | | | | | Power Input | Heat of Rejection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 15.6 | 18.3 | 21.1 | 23.9 | 26.7 | 27.0 | 29.4 | 32.2 | 35.0 | 37.8 | | |
| 12.8 | 0.898 | 0.723 | 0.866 | 1.048 | 1.185 | * | * | * | * | * | * | 0.985 | 0.913 |
| 15.6 | 0.912 | | 0.632 | 0.880 | 1.078 | 1.244 | 1.260 | * | * | * | * | 0.994 | 0.927 |
| 17.2 | 0.945 | | | 0.768 | 0.960 | 1.150 | 1.175 | * | * | * | * | 0.996 | 0.954 |
| 18.3 | 0.976 | | | 0.694 | 0.881 | 1.079 | 1.085 | 1.270 | * | * | * | 0.997 | 0.972 |
| 19.0 | 0.983 | | | 0.655 | 0.842 | 1.040 | 1.060 | 1.232 | * | * | * | 0.999 | 0.986 |
| **19.4** | **1.000** | | | 0.616 | 0.806 | **1.000** | 1.023 | 1.193 | 1.330 | 1.480 | * | **1.000** | **1.000** |
| 21.1 | 1.053 | | | | 0.693 | 0.879 | 0.900 | 1.075 | 1.205 | 1.404 | * | 1.003 | 1.044 |
| 23.9 | 1.168 | | | | | 0.687 | 0.715 | 0.875 | 1.040 | 1.261 | 1.476 | 1.007 | 1.141 |

**NOTE:** *Sensible capacity equals total capacity at conditions shown.

5/13/13

## Heating Capacity Corrections

| Ent Air DB °C | Heating Corrections | | |
|---|---|---|---|
| | Htg Cap | Power | Heat of Ext |
| 7.2 | 1.062 | 0.739 | 1.158 |
| 10.0 | 1.050 | 0.790 | 1.130 |
| 12.8 | 1.037 | 0.842 | 1.096 |
| 15.6 | 1.025 | 0.893 | 1.064 |
| 18.3 | 1.012 | 0.945 | 1.030 |
| 20.0 | 1.005 | 0.976 | 1.012 |
| **21.1** | **1.000** | **1.000** | **1.000** |
| 23.9 | 0.987 | 1.048 | 0.970 |
| 26.7 | 0.975 | 1.099 | 0.930 |

5/13/13

# Antifreeze Corrections

Catalog performance can be corrected for antifreeze use. Please use the following table and note the example given.

| Antifreeze Type | Antifreeze % by wt | Heating | | Cooling | | Pressure Drop |
|---|---|---|---|---|---|---|
| | | Load | Source | Load | Source | |
| **EWT** - °C | | **26.7** | **-1.1** | **10.0** | **32.2** | **-1.1** |
| **Water** | 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| **Ethylene Glycol** | 10 | 0.990 | 0.973 | 0.976 | 0.991 | 1.075 |
| | 20 | 0.978 | 0.943 | 0.947 | 0.979 | 1.163 |
| | 30 | 0.964 | 0.917 | 0.921 | 0.965 | 1.225 |
| | 40 | 0.953 | 0.890 | 0.897 | 0.955 | 1.324 |
| | 50 | 0.942 | 0.865 | 0.872 | 0.943 | 1.419 |
| **Propylene Glycol** | 10 | 0.981 | 0.958 | 0.959 | 0.981 | 1.130 |
| | 20 | 0.967 | 0.913 | 0.921 | 0.969 | 1.270 |
| | 30 | 0.946 | 0.854 | 0.869 | 0.950 | 1.433 |
| | 40 | 0.932 | 0.813 | 0.834 | 0.937 | 1.614 |
| | 50 | 0.915 | 0.770 | 0.796 | 0.922 | 1.816 |
| **Ethanol** | 10 | 0.986 | 0.927 | 0.945 | 0.991 | 1.242 |
| | 20 | 0.967 | 0.887 | 0.906 | 0.972 | 1.343 |
| | 30 | 0.944 | 0.856 | 0.869 | 0.947 | 1.383 |
| | 40 | 0.926 | 0.815 | 0.830 | 0.930 | 1.523 |
| | 50 | 0.907 | 0.779 | 0.795 | 0.911 | 1.639 |
| **Methanol** | 10 | 0.985 | 0.957 | 0.962 | 0.986 | 1.127 |
| | 20 | 0.969 | 0.924 | 0.929 | 0.970 | 1.197 |
| | 30 | 0.950 | 0.895 | 0.897 | 0.951 | 1.235 |
| | 40 | 0.935 | 0.863 | 0.866 | 0.936 | 1.323 |
| | 50 | 0.919 | 0.833 | 0.836 | 0.920 | 1.399 |

**WARNING: Gray area represents antifreeze concentrations greater than 35% by weight and should be avoided due to the extreme performance penalty they represent.**

## Antifreeze Correction Example

Antifreeze solution is Propylene Glycol 20% by weight. Determine the corrected heating and cooling performance at -1.1°C and 32.2°C respectively as well as pressure drop at -1.1°C for a NVK036 operating at 100% capacity.

The corrected cooling capacity at 32.2°C would be: 10.3 kW x 0.969 = 10.0 kW

The corrected heating capacity at -1.1°C would be: 11.0 kW x 0.913 = 10.0 kW

The corrected pressure drop at -1.1°C and 0.7 L/s would be: 23.50 kPa x 1.270 = 29.85 kPa

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____



# Performance Data

## NVK009 - 50% Part Load

| EWT °C | Flow L/s | WPD kPa | HEATING - EAT 21.1°C Airflow L/s | HC kW | Power kW | HE kW | LAT °C | COP | HWC kW |
|---|---|---|---|---|---|---|---|---|---|
| -6.7 | 0.2 | 2.10 | Operation not recommended | | | | | | |
| | 0.3 | 4.80 | | | | | | | |
| | 0.3 | 7.50 | 259.6 | 4.2 | 1.24 | 3.0 | 34.6 | 3.41 | 0.6 |
| | | | 354 | 4.3 | 1.25 | 3.0 | 31.1 | 3.43 | 0.5 |
| -1.1 | 0.2 | 2.04 | 259.6 | 4.8 | 1.30 | 3.5 | 36.5 | 3.71 | 0.7 |
| | | | 354 | 4.9 | 1.32 | 3.6 | 32.6 | 3.69 | 0.6 |
| | 0.3 | 4.66 | 259.6 | 5.1 | 1.34 | 3.7 | 37.3 | 3.79 | 0.8 |
| | | | 354 | 5.2 | 1.35 | 3.8 | 33.2 | 3.84 | 0.6 |
| | 0.3 | 7.28 | 259.6 | 5.2 | 1.35 | 3.8 | 37.6 | 3.84 | 0.8 |
| | | | 354 | 5.2 | 1.36 | 3.9 | 33.4 | 3.86 | 0.7 |
| 4.4 | 0.2 | 1.98 | 259.6 | 5.4 | 1.35 | 4.1 | 38.4 | 4.03 | 0.7 |
| | | | 354 | 5.5 | 1.36 | 4.2 | 34.0 | 4.06 | 0.6 |
| | 0.3 | 4.52 | 259.6 | 5.7 | 1.38 | 4.3 | 39.3 | 4.13 | 0.8 |
| | | | 354 | 5.8 | 1.38 | 4.4 | 34.7 | 4.20 | 0.7 |
| | 0.3 | 7.07 | 259.6 | 5.8 | 1.39 | 4.4 | 39.6 | 4.15 | 0.8 |
| | | | 354 | 5.9 | 1.39 | 4.5 | 34.9 | 4.23 | 0.7 |
| 10.0 | 0.2 | 1.91 | 259.6 | 6.0 | 1.45 | 4.6 | 40.3 | 4.16 | 0.8 |
| | | | 354 | 6.1 | 1.45 | 4.7 | 35.5 | 4.24 | 0.7 |
| | 0.3 | 4.38 | 259.6 | 6.3 | 1.48 | 4.8 | 41.3 | 4.27 | 0.9 |
| | | | 354 | 6.4 | 1.48 | 5.0 | 36.2 | 4.36 | 0.7 |
| | 0.3 | 6.85 | 259.6 | 6.4 | 1.50 | 4.9 | 41.6 | 4.27 | 0.9 |
| | | | 354 | 6.6 | 1.49 | 5.1 | 36.5 | 4.41 | 0.8 |
| 15.6 | 0.2 | 1.85 | 259.6 | 6.8 | 1.42 | 5.3 | 42.7 | 4.75 | 0.9 |
| | | | 354 | 6.9 | 1.41 | 5.5 | 37.3 | 4.91 | 0.7 |
| | 0.3 | 4.24 | 259.6 | 7.1 | 1.45 | 5.6 | 43.7 | 4.88 | 0.9 |
| | | | 354 | 7.2 | 1.44 | 5.8 | 38.1 | 5.03 | 0.8 |
| | 0.3 | 6.63 | 259.6 | 7.2 | 1.47 | 5.7 | 44.0 | 4.89 | 1.0 |
| | | | 354 | 7.4 | 1.45 | 5.9 | 38.3 | 5.08 | 0.8 |
| 21.1 | 0.2 | 1.79 | 259.6 | 7.4 | 1.35 | 6.1 | 44.8 | 5.48 | 0.9 |
| | | | 354 | 7.6 | 1.37 | 6.2 | 38.9 | 5.54 | 0.8 |
| | 0.3 | 4.10 | 259.6 | 7.7 | 1.38 | 6.4 | 45.8 | 5.61 | 1.0 |
| | | | 354 | 8.0 | 1.36 | 6.6 | 39.8 | 5.86 | 0.8 |
| | 0.3 | 6.41 | 259.6 | 7.8 | 1.55 | 6.2 | 45.9 | 5.01 | 1.0 |
| | | | 354 | 8.1 | 1.37 | 6.7 | 40.0 | 5.91 | 0.9 |
| 26.7 | 0.2 | 1.73 | 259.6 | 8.0 | 1.43 | 6.5 | 46.5 | 5.57 | 1.0 |
| | | | 354 | 8.2 | 1.39 | 6.8 | 40.3 | 5.88 | 0.8 |
| | 0.3 | 3.96 | 259.6 | 8.3 | 1.46 | 6.9 | 47.6 | 5.69 | 1.1 |
| | | | 354 | 8.6 | 1.43 | 7.2 | 41.2 | 6.03 | 0.9 |
| | 0.3 | 6.19 | 259.6 | 8.5 | 1.48 | 7.0 | 48.1 | 5.72 | 1.1 |
| | | | 354 | 8.7 | 1.44 | 7.3 | 41.5 | 6.07 | 0.9 |
| 32.2 | 0.2 | 1.67 | 259.6 | 8.5 | 1.44 | 7.1 | 48.3 | 5.92 | 1.1 |
| | | | 354 | 8.8 | 1.40 | 7.4 | 41.7 | 6.31 | 0.9 |
| | 0.3 | 3.82 | 259.6 | 8.9 | 1.47 | 7.4 | 49.5 | 6.03 | 1.1 |
| | | | 354 | 9.2 | 1.42 | 7.8 | 42.7 | 6.47 | 0.9 |
| | 0.3 | 5.97 | 259.6 | 9.0 | 1.49 | 7.5 | 50.0 | 6.06 | 1.2 |
| | | | 354 | 9.4 | 1.44 | 7.9 | 43.1 | 6.51 | 1.0 |
| 37.8 | 0.2 | 1.61 | Operation not recommended | | | | | | |
| | 0.3 | 3.68 | | | | | | | |
| | 0.3 | 5.76 | | | | | | | |
| 43.3 | 0.2 | 1.55 | | | | | | | |
| | 0.3 | 3.54 | | | | | | | |
| | 0.3 | 5.54 | | | | | | | |
| 48.9 | 0.2 | 1.49 | | | | | | | |
| | 0.3 | 3.40 | | | | | | | |
| | 0.3 | 5.32 | | | | | | | |

