



# Product Catalog

## **Horizon™ Outdoor Air Unit Water Source Heat Pump For 100% Outdoor Air Applications** Models: OABE, OADE, OAGE, OAKE, OANE



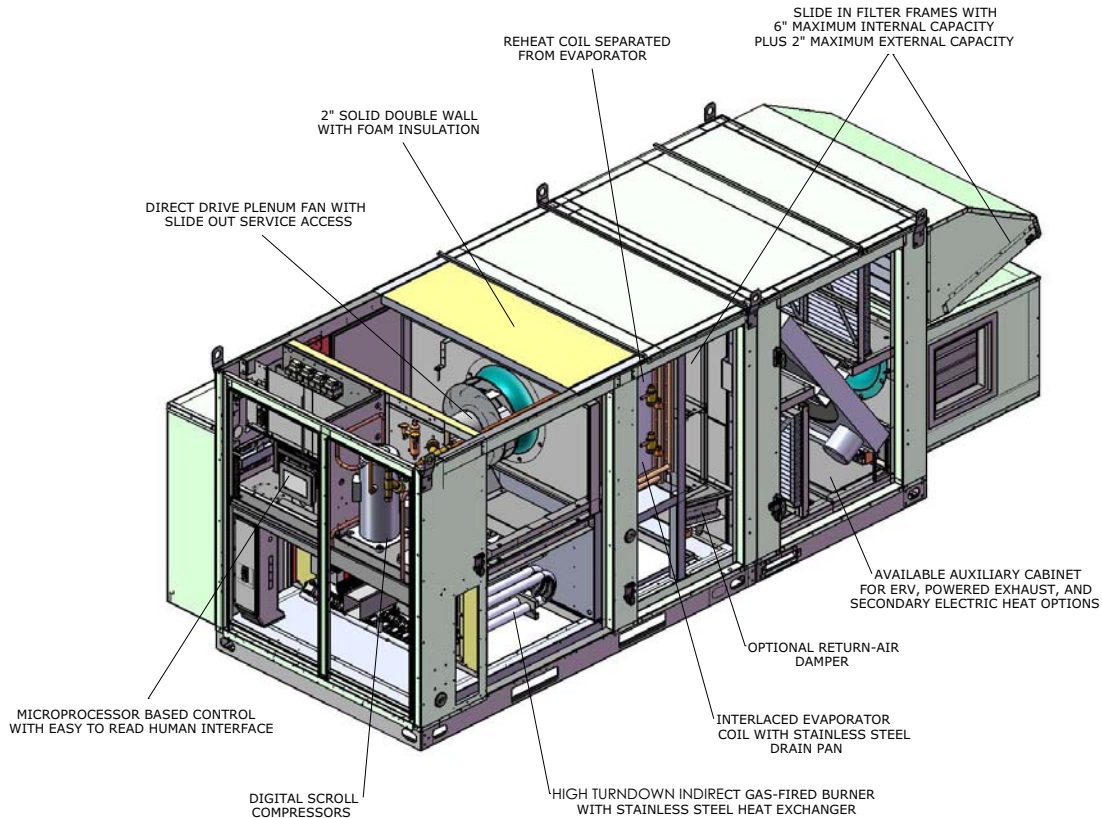


# Introduction

## The Horizon Outdoor Air Unit Water Source Heat Pump...

The Trane Horizon™ Outdoor Air Water Source Heat Pump for 100 percent outdoor air or dew point design applications leads the industry in:

- Indoor Air Quality (IAQ) Features
- Moisture Management
- High Quality and Durability
- Advanced Controls



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## Revision History

- Indoor WSHP data added
- Running edits



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# Model Number Descriptions

## Horizon Outdoor Air Unit Water Source Heat Pump

Model: OABE, OAGE

### Digit 1, 2 – Unit Type

OA = Outdoor Air

### Digit 3 – Cabinet Size

B = 500 cfm–3000 cfm  
G = 1250 cfm–7500 cfm

### Digit 4 – Major Design Sequence

D = Revision 1  
E = Heat Pump  
F = Indoor WSHP

### Digit 5, 6, 7 – Normal Gross Cooling Capacity (MBh)

000 = No Cooling  
036 = 3 Tons High Efficiency  
048 = 4 Tons High Efficiency  
060 = 5 Tons High Efficiency  
072 = 6 Tons High Efficiency  
084 = 7 Tons High Efficiency  
096 = 8 Tons High Efficiency  
108 = 9 Tons High Efficiency  
120 = 10 Tons High Efficiency  
144 = 12 Tons High Efficiency  
180 = 15 Tons High Efficiency  
210 = 17 Tons High Efficiency  
240 = 20 Tons High Efficiency  
264 = 22 Tons High Efficiency  
300 = 25 Tons High Efficiency  
360 = 30 Tons High Efficiency

### Digit 8 – Minor Design Sequence

A = Vertical Discharge/Vertical Return  
B = Vertical Discharge/Horizontal Return  
C = Horizontal Discharge/Vertical Return  
D = Horizontal Discharge/Horizontal Return  
E = Vertical Discharge/No Return  
F = Horizontal Discharge/No Return  
G = Vertical Discharge/Split Vertical Return-Exhaust  
H = Horizontal Discharge/Split Vertical Return-Exhaust

### Digit 9 – Voltage Selection

3 = 208-230/60/3  
4 = 460/60/3  
5 = 575/60/3

### Digit 10 – Reserved for Future Use

### Digit 11 – Evaporator Type

C = DX 4-Row Interlaced

### Digit 12 – Hot Gas Reheat

0 = No HGRH  
1 = Fin and Tube Modulating  
2 = Fin and Tube On/Off

### Digit 13 – Compressor

B = Digital Scroll (1<sup>st</sup> Circuit Only)  
C = Digital Scroll (1<sup>st</sup> and 2<sup>nd</sup> Circuit)

### Digit 14 – Condenser

3 = Water-Cooled DX Condenser Copper/Steel  
8 = Water-Cooled DX Condenser Copper/Nickel

### Digit 15 – Refrigerant Capacity Control

0 = No RCC Valve

### Digit 16 – Indoor Fan Motor (IFM)

0 = ECM w/Backward Curved Plenum Fan  
4 = Special Motor Option

### Digit 17 – Indoor Fan Wheel

A = 355  
B = 450  
C = 450 X 2

### Digit 18 – Indoor Fan Motor (hp)

A = 1 kW  
B = 2 kW  
C = 3 kW

### Digit 19 – Reserved for Future Use

### Digit 20 – Heater Type (PRI/SEC)

0 = No Heat  
A = Indirect-Fired (IF)  
C = Electric—Staged  
D = Electric—SCR Modulating  
G = Dual Fuel (PRI-IF/SEC-ELEC)  
H = Dual Fuel (PRI-ELEC-SCR/SEC-ELEC)  
J = Hot Water  
K = Steam  
L = No Primary Heat, Secondary ELEC  
N = Dual Fuel (PRI-ELEC-STAGED/SEC-ELEC)  
P = Dual Fuel (PRI-HW/SEC-DF)  
Q = Dual Fuel (PRI-HW/SEC-ELEC-STAGED)  
R = Dual Fuel (PRI-STEAM/SEC-DF)  
S = Dual Fuel (PRI-STEAM/SEC-ELEC-STAGED)  
T = Dual Fuel (PRI-IF/SEC-ELEC-SCR)  
U = Dual Fuel (PRI-ELEC-SCR/SEC-ELEC-SCR)  
V = No Primary Heat, Secondary ELEC-SCR  
W = Dual Fuel (PRI-ELEC-STAGED/SEC-ELEC-SCR)  
Y = Dual Fuel (PRI-HW/SEC-ELEC-SCR)  
Z = Dual Fuel (PRI-STEAM/SEC-ELEC-SCR)  
X = Special Heat Option

### Digit 21 – Primary Fuel Type

0 = No Heat  
1 = Natural Gas  
2 = Propane  
3 = Electric—Open Coil  
5 = Hot Water  
6 = Steam



## Model Number Descriptions

### OABE, OAGE Units

#### Digit 22 – Heater Capacity— Primary Heat Source

	IE	ELEC	HOT WATER
0	= No Heat	No Heat	No Heat
A	= 50 MBh	5 kW	1 Row/10 FPI
B	= 75 MBh	10 kW	1 Row/12 FPI
C	= 100 MBh	15 kW	1 Row/14 FPI
D	= 125 MBh	20 kW	2 Row/10 FPI
E	= 150 MBh	24 kW	2 Row/12 FPI
F	= 200 MBh	28 kW	2 Row/14 FPI
G	= 250 MBh	32 kW	3 Row/10 FPI
H	= 300 MBh	40 kW	3 Row/12 FPI
J	= 350 MBh	48 kW	3 Row/14 FPI
L	= 500 MBh	68 kW	
M	= 600 MBh	79 kW	
N	=	99 kW	
O	=	111 kW	
P	=	119 kW	
X	=	Special Heater Option	

#### Digit 23 – Heat Capacity— Secondary Heat Source

	ELEC
0	= No Heat/No Secondary Heat
A	= 5 kW
B	= 10 kW
C	= 15 kW
D	= 20 kW
E	= 24 kW
F	= 28 kW
G	= 32 kW

#### Digit 24 – Corrosive Environment Package

0	= No Corrosive Package
1	= S/S Interior, S/S Evap Coil Casing
2	= S/S Interior, Eco-Coated Coils
3	= S/S Interior, Copper/Copper Evap Coil
4	= S/S Coil Casing
5	= S/S Interior
6	= Eco-Coated Coils
7	= S/S Coil Casing with Eco-Coated Coils
8	= Copper/Copper Evap, HGRH Coils

#### Digit 25, 26 – Unit Controls

00	= Non DDC—Electromechanical
AA	= Trane—Discharge Air Control w/LON Read-Write w/Display
AB	= Trane—Space Control w/LON Read-Write w/Display
AC	= Trane—Discharge Air Control w/BACnet® (No Display)
AD	= Trane—Space Control w/BACnet (No Display)
AF	= Trane—Discharge Air Control w/BACnet w/Display
AG	= Trane—Space Control w/BACnet w/Display
AI	= Trane—Discharge Air Control w/LON Read-Write (No Display)
AJ	= Trane—Space Control w/LON Read-Write (No Display)
AK	= Trane—Multi-Zone VAV Control w/LON Read-Write w/Display
AL	= Trane—Multi-Zone VAV Control w/BACnet w/Display
AM	= Trane—Multi-Zone VAV Control w/LON Read-Write (No Display)
AN	= Trane—Multi-Zone VAV Control w/BACnet (No Display)
AO	= Trane—Single-Zone VAV Control w/LON Read-Write w/Display
AP	= Trane—Single-Zone VAV Control w/BACnet w/Display
AQ	= Trane—Single-Zone VAV Control w/LON Read-Write (No Display)
AR	= Trane—Single-Zone VAV Control w/BACnet (No Display)
XX	= Control Special

#### Digit 27 – Powered Exhaust Fan Motor (PFM) and Exhaust Dampers

0	= No Powered Exhaust
5	= Special Motor Option
6	= ECM w/Backward Curved Plenum Fan
7	= ECM w/Backward Curved Plenum Fan and Barometric Relief Damper
8	= ECM w/Backward Curved Plenum Fan and Isolation Dampers w/End Switch
9	= Barometric Relief Dampers (No PFM)

#### Digit 28 – Powered Exhaust Fan Wheel

0	= No Powered Exhaust
A	= 355
B	= 450
C	= 450 X 2

#### Digit 29 – Powered Exhaust Fan Motor (hp)

0	= No Powered Exhaust
A	= 1 kW
B	= 2 kW
C	= 3 kW

#### DIGIT 30 – Reserved for Future Use

#### Digit 31 – ERV (Requires Powered Exhaust)

0	= No ERV
A	= ERV—Composite Construction w/Bypass
B	= ERV—Composite Construction with Frost Protection w/VFD
C	= ERV—Aluminum Construction w/Bypass
D	= ERV—Aluminum Construction with Frost Protection w/VFD

#### Digit 32 – ERV Size

0	= No ERV
1	= 3014
2	= 3622
3	= 4136
4	= 4634
5	= 5856

#### Digit 33 – Damper Options

0	= 100% OA 2-Position Damper
1	= 100% OA 2-Position Damper w/RA 2-Position Damper
2	= Modulating OA and RA Dampers w/Economizer

#### Digit 34 – Filtration Options

A	= No Filters
B	= MERV-8, 30%
C	= MERV-13, 80%
D	= MERV-14, 95%
E	= MERV-8 30%, MERV-13 80%
F	= MERV-8 30%, MERV-14 95%
G	= MERV-8, 30%, with UVC
H	= MERV-13, 80%, with UVC
J	= MERV-14, 95%, with UVC
K	= MERV-8 30%, MERV-13 80%, and UVC
L	= MERV-8 30%, MERV-14 95%, and UVC
X	= Special Filter Options

#### Digit 35 – Smoke Detector— Factory Installed

0	= No Smoke Detector
1	= Supply Smoke Detector
2	= Return Smoke Detector
3	= Supply and Return Smoke Detectors

## Model Number Descriptions

*OABE, OAGE Units*

### **Digit 36 – Electrical Options**

- 0 = Terminal Block
- A = Non-Fused Disconnect
- B = Fused Disconnect Switch
- C = Non-Fused Disconnect w/Convenience Outlet
- D = Fused Disconnect Switch w/Convenience Outlet
- E = Dual Point Power
- F = Dual Point Power w/Convenience Outlet
- G = 65 SCCR Electrical Rating w/Non-Fused Disconnect
- H = 65 SCCR Electrical Rating w/Fused Disconnect
- J = 65 KAIC Electrical Rating w/Non-Fused Disconnect
- K = 65 KAIC Electrical Rating w/Fused Disconnect
- L = 65 KAIC Non-Fused w/Convenience Outlet
- M = 65 KAIC Fused w/Convenience Outlet
- N = 65 SCCR Non-Fused w/Convenience Outlet

### **Digit 37 – Air Flow Monitoring**

- 0 = No Airflow Monitoring
- 1 = Airflow Monitoring—IFM Piezo Ring
- 2 = Airflow Monitoring—PE Piezo Ring
- 3 = Airflow Monitoring—Outdoor Air with Display and IFM w/Piezo Ring
- 4 = Airflow Monitoring—IFM Piezo Ring and PE Piezo Ring
- 5 = Airflow Monitoring—Outdoor Air Monitoring w/Display Supply Air and Exhaust Air w/Piezo Rings
- 6 = Airflow Monitoring—Outdoor Air Monitoring for Direct Fired Heat Units

### **Digit 38 – Accessories**

- 0 = No Options
- C = LED Service Light in Supply Fan Section
- F = LED Service Light in Exhaust Fan Section
- G = LED Service Light in Supply and Exhaust Fan Section

### **Digit 39 – Altitude**

- 0 = Sea Level to 1,000 feet
- 1 = 1,001 to 2,000 feet
- 2 = 2,001 to 3,000 feet
- 3 = 3,001 to 4,000 feet
- 4 = 4,001 to 5,000 feet
- 5 = 5,001 to 6,000 feet
- 6 = 6,001 to 7,000 feet
- 7 = Above 7,000 feet