| EWT °C | Flow L/s | WPD kPa | COOLING - EAT 26.7/19.4°C Airflow L/s | TC kW | SC kW | S/T Ratio | Power kW | HR kW | EER | HWC kW |
|---|---|---|---|---|---|---|---|---|---|---|
| -6.7 | 0.2 | 1.05 | Operation not recommended | | | | | | | |
| | 0.2 | 3.19 | | | | | | | | |
| | 0.3 | 5.32 | | | | | | | | |
| -1.1 | 0.2 | 1.02 | 236 | 6.8 | 4.46 | 0.65 | 0.49 | 7.32 | 13.8 | – |
| | | | 306.8 | 6.7 | 4.42 | 0.66 | 0.55 | 7.23 | 12.3 | – |
| | 0.2 | 3.09 | 236 | 6.8 | 4.46 | 0.65 | 0.48 | 7.30 | 14.3 | – |
| | | | 306.8 | 6.6 | 4.59 | 0.69 | 0.58 | 7.18 | 11.4 | – |
| | 0.3 | 5.17 | 236 | 6.9 | 4.59 | 0.66 | 0.47 | 7.41 | 14.7 | – |
| | | | 306.8 | 6.7 | 4.54 | 0.68 | 0.54 | 7.25 | 12.4 | – |
| 4.4 | 0.2 | 0.99 | 236 | 7.0 | 4.60 | 0.65 | 0.57 | 7.59 | 12.4 | – |
| | | | 306.8 | 7.0 | 4.69 | 0.67 | 0.63 | 7.64 | 11.1 | – |
| | 0.2 | 3.00 | 236 | 7.0 | 4.60 | 0.65 | 0.55 | 7.58 | 12.9 | – |
| | | | 306.8 | 7.0 | 4.79 | 0.69 | 0.64 | 7.61 | 10.9 | – |
| | 0.3 | 5.02 | 236 | 7.1 | 4.65 | 0.65 | 0.54 | 7.66 | 13.1 | – |
| | | | 306.8 | 7.1 | 4.77 | 0.68 | 0.61 | 7.66 | 11.7 | – |
| 10.0 | 0.2 | 0.96 | 236 | 7.1 | 4.75 | 0.67 | 0.59 | 7.68 | 11.9 | – |
| | | | 306.8 | 7.1 | 4.93 | 0.69 | 0.66 | 7.77 | 10.7 | – |
| | 0.2 | 2.91 | 236 | 7.1 | 4.76 | 0.67 | 0.57 | 7.67 | 12.4 | – |
| | | | 306.8 | 7.1 | 4.98 | 0.70 | 0.65 | 7.76 | 10.9 | – |
| | 0.3 | 4.86 | 236 | 7.2 | 4.79 | 0.67 | 0.57 | 7.74 | 12.6 | – |
| | | | 306.8 | 7.2 | 4.98 | 0.69 | 0.62 | 7.80 | 11.6 | – |
| 15.6 | 0.2 | 0.93 | 236 | 6.6 | 4.53 | 0.69 | 0.70 | 7.28 | 9.4 | 0.3 |
| | | | 306.8 | 6.7 | 4.81 | 0.71 | 0.77 | 7.50 | 8.8 | 0.3 |
| | 0.2 | 2.82 | 236 | 6.6 | 4.55 | 0.69 | 0.67 | 7.28 | 9.8 | 0.3 |
| | | | 306.8 | 6.8 | 4.83 | 0.71 | 0.75 | 7.51 | 9.1 | 0.3 |
| | 0.3 | 4.71 | 236 | 6.7 | 4.58 | 0.69 | 0.67 | 7.34 | 10.0 | 0.3 |
| | | | 306.8 | 6.8 | 4.86 | 0.71 | 0.72 | 7.52 | 9.5 | 0.3 |
| 21.1 | 0.2 | 0.90 | 236 | 6.2 | 4.59 | 0.74 | 0.84 | 7.07 | 7.4 | 0.4 |
| | | | 306.8 | 5.5 | 4.31 | 0.78 | 0.91 | 6.45 | 6.1 | 0.4 |
| | 0.2 | 2.72 | 236 | 6.3 | 4.62 | 0.74 | 0.81 | 7.07 | 7.7 | 0.4 |
| | | | 306.8 | 6.6 | 4.99 | 0.76 | 0.88 | 7.44 | 7.5 | 0.4 |
| | 0.3 | 4.55 | 236 | 5.4 | 3.75 | 0.69 | 0.79 | 6.21 | 6.9 | 0.4 |
| | | | 306.8 | 6.6 | 5.04 | 0.77 | 0.85 | 7.41 | 7.7 | 0.4 |
| 26.7 | 0.2 | 0.87 | 236 | 5.9 | 4.40 | 0.75 | 0.97 | 6.82 | 6.0 | 0.6 |
| | | | 306.8 | 6.0 | 4.70 | 0.78 | 1.04 | 7.04 | 5.8 | 0.6 |
| | 0.2 | 2.63 | 236 | 5.9 | 4.43 | 0.75 | 0.94 | 6.82 | 6.3 | 0.6 |
| | | | 306.8 | 6.1 | 4.70 | 0.77 | 0.99 | 7.06 | 6.1 | 0.6 |
| | 0.3 | 4.40 | 236 | 5.9 | 4.47 | 0.75 | 0.92 | 6.87 | 6.5 | 0.6 |
| | | | 306.8 | 6.1 | 4.75 | 0.78 | 0.96 | 7.06 | 6.3 | 0.7 |
| 32.2 | 0.2 | 0.83 | 236 | 5.4 | 4.19 | 0.77 | 1.11 | 6.53 | 4.9 | 0.8 |
| | | | 306.8 | 5.5 | 4.41 | 0.81 | 1.18 | 6.63 | 4.6 | 0.8 |
| | 0.2 | 2.54 | 236 | 5.5 | 4.23 | 0.78 | 1.07 | 6.53 | 5.1 | 0.8 |
| | | | 306.8 | 5.5 | 4.41 | 0.80 | 1.11 | 6.63 | 5.0 | 0.8 |
| | 0.3 | 4.24 | 236 | 5.5 | 4.28 | 0.78 | 1.05 | 6.56 | 5.3 | 0.8 |
| | | | 306.8 | 5.6 | 4.45 | 0.80 | 1.08 | 6.65 | 5.2 | 0.8 |
| 37.8 | 0.2 | 0.80 | 236 | 5.2 | 4.04 | 0.78 | 1.39 | 6.55 | 3.7 | 0.9 |
| | | | 306.8 | 5.2 | 4.23 | 0.81 | 1.43 | 6.64 | 3.6 | 0.9 |
| | 0.2 | 2.45 | 236 | 5.2 | 4.08 | 0.78 | 1.33 | 6.54 | 3.9 | 0.9 |
| | | | 306.8 | 5.3 | 4.26 | 0.81 | 1.36 | 6.62 | 3.9 | 0.9 |
| | 0.3 | 4.09 | 236 | 5.3 | 4.13 | 0.79 | 1.30 | 6.56 | 4.0 | 1.0 |
| | | | 306.8 | 5.3 | 4.30 | 0.81 | 1.33 | 6.64 | 4.0 | 1.0 |
| 43.3 | 0.2 | 0.77 | 236 | 4.3 | 3.70 | 0.86 | 1.56 | 5.88 | 2.8 | 0.9 |
| | | | 306.8 | 4.4 | 3.85 | 0.88 | 1.57 | 5.94 | 2.8 | 0.9 |
| | 0.2 | 2.35 | 236 | 4.4 | 3.75 | 0.86 | 1.49 | 5.86 | 2.9 | 1.0 |
| | | | 306.8 | 4.4 | 3.91 | 0.89 | 1.51 | 5.92 | 2.9 | 1.0 |
| | 0.3 | 3.93 | 236 | 4.4 | 3.80 | 0.86 | 1.46 | 5.87 | 3.0 | 1.0 |
| | | | 306.8 | 4.5 | 3.96 | 0.89 | 1.47 | 5.92 | 3.0 | 1.0 |
| 48.9 | 0.2 | 0.74 | 236 | 3.9 | 3.31 | 0.86 | 1.81 | 5.68 | 2.1 | 1.3 |
| | | | 306.8 | 3.8 | 3.32 | 0.87 | 1.75 | 5.55 | 2.2 | 1.3 |
| | 0.2 | 2.26 | 236 | 3.9 | 3.36 | 0.86 | 1.74 | 5.65 | 2.3 | 1.3 |
| | | | 306.8 | 3.8 | 3.42 | 0.89 | 1.74 | 5.57 | 2.2 | 1.3 |
| | 0.3 | 3.78 | 236 | 4.0 | 3.50 | 0.88 | 1.67 | 5.65 | 2.4 | 1.3 |
| | | | 306.8 | 3.9 | 3.46 | 0.89 | 1.69 | 5.59 | 2.3 | 1.3 |

9/5/14

# Performance Data cont.

## NVK009 - 100% Full Load

| EWT °C | Flow L/s | WPD kPa | HEATING - EAT 21.1°C | | | | | | | EWT °C | Flow L/s | WPD kPa | COOLING - EAT 26.7/19.4°C | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Airflow L/s | HC kW | Power kW | HE kW | LAT °C | COP | HWC kW | | | | Airflow L/s | TC kW | SC kW | S/T Ratio | Power kW | HR kW | EER | HWC kW |
| -6.7 | 0.3 | 7.52 | Operation not recommended | | | | | | | -6.7 | 0.3 | 4.83 | Operation not recommended | | | | | | | |
| | 0.5 | 18.56 | | | | | | | | | 0.4 | 11.70 | | | | | | | | |
| | 0.7 | 24.20 | 542.8 | 9.3 | 2.84 | 6.4 | 35.2 | 3.26 | 1.4 | | 0.6 | 19.36 | | | | | | | | |
| | | | 708 | 9.5 | 2.87 | 6.7 | 32.3 | 3.32 | 1.3 | | | | | | | | | | | |
| -1.1 | 0.3 | 7.31 | 542.8 | 10.3 | 2.74 | 7.6 | 36.9 | 3.77 | 1.5 | -1.1 | 0.3 | 4.69 | 472 | 11.5 | 8.01 | 0.70 | 0.98 | 12.48 | 11.8 | – |
| | | | 708 | 10.5 | 2.79 | 7.7 | 33.4 | 3.78 | 1.4 | | | | 613.6 | 11.3 | 8.02 | 0.71 | 1.09 | 12.36 | 10.3 | – |
| | 0.5 | 18.02 | 542.8 | 10.4 | 2.77 | 7.7 | 37.0 | 3.77 | 1.6 | | 0.4 | 11.36 | 472 | 11.5 | 7.99 | 0.70 | 0.95 | 12.44 | 12.2 | – |
| | | | 708 | 10.6 | 2.82 | 7.8 | 33.6 | 3.77 | 1.4 | | | | 613.6 | 11.1 | 8.23 | 0.74 | 1.14 | 12.27 | 9.7 | – |
| | 0.7 | 23.50 | 542.8 | 10.6 | 2.92 | 7.7 | 37.3 | 3.62 | 1.6 | | 0.6 | 18.80 | 472 | 11.5 | 8.06 | 0.70 | 0.95 | 12.48 | 12.2 | – |
| | | | 708 | 11.0 | 2.89 | 8.1 | 33.9 | 3.79 | 1.5 | | | | 613.6 | 11.3 | 8.15 | 0.72 | 1.07 | 12.38 | 10.6 | – |
| 4.4 | 0.3 | 7.03 | 542.8 | 12.0 | 2.73 | 9.3 | 39.4 | 4.40 | 1.6 | 4.4 | 0.3 | 4.55 | 472 | 12.1 | 8.67 | 0.72 | 1.10 | 13.16 | 11.0 | – |
| | | | 708 | 12.2 | 2.77 | 9.4 | 35.4 | 4.39 | 1.5 | | | | 613.6 | 12.0 | 8.88 | 0.74 | 1.23 | 13.25 | 9.8 | – |
| | 0.5 | 17.48 | 542.8 | 12.1 | 2.74 | 9.4 | 39.6 | 4.42 | 1.7 | | 0.4 | 11.02 | 472 | 12.1 | 8.67 | 0.72 | 1.06 | 13.13 | 11.4 | – |
| | | | 708 | 12.4 | 2.80 | 9.6 | 35.6 | 4.43 | 1.5 | | | | 613.6 | 12.0 | 9.04 | 0.76 | 1.24 | 13.20 | 9.6 | – |
| | 0.7 | 22.80 | 542.8 | 12.5 | 2.80 | 9.6 | 40.1 | 4.44 | 1.7 | | 0.6 | 18.24 | 472 | 12.2 | 8.72 | 0.72 | 1.06 | 13.22 | 11.5 | – |
| | | | 708 | 12.7 | 2.85 | 9.8 | 36.0 | 4.46 | 1.5 | | | | 613.6 | 12.1 | 9.01 | 0.74 | 1.18 | 13.27 | 10.3 | – |
| 10.0 | 0.3 | 6.83 | 542.8 | 13.5 | 2.85 | 10.6 | 41.7 | 4.73 | 1.7 | 10.0 | 0.3 | 4.41 | 472 | 12.9 | 9.48 | 0.73 | 1.25 | 14.15 | 10.3 | – |
| | | | 708 | 13.6 | 2.88 | 10.7 | 37.0 | 4.72 | 1.6 | | | | 613.6 | 12.9 | 9.84 | 0.76 | 1.40 | 14.34 | 9.2 | – |
| | 0.5 | 16.94 | 542.8 | 13.6 | 2.84 | 10.8 | 41.9 | 4.79 | 1.9 | | 0.4 | 10.68 | 472 | 12.9 | 9.50 | 0.73 | 1.21 | 14.13 | 10.7 | – |
| | | | 708 | 14.0 | 2.91 | 11.1 | 37.5 | 4.80 | 1.7 | | | | 613.6 | 12.9 | 9.94 | 0.77 | 1.38 | 14.32 | 9.4 | – |
| | 0.7 | 22.09 | 542.8 | 13.9 | 2.93 | 11.0 | 42.3 | 4.74 | 1.9 | | 0.6 | 17.67 | 472 | 13.1 | 9.54 | 0.73 | 1.20 | 14.26 | 10.9 | – |
| | | | 708 | 14.2 | 2.94 | 11.3 | 37.7 | 4.83 | 2.0 | | | | 613.6 | 13.1 | 9.94 | 0.76 | 1.31 | 14.38 | 10.0 | – |
| 15.6 | 0.3 | 6.41 | 542.8 | 14.9 | 2.87 | 12.0 | 43.8 | 5.18 | 1.8 | 15.6 | 0.3 | 4.27 | 472 | 11.8 | 9.05 | 0.77 | 1.45 | 13.27 | 8.1 | 0.5 |
| | | | 708 | 15.1 | 2.89 | 12.2 | 38.8 | 5.23 | 1.7 | | | | 613.6 | 12.1 | 9.61 | 0.79 | 1.59 | 13.68 | 7.6 | 0.6 |
| | 0.5 | 16.40 | 542.8 | 15.2 | 2.88 | 12.4 | 44.4 | 5.29 | 2.0 | | 0.4 | 10.34 | 472 | 11.9 | 9.09 | 0.77 | 1.40 | 13.26 | 8.5 | 0.6 |
| | | | 708 | 15.5 | 2.92 | 12.5 | 39.2 | 5.29 | 1.7 | | | | 613.6 | 12.2 | 9.66 | 0.79 | 1.55 | 13.70 | 7.9 | 0.6 |
| | 0.7 | 21.39 | 542.8 | 15.6 | 2.93 | 12.6 | 44.9 | 5.31 | 2.0 | | 0.6 | 17.11 | 472 | 12.0 | 9.15 | 0.76 | 1.39 | 13.37 | 8.6 | 0.6 |
| | | | 708 | 15.9 | 2.97 | 12.9 | 39.7 | 5.36 | 1.7 | | | | 613.6 | 12.2 | 9.71 | 0.79 | 1.49 | 13.70 | 8.2 | 0.6 |
| 21.1 | 0.3 | 6.21 | 542.8 | 16.1 | 2.95 | 13.1 | 45.7 | 5.45 | 1.9 | 21.1 | 0.3 | 4.14 | 472 | 11.4 | 8.89 | 0.78 | 1.68 | 13.08 | 6.8 | 0.8 |
| | | | 708 | 16.5 | 3.00 | 13.5 | 40.5 | 5.51 | 1.8 | | | | 613.6 | 10.8 | 8.70 | 0.81 | 1.84 | 12.63 | 5.9 | 0.8 |
| | 0.5 | 15.86 | 542.8 | 16.7 | 3.02 | 13.6 | 46.5 | 5.52 | 2.0 | | 0.4 | 10.00 | 472 | 11.5 | 8.95 | 0.78 | 1.62 | 13.07 | 7.1 | 0.9 |
| | | | 708 | 17.0 | 2.95 | 14.0 | 41.0 | 5.75 | 1.9 | | | | 613.6 | 12.0 | 9.66 | 0.80 | 1.74 | 13.77 | 6.9 | 0.9 |
| | 0.7 | 20.68 | 542.8 | 17.2 | 3.08 | 14.1 | 47.4 | 5.58 | 2.2 | | 0.6 | 16.55 | 472 | 10.6 | 7.62 | 0.72 | 1.62 | 12.23 | 6.5 | 0.9 |
| | | | 708 | 17.6 | 3.01 | 14.6 | 41.7 | 5.84 | 1.9 | | | | 613.6 | 12.0 | 9.76 | 0.81 | 1.69 | 13.72 | 7.1 | 1.0 |
| 26.7 | 0.3 | 6.00 | 542.8 | 17.6 | 3.15 | 14.5 | 48.0 | 5.59 | 2.1 | 26.7 | 0.3 | 3.93 | 472 | 11.1 | 9.00 | 0.81 | 1.95 | 13.04 | 5.7 | 1.2 |
| | | | 708 | 18.0 | 3.16 | 14.8 | 42.1 | 5.68 | 1.8 | | | | 613.6 | 11.4 | 9.62 | 0.85 | 2.08 | 13.47 | 5.5 | 1.2 |
| | 0.5 | 15.32 | 542.8 | 18.5 | 3.18 | 15.3 | 49.3 | 5.80 | 2.2 | | 0.4 | 9.66 | 472 | 11.2 | 9.07 | 0.81 | 1.88 | 13.04 | 5.9 | 1.2 |
| | | | 708 | 18.6 | 3.17 | 15.4 | 42.9 | 5.85 | 1.9 | | | | 613.6 | 11.5 | 9.62 | 0.84 | 1.98 | 13.48 | 5.8 | 1.2 |
| | 0.7 | 19.98 | 542.8 | 18.7 | 3.23 | 15.5 | 49.7 | 5.79 | 2.2 | | 0.6 | 15.98 | 472 | 11.3 | 9.15 | 0.81 | 1.85 | 13.12 | 6.1 | 1.3 |
| | | | 708 | 19.1 | 3.25 | 15.8 | 43.4 | 5.87 | 2.1 | | | | 613.6 | 11.6 | 9.72 | 0.84 | 1.93 | 13.48 | 6.0 | 1.3 |
| 32.2 | 0.3 | 5.79 | 542.8 | 19.0 | 3.35 | 15.6 | 50.1 | 5.66 | 2.2 | 32.2 | 0.3 | 3.79 | 472 | 10.0 | 8.61 | 0.86 | 2.25 | 12.29 | 4.5 | 1.6 |
| | | | 708 | 19.3 | 3.29 | 16.0 | 43.7 | 5.86 | 2.0 | | | | 613.6 | 10.1 | 9.06 | 0.90 | 2.39 | 12.50 | 4.2 | 1.6 |
| | 0.5 | 14.77 | 542.8 | 20.0 | 3.41 | 16.6 | 51.6 | 5.86 | 2.3 | | 0.4 | 9.31 | 472 | 10.1 | 8.70 | 0.86 | 2.16 | 12.28 | 4.7 | 1.6 |
| | | | 708 | 20.2 | 3.33 | 16.9 | 44.8 | 6.07 | 2.1 | | | | 613.6 | 10.2 | 9.06 | 0.89 | 2.26 | 12.47 | 4.5 | 1.6 |
| | 0.7 | 19.27 | 542.8 | 20.1 | 3.48 | 16.6 | 51.7 | 5.76 | 2.5 | | 0.6 | 15.41 | 472 | 10.2 | 8.79 | 0.86 | 2.12 | 12.34 | 4.8 | 1.7 |
| | | | 708 | 20.6 | 3.42 | 17.2 | 45.2 | 6.01 | 2.3 | | | | 613.6 | 10.3 | 9.16 | 0.89 | 2.19 | 12.51 | 4.7 | 1.7 |
| 37.8 | 0.3 | 5.52 | Operation not recommended | | | | | | | 37.8 | 0.3 | 3.65 | 472 | 9.8 | 8.48 | 0.86 | 2.61 | 12.44 | 3.8 | 2.0 |
| | | | | | | | | | | | | | 613.6 | 9.9 | 8.88 | 0.90 | 2.69 | 12.61 | 3.7 | 2.0 |
| | 0.5 | 14.24 | | | | | | | | | 0.4 | 8.98 | 472 | 9.9 | 8.58 | 0.87 | 2.50 | 12.42 | 4.0 | 2.1 |
| | | | | | | | | | | | | | 613.6 | 10.0 | 8.94 | 0.89 | 2.56 | 12.58 | 3.9 | 2.1 |
| | 0.7 | 18.57 | | | | | | | | | 0.6 | 14.86 | 472 | 10.0 | 8.68 | 0.87 | 2.44 | 12.47 | 4.1 | 2.2 |
| | | | | | | | | | | | | | 613.6 | 10.1 | 9.04 | 0.89 | 2.49 | 12.62 | 4.1 | 1.8 |
| 43.3 | 0.3 | 5.31 | | | | | | | | 43.3 | 0.3 | 3.52 | 472 | 8.7 | 7.83 | 0.90 | 3.01 | 11.71 | 2.9 | 2.4 |
| | | | | | | | | | | | | | 613.6 | 8.8 | 8.16 | 0.93 | 3.04 | 11.83 | 2.9 | 2.3 |
| | 0.5 | 13.70 | | | | | | | | | 0.4 | 8.64 | 472 | 8.8 | 7.95 | 0.90 | 2.88 | 11.67 | 3.0 | 2.5 |
| | | | | | | | | | | | | | 613.6 | 8.9 | 8.28 | 0.93 | 2.91 | 11.79 | 3.0 | 2.5 |
| | 0.7 | 17.87 | | | | | | | | | 0.6 | 14.30 | 472 | 8.1 | 8.05 | 0.99 | 2.81 | 10.96 | 2.9 | 2.6 |
| | | | | | | | | | | | | | 613.6 | 9.0 | 8.38 | 0.93 | 2.84 | 11.81 | 3.2 | 2.4 |
| 48.9 | 0.3 | 5.03 | | | | | | | | 48.9 | 0.3 | 3.38 | 472 | 8.2 | 7.52 | 0.92 | 3.40 | 11.60 | 2.4 | 2.9 |
| | | | | | | | | | | | | | 613.6 | 8.1 | 7.63 | 0.95 | 3.31 | 11.39 | 2.4 | 3.0 |
| | 0.5 | 13.16 | | | | | | | | | 0.4 | 8.30 | 472 | 8.3 | 7.64 | 0.92 | 3.26 | 11.55 | 2.5 | 3.0 |
| | | | | | | | | | | | | | 613.6 | 8.1 | 7.77 | 0.96 | 3.27 | 11.39 | 2.5 | 3.1 |
| | 0.7 | 17.17 | | | | | | | | | 0.6 | 13.73 | 472 | 8.3 | 7.79 | 0.94 | 3.17 | 11.49 | 2.6 | 3.1 |
| | | | | | | | | | | | | | 613.6 | 8.3 | 7.85 | 0.95 | 3.17 | 11.44 | 2.6 | 3.1 |