## Model Number Descriptions

### Models: OADE, OAKE, OANE

#### Digit 1, 2 – Unit Type

OA = Outdoor Air

#### Digit 3 – Cabinet Size

D = 625 cfm–4,000 cfm  
K = 1,500 cfm–9,000 cfm  
N = 3,750 cfm–13,500 cfm

#### Digit 4 – Major Design Sequence

C = Revision 4  
D = Revision 5  
E = Heat Pump  
F = Indoor WSHP

#### Digit 5, 6, 7 – Normal Gross Cooling Capacity (MBh)

000= No Cooling  
060= 5 Tons High Efficiency  
072= 6 Tons High Efficiency  
084= 7 Tons High Efficiency  
096= 8 Tons High Efficiency  
120= 10 Tons High Efficiency  
144= 12 Tons High Efficiency  
180= 15 Tons High Efficiency  
210= 17 Tons High Efficiency  
240= 20 Tons High Efficiency  
264= 22 Tons High Efficiency  
300= 25 Tons High Efficiency  
360= 30 Tons High Efficiency  
420= 35 Tons High Efficiency  
480= 40 Tons High Efficiency  
540= 45 Tons High Efficiency  
600= 50 Tons High Efficiency  
648= 54 Tons High Efficiency

#### Digit 8 – Minor Design Sequence

A = Vertical Discharge/Vertical Return  
B = Vertical Discharge/  
Horizontal Return  
C = Horizontal Discharge/  
Vertical Return  
D = Horizontal Discharge/  
Horizontal Return  
E = Vertical Discharge/No Return  
F = Horizontal Discharge/No Return  
G = Vertical Discharge/Split Vertical  
Return-Exhaust  
H = Horizontal Discharge/Split  
Vertical Return-Exhaust

#### Digit 9 – Voltage Selection

3 = 208-230/60/3  
4 = 460/60/3  
5 = 575/60/3

#### Digit 10 – Reserved for Future Use

#### Digit 11 – Evaporator Type

C = DX 4-Row Interlaced

#### Digit 12 – Hot Gas Reheat

0 = No HGRH  
1 = Fin and Tube Modulating  
2 = Fin and Tube On/Off

#### Digit 13 – Compressor

B = Digital Scroll (1<sup>st</sup> Circuit Only)  
C = Digital Scroll (1<sup>st</sup> and 2<sup>nd</sup> Circuit)

#### Digit 14 – Condenser

3 = Water-Cooled DX Condenser  
Copper/Steel  
8 = Water-Cooled DX Condenser  
Copper/Nickel

#### Digit 15 – Refrigerant Capacity Control

0 = No RCC Valve

#### Digit 16 – Indoor Fan Motor (IFM)

0 = Direct Drive w/VFD  
1 = Direct Drive (VFD by Others)  
4 = Direct Drive w/Shaft  
Grounding Ring w/VFD  
5 = Special Motor Option

#### Digit 17 – Indoor Fan Wheel

A = 120  
B = 120.6  
C = 140  
D = 140.6  
E = 160  
F = 160.6  
G = 180  
H = 180.6  
J = 200  
K = 200.6  
L = 180 X 2  
M = 180.6 X 2

#### Digit 18 – Indoor Fan Motor HP

A = 1/2 hp–1800 rpm  
B = 1/2 hp–3600 rpm  
C = 3/4 hp–1800 rpm  
D = 3/4 hp–3600 rpm  
E = 1 hp–1800 rpm  
F = 1 hp–3600 rpm  
G = 1.5 hp–1800 rpm  
H = 1.5 hp–3600 rpm  
J = 2 hp–1800 rpm  
K = 2 hp–3600 rpm  
L = 3 hp–1800 rpm  
M = 3 hp–3600 rpm  
N = 5 hp–1800 rpm  
P = 5 hp–3600 rpm  
R = 7.5 hp–1800 rpm  
S = 7.5 hp–3600 rpm  
T = 10 hp–1800 rpm  
U = 10 hp–3600 rpm  
V = 15 hp–1800 rpm  
W = 15 hp–3600 rpm

#### Digit 19 – Reserved for Future Use

#### Digit 20 – Heat Type (PRI/SEC)

0 = No Heat  
A = Indirect-Fired (IF)  
C = Electric—Staged  
D = Electric—SCR Modulating  
G = Dual Fuel (PRI-IF/SEC-ELEC)  
H = Dual Fuel  
(PRI-ELEC-SCR/SEC-ELEC)  
J = Hot Water  
K = Steam  
L = No Primary Heat,  
Secondary ELEC  
N = Dual Fuel  
(PRI-ELEC-STAGED/SEC-ELEC)  
P = Dual Fuel (PRI-HW/SEC-DF)  
Q = Dual Fuel  
(PRI-HW/SEC-ELEC-STAGED)  
R = Dual Fuel (PRI-STEAM/SEC-DF)  
S = Dual Fuel  
(PRI-STEAM/SEC-ELEC-STAGED)  
T = Dual Fuel (PRI-IF/SEC-ELEC-SCR)  
U = Dual Fuel  
(PRI-ELEC-SCR/SEC-ELEC- SCR)  
V = No Primary Heat,  
Secondary ELEC-SCR  
W = Dual Fuel (PRI-ELEC-STAGED/  
SEC-ELEC-SCR)  
Y = Dual Fuel  
(PRI-HW/SEC-ELEC-SCR)  
Z = Dual Fuel  
(PRI-STEAM/SEC-ELEC- SCR)  
X = Special Heat Option

#### Digit 21 – Primary Fuel Type

0 = No Heat  
1 = Natural Gas  
2 = Propane  
3 = Electric—Open Coil  
4 = Electric—Sheathed Coil  
5 = Hot Water  
6 = Steam



## Model Number Descriptions

*OADE, OAKE, OANE Units*

### Digit 22 — Heat Capacity— Primary Heat Source

	<b>IE</b>	<b>ELEC</b>	<b>HOT WATER</b>
0	= No Heat	No Heat	No Heat
A	= 50 MBh	10 kW	1 Row/10 FPI
B	= 75 MBh	20 kW	1 Row/12 FPI
C	= 100 MBh	24 kW	1 Row/14 FPI
D	= 125 MBh	28 kW	2 Row/10 FPI
E	= 150 MBh	32 kW	2 Row/12 FPI
F	= 200 MBh	40 kW	2 Row/14 FPI
G	= 250 MBh	48 kW	3 Row/10 FPI
H	= 300 MBh	60 kW	3 Row/12 FPI
J	= 350 MBh	68 kW	3 Row/14 FPI
K	= 400 MBh	79 kW	
L	= 500 MBh	99 kW	
M	= 600 MBh	111 kW	
N	= 700 MBh	119 kW	
P	= 800 MBh	139 kW	
R	= 1000 MBh	159 kW	
S	=	179 kW	
T	=	199 kW	
U	=	215 kW	
X	=	Special Heater Option	

### Digit 23 — Heat Capacity— Secondary Heat Source

	<b>ELEC</b>
0	= No Heat/No Secondary Heat
A	= 10 kW
B	= 20 kW
C	= 24 kW
D	= 28 kW
E	= 32 kW
F	= 40 kW

### Digit 24 — Corrosive Environment Package

0	= No Corrosive Package
1	= S/S Interior, S/S Evap Coil Casing
2	= S/S Interior, Eco-Coated Coils
3	= S/S Interior, Copper/Copper Evap Coil
4	= S/S Coil Casing
5	= S/S Interior
6	= Eco-Coated Coils
7	= S/S Coil Casing with Eco-Coated Coils
8	= Copper/Copper Evap, HGRH Coils

### Digit 25, 26 — Unit Controls

00	= Non DDC—Electromechanical
AA	= Trane—Discharge Air Control w/LON Read-Write w/Display
AB	= Trane—Space Control w/LON Read-Write w/Display
AC	= Trane—Discharge Air Control w/BACnet® (No Display)
AD	= Trane—Space Control w/BACnet (No Display)
AF	= Trane—Discharge Air Control w/BACnet w/Display
AG	= Trane—Space Control w/BACnet w/Display
AI	= Trane—Discharge Air Control w/LON Read-Write (No Display)
AJ	= Trane—Space Control w/LON Read-Write (No Display)
XX	= Control Special

### Digit 27 — Powered Exhaust Fan Motor (PFM) and Exhaust Dampers

0	= No Powered Exhaust
1	= Direct Drive w/VFD and Gravity Dampers
4	= Belt Drive w/VFD
5	= Special Motor Option
6	= Direct Drive w/VFD and Barometric Relief Damper
7	= Direct Drive w/VFD and Isolation Dampers w/End Switch
8	= Barometric Relief Dampers (No PFM)

### Digit 28 — Powered Exhaust Fan Wheel

0	= No Powered Exhaust
A	= 120
B	= 120.6
C	= 140
D	= 140.6
E	= 160
F	= 160.6
G	= 180
H	= 180.6
J	= 200
K	= 200.6
L	= 180 X 2
M	= 180.6 X 2

### Digit 29 — Powered Exhaust Fan Motor (hp)

0	= No Powered Exhaust
A	= 1/2 hp—1800 rpm
B	= 1/2 hp—3600 rpm
C	= 3/4 hp—1800 rpm
D	= 3/4 hp—3600 rpm
E	= 1 hp—1800 rpm
F	= 1 hp—3600 rpm
G	= 1.5 hp—1800 rpm
H	= 1.5 hp—3600 rpm
J	= 2 hp—1800 rpm
K	= 2 hp—3600 rpm
L	= 3 hp—1800 rpm
M	= 3 hp—3600 rpm
N	= 5 hp—1800 rpm
P	= 5 hp—3600 rpm
R	= 7.5 hp—1800 rpm
S	= 7.5 hp—3600 rpm
T	= 10 hp—1800 rpm
U	= 10 hp—3600 rpm
V	= 15 hp—1800 rpm
W	= 15 hp—3600 rpm

### Digit 30 — Reserved for Future Use

### Digit 31 — ERV (Requires Powered Exhaust)

0	= No ERV
A	= ERV—Composite Construction
B	= ERV—Composite Construction with Frost Protection w/VFD
C	= ERV—Composite Construction with Bypass
D	= ERV—Composite Construction with Frost Protection and Bypass
E	= ERV—Aluminum Construction
F	= ERV—Aluminum Construction with Frost Protection w/VFD
G	= ERV—Aluminum Construction with Bypass
H	= ERV—Aluminum Construction with Frost Protection and Bypass

### Digit 32 — ERV Size

0	= No ERV
1	= 3014
2	= 3622
3	= 4136
4	= 4634
5	= 5856
6	= 6488
7	= 6876
8	= 74122

### Digit 33 — Damper Options

0	= 100% OA 2-Position Damper
1	= 100% OA 2-Position Damper w/RA 2-Position Damper
2	= Modulating OA and RA Dampers w/Economizer



## Model Number Descriptions

*OADE, OAKE, OANE Units*

### Digit 34 – Filtration Options

- A = Aluminum Mesh Intake Filters (ALM)
- B = MERV-8,30%, and ALM
- C = MERV-13, 80%, and ALM
- D = MERV-14, 95%, and ALM
- E = MERV-8 30%, MERV-13 80%, and ALM
- F = MERV-8 30%, MERV-14 95%, and ALM
- G = MERV-8, 30%, and ALM, with UVC
- H = MERV-13, 80%, and ALM, with UVC
- J = MERV-14, 95%, and ALM, with UVC
- K = MERV-8 30%, MERV-13 80%, ALM, and UVC
- L = MERV-8 30%, MERV-14 95%, ALM, and UVC
- X = Special Filter Options

### Digit 35 – Smoke Detector—Factory Installed

- 0 = No Smoke Detector
- 1 = Supply Smoke Detector
- 2 = Return Smoke Detector
- 3 = Supply and Return Smoke Detector

### Digit 36 – Electrical Options

- 0 = Non-Fused Disconnect
- A = Fused Disconnect Switch
- B = Non-Fused Disconnect w/Convenience Outlet
- C = Fused Disconnect Switch w/Convenience Outlet
- D = Dual Point Power
- E = Dual Point Power w/Convenience Outlet
- F = 65 SCCR Electrical Rating w/Non-Fused Disconnect
- G = 65 SCCR Electrical Rating w/Fused Disconnect
- H = 65 KAIC Electrical Rating w/Non-Fused Disconnect
- J = 65 KAIC Electrical Rating w/Fused Disconnect
- L = 65 KAIC Fused w/Convenience Outlet
- M = 65 SCCR Non-Fused w/Convenience Outlet

### Digit 37 – Air Flow Monitoring

- 0 = No Airflow Monitoring
- 1 = Airflow Monitoring—IFM Piezo Ring
- 2 = Airflow Monitoring—PE Piezo Ring
- 3 = Airflow Monitoring—Outdoor Air with Display and IFM w/Piezo Ring
- 4 = Airflow Monitoring—IFM Piezo Ring and PE Piezo Ring
- 5 = Airflow Monitoring—Outdoor Air Monitoring w/ Display Supply Air and Exhaust Air w/Piezo Rings
- 6 = Airflow Monitoring—Outdoor Air Monitoring for Direct Fired Heat Units

### Digit 38 – Accessories

- 0 = No Options
- B = LED Service Light in Supply Fan Section
- D = LED Service Light in Exhaust Fan Section
- E = LED Service Light in Supply and Exhaust Fan Section

### Digit 39 – Altitude

- 0 = Sea Level to 1,000 feet
- 1 = 1,001 to 2,000 feet
- 2 = 2,001 to 3,000 feet
- 3 = 3,001 to 4,000 feet
- 4 = 4,001 to 5,000 feet
- 5 = 5,001 to 6,000 feet
- 6 = 6,001 to 7,000 feet
- 7 = Above 7,000 feet



## Features and Benefits

We designed the Horizon™ Outdoor Air Unit based on customer requirements from across the country. Thorough analysis of the performance requirements resulted in a robust design with the ability to effectively operate over an expansive performance envelope required for the year-round treatment of outdoor air.

Also, we took into account today's HVAC market issues, such as indoor air quality (IAQ). We equipped the Horizon Outdoor Air Unit to meet your ventilation needs—in direct response to the ventilation and humidity control requirements of ASHRAE standard 62.1.

Trane's Horizon Outdoor Air Unit leads the industry in the key areas of:

- indoor air quality (IAQ)
- energy efficiency
- high quality and durability
- advanced, integrated controls
- flexibility (including indoor installation)
- enhanced serviceability

### Indoor Air Quality (IAQ) Features

- Stainless steel drain pan sloped in two directions to ensure proper drainage and reduce the potential for microbial growth
- Double-wall foamed panel construction throughout the indoor section of unit to provide, non-porous, cleanable interior surfaces
- Inlet hood with moisture eliminators
- High efficiency throwaway filter option with standard 2-, 4-, or 6-inch adjustable filter rack
- Piezometer airflow measurement option
- Easy filter access encourages frequent changing
- Refrigerant hot gas reheat for low dewpoint supply air for superior humidity control
- Capable of providing low dew point supply air for superior humidity control

### Energy Efficiency

- Total energy wheel option for recovered energy from centralized building exhaust
- Optional modulating recovered refrigerant reheat for unit supply air

### High Quality and Durability

- Robust unit construction with 2-inch double-wall panels and reversible, hinged access doors.
- High quality, long-lasting latches and hinges for all access doors
- Protective standard prepainted finish on cabinet exterior with optional corrosion inhibiting coatings available for the unit exterior, interior and coils

### Advanced Controls

- All controls are factory-engineered, mounted, configured and tested to minimize field startup time
- UC600 microprocessor control with easy-to-read human interface and display for monitoring, setting, editing, and controlling
- Human interface with touch-pad screen for monitoring, setting, editing and controlling
- Capable of supply-air control or zone control of both temperature and relative humidity
- Occupied and unoccupied control sequences
- Optional remote human interface for ease of control access without going outdoors
- Optional LonTalk® communications interface communication link with a Tracer Summit™ building management system or other control systems that support LonTalk

## Features and Benefits

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### Flexibility

- Numerous heater options and temperature rise capabilities available
- Multiple roof curb options (1- or 2-inch vibration isolation, horizontal discharge, multiple heights)
- Indoor installation with ducted OA/EA and horizontal supply and return
- Dual fuel option with electric preheat and electric, indirect fired gas, or hot water primary heat
- Custom colors