9/5/14

# Performance Data cont.

## NVK012 - 50% Part Load

| EWT °C | Flow L/s | WPD kPa | HEATING - EAT 21.1°C Airflow L/s | HC kW | Power kW | HE kW | LAT °C | COP | HWC kW | EWT °C | Flow L/s | WPD kPa | COOLING - EAT 26.7/19.4°C Airflow L/s | TC kW | SC kW | S/T Ratio | Power kW | HR kW | EER | HWC kW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **-6.7** | 0.2 | 3.87 | Operation not recommended | | | | | | | **-6.7** | 0.2 | 3.23 | Operation not recommended | | | | | | | |
| | 0.3 | 6.66 | | | | | | | | | 0.3 | 5.61 | | | | | | | | |
| | 0.4 | 9.44 | 306.8 | 5.2 | 1.55 | 3.6 | 35.0 | 3.33 | 0.7 | | 0.4 | 7.99 | | | | | | | | |
| | | | 424.8 | 5.2 | 1.56 | 3.7 | 31.3 | 3.35 | 0.9 | | | | | | | | | | | |
| **-1.1** | 0.2 | 3.76 | 306.8 | 5.9 | 1.54 | 4.3 | 37.0 | 3.81 | 0.8 | **-1.1** | 0.2 | 3.13 | 236 | 8.2 | 4.49 | 0.55 | 0.53 | 8.69 | 15.5 | – |
| | | | 424.8 | 6.0 | 1.57 | 4.4 | 32.7 | 3.80 | 0.7 | | | | 354 | 8.0 | 4.45 | 0.56 | 0.58 | 8.57 | 13.7 | – |
| | 0.3 | 6.46 | 306.8 | 6.2 | 1.58 | 4.6 | 37.8 | 3.90 | 0.9 | | 0.3 | 5.44 | 236 | 8.2 | 4.48 | 0.55 | 0.51 | 8.67 | 16.0 | – |
| | | | 424.8 | 6.3 | 1.60 | 4.7 | 33.4 | 3.94 | 0.8 | | | | 354 | 7.9 | 4.62 | 0.58 | 0.62 | 8.51 | 12.8 | – |
| | 0.4 | 9.16 | 306.8 | 6.3 | 1.60 | 4.7 | 38.1 | 3.94 | 0.9 | | 0.4 | 7.75 | 236 | 8.3 | 5.04 | 0.61 | 0.51 | 8.81 | 16.4 | – |
| | | | 424.8 | 6.4 | 1.61 | 4.8 | 33.6 | 3.96 | 0.8 | | | | 354 | 8.0 | 4.57 | 0.57 | 0.58 | 8.60 | 13.9 | – |
| **4.4** | 0.2 | 3.65 | 306.8 | 7.0 | 1.58 | 5.5 | 40.1 | 4.45 | 0.9 | **4.4** | 0.2 | 3.04 | 236 | 8.5 | 5.11 | 0.60 | 0.61 | 9.12 | 14.0 | – |
| | | | 424.8 | 7.2 | 1.59 | 5.6 | 35.1 | 4.49 | 0.8 | | | | 354 | 8.5 | 5.22 | 0.62 | 0.68 | 9.16 | 12.5 | – |
| | 0.3 | 6.27 | 306.8 | 7.4 | 1.62 | 5.8 | 41.1 | 4.57 | 1.0 | | 0.3 | 5.28 | 236 | 8.5 | 5.11 | 0.60 | 0.59 | 9.10 | 14.5 | – |
| | | | 424.8 | 7.5 | 1.63 | 5.9 | 35.8 | 4.64 | 0.8 | | | | 354 | 8.4 | 5.33 | 0.63 | 0.69 | 9.13 | 12.3 | – |
| | 0.4 | 8.89 | 306.8 | 7.5 | 1.64 | 5.9 | 41.4 | 4.59 | 1.0 | | 0.4 | 7.52 | 236 | 8.6 | 5.18 | 0.60 | 0.58 | 9.21 | 14.8 | – |
| | | | 424.8 | 7.7 | 1.64 | 6.0 | 36.1 | 4.68 | 0.8 | | | | 354 | 8.5 | 5.31 | 0.62 | 0.65 | 9.19 | 13.1 | – |
| **10.0** | 0.2 | 3.53 | 306.8 | 7.8 | 1.66 | 6.2 | 42.3 | 4.71 | 1.0 | **10.0** | 0.2 | 2.95 | 236 | 9.1 | 5.84 | 0.64 | 0.71 | 9.81 | 12.8 | – |
| | | | 424.8 | 8.0 | 1.66 | 6.3 | 36.7 | 4.81 | 0.8 | | | | 354 | 9.1 | 6.06 | 0.66 | 0.80 | 9.93 | 11.4 | – |
| | 0.3 | 6.08 | 306.8 | 8.2 | 1.70 | 6.5 | 43.3 | 4.84 | 1.0 | | 0.3 | 5.12 | 236 | 9.1 | 5.85 | 0.64 | 0.69 | 9.80 | 13.3 | – |
| | | | 424.8 | 8.4 | 1.70 | 6.7 | 37.5 | 4.94 | 0.9 | | | | 354 | 9.1 | 6.13 | 0.67 | 0.78 | 9.91 | 11.7 | – |
| | 0.4 | 8.62 | 306.8 | 8.3 | 1.72 | 6.6 | 43.6 | 4.85 | 1.1 | | 0.4 | 7.29 | 236 | 9.2 | 5.88 | 0.64 | 0.68 | 9.89 | 13.5 | – |
| | | | 424.8 | 8.5 | 1.71 | 6.8 | 37.8 | 4.99 | 1.0 | | | | 354 | 9.2 | 6.13 | 0.66 | 0.75 | 9.97 | 12.4 | – |
| **15.6** | 0.2 | 3.42 | 306.8 | 8.9 | 1.72 | 7.2 | 45.2 | 5.19 | 1.1 | **15.6** | 0.2 | 2.85 | 236 | 8.3 | 5.57 | 0.67 | 0.82 | 9.12 | 10.2 | 0.3 |
| | | | 424.8 | 9.1 | 1.70 | 7.4 | 38.9 | 5.36 | 0.9 | | | | 354 | 8.5 | 5.91 | 0.70 | 0.90 | 9.39 | 9.5 | 0.4 |
| | 0.3 | 5.88 | 306.8 | 9.3 | 1.75 | 7.6 | 46.3 | 5.32 | 1.1 | | 0.3 | 4.95 | 236 | 8.3 | 5.59 | 0.67 | 0.79 | 9.12 | 10.6 | 0.4 |
| | | | 424.8 | 9.6 | 1.74 | 7.8 | 39.8 | 5.50 | 1.0 | | | | 354 | 8.5 | 5.94 | 0.70 | 0.87 | 9.41 | 9.8 | 0.4 |
| | 0.4 | 8.34 | 306.8 | 9.5 | 1.78 | 7.7 | 46.8 | 5.34 | 1.2 | | 0.4 | 7.06 | 236 | 8.4 | 5.63 | 0.67 | 0.78 | 9.20 | 10.8 | 0.4 |
| | | | 424.8 | 9.7 | 1.75 | 8.0 | 40.1 | 5.55 | 1.0 | | | | 354 | 8.6 | 5.97 | 0.70 | 0.84 | 9.42 | 10.3 | 0.4 |
| **21.1** | 0.2 | 3.31 | 306.8 | 10.0 | 1.80 | 8.2 | 48.1 | 5.56 | 1.2 | **21.1** | 0.2 | 2.76 | 236 | 7.9 | 5.56 | 0.70 | 1.01 | 8.93 | 7.8 | 0.5 |
| | | | 424.8 | 9.9 | 1.79 | 8.1 | 40.5 | 5.55 | 1.0 | | | | 354 | 8.1 | 5.93 | 0.74 | 1.18 | 9.24 | 6.8 | 0.5 |
| | 0.3 | 5.69 | 306.8 | 10.4 | 1.83 | 8.6 | 49.2 | 5.69 | 1.3 | | 0.3 | 4.79 | 236 | 8.0 | 5.59 | 0.70 | 0.98 | 8.93 | 8.2 | 0.6 |
| | | | 424.8 | 10.7 | 1.81 | 8.9 | 42.1 | 5.94 | 1.1 | | | | 354 | 8.4 | 6.03 | 0.72 | 1.05 | 9.40 | 8.0 | 0.6 |
| | 0.4 | 8.07 | 306.8 | 10.4 | 1.84 | 8.6 | 49.3 | 5.67 | 1.3 | | 0.4 | 6.83 | 236 | 6.9 | 4.07 | 0.62 | 1.01 | 7.93 | 6.8 | 0.5 |
| | | | 424.8 | 10.9 | 1.82 | 9.1 | 42.4 | 5.99 | 1.1 | | | | 354 | 8.4 | 6.10 | 0.73 | 1.02 | 9.37 | 8.2 | 0.6 |
| **26.7** | 0.2 | 3.20 | 306.8 | 10.7 | 1.83 | 8.8 | 49.9 | 5.83 | 1.2 | **26.7** | 0.2 | 2.66 | 236 | 7.8 | 5.66 | 0.73 | 1.19 | 8.98 | 6.6 | 0.7 |
| | | | 424.8 | 11.0 | 1.84 | 9.1 | 42.5 | 5.96 | 1.0 | | | | 354 | 8.0 | 6.05 | 0.76 | 1.27 | 9.27 | 6.3 | 0.7 |
| | 0.3 | 5.49 | 306.8 | 11.1 | 1.87 | 9.3 | 51.2 | 5.95 | 1.3 | | 0.3 | 4.63 | 236 | 7.8 | 5.70 | 0.73 | 1.14 | 8.98 | 6.9 | 0.8 |
| | | | 424.8 | 11.5 | 1.88 | 9.6 | 43.5 | 6.11 | 1.1 | | | | 354 | 8.1 | 6.05 | 0.75 | 1.21 | 9.29 | 6.7 | 0.8 |
| | 0.4 | 7.79 | 306.8 | 11.3 | 1.91 | 9.4 | 51.7 | 5.93 | 1.4 | | 0.4 | 6.59 | 236 | 7.9 | 5.75 | 0.73 | 1.12 | 9.04 | 7.0 | 0.8 |
| | | | 424.8 | 11.7 | 1.90 | 9.8 | 43.9 | 6.15 | 1.2 | | | | 354 | 8.1 | 6.11 | 0.75 | 1.17 | 9.29 | 6.9 | 0.9 |
| **32.2** | 0.2 | 3.08 | 306.8 | 11.3 | 1.88 | 9.5 | 51.8 | 6.04 | 1.3 | **32.2** | 0.2 | 2.57 | 236 | 7.1 | 5.31 | 0.75 | 1.41 | 8.51 | 5.0 | 1.0 |
| | | | 424.8 | 11.7 | 1.89 | 9.8 | 44.0 | 6.20 | 1.1 | | | | 354 | 7.2 | 5.59 | 0.78 | 1.49 | 8.65 | 4.8 | 1.0 |
| | 0.3 | 5.30 | 306.8 | 11.8 | 1.92 | 9.9 | 53.1 | 6.17 | 1.4 | | 0.3 | 4.46 | 236 | 7.2 | 5.36 | 0.75 | 1.35 | 8.51 | 5.3 | 1.0 |
| | | | 424.8 | 12.3 | 1.93 | 10.3 | 45.0 | 6.36 | 1.2 | | | | 354 | 7.2 | 5.59 | 0.77 | 1.41 | 8.64 | 5.1 | 1.0 |
| | 0.4 | 7.51 | 306.8 | 12.0 | 1.97 | 10.1 | 53.6 | 6.11 | 1.5 | | 0.4 | 6.36 | 236 | 7.2 | 5.42 | 0.75 | 1.33 | 8.55 | 5.4 | 1.1 |
| | | | 424.8 | 12.5 | 1.95 | 10.5 | 45.5 | 6.40 | 1.3 | | | | 354 | 7.3 | 5.64 | 0.77 | 1.37 | 8.67 | 5.3 | 1.1 |
| **37.8** | 0.2 | 2.97 | Operation not recommended | | | | | | | **37.8** | 0.2 | 2.48 | 236 | 6.9 | 5.37 | 0.77 | 1.70 | 8.65 | 4.1 | 1.3 |
| | | | | | | | | | | | | | 354 | 7.0 | 5.62 | 0.80 | 1.75 | 8.76 | 4.0 | 1.3 |
| | 0.3 | 5.11 | | | | | | | | | 0.3 | 4.30 | 236 | 7.0 | 5.43 | 0.78 | 1.63 | 8.64 | 4.3 | 1.3 |
| | | | | | | | | | | | | | 354 | 7.1 | 5.66 | 0.80 | 1.67 | 8.75 | 4.2 | 1.3 |
| | 0.4 | 7.24 | | | | | | | | | 0.4 | 6.13 | 236 | 7.1 | 5.49 | 0.78 | 1.60 | 8.67 | 4.4 | 1.4 |
| | | | | | | | | | | | | | 354 | 7.1 | 5.72 | 0.80 | 1.63 | 8.78 | 4.4 | 1.4 |
| **43.3** | 0.2 | 2.86 | | | | | | | | **43.3** | 0.2 | 2.38 | 236 | 6.3 | 5.04 | 0.80 | 1.97 | 8.25 | 3.2 | 1.5 |
| | | | | | | | | | | | | | 354 | 6.3 | 5.25 | 0.83 | 1.99 | 8.34 | 3.2 | 1.5 |
| | 0.3 | 4.91 | | | | | | | | | 0.3 | 4.14 | 236 | 6.3 | 5.11 | 0.81 | 1.89 | 8.24 | 3.4 | 1.6 |
| | | | | | | | | | | | | | 354 | 6.4 | 5.33 | 0.83 | 1.91 | 8.32 | 3.4 | 1.6 |
| | 0.4 | 6.97 | | | | | | | | | 0.4 | 5.90 | 236 | 6.4 | 5.18 | 0.81 | 1.84 | 8.25 | 3.5 | 1.7 |
| | | | | | | | | | | | | | 354 | 6.5 | 5.39 | 0.83 | 1.86 | 8.34 | 3.5 | 1.7 |
| **48.9** | 0.2 | 2.75 | | | | | | | | **48.9** | 0.2 | 2.29 | 236 | 5.8 | 4.69 | 0.81 | 2.39 | 8.18 | 2.4 | 1.9 |
| | | | | | | | | | | | | | 354 | 5.7 | 4.70 | 0.83 | 2.30 | 8.00 | 2.5 | 1.9 |
| | 0.3 | 4.72 | | | | | | | | | 0.3 | 3.98 | 236 | 5.8 | 4.76 | 0.81 | 2.29 | 8.14 | 2.6 | 1.9 |
| | | | | | | | | | | | | | 354 | 5.7 | 4.84 | 0.85 | 2.30 | 8.03 | 2.5 | 1.9 |
| | 0.4 | 6.70 | | | | | | | | | 0.4 | 5.67 | 236 | 6.0 | 4.95 | 0.83 | 2.21 | 8.16 | 2.7 | 2.0 |
| | | | | | | | | | | | | | 354 | 5.8 | 4.89 | 0.84 | 2.23 | 8.06 | 2.6 | 2.0 |

9/5/14

# Performance Data cont.

## NVK012 - 100% Full Load

| EWT °C | Flow L/s | WPD kPa | HEATING - EAT 21.1°C Airflow L/s | HC kW | Power kW | HE kW | LAT °C | COP | HWC kW | EWT °C | Flow L/s | WPD kPa | COOLING - EAT 26.7/19.4°C Airflow L/s | TC kW | SC kW | S/T Ratio | Power kW | HR kW | EER | HWC kW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **-6.7** | 0.4 | 9.68 | Operation not recommended | | | | | | | **-6.7** | 0.3 | 7.26 | Operation not recommended | | | | | | | |
| | 0.6 | 19.67 | | | | | | | | | 0.5 | 13.76 | | | | | | | | |
| | 0.9 | 33.00 | 708 | 11.9 | 3.67 | 8.2 | 35.0 | 3.24 | 1.8 | | 0.7 | 20.25 | | | | | | | | |
| | | | 849.6 | 12.2 | 3.72 | 8.5 | 33.0 | 3.28 | 1.6 | | | | | | | | | | | |
| **-1.1** | 0.4 | 9.40 | 708 | 13.2 | 3.86 | 9.3 | 36.5 | 3.41 | 1.9 | **-1.1** | 0.3 | 7.05 | 472 | 15.4 | 10.63 | 0.69 | 1.21 | 16.62 | 12.7 | – |
| | | | 849.6 | 13.4 | 3.93 | 9.5 | 34.2 | 3.41 | 1.8 | | | | 660.8 | 15.1 | 10.64 | 0.70 | 1.35 | 16.45 | 11.2 | – |
| | 0.6 | 19.10 | 708 | 13.3 | 3.90 | 9.4 | 36.6 | 3.40 | 2.0 | | 0.5 | 13.36 | 472 | 15.4 | 10.61 | 0.69 | 1.17 | 16.57 | 13.2 | – |
| | | | 849.6 | 13.5 | 3.97 | 9.6 | 34.3 | 3.41 | 1.8 | | | | 660.8 | 14.9 | 10.92 | 0.73 | 1.41 | 16.32 | 10.6 | – |
| | 0.9 | 32.04 | 708 | 13.5 | 4.11 | 9.4 | 36.9 | 3.27 | 2.0 | | 0.7 | 19.66 | 472 | 15.4 | 10.70 | 0.69 | 1.17 | 16.62 | 13.2 | – |
| | | | 849.6 | 14.0 | 4.07 | 9.9 | 34.7 | 3.43 | 1.9 | | | | 660.8 | 15.2 | 10.81 | 0.71 | 1.32 | 16.47 | 11.5 | – |
| **4.4** | 0.4 | 9.12 | 708 | 14.6 | 3.94 | 10.6 | 38.2 | 3.70 | 2.1 | **4.4** | 0.3 | 6.84 | 472 | 15.8 | 10.89 | 0.69 | 1.40 | 17.17 | 11.3 | – |
| | | | 849.6 | 14.8 | 4.00 | 10.8 | 35.5 | 3.70 | 1.8 | | | | 660.8 | 15.7 | 11.16 | 0.71 | 1.56 | 17.29 | 10.1 | – |
| | 0.6 | 18.53 | 708 | 14.7 | 3.95 | 10.8 | 38.3 | 3.72 | 2.1 | | 0.5 | 12.96 | 472 | 15.8 | 10.89 | 0.69 | 1.35 | 17.13 | 11.7 | – |
| | | | 849.6 | 15.1 | 4.04 | 11.0 | 35.8 | 3.73 | 1.9 | | | | 660.8 | 15.6 | 11.36 | 0.73 | 1.58 | 17.22 | 9.9 | – |
| | 0.9 | 31.08 | 708 | 15.1 | 4.04 | 11.1 | 38.8 | 3.74 | 2.2 | | 0.7 | 19.07 | 472 | 15.9 | 10.95 | 0.69 | 1.35 | 17.25 | 11.8 | – |
| | | | 849.6 | 15.4 | 4.11 | 11.3 | 36.1 | 3.75 | 1.9 | | | | 660.8 | 15.8 | 11.31 | 0.71 | 1.49 | 17.32 | 10.6 | – |
| **10.0** | 0.4 | 8.84 | 708 | 17.0 | 4.04 | 13.0 | 41.0 | 4.20 | 2.2 | **10.0** | 0.3 | 6.63 | 472 | 16.6 | 11.40 | 0.69 | 1.64 | 18.26 | 10.2 | – |
| | | | 849.6 | 17.2 | 4.09 | 13.1 | 37.9 | 4.20 | 2.1 | | | | 660.8 | 16.7 | 11.84 | 0.71 | 1.83 | 18.51 | 9.1 | – |
| | 0.6 | 17.95 | 708 | 17.2 | 4.03 | 13.1 | 41.2 | 4.26 | 2.4 | | 0.5 | 12.56 | 472 | 16.7 | 11.43 | 0.69 | 1.58 | 18.24 | 10.6 | – |
| | | | 849.6 | 17.6 | 4.13 | 13.5 | 38.3 | 4.27 | 2.1 | | | | 660.8 | 16.7 | 11.96 | 0.72 | 1.80 | 18.48 | 9.3 | – |
| | 0.9 | 30.12 | 708 | 17.6 | 4.16 | 13.4 | 41.7 | 4.22 | 2.5 | | 0.7 | 18.48 | 472 | 16.8 | 11.49 | 0.68 | 1.57 | 18.40 | 10.7 | – |
| | | | 849.6 | 17.9 | 4.17 | 13.8 | 38.6 | 4.30 | 2.5 | | | | 660.8 | 16.9 | 11.96 | 0.71 | 1.71 | 18.56 | 9.9 | – |
| **15.6** | 0.4 | 8.56 | 708 | 18.5 | 3.99 | 14.5 | 42.8 | 4.64 | 2.2 | **15.6** | 0.3 | 6.42 | 472 | 15.0 | 10.71 | 0.71 | 1.88 | 16.90 | 8.0 | 0.8 |
| | | | 849.6 | 18.8 | 4.03 | 14.8 | 39.5 | 4.67 | 2.1 | | | | 660.8 | 15.4 | 11.36 | 0.74 | 2.06 | 17.42 | 7.5 | 0.8 |
| | 0.6 | 17.38 | 708 | 19.0 | 4.01 | 15.0 | 43.3 | 4.73 | 2.5 | | 0.5 | 12.16 | 472 | 15.1 | 10.75 | 0.71 | 1.81 | 16.88 | 8.3 | 0.8 |
| | | | 849.6 | 19.2 | 4.07 | 15.2 | 39.9 | 4.73 | 2.1 | | | | 660.8 | 15.4 | 11.42 | 0.74 | 2.00 | 17.44 | 7.7 | 0.8 |
| | 0.9 | 29.16 | 708 | 19.4 | 4.08 | 15.3 | 43.8 | 4.75 | 2.5 | | 0.7 | 17.89 | 472 | 15.2 | 10.82 | 0.71 | 1.80 | 17.01 | 8.5 | 0.8 |
| | | | 849.6 | 19.8 | 4.13 | 15.7 | 40.4 | 4.79 | 2.2 | | | | 660.8 | 15.5 | 11.48 | 0.74 | 1.93 | 17.44 | 8.1 | 0.9 |
| **21.1** | 0.4 | 8.27 | 708 | 19.8 | 4.02 | 15.8 | 44.3 | 4.93 | 2.4 | **21.1** | 0.3 | 6.21 | 472 | 14.3 | 10.26 | 0.72 | 2.22 | 16.52 | 6.5 | 1.0 |
| | | | 849.6 | 20.0 | 3.94 | 16.1 | 40.6 | 5.08 | 2.2 | | | | 660.8 | 14.0 | 10.08 | 0.72 | 2.52 | 16.47 | 5.5 | 1.1 |
| | 0.6 | 16.81 | 708 | 20.9 | 4.00 | 16.9 | 45.6 | 5.23 | 2.5 | | 0.5 | 11.76 | 472 | 14.4 | 10.32 | 0.72 | 2.13 | 16.51 | 6.7 | 1.1 |
| | | | 849.6 | 21.0 | 4.02 | 17.0 | 41.6 | 5.23 | 2.3 | | | | 660.8 | 15.1 | 11.14 | 0.74 | 2.30 | 17.38 | 6.6 | 1.1 |
| | 0.9 | 28.20 | 708 | 21.3 | 4.61 | 16.7 | 46.0 | 4.62 | 2.8 | | 0.7 | 17.31 | 472 | 12.9 | 8.76 | 0.68 | 2.17 | 15.07 | 5.9 | 1.1 |
| | | | 849.6 | 21.8 | 4.10 | 17.7 | 42.3 | 5.31 | 2.4 | | | | 660.8 | 15.1 | 11.25 | 0.75 | 2.23 | 17.32 | 6.8 | 1.2 |
| **26.7** | 0.4 | 7.99 | 708 | 22.0 | 4.01 | 18.0 | 46.8 | 5.48 | 2.6 | **26.7** | 0.3 | 5.99 | 472 | 13.9 | 10.31 | 0.74 | 2.56 | 16.48 | 5.4 | 1.6 |
| | | | 849.6 | 22.4 | 4.01 | 18.4 | 42.9 | 5.57 | 2.3 | | | | 660.8 | 14.3 | 11.03 | 0.77 | 2.73 | 17.02 | 5.2 | 1.6 |
| | 0.6 | 16.24 | 708 | 23.0 | 4.08 | 18.9 | 48.0 | 5.63 | 2.8 | | 0.5 | 11.36 | 472 | 14.0 | 10.39 | 0.74 | 2.46 | 16.47 | 5.7 | 1.7 |
| | | | 849.6 | 23.1 | 4.03 | 19.1 | 43.7 | 5.74 | 2.3 | | | | 660.8 | 14.4 | 11.03 | 0.76 | 2.60 | 17.04 | 5.5 | 1.7 |
| | 0.9 | 27.24 | 708 | 23.3 | 4.13 | 19.2 | 48.4 | 5.65 | 2.8 | | 0.7 | 16.72 | 472 | 14.1 | 10.49 | 0.74 | 2.42 | 16.57 | 5.8 | 1.7 |
| | | | 849.6 | 23.8 | 4.16 | 19.6 | 44.3 | 5.72 | 2.6 | | | | 660.8 | 14.5 | 11.14 | 0.77 | 2.53 | 17.03 | 5.7 | 1.7 |
| **32.2** | 0.4 | 7.71 | 708 | 23.7 | 4.04 | 19.7 | 48.9 | 5.88 | 2.8 | **32.2** | 0.3 | 5.78 | 472 | 12.5 | 9.79 | 0.78 | 2.94 | 15.46 | 4.3 | 2.0 |
| | | | 849.6 | 24.1 | 4.03 | 20.1 | 44.6 | 5.99 | 2.5 | | | | 660.8 | 12.6 | 10.30 | 0.82 | 3.12 | 15.73 | 4.0 | 1.9 |
| | 0.6 | 15.66 | 708 | 25.0 | 4.13 | 20.9 | 50.4 | 6.05 | 2.8 | | 0.5 | 10.95 | 472 | 12.6 | 9.89 | 0.78 | 2.83 | 15.44 | 4.5 | 2.1 |
| | | | 849.6 | 25.3 | 4.03 | 21.3 | 45.8 | 6.28 | 2.6 | | | | 660.8 | 12.7 | 10.30 | 0.81 | 2.95 | 15.68 | 4.3 | 2.1 |
| | 0.9 | 26.27 | 708 | 25.1 | 4.35 | 20.8 | 50.5 | 5.77 | 3.0 | | 0.7 | 16.12 | 472 | 12.7 | 9.99 | 0.78 | 2.77 | 15.51 | 4.6 | 2.1 |
| | | | 849.6 | 25.8 | 4.20 | 21.6 | 46.3 | 6.14 | 2.8 | | | | 660.8 | 12.9 | 10.40 | 0.81 | 2.86 | 15.73 | 4.5 | 2.2 |
| **37.8** | 0.4 | 7.43 | Operation not recommended | | | | | | | **37.8** | 0.3 | 5.57 | 472 | 12.4 | 9.65 | 0.78 | 3.45 | 15.87 | 3.6 | 2.6 |
| | | | | | | | | | | | | | 660.8 | 12.5 | 10.10 | 0.81 | 3.55 | 16.09 | 3.5 | 2.6 |
| | 0.6 | 15.09 | | | | | | | | | 0.5 | 10.56 | 472 | 12.5 | 9.77 | 0.78 | 3.30 | 15.84 | 3.8 | 2.7 |
| | | | | | | | | | | | | | 660.8 | 12.7 | 10.17 | 0.80 | 3.39 | 16.05 | 3.7 | 2.7 |
| | 0.9 | 25.32 | | | | | | | | | 0.7 | 15.54 | 472 | 12.7 | 9.88 | 0.78 | 3.23 | 15.89 | 3.9 | 2.9 |
| | | | | | | | | | | | | | 660.8 | 12.8 | 10.29 | 0.80 | 3.29 | 16.09 | 3.9 | 2.4 |
| **43.3** | 0.4 | 7.15 | | | | | | | | **43.3** | 0.3 | 5.36 | 472 | 11.4 | 9.28 | 0.82 | 3.93 | 15.30 | 2.9 | 3.1 |
| | | | | | | | | | | | | | 660.8 | 11.5 | 9.67 | 0.84 | 3.97 | 15.46 | 2.9 | 3.1 |
| | 0.6 | 14.52 | | | | | | | | | 0.5 | 10.16 | 472 | 11.5 | 9.42 | 0.82 | 3.77 | 15.26 | 3.1 | 3.2 |
| | | | | | | | | | | | | | 660.8 | 11.6 | 9.81 | 0.85 | 3.80 | 15.41 | 3.1 | 3.2 |
| | 0.9 | 24.36 | | | | | | | | | 0.7 | 14.95 | 472 | 11.6 | 9.54 | 0.82 | 3.67 | 15.28 | 3.2 | 3.4 |
| | | | | | | | | | | | | | 660.8 | 11.7 | 9.94 | 0.85 | 3.71 | 15.43 | 3.2 | 3.1 |
| **48.9** | 0.4 | 6.87 | | | | | | | | **48.9** | 0.3 | 5.15 | 472 | 10.6 | 8.52 | 0.80 | 4.57 | 15.15 | 2.3 | 3.7 |
| | | | | | | | | | | | | | 660.8 | 10.4 | 8.65 | 0.83 | 4.45 | 14.88 | 2.3 | 3.9 |
| | 0.6 | 13.95 | | | | | | | | | 0.5 | 9.76 | 472 | 10.7 | 8.66 | 0.81 | 4.38 | 15.08 | 2.4 | 3.9 |
| | | | | | | | | | | | | | 660.8 | 10.5 | 8.81 | 0.84 | 4.39 | 14.88 | 2.4 | 4.0 |
| | 0.9 | 23.41 | | | | | | | | | 0.7 | 14.36 | 472 | 10.7 | 8.83 | 0.82 | 4.26 | 15.00 | 2.5 | 4.1 |
| | | | | | | | | | | | | | 660.8 | 10.7 | 8.90 | 0.83 | 4.26 | 14.93 | 2.5 | 4.1 |