**Figure 1. Condenser side view of the Trane Horizon™ Outdoor Air Unit Water Source Heat Pump**



### Enhanced Serviceability

- Hinged access doors for ease of maintenance and service
- Easy-open door latches
- Slide out access direct-drive plenum fan
- Optional slide out, self-cleaning total-energy wheel
- Sight glass for each refrigeration circuit
- Optional control display
- High voltage cover

### Standard Unit Features

- Multiple cabinet sizes with airflow range from 500 to 13,500 cfm
- Two-inch double-wall, R-13 construction with heavy gauge galvanized metal skin
- Outdoor air inlet hood
- Prepainted exterior finish
- Water-cooled DX refrigeration system
- Completely factory-piped and leak-tested refrigeration system
- Stainless steel drain pans sloped in two planes
- Digital scroll compressors

- Single-point power connections for units with optional total-energy wheel, powered exhaust, and electric heat
- Filter rack adjustable for 2-, 4-, or 6-inch filters
- Factory-assembled inlet hood with 2-inch mist eliminators (OAD, OAG, OAK, OAN)
- Non-fused disconnect switch
- Type 439 stainless steel heat exchanger
- Low leak parallel blade outdoor air damper with edge seals
- High-efficiency fan motors
- Variable frequency drive (VFD) on the OAD, OAK, and OAN cabinets
- EC motors on the OAB and OAG cabinets

### Standard Control Features

- Neoprene vibration isolation under supply and exhaust fan base (OAD, OAK, OAN)
- Fully integrated, factory-installed and commissioned microelectronic controls
- Supply airflow proving
- Emergency stop
- Occupied/unoccupied control modes
- High turn-down (up to 20:1) modulating indirect gas-fired heat
- Clogged filter switch
- Low ambient control down to 0°F

### Optional Features

- Modulating electric heat
- Hot water coils
- Steam heat (future)
- Low leak parallel blade return air damper with edge seals
- Modulating damper control systems
- Pleated media filters (2-inch MERV-8, 2-inch MERV-13, 4-inch MERV-14, or a combination 2-inch/4-inch filter)
- 24 V electrostatic filters
- 120 V UVC downstream of evaporator coil
- Adjustable powered exhaust
- Exhaust dampers (gravity, barometric relief, and 2-position isolation)
- Fused disconnect switch
- Factory-installed smoke detectors (supply and/or return)
- Stainless steel inner liner
- Integral total-energy wheel
- Protective coatings for the unit and/or coils
- Remote human interface
- Factory or field-wired convenience outlet
- LED service lights
- Direct drive BI airfoil plenum fan
- Unit mounted human interface panel
- Horizontal supply/return and ducted OA/EA for indoor installation

# Application Considerations

## Overview

### Outdoor Air Unit Functions

The Horizon™ Outdoor Air Unit (OAU) provides conditioned outdoor air suitable for mechanical ventilation or make-up air. The OAU conditions outdoor air as necessary to meet system performance requirements by ventilation with filtration, cooling, dehumidification, and/or heating. The OAU may deliver ventilation air in a number of ways. Refer to “[System Configurations](#),” p. 14 and [Figure 5](#), p. 16, [Figure 6](#), p. 16, and [Figure 8](#), p. 17 for more information.

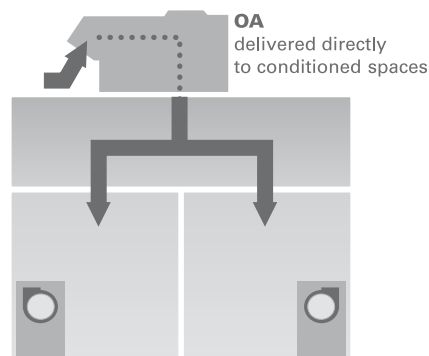
- Ventilation with Filtration
- Cooling
- Dehumidification
- Heating

### System Configurations

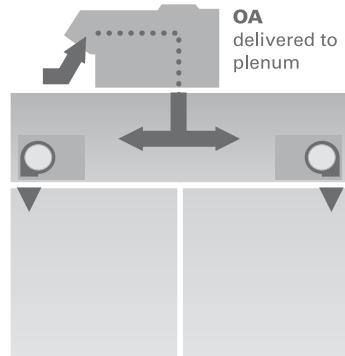
Dedicated outdoor air systems can deliver conditioned outdoor air in one of the following ways:

1. Conditioned outdoor air supplied directly to each occupied space, with the local terminal unit controlling the space dry-bulb temperature. Refer to [Figure 2](#), p. 14.
2. Conditioned outdoor air supplied directly to local terminal units, or return ducts of local RTUs, which deliver a mixture of the conditioned outdoor air and (conditioned) recirculated air to the space. Refer to [Figure 3](#), p. 15.
3. Conditioned outdoor air supplied directly to a single space to control the space temperature and humidity. For example, this application will provide temperature and humidity control of ventilated spaces, such as commercial kitchens or laboratories.

**Figure 2. Direct discharge to conditioned space**



**Figure 3. Indirect discharge to fan-coil units**



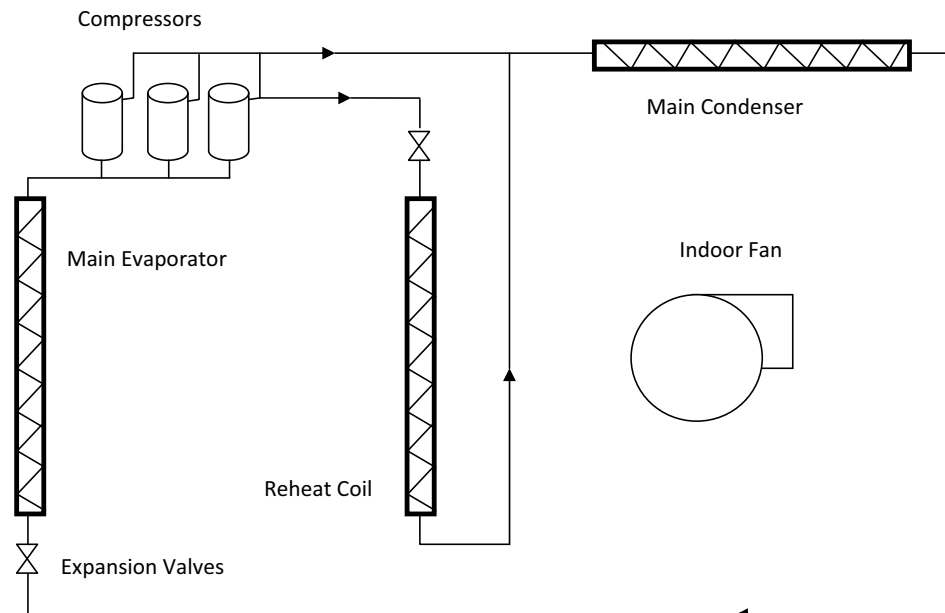
## Horizon OAU Operation

The Horizon™ OAU can use either DX cooling, condenser reheat, electric or gas heat to condition outdoor air. The unit controls modulate cooling and heating capacity, reducing the supply air temperature swings associated with staged heating and cooling.

## OAU with Reheat

Figure 4, p. 15 shows the OAU system with a DX refrigerant circuit design using reheat.

**Figure 4. Refrigeration system diagram with reheat**



## Dehumidification

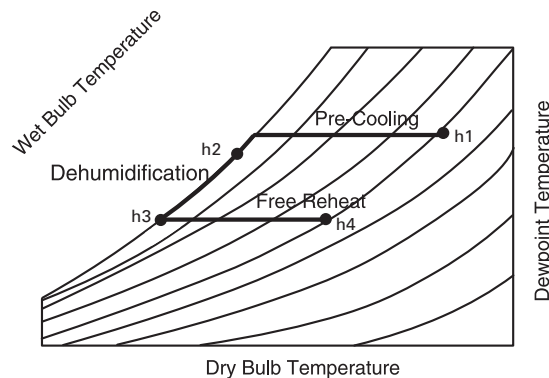
Consider Figure 5, p. 16. If the outdoor air dew point is above the dehumidification setpoint (or in the case of zone control, the zone RH is above the RH setpoint), the OAU will:

- cool the outdoor air to remove required moisture and
- reheat to meet the discharge temperature setpoint.