9/5/14

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____



# Performance Data cont.

## NVK015 - 50% Part Load

| EWT °C | Flow L/s | WPD kPa | HEATING - EAT 21.1°C Airflow L/s | HC kW | Power kW | HE kW | LAT °C | COP | HWC kW | EWT °C | Flow L/s | WPD kPa | COOLING - EAT 26.7/19.4°C Airflow L/s | TC kW | SC kW | S/T Ratio | Power kW | HR kW | EER | HWC kW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **-6.7** | 0.3 | 4.36 | Operation not recommended | | | | | | | **-6.7** | 0.3 | 2.99 | Operation not recommended | | | | | | | |
| | 0.4 | 8.07 | | | | | | | | | 0.4 | 8.39 | | | | | | | | |
| | 0.5 | 13.39 | 401.2 | 6.6 | 2.18 | 4.4 | 34.7 | 3.02 | 1.0 | | 0.5 | 12.42 | | | | | | | | |
| | | | 519.2 | 6.8 | 2.16 | 4.7 | 32.0 | 3.16 | 0.9 | | | | | | | | | | | |
| **-1.1** | 0.3 | 4.23 | 401.2 | 7.6 | 2.15 | 5.5 | 36.9 | 3.55 | 1.1 | **-1.1** | 0.3 | 2.90 | 330.4 | 10.8 | 6.28 | 0.58 | 0.74 | 11.53 | 14.5 | – |
| | | | 519.2 | 7.8 | 2.18 | 5.6 | 33.5 | 3.56 | 1.0 | | | | 448.4 | 10.4 | 6.27 | 0.60 | 0.84 | 11.28 | 12.5 | – |
| | 0.4 | 7.83 | 401.2 | 7.7 | 2.17 | 5.5 | 37.0 | 3.55 | 1.2 | | 0.4 | 8.15 | 330.4 | 10.8 | 6.27 | 0.58 | 0.72 | 11.50 | 15.0 | – |
| | | | 519.2 | 7.8 | 2.21 | 5.6 | 33.6 | 3.56 | 1.0 | | | | 448.4 | 10.4 | 6.45 | 0.62 | 0.87 | 11.31 | 12.0 | – |
| | 0.5 | 13.00 | 401.2 | 7.8 | 2.29 | 5.5 | 37.2 | 3.41 | 1.2 | | 0.5 | 12.06 | 330.4 | 11.0 | 6.63 | 0.60 | 0.71 | 11.70 | 15.5 | – |
| | | | 519.2 | 8.1 | 2.26 | 5.8 | 34.0 | 3.57 | 1.1 | | | | 448.4 | 10.6 | 6.39 | 0.60 | 0.81 | 11.42 | 13.0 | – |
| **4.4** | 0.3 | 4.10 | 401.2 | 9.1 | 2.22 | 6.8 | 39.8 | 4.08 | 1.3 | **4.4** | 0.3 | 2.81 | 330.4 | 11.0 | 6.91 | 0.63 | 0.86 | 11.91 | 12.8 | – |
| | | | 519.2 | 9.2 | 2.25 | 6.9 | 35.8 | 4.08 | 1.1 | | | | 448.4 | 11.0 | 7.08 | 0.65 | 0.97 | 11.94 | 11.3 | – |
| | 0.4 | 7.60 | 401.2 | 9.2 | 2.23 | 6.9 | 40.0 | 4.10 | 1.3 | | 0.4 | 7.90 | 330.4 | 11.1 | 6.91 | 0.63 | 0.83 | 11.89 | 13.2 | – |
| | | | 519.2 | 9.4 | 2.28 | 7.1 | 36.1 | 4.11 | 1.1 | | | | 448.4 | 11.0 | 7.21 | 0.66 | 0.98 | 11.93 | 11.2 | – |
| | 0.5 | 12.61 | 401.2 | 9.4 | 2.28 | 7.1 | 40.5 | 4.12 | 1.4 | | 0.5 | 11.70 | 330.4 | 11.2 | 7.07 | 0.63 | 0.83 | 12.02 | 13.5 | – |
| | | | 519.2 | 9.6 | 2.32 | 7.3 | 36.4 | 4.14 | 1.1 | | | | 448.4 | 11.1 | 7.18 | 0.65 | 0.92 | 12.00 | 12.0 | – |
| **10.0** | 0.3 | 3.98 | 401.2 | 10.3 | 2.34 | 8.0 | 42.4 | 4.41 | 1.4 | **10.0** | 0.3 | 2.72 | 330.4 | 11.2 | 7.34 | 0.66 | 1.02 | 12.18 | 11.0 | – |
| | | | 519.2 | 10.4 | 2.36 | 8.0 | 37.7 | 4.40 | 1.2 | | | | 448.4 | 11.2 | 7.62 | 0.68 | 1.14 | 12.34 | 9.8 | – |
| | 0.4 | 7.36 | 401.2 | 10.4 | 2.33 | 8.1 | 42.6 | 4.46 | 1.4 | | 0.4 | 7.66 | 330.4 | 11.2 | 7.36 | 0.66 | 0.98 | 12.17 | 11.4 | – |
| | | | 519.2 | 10.7 | 2.39 | 8.3 | 38.2 | 4.47 | 1.2 | | | | 448.4 | 11.2 | 7.70 | 0.69 | 1.12 | 12.32 | 10.0 | – |
| | 0.5 | 12.22 | 401.2 | 10.6 | 2.41 | 8.2 | 43.1 | 4.42 | 1.5 | | 0.5 | 11.34 | 330.4 | 11.3 | 7.39 | 0.65 | 0.98 | 12.27 | 11.6 | – |
| | | | 519.2 | 10.9 | 2.41 | 8.5 | 38.5 | 4.51 | 1.4 | | | | 448.4 | 11.3 | 7.70 | 0.68 | 1.06 | 12.38 | 10.6 | – |
| **15.6** | 0.3 | 3.85 | 401.2 | 11.5 | 2.33 | 9.2 | 44.9 | 4.94 | 1.5 | **15.6** | 0.3 | 2.64 | 330.4 | 11.0 | 7.71 | 0.70 | 1.22 | 12.24 | 9.1 | 0.4 |
| | | | 519.2 | 11.7 | 2.35 | 9.3 | 39.8 | 4.98 | 1.2 | | | | 448.4 | 11.3 | 8.18 | 0.73 | 1.33 | 12.61 | 8.5 | 0.5 |
| | 0.4 | 7.13 | 401.2 | 11.8 | 2.34 | 9.4 | 45.4 | 5.03 | 1.6 | | 0.4 | 7.41 | 330.4 | 11.1 | 7.74 | 0.70 | 1.17 | 12.23 | 9.4 | 0.5 |
| | | | 519.2 | 11.9 | 2.37 | 9.6 | 40.2 | 5.04 | 1.3 | | | | 448.4 | 11.3 | 8.22 | 0.73 | 1.29 | 12.63 | 8.7 | 0.5 |
| | 0.5 | 11.83 | 401.2 | 12.0 | 2.38 | 9.7 | 46.0 | 5.06 | 1.6 | | 0.5 | 10.98 | 330.4 | 11.2 | 7.79 | 0.70 | 1.16 | 12.33 | 9.6 | 0.5 |
| | | | 519.2 | 12.3 | 2.41 | 9.9 | 40.7 | 5.10 | 1.4 | | | | 448.4 | 11.4 | 8.26 | 0.73 | 1.25 | 12.63 | 9.1 | 0.5 |
| **21.1** | 0.3 | 3.72 | 401.2 | 12.5 | 2.33 | 10.2 | 46.9 | 5.36 | 1.6 | **21.1** | 0.3 | 2.55 | 330.4 | 10.6 | 7.72 | 0.73 | 1.39 | 12.03 | 7.7 | 0.6 |
| | | | 519.2 | 13.1 | 2.40 | 10.7 | 42.1 | 5.47 | 1.3 | | | | 448.4 | 11.4 | 8.31 | 0.73 | 1.53 | 12.94 | 7.4 | 0.7 |
| | 0.4 | 6.89 | 401.2 | 12.7 | 2.39 | 10.3 | 47.3 | 5.31 | 1.7 | | 0.4 | 7.17 | 330.4 | 10.7 | 7.77 | 0.73 | 1.33 | 12.03 | 8.0 | 0.7 |
| | | | 519.2 | 13.3 | 2.33 | 10.9 | 42.3 | 5.68 | 1.4 | | | | 448.4 | 11.2 | 8.39 | 0.75 | 1.44 | 12.66 | 7.8 | 0.7 |
| | 0.5 | 11.45 | 401.2 | 13.1 | 2.44 | 10.7 | 48.2 | 5.38 | 1.8 | | 0.5 | 10.62 | 330.4 | 10.6 | 6.76 | 0.64 | 1.37 | 11.93 | 7.7 | 0.7 |
| | | | 519.2 | 13.7 | 2.38 | 11.4 | 43.0 | 5.78 | 1.5 | | | | 448.4 | 11.2 | 8.47 | 0.75 | 1.40 | 12.62 | 8.0 | 0.7 |
| **26.7** | 0.3 | 3.60 | 401.2 | 13.7 | 2.36 | 11.4 | 49.4 | 5.81 | 1.7 | **26.7** | 0.3 | 2.46 | 330.4 | 10.4 | 7.89 | 0.76 | 1.65 | 12.06 | 6.3 | 0.9 |
| | | | 519.2 | 14.0 | 2.36 | 11.6 | 43.4 | 5.91 | 1.4 | | | | 448.4 | 10.7 | 8.43 | 0.79 | 1.76 | 12.45 | 6.1 | 0.9 |
| | 0.4 | 6.66 | 401.2 | 14.3 | 2.40 | 11.9 | 50.7 | 5.97 | 1.8 | | 0.4 | 6.93 | 330.4 | 10.5 | 7.95 | 0.76 | 1.59 | 12.06 | 6.6 | 1.0 |
| | | | 519.2 | 14.4 | 2.39 | 12.0 | 44.1 | 6.03 | 1.5 | | | | 448.4 | 10.8 | 8.43 | 0.78 | 1.68 | 12.47 | 6.4 | 1.0 |
| | 0.5 | 11.06 | 401.2 | 14.6 | 2.43 | 12.1 | 51.2 | 5.99 | 1.9 | | 0.5 | 10.26 | 330.4 | 10.6 | 8.02 | 0.76 | 1.56 | 12.14 | 6.8 | 1.0 |
| | | | 519.2 | 14.9 | 2.45 | 12.4 | 44.8 | 6.06 | 1.6 | | | | 448.4 | 10.8 | 8.52 | 0.79 | 1.63 | 12.47 | 6.7 | 1.2 |
| **32.2** | 0.3 | 3.47 | 401.2 | 14.8 | 2.41 | 12.4 | 51.6 | 6.12 | 1.8 | **32.2** | 0.3 | 2.38 | 330.4 | 10.1 | 8.11 | 0.80 | 1.97 | 12.12 | 5.1 | 1.3 |
| | | | 519.2 | 15.0 | 2.38 | 12.6 | 45.0 | 6.31 | 1.5 | | | | 448.4 | 10.2 | 8.53 | 0.83 | 2.09 | 12.31 | 4.9 | 1.3 |
| | 0.4 | 6.42 | 401.2 | 15.4 | 2.48 | 12.9 | 52.9 | 6.20 | 1.9 | | 0.4 | 6.68 | 330.4 | 10.2 | 8.19 | 0.80 | 1.89 | 12.12 | 5.4 | 1.3 |
| | | | 519.2 | 15.6 | 2.42 | 13.1 | 45.9 | 6.43 | 1.6 | | | | 448.4 | 10.3 | 8.53 | 0.83 | 1.97 | 12.30 | 5.2 | 1.3 |
| | 0.5 | 10.66 | 401.2 | 15.6 | 2.51 | 13.1 | 53.4 | 6.22 | 2.1 | | 0.5 | 9.89 | 330.4 | 10.3 | 8.27 | 0.80 | 1.86 | 12.19 | 5.6 | 1.4 |
| | | | 519.2 | 16.0 | 2.47 | 13.6 | 46.7 | 6.48 | 1.7 | | | | 448.4 | 10.4 | 8.62 | 0.83 | 1.92 | 12.35 | 5.4 | 1.4 |
| **37.8** | 0.3 | 3.34 | Operation not recommended | | | | | | | **37.8** | 0.3 | 2.29 | 330.4 | 9.2 | 7.45 | 0.81 | 2.30 | 11.49 | 4.0 | 1.6 |
| | | | | | | | | | | | | | 448.4 | 9.3 | 7.80 | 0.84 | 2.37 | 11.64 | 3.9 | 1.6 |
| | 0.4 | 6.19 | | | | | | | | | 0.4 | 6.44 | 330.4 | 9.3 | 7.54 | 0.81 | 2.21 | 11.47 | 4.2 | 1.6 |
| | | | | | | | | | | | | | 448.4 | 9.4 | 7.86 | 0.84 | 2.26 | 11.62 | 4.1 | 1.6 |
| | 0.5 | 10.28 | | | | | | | | | 0.5 | 9.53 | 330.4 | 9.4 | 7.63 | 0.82 | 2.16 | 11.52 | 4.3 | 1.7 |
| | | | | | | | | | | | | | 448.4 | 9.5 | 7.95 | 0.84 | 2.20 | 11.66 | 4.3 | 1.7 |
| **43.3** | 0.3 | 3.22 | | | | | | | | **43.3** | 0.3 | 2.20 | 330.4 | 7.8 | 6.55 | 0.83 | 2.50 | 10.35 | 3.1 | 1.8 |
| | | | | | | | | | | | | | 448.4 | 7.9 | 6.82 | 0.86 | 2.53 | 10.45 | 3.1 | 1.8 |
| | 0.4 | 5.96 | | | | | | | | | 0.4 | 6.19 | 330.4 | 7.9 | 6.64 | 0.84 | 2.40 | 10.33 | 3.3 | 2.0 |
| | | | | | | | | | | | | | 448.4 | 8.0 | 6.92 | 0.86 | 2.42 | 10.43 | 3.3 | 2.0 |
| | 0.5 | 9.89 | | | | | | | | | 0.5 | 9.17 | 330.4 | 8.0 | 6.72 | 0.84 | 2.34 | 10.35 | 3.4 | 2.1 |
| | | | | | | | | | | | | | 448.4 | 8.1 | 7.00 | 0.87 | 2.36 | 10.45 | 3.4 | 2.1 |
| **48.9** | 0.3 | 3.09 | | | | | | | | **48.9** | 0.3 | 2.12 | 330.4 | 7.4 | 6.42 | 0.87 | 2.99 | 10.35 | 2.5 | 2.4 |
| | | | | | | | | | | | | | 448.4 | 7.2 | 6.50 | 0.91 | 2.94 | 10.10 | 2.4 | 2.4 |
| | 0.4 | 5.72 | | | | | | | | | 0.4 | 5.95 | 330.4 | 7.4 | 6.53 | 0.88 | 2.87 | 10.30 | 2.6 | 2.5 |
| | | | | | | | | | | | | | 448.4 | 7.3 | 6.64 | 0.91 | 2.87 | 10.16 | 2.5 | 2.5 |
| | 0.5 | 9.50 | | | | | | | | | 0.5 | 8.81 | 330.4 | 7.6 | 6.98 | 0.92 | 2.74 | 10.32 | 2.8 | 2.5 |
| | | | | | | | | | | | | | 448.4 | 7.4 | 6.71 | 0.91 | 2.79 | 10.21 | 2.7 | 2.5 |

9/5/14

# Performance Data cont.

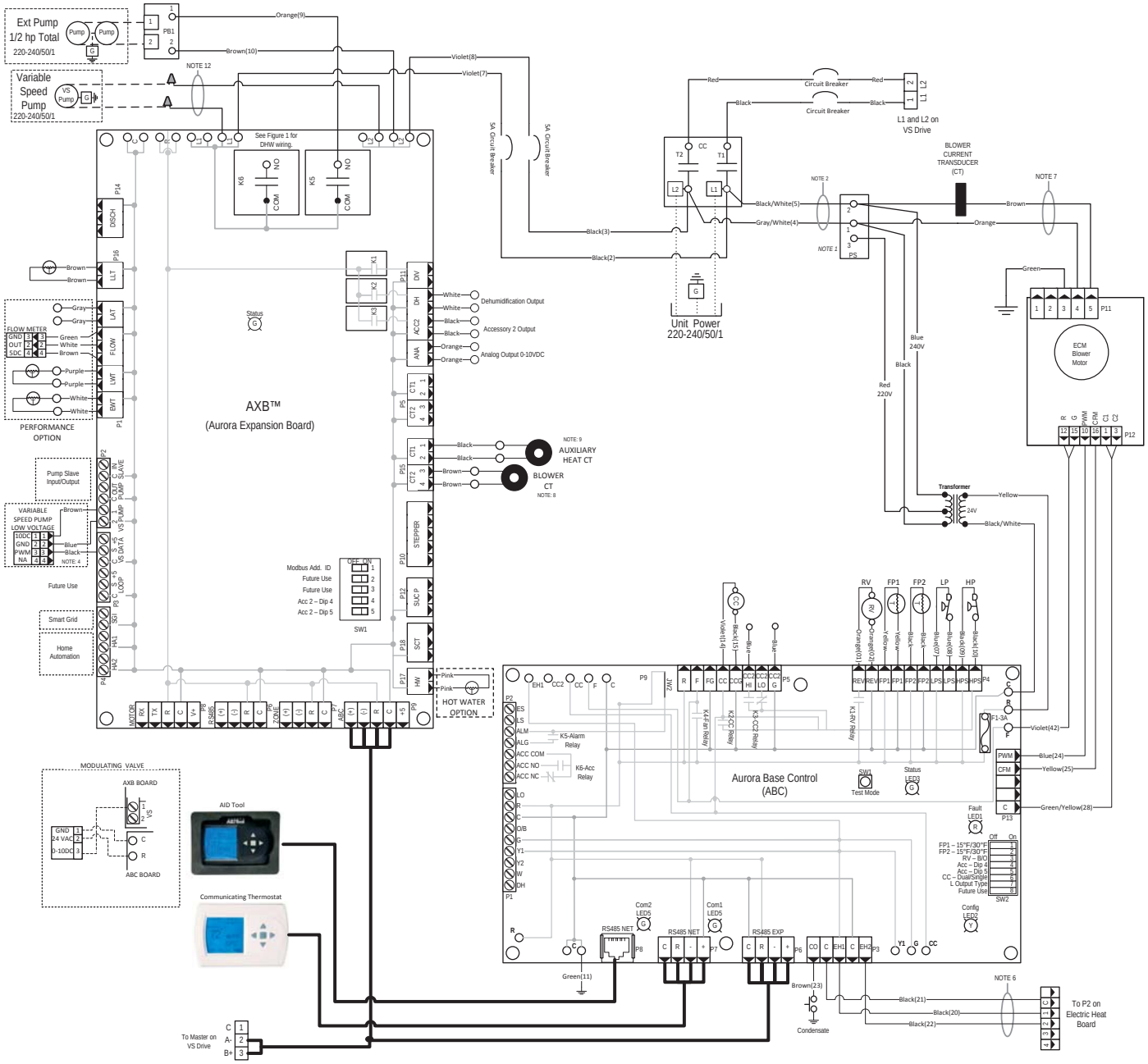
## NVK015 - 100% Full Load

| EWT °C | Flow L/s | WPD kPa | HEATING - EAT 21.1°C | | | | | | | EWT °C | Flow L/s | WPD kPa | COOLING - EAT 26.7/19.4°C | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Airflow L/s | HC kW | Power kW | HE kW | LAT °C | COP | HWC kW | | | | Airflow L/s | TC kW | SC kW | S/T Ratio | Power kW | HR kW | EER | HWC kW |
| -6.7 | 0.5 | 13.79 | Operation not recommended | | | | | | | -6.7 | 0.4 | 8.31 | Operation not recommended | | | | | | | |
| | 0.8 | 24.27 | | | | | | | | | 0.6 | 18.64 | | | | | | | | |
| | 1.1 | 45.18 | 849.6 | 15.1 | 5.23 | 9.8 | 35.8 | 2.88 | 2.4 | | 0.9 | 28.96 | | | | | | | | |
| | | | 1038.4 | 15.4 | 5.27 | 10.1 | 33.4 | 2.91 | 2.2 | | | | | | | | | | | |
| -1.1 | 0.5 | 13.44 | 849.6 | 16.6 | 5.07 | 11.6 | 37.3 | 3.28 | 2.5 | -1.1 | 0.4 | 8.07 | 708 | 20.4 | 13.59 | 0.67 | 1.86 | 22.24 | 11.0 | – |
| | | | 1038.4 | 17.0 | 5.16 | 11.8 | 34.6 | 3.29 | 2.3 | | | | 849.6 | 20.0 | 13.61 | 0.68 | 2.08 | 22.05 | 9.6 | – |
| | 0.8 | 23.57 | 849.6 | 16.8 | 5.12 | 11.7 | 37.5 | 3.28 | 2.5 | | 0.6 | 18.09 | 708 | 20.4 | 13.57 | 0.67 | 1.80 | 22.17 | 11.3 | – |
| | | | 1038.4 | 17.1 | 5.21 | 11.9 | 34.8 | 3.28 | 2.3 | | | | 849.6 | 19.7 | 13.97 | 0.71 | 2.18 | 21.90 | 9.1 | – |
| | 1.1 | 43.87 | 849.6 | 17.0 | 5.40 | 11.6 | 37.7 | 3.15 | 2.6 | | 0.9 | 28.12 | 708 | 20.4 | 13.69 | 0.67 | 1.81 | 22.24 | 11.3 | – |
| | | | 1038.4 | 17.6 | 5.35 | 12.3 | 35.2 | 3.30 | 2.3 | | | | 849.6 | 20.0 | 13.83 | 0.69 | 2.04 | 22.08 | 9.8 | – |
| 4.4 | 0.5 | 13.10 | 849.6 | 19.0 | 5.16 | 13.8 | 39.6 | 3.68 | 2.6 | 4.4 | 0.4 | 7.83 | 708 | 20.1 | 13.63 | 0.68 | 2.08 | 22.18 | 9.6 | – |
| | | | 1038.4 | 19.3 | 5.24 | 14.0 | 36.5 | 3.68 | 2.4 | | | | 849.6 | 20.0 | 13.96 | 0.70 | 2.33 | 22.37 | 8.6 | – |
| | 0.8 | 22.86 | 849.6 | 19.2 | 5.18 | 14.0 | 39.8 | 3.70 | 2.7 | | 0.6 | 17.55 | 708 | 20.1 | 13.63 | 0.68 | 2.01 | 22.13 | 10.0 | – |
| | | | 1038.4 | 19.6 | 5.29 | 14.3 | 36.8 | 3.71 | 2.5 | | | | 849.6 | 19.9 | 14.22 | 0.71 | 2.35 | 22.29 | 8.5 | – |
| | 1.1 | 42.55 | 849.6 | 19.7 | 5.30 | 14.4 | 40.3 | 3.72 | 2.8 | | 0.9 | 27.28 | 708 | 20.3 | 13.71 | 0.68 | 2.01 | 22.28 | 10.1 | – |
| | | | 1038.4 | 20.1 | 5.38 | 14.7 | 37.1 | 3.73 | 2.5 | | | | 849.6 | 20.2 | 14.16 | 0.70 | 2.23 | 22.39 | 9.1 | – |
| 10.0 | 0.5 | 12.76 | 849.6 | 21.2 | 5.28 | 15.9 | 41.7 | 4.01 | 2.8 | 10.0 | 0.4 | 7.59 | 708 | 20.1 | 13.78 | 0.69 | 2.36 | 22.46 | 8.5 | – |
| | | | 1038.4 | 21.4 | 5.34 | 16.0 | 38.2 | 4.00 | 2.5 | | | | 849.6 | 20.2 | 14.30 | 0.71 | 2.64 | 22.80 | 7.6 | – |
| | 0.8 | 22.16 | 849.6 | 21.4 | 5.27 | 16.1 | 42.0 | 4.06 | 2.9 | | 0.6 | 17.01 | 708 | 20.1 | 13.81 | 0.69 | 2.27 | 22.41 | 8.9 | – |
| | | | 1038.4 | 21.9 | 5.39 | 16.5 | 38.6 | 4.07 | 2.6 | | | | 849.6 | 20.2 | 14.45 | 0.72 | 2.59 | 22.75 | 7.8 | – |
| | 1.1 | 41.24 | 849.6 | 21.9 | 5.44 | 16.4 | 42.4 | 4.02 | 3.0 | | 0.9 | 26.44 | 708 | 20.3 | 13.88 | 0.68 | 2.26 | 22.60 | 9.0 | – |
| | | | 1038.4 | 22.3 | 5.45 | 16.9 | 38.9 | 4.10 | 2.7 | | | | 849.6 | 20.4 | 14.45 | 0.71 | 2.46 | 22.83 | 8.3 | – |
| 15.6 | 0.5 | 12.41 | 849.6 | 23.7 | 5.43 | 18.3 | 44.2 | 4.37 | 2.9 | 15.6 | 0.4 | 7.34 | 708 | 18.7 | 13.24 | 0.71 | 2.68 | 21.36 | 7.0 | 0.9 |
| | | | 1038.4 | 24.1 | 5.47 | 18.6 | 40.3 | 4.40 | 2.6 | | | | 849.6 | 19.1 | 14.06 | 0.74 | 2.93 | 22.05 | 6.5 | 0.9 |
| | 0.8 | 21.45 | 849.6 | 24.3 | 5.45 | 18.8 | 44.8 | 4.45 | 3.1 | | 0.6 | 16.47 | 708 | 18.8 | 13.30 | 0.71 | 2.58 | 21.33 | 7.3 | 0.8 |
| | | | 1038.4 | 24.6 | 5.53 | 19.1 | 40.7 | 4.45 | 2.8 | | | | 849.6 | 19.2 | 14.13 | 0.74 | 2.85 | 22.06 | 6.7 | 0.9 |
| | 1.1 | 39.92 | 849.6 | 24.8 | 5.55 | 19.2 | 45.3 | 4.47 | 3.2 | | 0.9 | 25.59 | 708 | 18.9 | 13.38 | 0.71 | 2.55 | 21.49 | 7.4 | 0.8 |
| | | | 1038.4 | 25.3 | 5.61 | 19.7 | 41.3 | 4.51 | 2.9 | | | | 849.6 | 19.3 | 14.20 | 0.74 | 2.74 | 22.05 | 7.1 | 0.8 |
| 21.1 | 0.5 | 12.07 | 849.6 | 25.9 | 5.68 | 20.2 | 46.4 | 4.56 | 3.1 | 21.1 | 0.4 | 7.10 | 708 | 17.6 | 12.93 | 0.73 | 3.03 | 20.67 | 5.8 | 1.4 |
| | | | 1038.4 | 26.4 | 5.63 | 20.7 | 42.1 | 4.68 | 2.8 | | | | 849.6 | 18.4 | 13.83 | 0.75 | 3.41 | 21.80 | 5.4 | 1.4 |
| | 0.8 | 20.74 | 849.6 | 27.3 | 5.65 | 21.7 | 47.7 | 4.83 | 3.3 | | 0.6 | 15.93 | 708 | 17.7 | 13.01 | 0.73 | 2.91 | 20.64 | 6.1 | 1.3 |
| | | | 1038.4 | 27.4 | 5.68 | 21.8 | 43.0 | 4.83 | 2.9 | | | | 849.6 | 18.6 | 14.04 | 0.75 | 3.14 | 21.75 | 5.9 | 1.3 |
| | 1.1 | 38.61 | 849.6 | 27.8 | 5.91 | 21.9 | 48.2 | 4.71 | 3.5 | | 0.9 | 24.75 | 708 | 18.2 | 12.91 | 0.71 | 2.86 | 21.08 | 6.4 | 1.2 |
| | | | 1038.4 | 28.5 | 5.80 | 22.7 | 43.8 | 4.91 | 3.1 | | | | 849.6 | 18.6 | 14.18 | 0.76 | 3.04 | 21.65 | 6.1 | 1.2 |
| 26.7 | 0.5 | 11.55 | 849.6 | 28.6 | 5.74 | 22.9 | 49.0 | 4.98 | 3.4 | 26.7 | 0.4 | 6.86 | 708 | 17.0 | 12.77 | 0.75 | 3.48 | 20.51 | 4.9 | 1.8 |
| | | | 1038.4 | 29.1 | 5.75 | 23.4 | 44.4 | 5.06 | 2.9 | | | | 849.6 | 17.5 | 13.65 | 0.78 | 3.71 | 21.19 | 4.7 | 1.8 |
| | 0.8 | 20.04 | 849.6 | 29.9 | 5.84 | 24.1 | 50.3 | 5.12 | 3.6 | | 0.6 | 15.39 | 708 | 17.1 | 12.87 | 0.75 | 3.34 | 20.48 | 5.1 | 1.7 |
| | | | 1038.4 | 30.2 | 5.78 | 24.4 | 45.2 | 5.21 | 3.1 | | | | 849.6 | 17.7 | 13.65 | 0.77 | 3.53 | 21.19 | 5.0 | 1.7 |
| | 1.1 | 37.30 | 849.6 | 30.4 | 6.02 | 24.4 | 50.7 | 5.04 | 3.7 | | 0.9 | 23.91 | 708 | 17.3 | 12.98 | 0.75 | 3.29 | 20.60 | 5.3 | 1.6 |
| | | | 1038.4 | 31.0 | 5.96 | 25.0 | 45.8 | 5.19 | 3.3 | | | | 849.6 | 17.7 | 13.79 | 0.78 | 3.43 | 21.17 | 5.2 | 1.6 |
| 32.2 | 0.5 | 11.03 | 849.6 | 31.2 | 5.99 | 25.2 | 51.5 | 5.20 | 3.4 | 32.2 | 0.4 | 6.62 | 708 | 15.9 | 12.38 | 0.78 | 3.98 | 19.84 | 4.0 | 2.4 |
| | | | 1038.4 | 31.7 | 5.93 | 25.7 | 46.4 | 5.34 | 3.0 | | | | 849.6 | 16.0 | 13.03 | 0.82 | 4.22 | 20.19 | 3.8 | 2.4 |
| | 0.8 | 19.32 | 849.6 | 32.8 | 6.08 | 26.7 | 53.1 | 5.40 | 3.7 | | 0.6 | 14.84 | 708 | 16.0 | 12.51 | 0.78 | 3.83 | 19.80 | 4.2 | 2.3 |
| | | | 1038.4 | 33.2 | 5.93 | 27.3 | 47.6 | 5.60 | 3.3 | | | | 849.6 | 16.1 | 13.03 | 0.81 | 3.99 | 20.12 | 4.0 | 2.3 |
| | 1.1 | 35.97 | 849.6 | 33.0 | 6.40 | 26.6 | 53.3 | 5.15 | 3.9 | | 0.9 | 23.06 | 708 | 16.1 | 12.63 | 0.78 | 3.75 | 19.89 | 4.3 | 2.1 |
| | | | 1038.4 | 33.8 | 6.18 | 27.7 | 48.1 | 5.48 | 3.5 | | | | 849.6 | 16.3 | 13.16 | 0.81 | 3.87 | 20.17 | 4.2 | 2.2 |
| 37.8 | 0.5 | 10.69 | Operation not recommended | | | | | | | 37.8 | 0.4 | 6.38 | 708 | 15.0 | 12.13 | 0.81 | 4.50 | 19.52 | 3.3 | 3.0 |
| | | | | | | | | | | | | | 849.6 | 15.2 | 12.70 | 0.84 | 4.64 | 19.79 | 3.3 | 3.0 |
| | 0.8 | 18.63 | | | | | | | | | 0.6 | 14.30 | 708 | 15.2 | 12.28 | 0.81 | 4.31 | 19.47 | 3.5 | 2.8 |
| | | | | | | | | | | | | | 849.6 | 15.3 | 12.79 | 0.84 | 4.42 | 19.73 | 3.5 | 2.9 |
| | 1.1 | 34.67 | | | | | | | | | 0.9 | 22.23 | 708 | 15.3 | 12.42 | 0.81 | 4.22 | 19.53 | 3.6 | 2.7 |
| | | | | | | | | | | | | | 849.6 | 15.5 | 12.94 | 0.84 | 4.30 | 19.76 | 3.6 | 2.7 |
| 43.3 | 0.5 | 10.34 | | | | | | | | 43.3 | 0.4 | 6.14 | 708 | 13.6 | 11.42 | 0.84 | 5.06 | 18.65 | 2.7 | 3.8 |
| | | | | | | | | | | | | | 849.6 | 13.7 | 11.90 | 0.87 | 5.11 | 18.84 | 2.7 | 3.8 |
| | 0.8 | 17.92 | | | | | | | | | 0.6 | 13.76 | 708 | 13.7 | 11.59 | 0.84 | 4.85 | 18.58 | 2.8 | 3.6 |
| | | | | | | | | | | | | | 849.6 | 13.9 | 12.07 | 0.87 | 4.89 | 18.76 | 2.8 | 3.6 |
| | 1.1 | 33.36 | | | | | | | | | 0.9 | 21.38 | 708 | 13.9 | 11.73 | 0.85 | 4.73 | 18.60 | 2.9 | 3.4 |
| | | | | | | | | | | | | | 849.6 | 14.0 | 12.22 | 0.87 | 4.77 | 18.78 | 2.9 | 3.4 |
| 48.9 | 0.5 | 9.65 | | | | | | | | 48.9 | 0.4 | 5.89 | 708 | 12.6 | 11.31 | 0.90 | 5.75 | 18.31 | 2.2 | 4.7 |
| | | | | | | | | | | | | | 849.6 | 12.4 | 11.48 | 0.93 | 5.60 | 17.97 | 2.2 | 4.7 |
| | 0.8 | 17.22 | | | | | | | | | 0.6 | 13.22 | 708 | 12.7 | 11.49 | 0.90 | 5.51 | 18.21 | 2.3 | 4.5 |
| | | | | | | | | | | | | | 849.6 | 12.4 | 11.69 | 0.94 | 5.52 | 17.97 | 2.3 | 4.5 |
| | 1.1 | 32.05 | | | | | | | | | 0.9 | 20.54 | 708 | 12.7 | 11.72 | 0.92 | 5.36 | 18.10 | 2.4 | 4.2 |
| | | | | | | | | | | | | | 849.6 | 12.7 | 11.81 | 0.93 | 5.36 | 18.02 | 2.4 | 4.2 |