## Application Considerations

At  $h_1$ , 100 percent outdoor air enters the OAU. The OAU filters, cools, and dehumidifies the air as it moves through the evaporator coil. Air leaves the evaporator coil saturated at the preset dew point condition ( $h_3$ ) and is reheated by the reheat coil to the pre-set reheat temperature setpoint ( $h_4$ ). The reheat coil transfers energy to the airstream. A liquid solenoid valve effectively modulates the reheat capacity. The outdoor condenser rejects surplus heat. The reheat circuit is first on and last off, so reheat energy is available at full and part load conditions. Since both the dew point setpoint and discharge temperature setpoint are fully adjustable, the desired supply air conditions are maintained at all load conditions.

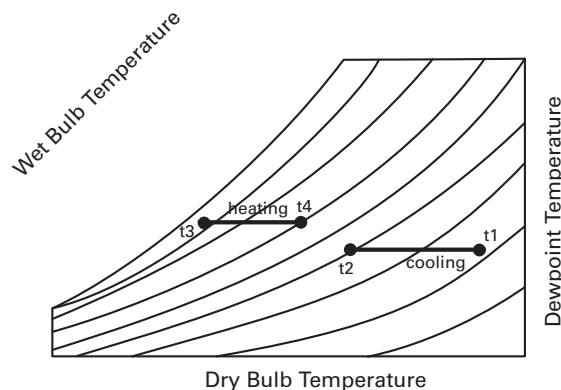
**Figure 5. Psychrometric chart with dehumidification and reheat**



## Cooling or Heating

Consider [Figure 6, p. 16](#). If the outdoor air dew point or zone RH is equal to or below the dehumidification setpoint, the OAU will heat or cool the outdoor air to separate cooling or heating setpoints. At  $t_1$  or  $t_3$ , 100 percent outdoor air enters the OAU. The OAU filters, and cools or heats the air as it is drawn through the evaporator and heating section. The air leaves the OAU at the cooling or heating discharge setpoint ( $t_2$  or  $t_4$ ).

**Figure 6. Psychrometric chart with cooling or heating only**



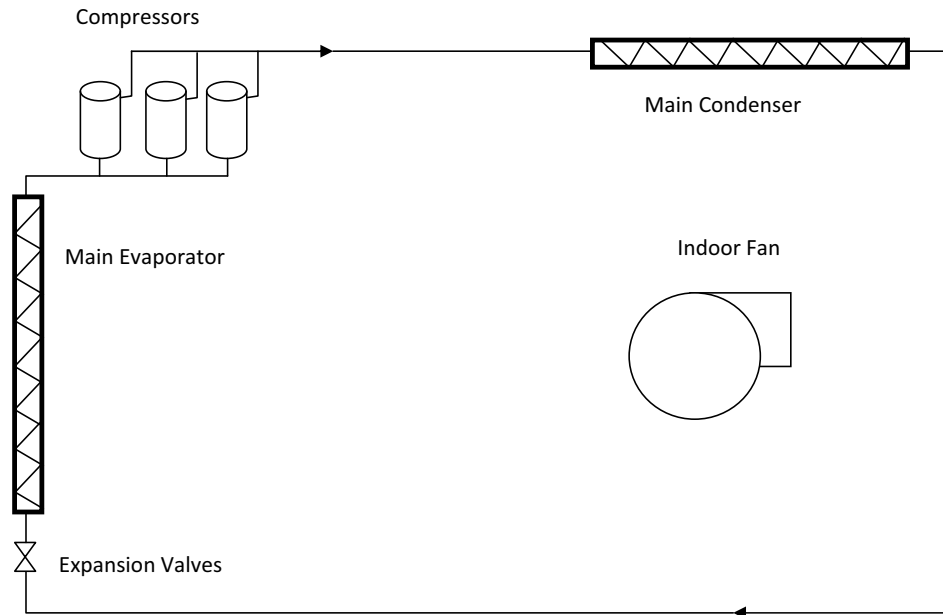
## OAU Outdoor Air Control without Reheat

[Figure 7, p. 17](#) shows the Horizon™ OAU DX system, using a refrigerant circuit design without reheat.

**Note:** Space control not available without reheat.



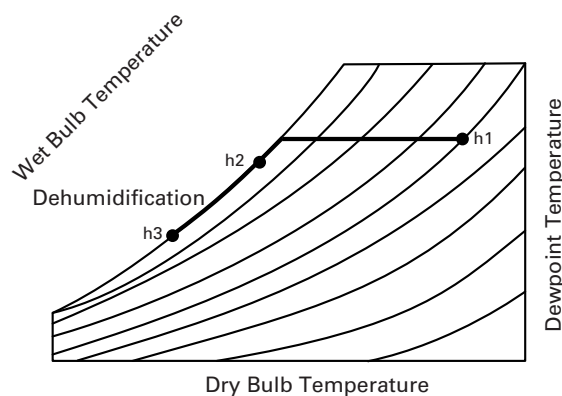
**Figure 7. Refrigeration system diagram without reheat**



## Dehumidification

Consider [Figure 8, p. 17](#). If the outdoor air dew point is above the dehumidification setpoint, the OAU will dehumidify the outdoor air. 100 percent outdoor air enters the OAU (h1). The unit filters, cools and dehumidifies the air as it is drawn through the evaporator coils. Air leaves the evaporator coils saturated at a preset dew point setpoint (h3). Since the dew point setpoint is fully adjustable, the desired dew point condition is maintained at all load conditions.

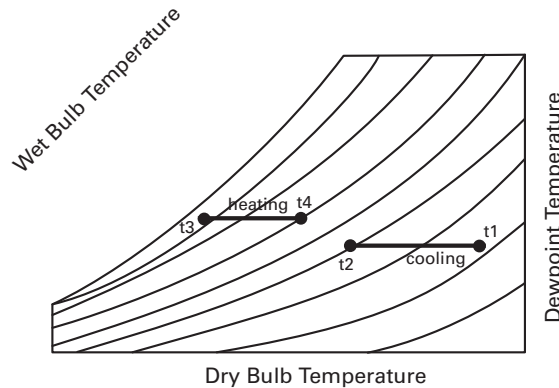
**Figure 8. Psychrometric chart with dehumidification, no reheat**



## Cooling or Heating

Consider [Figure 9, p. 18](#). If the outdoor air dew point is below the dehumidification setpoint, the OAU will heat or cool the outdoor air to separate cooling or heating setpoints. 100 percent outdoor air enters the OAU (t1 or t3). The unit filters and cools or heats the air as it is drawn through the evaporators and heating section. The air leaves the OAU at the cooling or heating setpoint.

**Figure 9. Psychrometric chart with cooling and heating only**



## Establishing Capacity Requirements

Determining the OAU capacity requirements requires careful thought. Light Commercial equipment is typically selected based on design **sensible** conditions. Since **latent** loads drive the need for the OAU, base the selection on design **latent** conditions.

## Cooling & Dehumidification Selection Criteria

### Evaporator Design Entering Conditions

For many climates the peak outdoor air enthalpy occurs at a time when the outdoor dry-bulb temperature is not the highest. Refer to the chapter on climatic design information in the ASHRAE Handbook of Fundamentals. The cooling and dehumidification design condition data is provided three ways:

1. Design dry-bulb temperature with mean coincident wet bulb temperature
2. Design wet-bulb temperature with mean coincident dry-bulb temperature
3. Design dew point temperature with mean coincident dry-bulb temperature

The design wet-bulb condition typically represents a significantly higher outdoor air enthalpy than the design dry-bulb condition. Use the condition that represents the highest enthalpy as the entering evaporator selection condition.