9/5/14

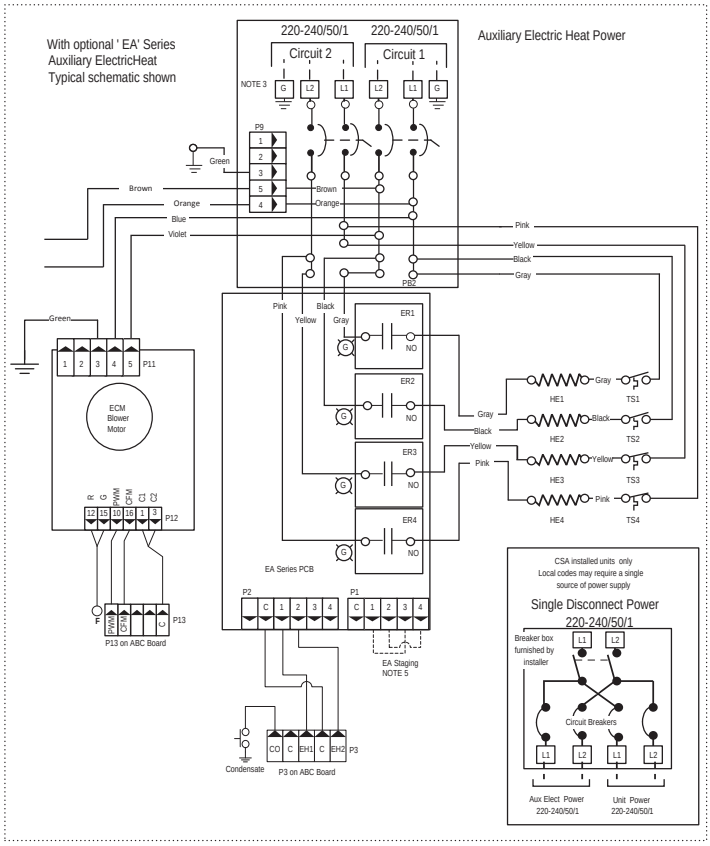
# Wiring Schematics

## Aurora Variable Speed



# Wiring Schematics cont.

## Aurora Variable Speed cont.



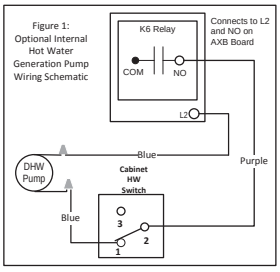




Figure 1:
Optional Internal
Hot Water
Generation Pump
Wiring Schematic

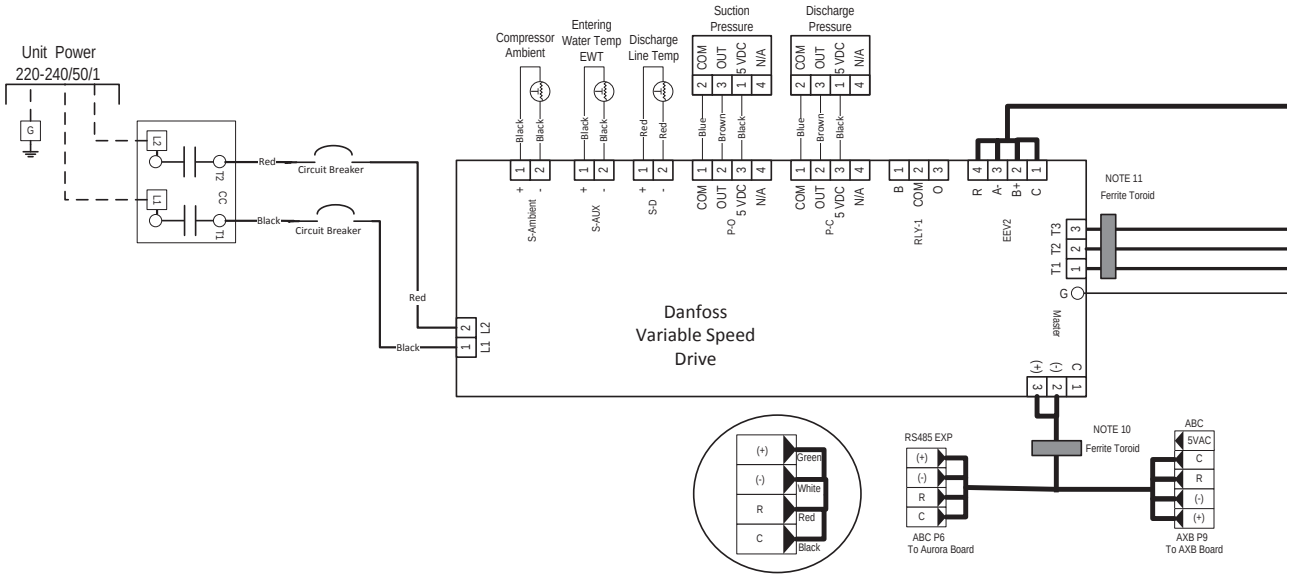
### Notes

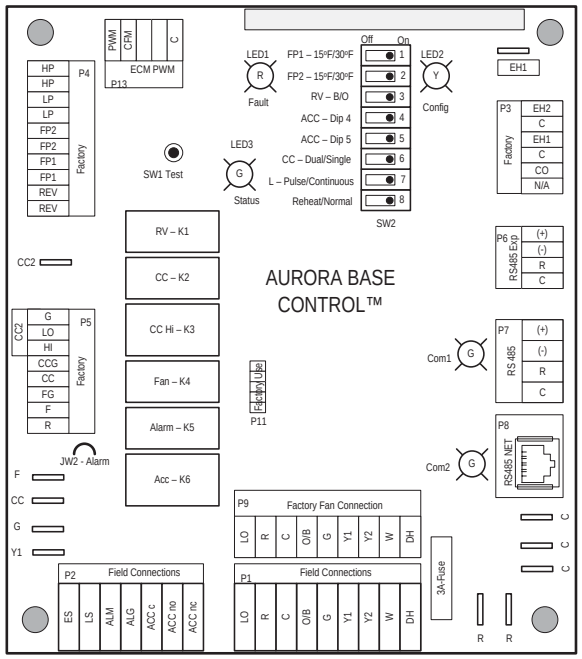
1 - Switch blue and red wires for 220V operation.
2 - The blk/wh and gray/wh wires are removed when Aux Heat is installed
3 - Use manufacturer's part number 19P592-01 (jumper bar assembly) when single source power is required.
4 – Variable speed pump low voltage harness provided with Variable Speed Flow Center.
5 - For additional Auxiliary Heat staging place jumpers as shown.
6 - Wires provided for Auxiliary Heat low voltage control. Wires are secured at blower.
7 – When Auxiliary Heat is field installed the harness will then be connected to the auxiliary heat unit. The auxiliary heat unit will then power the blower. Refer to EAS/EAM/EAL Auxiliary Heat kit installation instructions.
8 – Brown blower power wire routed through Current Transducer two times.
9 – Field Connected: Refer to Installation Manual and Auxiliary Heat Instructions for Current Transducer installation.
10 – Communication cable routed through Ferrite Toroid four times.
11 – Compressor power cable routed through Ferrite Toroid three times.
12 – Variable speed pump power wires to connect the pump to L1 and L2 on the AXB board are provided with Variable Speed Flow Center.

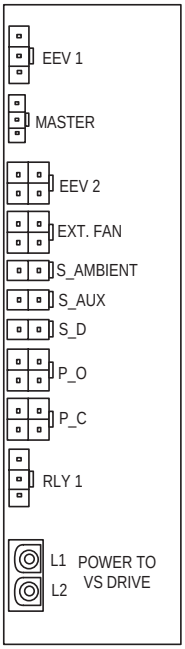
97P842-11A 02/15/13

# Wiring Schematics cont.

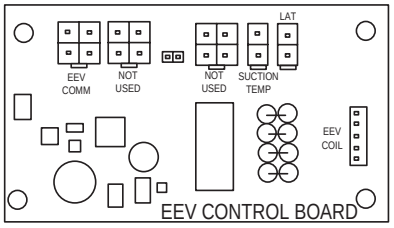
## Aurora Variable Speed Drive/EEV Wiring

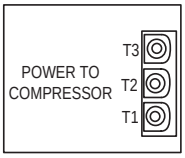


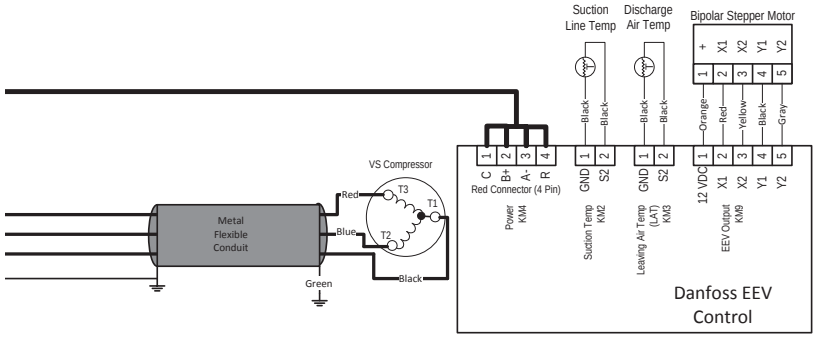

VARIABLE SPEED
DRIVE END VIEWS

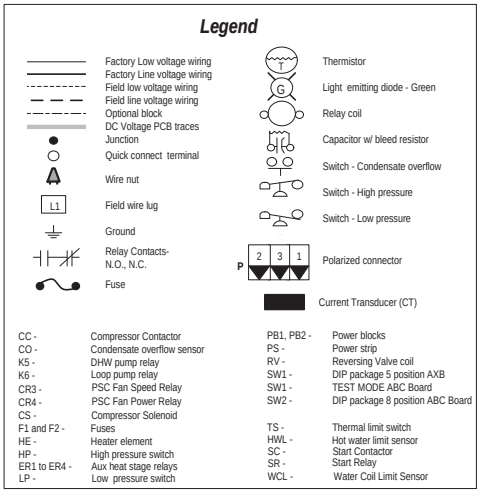


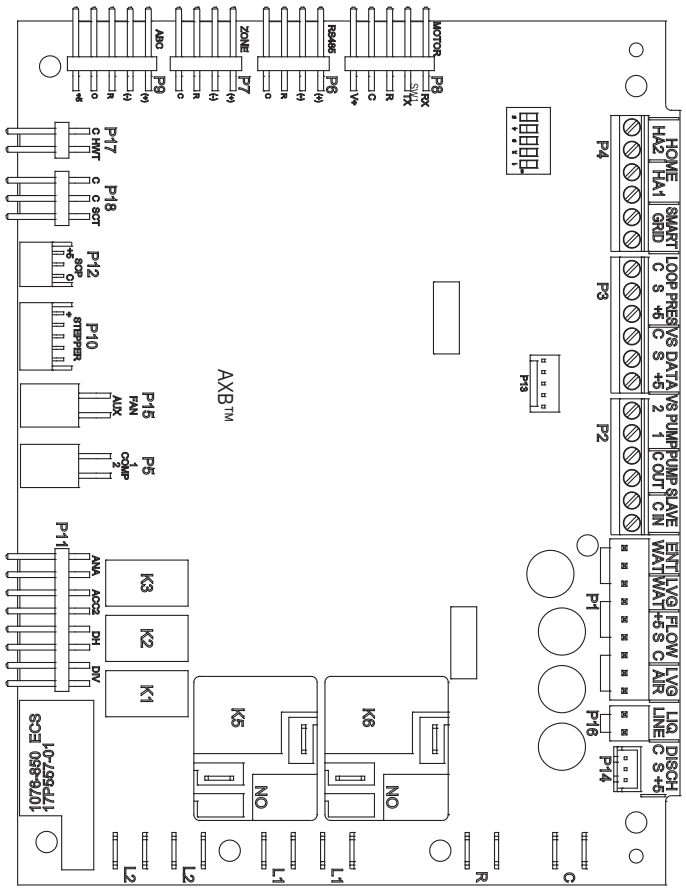



# Wiring Schematics cont.

## Aurora Variable Speed Drive/EEV Wiring cont.




| Aurora LED Flash Codes | | | |
|---|---|---|---|
| Slow Flash | 1 second on and 1 second off | | |
| Fast Flash | 100 milliseconds on and 100 milliseconds off | | |
| Flash Code | 100 milliseconds on and 400 milliseconds off with a 2 second pause before repeating | | |
| **Fault LED (LED 1, Red)** | | **Random Start Delay (Alternating Colors)** | |
| Normal Mode | OFF | Status LED (LED1, Green) | Fast Flash |
| Input Fault Lockout | Flash Code 1 | Configuration LED (LED 2, Yellow) | Fast Flash |
| High Pressure Lockout | Flash Code 2 | Fault LED (LED 3, Red) | Fast Flash |
| Low Pressure Lockout | Flash Code 3 | **Configuration LED (LED 2, Yellow)** | |
| Freeze Detection- FP2 | Flash Code 4 | No Software Overide | OFF |
| Freeze Detection - FP1 | Flash Code 5 | DIP Switch Overide | Slow Flash |
| Reserved | Flash Code 6 | **Status LED (LED 3, Green)** | |
| Condensate Overflow Lockout | Flash Code 7 | Normal Mode | ON |
| Over/Under Voltage Shutdown | Flash Code 8 | Control is Non - Functional | OFF |
| Future Use | Flash Code 9 | Test Mode | Slow Flash |
| Compressor Monitoring | Flash Code 10 | Lockout Active | Fast Flash |
| Fault- FP1 and FP2 Sensor Error | Flash Code 11 | Dehumidification Mode | Flash Code 2 |
| Future Use | Flash Code 12 | Future Use | Flash Code 3 |
| Non-Critical AXB Sensor Error | Flash Code 13 | Future Use | Flash Code 4 |
| Critical AXB Sensor Error | Flash Code 14 | Load Shed | Flash Code 5 |
| Alarm - Hot Water | Flash Code 15 | ESD | Flash Code 6 |
| Fault Variable Speed Pump | Flash Code 16 | Future Use | Flash Code 7 |
| Future Use | Flash Code 17 | **Fault LED (LED 1, Red) Cont.** | |
| Non-Critical Communication Error | Flash Code 18 | Safe Mode - Ambient Temperature Sensor | Flash Code 49 |
| Fault - Critical Communication Error | Flash Code 19 | Fault - Discharge Temperature Sensor | Flash Code 51 |
| Alarm - Low Loop Pressure | Flash Code 21 | Fault - Suction Pressure Sensor | Flash Code 52 |
| Fault - Communication ECM Fan Motor Error | Flash Code 22 | Fault - Condensing Pressure Sensor | Flash Code 53 |
| Alarm - Home Automation 1 | Flash Code 23 | Fault - Low Supply Voltage | Flash Code 54 |
| Alarm - Home Automation 2 | Flash Code 24 | Fault - Compressor Out of Envelope | Flash Code 55 |
| Fault - EEV Error | Flash Code 25 | Fault - Over Current | Flash Code 56 |
| Derate - Drive Temperature | Flash Code 41 | Fault - Over/Under Voltage | Flash Code 57 |
| Derate - High Discharge Temperature | Flash Code 42 | Fault - High Drive Temperature | Flash Code 58 |
| Derate - Low Suction Temperature | Flash Code 43 | Fault - Drive Internal Error MOC/AOC | Flash Code 59 |
| Derate - Low Condensing Pressure | Flash Code 44 | Fault - Multiple Safe Modes | Flash Code 61 |
| Derate - High Condensing Pressure | Flash Code 45 | Fault - Loss of Charge | Flash Code 71 |
| Derate - Outer Power Limit | Flash Code 46 | Safe Mode - Suction Temperature Sensor | Flash Code 72 |
| Safe Mode - EEV (Indoor) Communication | Flash Code 47 | Safe Mode - LAT Temperature Sensor | Flash Code 73 |
| Safe Mode - EEV (Outdoor) Communication | Flash Code 48 | Safe Mode - Max Operating Pressure | Flash Code 74 |

| AXB Accessory 2 DIP Settings | | |
|---|---|---|
| **SW1-4** | **SW1-5** | **DESCRIPTION** |
| ON | ON | Cycles with Blower |
| OFF | ON | Cycles with CC first stage compressor or compressor spd 1-12 |
| ON | OFF | Cycles with CC2 second stage of compressor or comp spd 7-12 |
| OFF | OFF | Cycles with DH from ABC board |

| ABC SW2 Accessory Relay | | |
|---|---|---|
| **DESCRIPTION** | **SW2-4** | **SW2-5** |
| Cycle with Blower | ON | ON |
| Cycle with Compressor | OFF | OFF |
| Water Valve Slow Opening | ON | OFF |
| Cycle with Comm. T-stat Hum Cmd | OFF | ON |

97P842-11B 2/15/13

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____



# Engineering Guide Specifications

## General

Furnish and install WaterFurnace Water Source Heat Pumps as indicated on the plans. Equipment shall be completely assembled, piped and internally wired. Capacities and characteristics as listed in the schedule and the specifications that follow. The reverse cycle heating/cooling units shall be either suspended type with horizontal air inlet and discharge or floor mounted type with horizontal air inlet and vertical upflow air discharge. Each unit shall be computer run-tested at the factory with conditioned water and operation verified to catalog data. Each unit shall be mounted on a pallet and shipped in a corrugated box or stretch-wrapped. The units shall be designed to operate with entering liquid temperature between -6.7°C and 48.9°C.

## Casing and Cabinet

The cabinet shall be fabricated from heavy-gauge galvanized steel and finished with optional corrosion-resistant powder coating. This corrosion protection system shall meet the stringent 1000 hour salt spray test per ASTM B117. The interior shall be insulated with 12.7 mm thick, multi-density, cleanable aluminum foil coated glass fiber with edges sealed or tucked under flanges to prevent the introduction of glass fibers into the discharge air. Standard cabinet panel insulation must meet NFPA 90A requirements, air erosion and mold growth limits of UL-181, stringent fungal resistance test per ASTM-C1071 and ASTM G21, and shall meet zero level bacteria growth per ASTM G22. Unit insulation must meet these stringent requirements or unit(s) will not be accepted.

One (horizontal) to two (vertical) blower and two compressor compartment access panels shall be 'lift-out' removable with supply and return ductwork in place.

A duct collar shall be provided on the supply air opening. Standard size 25.4mm MERV 4 filters shall be provided with each unit. Units shall have a return air filter rack that is field convertible from 25.4mm to 50.8mm. The units shall have an insulated divider panel between the air handling section and the compressor section to minimize the transmission of compressor noise. Vertical units shall be supplied with left or right horizontal air inlet and top vertical air discharge. Horizontal units shall be supplied with left or right air inlet and side or end air discharge.

The compressor shall be double isolation mounted using selected durometer grommets to provide vibration free compressor mounting. The compressor mounting bracket shall be acoustically deadened galvanized steel to prevent vibration transmission to the cabinet.

***Option: AlpinePure MERV 13 filter -*** A 50.8mm thick MERV 13 filter can help fulfill a credit under the LEED Rating System. Its low initial resistance promotes low energy consumption (52.3 Pa @ 1.5 m/s) and provides nearly twice the life of a standard filter (1.5 m/s vs. standard 2.54 m/s application).

## Refrigerant Circuit

All units shall utilize the non-ozone depleting and low global warming potential refrigerant R-410A. All units shall contain a sealed refrigerant circuit including a hermetic motor-compressor, bidirectional thermostatic expansion valve, finned tube air-to-refrigerant heat exchanger, reversing valve, coaxial tube water-to-refrigerant heat exchanger, optional hot water generator coil, and service ports.

Compressors shall be high-efficiency single speed rotary or scroll type designed for heat pump duty and mounted on vibration isolators. The compressor shall be double isolation mounted using selected durometer grommets to provide vibration free compressor mounting.

***Option: FormiShield electro-coated air coil*** for maximum protection against formicary corrosion.

The coaxial water-to-refrigerant heat exchanger shall be designed for low water pressure drop and constructed of a convoluted copper (cupronickel option) inner tube and a steel outer tube. Refrigerant to air heat exchangers shall utilize enhanced corrugated lanced aluminum fins and rifled copper tube construction rated to withstand 4135 kPa refrigerant working pressure. Refrigerant to water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 4135 kPa working refrigerant pressure and 3101 kPa working water pressure.

The thermostatic expansion valve shall provide proper superheat over the entire liquid temperature range with minimal "hunting." The valve shall operate bidirectionally without the use of check valves.

***Option: Cupronickel refrigerant to water heat exchanger*** shall be of copper-nickel inner water tube and steel refrigerant outer tube design, rated to withstand 4135 kPa working refrigerant pressure and 3101 kPa working water pressure. Water lines shall also be of cupronickel construction.

***Option: Hot water generator*** - Internal double wall vented hot water generator coil refrigerant to water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 4135 kPa working refrigerant pressure and 3101 kPa working water pressure.

# Engineering Guide Specifications cont.

## Blower Motor and Assembly

The blower shall be a direct drive centrifugal type with a dynamically balanced wheel. The housing and wheel shall be designed for quiet low outlet velocity operation. The blower housing shall be removable from the unit without disconnecting the supply air ductwork for servicing of the blower motor. The blower motor shall be isolated from the housing by rubber grommets. The motor shall be permanently lubricated and have thermostatic overload protection.

## Electrical

A control box shall be located within the unit compressor compartment and shall contain a 50VA or 75VA transformer, 24 volt activated, 2 pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation. Electromechanical operation WILL NOT be accepted. Units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be 24 volt and provide heating or cooling as required by the remote thermostat/sensor.

An Aurora microprocessor-based controller that interfaces with a multi-stage electronic thermostat to monitor and control unit operation shall be provided. The control shall provide operational sequencing, blower speed control, high and low pressure switch monitoring, freeze detection, condensate overflow sensing, lockout mode control, LED status and fault indicators, fault memory, field selectable options and accessory output. The control shall provide fault retry three times before locking out to limit nuisance trips.

A detachable terminal block with screw terminals will be provided for field control wiring. All units shall have knockouts for entrance of low and line voltage wiring. The blower motor and control box shall be harness plug wired for easy removal.

## Piping

Supply and return water connections shall be FPT copper fittings fixed to the corner post, which eliminate the need for backup pipe wrenches.

With vertical units, the condensate connection shall be a 19.1 mm PVC socket with internally-trapped hose that can be routed to front or side corner post locations.

## Hanger Kit

**(included with horizontal units only - field installed)**
The hanger kit shall consist of galvanized steel brackets, bolts, lock washers, and isolators and shall be designed to fasten to the unit bottom panel for suspension from 3/8 in. threaded rods. Unit sizes 005-015 shall require four brackets and unit size 017 shall require five brackets. Brackets shall not inhibit filter removal in any way.

## Options and Accessories

### Cupronickel Heat Exchanger

An optional cupronickel water-to-refrigerant heat exchanger shall be provided.

### Hot Water Generator

An optional ThermaShield coated heat reclaiming hot water generator coil of vented double-wall copper construction suitable for potable water shall be provided. The coil and hot water circulating pump shall be factory mounted inside the unit with integral electronic high limit temperature monitoring and external on/off switch. Hot water set point is selectable through the AID Tool.

### AlpinePure 411–Rack 4 in. Pleated Filter Accessory

A 4 in. [102 mm] thick MERV 11 filter and filter rack shall be provided in lieu of the standard filter and rack.

### Thermostat (field-installed)

A communicating auto-changeover electronic digital thermostat shall be provided. The thermostat shall offer variable speed heating and cooling staging with precise temperature control. An OFF-HEAT-AUTO-COOL-EMERG system switch, OFF-AUTO-INTERMITTENT blower switch, and indicating display shall be provided. The thermostat shall display in °F or °C. The thermostat shall provide real time energy consumption data of the unit.

### Color Touchscreen Thermostat (field-installed)

A color touchscreen communicating auto-changeover electronic digital thermostat shall be provided. The thermostat shall offer variable speed heating and cooling staging with precise temperature control. An OFF-HEAT-AUTO-COOL-EMERG system switch, OFF-AUTO-INTERMITTENT blower switch, and indicating display shall be provided. The thermostat shall display in °F or °C. The thermostat shall provide real time and historical energy consumption data of the unit.

### Electronic Air Cleaner (field-installed)

A 25mm electronic air cleaner, cleanable 97% efficiency at 0.3 microns and larger, shall be provided in lieu of the standard throwaway filter. The initial pressure drop across the filter shall not exceed 0.05 kPa at 1.5 m/s force velocity.

### Electrostatic Air Cleaner (field-installed)

A 25mm electrostatic air cleaner, cleanable 90% efficiency, shall be provided in lieu of the standard throwaway filter. The initial pressure drop across the filter shall not exceed 0.04 kPa at 1.5 m/s force velocity.

# Engineering Guide Specifications cont.

**AlpinePure 411–Rack 102mm Pleated Filter Accessory**
A 102mm thick MERV 11 filter and filter rack shall be provided in lieu of the standard filter and rack.

### AlpinePure MERV 13 Filter (field-installed)

A 50mm thick MERV 13 filter shall be provided in lieu of the standard filter and fits the factory filter rack. The filter maintains MERV 13 rating in full ASHRAE 52.2 independent testing as required for LEED® certification. Helps fulfill a full credit under the LEED rating system.

### AlpinePure HRV/ERV (field installed)

A self-contained unit shall provide removal of stale air while replenishing the structure with an equal amount of fresh, clean air. The incoming and exhaust air streams shall be completely separate through the exchanger. The Heat Recovery Ventilator (HRV) shall transfer sensible heat from the stale exhaust air to the fresh incoming air with a Sensible Efficiency up to 79%. The HRV shall be equipped with a Defrost Mode. The Energy Recovery Ventilator (ERV) shall transfer sensible heat as well as latent heat with a Total Efficiency of 50%. The ERV shall be designed for use in warm humid areas with heavy air conditioning use. The ERV shall not be recommended for use in areas where the temperature drops below -4°C for more than five days. The ERV shall not be equipped with a Defrost Mode.

### AlpinePure HEPA Filter (field-installed)

For the ultimate in air filtration, the AlpinePure Series HEPA filter captures 99.97% of all particles down to 0.30 microns in size.

### AlpinePure Drain Pan Treatment (field-installed)

Provides dependable, sustained time-release protection from slime build-up and foul smelling odors in the drain pan. Also adds a light, pleasant scent to the air.

### Earth Loop Flow Center (field-installed)

A self-contained module shall provide all liquid flow, fill and connection requirements for ground source closed loop systems up to 76 L/s. The pumps shall be wired to a power block located in the nearest unit. The heat pump units shall contain low voltage pump slaving control so that two units may share one flow center.

### Auxiliary Heater (field-installed)

An electric resistance heater shall provide supplemental and/or emergency heating capability. Vertical units shall have the control panel and resistance heater coil assembly mounted internally. For horizontal units, the control panel shall be mounted internally while the resistance heater coil assembly shall be mounted externally. A low voltage plug shall be provided in each unit for quick auxiliary heat connection. The heater shall operate in sequenced stages as controlled by the unit's microprocessor. The heater shall feed line voltage power to the unit blower and transformer to provide emergency heat capability in the event of an open compressor circuit breaker.

# Revision Guide

| Pages: | Description: | Date: | By: |
|---|---|---|---|
| All | First Published | 05 Sept 2013 | DS |
| 3, 15-20 | Updated data tables EER values to be in W/W units | 18 Nov 2014 | MA |