### Evaporator Design Leaving Conditions

Due to the uncertainty of the local terminal unit's latent capacity at part load, it is usually most straightforward to size the OAU to handle the entire latent load on the system, both indoor and outdoor. With this design approach, the terminal units may do some latent cooling (dehumidification) during periods of higher sensible load. At these times, the space will run slightly drier than the design RH limit. This is why it makes sense to select the OAU to limit the space RH to a maximum allowable level for those conditions when the terminal units are providing no space latent cooling, such as 60 percent RH. Using lower humidity limits may result in an unnecessary increase in system operating energy use.

Use [Table 1, p. 19](#), [Table 2, p. 19](#), and [Table 3, p. 20](#) to identify the appropriate supply air dew point for specific design conditions. For a more detailed discussion on determining the selection criteria of a OAU, refer to SYS-APG001-EN (*Application Guide: Designing Dedicated Outdoor-Air Systems*) or SYS-APM004-EN (*Applications Engineering Manual: Dehumidification in HVAC Systems*).

### Reheat

**Table 1. Supply air dew point temperature, 75°F at 60 percent RH space limit**

Latent Load Btu/h per Person	cfm per person										
	10	15	20	25	30	35	40	45	50	55	60
100	54.6	56.6	57.5	58.1	58.4	58.7	58.9	59.0	59.2	59.2	59.3
120	53.3	55.8	57.0	57.6	58.1	58.4	58.6	58.8	58.9	59.1	59.2
140	52.0	55.0	56.4	57.2	57.7	58.1	58.3	58.6	58.7	58.9	59.0
160	50.6	54.2	55.8	56.7	57.3	57.8	58.1	58.3	58.5	58.7	58.8
180	49.2	53.3	55.2	56.3	57.0	57.4	57.8	58.1	58.3	58.5	58.6
200	47.7	52.5	54.6	55.8	56.6	57.1	57.5	57.8	58.1	58.3	58.4
220	46.1	51.6	54.0	55.3	56.2	56.8	57.2	57.6	57.9	58.1	58.3
240	—	50.6	53.3	54.8	55.8	56.5	57.0	57.3	57.6	57.9	58.1
260	—	49.7	52.7	54.3	55.4	56.1	56.7	57.1	57.4	57.7	57.9
280	—	48.7	52.0	53.8	55.0	55.8	56.4	56.8	57.2	57.5	57.7
300	—	47.7	51.3	53.3	54.6	55.5	56.1	56.6	57.0	57.3	57.5
320	—	46.6	50.6	52.8	54.2	55.1	55.8	56.3	56.7	57.1	57.3
340	—	45.5	49.9	52.3	53.8	54.8	55.5	56.1	56.5	56.8	57.1
360	—	—	49.2	51.7	53.3	54.4	55.2	55.8	56.3	56.6	57.0
380	—	—	48.5	51.2	52.9	54.1	54.9	55.5	56.0	56.4	56.8
400	—	—	47.7	50.6	52.5	53.7	54.6	55.3	55.8	56.2	56.6
420	—	—	46.9	50.1	52.0	53.3	54.3	55.0	55.6	56.0	56.4
440	—	—	46.1	49.5	51.6	53.0	54.0	54.7	55.3	55.8	56.2
460	—	—	45.3	48.9	51.1	52.6	53.6	54.4	55.1	55.6	56.0
480	—	—	—	48.3	50.6	52.2	53.3	54.2	54.8	55.4	55.8
500	—	—	—	47.7	50.2	51.8	53.0	53.9	54.6	55.1	55.6

**Note:** Minimum dew point selectable is 45°F.

**Table 2. Supply air dew point temperature, 75°F at 55 percent RH space limit**

Latent Load Btu/h per Person	cfm per person										
	10	15	20	25	30	35	40	45	50	55	60
100	51.6	53.8	54.9	55.5	55.9	56.1	56.3	56.5	56.6	56.7	56.8
120	50.2	53.0	54.2	55.0	55.5	55.8	56.1	56.2	56.4	56.5	56.6
140	48.8	52.1	53.6	54.5	55.1	55.5	55.8	56.0	56.2	56.3	56.4
160	47.2	51.2	53.0	54.0	54.6	55.1	55.5	55.7	55.9	56.1	56.2
180	45.6	50.2	52.3	53.5	54.2	54.8	55.2	55.5	55.7	55.9	56.1
200	—	49.3	51.6	53.0	53.8	54.4	54.9	55.2	55.5	55.7	55.9
220	—	48.3	50.9	52.4	53.4	54.1	54.5	54.9	55.2	55.5	55.7
240	—	47.2	50.2	51.9	53.0	53.7	54.2	54.6	55.0	55.2	55.5
260	—	46.2	49.5	51.4	52.5	53.3	53.9	54.4	54.7	55.0	55.3
280	—	45.1	48.8	50.8	52.1	53.0	53.6	54.1	54.5	54.8	55.1
300	—	—	48.0	50.2	51.6	52.6	53.3	53.8	54.2	54.6	54.9
320	—	—	47.2	49.7	51.2	52.2	53.0	53.5	54.0	54.3	54.6
340	—	—	46.4	49.1	50.7	51.8	52.6	53.3	53.7	54.1	54.4
360	—	—	45.6	48.5	50.2	51.4	52.3	53.0	53.5	53.9	54.2
380	—	—	—	47.9	49.8	51.0	52.0	52.7	53.2	53.7	54.0
400	—	—	—	47.2	49.3	50.6	51.6	52.4	53.0	53.4	53.8
420	—	—	—	46.6	48.8	50.2	51.3	52.1	52.7	53.2	53.6
440	—	—	—	46.0	48.3	49.8	50.9	51.8	52.4	53.0	53.4
460	—	—	—	45.3	47.8	49.4	50.6	51.5	52.2	52.7	53.2
480	—	—	—	—	47.2	49.0	50.2	51.2	51.9	52.5	53.0
500	—	—	—	—	46.7	48.6	49.9	50.9	51.6	52.2	52.7

**Note:** Minimum dew point selectable is 45°F.

## Application Considerations

**Table 3. Supply air dew point temperature, 75°F at 50 percent RH space limit**

Latent Load Btu/h per Person	cfm per person										
	10	15	20	25	30	35	40	45	50	55	60
100	48.4	50.8	51.9	52.6	53	53.3	53.6	53.8	53.9	54	54.1
120	46.8	49.8	51.3	52.1	52.6	53	53.3	53.5	53.6	53.8	53.9
140	45.2	48.9	50.6	51.5	52.2	52.6	52.9	53.2	53.4	53.5	53.7
160	—	47.9	49.8	51	51.7	52.2	52.6	52.9	53.1	53.3	53.5
180	—	46.8	49.1	50.4	51.3	51.8	52.3	52.6	52.9	53.1	53.3
200	—	45.7	48.4	49.8	50.8	51.5	51.9	52.3	52.6	52.8	53.0
220	—	—	47.6	49.3	50.3	51.1	51.6	52	52.3	52.6	52.8
240	—	—	46.8	48.7	49.8	50.7	51.3	51.7	52.1	52.4	52.6
260	—	—	46	48.1	49.4	50.3	50.9	51.4	51.8	52.1	52.4
280	—	—	45.2	47.4	48.9	49.8	50.6	51.1	51.5	51.9	52.2
300	—	—	—	46.8	48.4	49.4	50.2	50.8	51.3	51.6	51.9
320	—	—	—	46.2	47.9	49	49.8	50.5	51	51.4	51.7
340	—	—	—	45.5	47.3	48.6	49.5	50.2	50.7	51.1	51.5
360	—	—	—	—	46.8	48.2	49.1	49.8	50.4	50.9	51.3
380	—	—	—	—	46.3	47.7	48.7	49.5	50.1	50.6	51
400	—	—	—	—	45.7	47.3	48.4	49.2	49.8	50.4	50.8
420	—	—	—	—	45.2	46.8	48	48.9	49.6	50.1	50.6
440	—	—	—	—	—	46.3	47.6	48.5	49.3	49.8	50.3
460	—	—	—	—	—	45.9	47.2	48.2	49	49.6	50.1
480	—	—	—	—	—	45.4	46.8	47.9	48.7	49.3	49.8
500	—	—	—	—	—	—	46.4	47.5	48.4	49.1	49.6

**Note:** Minimum dew point selectable is 45°F.

The Trane OAU utilizes recovered energy from the cooling process to reheat the air leaving the evaporator coil as required to meet the discharge air setpoint. The reheat refrigeration circuit is adequate to deliver enough reheat to supply neutral-temperature air (e.g., 75°F dry-bulb) under most operating conditions. On very low load days, the reheat circuit may not contain enough energy to meet the desired reheat setpoint.

## Heating

The OAU has electric, heat pump, or gas heat options. The electric heat option is available in 0°F–80°F temperature rise offerings with SCR modulation. This means that the lowest temperature rise provided depends only on heater size and unit airflow. Calculate the temperature rise to confirm that it provides acceptable control. The electric heat will modulate to maintain heating setpoint.

When using hot water heat, the unit controller will modulate a field-provided coil control valve. Provide an ethylene glycol and water mixture or other means of freeze protection for the hot water coil if the OAU will be subject to sub-freezing temperatures.

## Capacity Control

The capacity control system on the Horizon™ Outdoor Air Unit is flexible enough to accommodate a variety of system applications. These applications include:

- treating outdoor air to supply a single space or multiple spaces or
- simultaneously meet building make-up air needs while controlling the temperature and relative humidity of a single space.

Each of these applications requires careful consideration to achieve the desired results.

## Discharge Air Control

For many multiple space, dedicated outdoor air systems, the OAU will continuously supply outdoor air at a dry-bulb setpoint and a dew point that does not exceed its dew point setpoint. This control approach is simple because it allows the OAU to function independent of local terminal unit operation or actual space conditions. If the unit selection criteria is determined using the method suggested in “Establishing Capacity Requirements,” p. 18, the Outdoor Air Unit will limit the space relative humidity to the target level.

Many dedicated outdoor air systems supply reheated air directly to terminal units or to spaces that have terminal units performing local sensible cooling. This results in the local terminal units re-cooling the previously re-heated outdoor air. Resetting the supply air dry-bulb temperature of the Outdoor Air Unit offers the opportunity to minimize the amount of time re-cooling occurs. Refer to “Cooling Setpoint,” p. 21 for more information.

## Cooling Setpoint

Because the Trane OAU dehumidifies the outdoor air by cooling it, this cool outdoor air can reduce the sensible cooling load on the local terminal unit. At low space sensible loads, the cool outdoor air may sub-cool the space, causing the local terminal unit to add heat (new energy heat). Therefore, reset occupied Space Cooling Setpoint (SPCS—Space Control Sequence) or Evaporator Cooling Setpoint (ECS—Outdoor Air Control Sequence) of the OAU to minimize space sensible re-cooling so the terminal unit with the lowest sensible load is almost at zero cooling capacity (within the limit of the dew point setpoint). To take full advantage of space demand based dry-bulb reset, you may need to size some of the local terminal units based on neutral outdoor air temperature. This strategy will more effectively manage occupant comfort during seasonal changeover for two-pipe terminal unit systems. Because the OAU is not connected to the chiller or boiler plant, accomplish this by resetting the Outdoor Air Unit SPCS or ECS to keep the critical zone at zero heating capacity when the boiler is off and zero cooling capacity when the chiller is off. A Trane Integrated Comfort™ system can provide this control capability.

## Unoccupied Space Humidity Control

The Horizon™ OAU provides conditioned outdoor air for the ventilation and/or make-up air needs of a building during occupied hours. It can also limit building relative humidity during unoccupied hours. To do this, provide a return air path to the OAU and place a relative humidity sensor in the space served by the OAU or in a common relief air path (like a return corridor) if the OAU serves multiple spaces. The unit will cycle as required to limit the space humidity to the unoccupied Dewpoint Setpoint (NSDS) setpoint. Reheat and return air damper options are required for this operation. For dedicated outdoor air systems ducted to terminal units, these units must cycle with the operation of the Horizon OAU. A Trane Integrated Comfort™ system can provide this control capability.

## Space Control

For single space applications, the Horizon OAU can control space temperature and limit space relative humidity. To do this, size the airflow to meet whichever is the highest: the space loads and ventilation and/or make-up air needs of the application. Install a temperature sensor in the space to provide temperature control and reset the supply air temperature. If reset of the supply air dew point is desired, install a space relative humidity sensor in the space to provide relative humidity limit control.

## Outdoor Airflow Balancing

Establish final unit airflow through a field air balancing procedure. Change the fan speed through replacement or fan sheave adjustment (belt drive indoor fan motor) or VFD Setpoint via the UC600 controller (direct drive fan motor).

## Air to Air Energy Recovery

Energy recovery can significantly reduce HVAC system first-cost and operating energy costs. You can use recovered energy for two purposes:

1. to temper or reheat supply air for independent control of sensible and latent capacity, or
2. to precondition outdoor air as it enters the building for ventilation.

The Horizon™ OAU offers refrigerant heat recovery for reheating the supply air. To precondition

## Application Considerations

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the outdoor air, use the optional total-energy wheel to recover energy from building exhaust.

### Controlling the Total-Energy Wheel

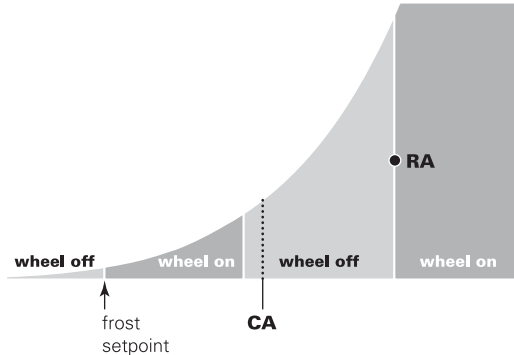
One way to control an energy recovery device is to turn it on and off with the OAU system exhaust fan. In this case, the total energy wheel enables when the unit is in occupied mode and the exhaust fan is running. While this control method is certainly simple and effective in some applications, it may not provide the expected energy saving benefit, particularly when cold air (vs. neutral air) is supplied to the building.

Another more effective approach is to use the outdoor air dry-bulb to determine when to energize or de-energize the energy recovery device. See [Figure 11, p. 22](#) for an example of this simplified control. In addition to being more effective from a control standpoint, it's also a very simple control method because the wheel is enabled when all of the following are true:

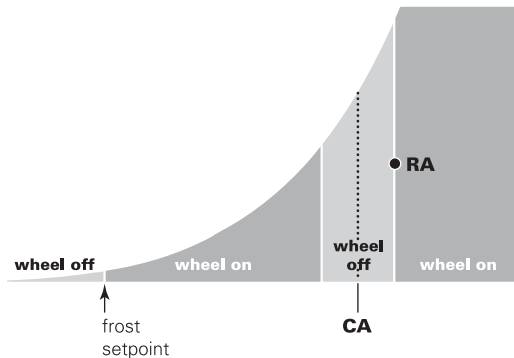
- unit is in occupied mode,
- exhaust fan is enabled,
- Unit Main Control Module (MCM) calls for unit to operate in dehumidification, cooling, or heating modes, and
- outside air temperature is above the frost protection setpoint (default setpoint 12°F).

If using the OAU to deliver cold, dry conditioned air to the building (outdoor air is cooled to a low dew point but not reheated), use the cooling setpoint control strategy (see ["Cooling Setpoint," p. 21](#)).

**Figure 10. Dry-bulb control in a cold DB/dry DP application**



**Figure 11. Dry-bulb control in a neutral DB/dry DP application**



### Cross Leakage

All energy wheels have some cross leakage. Therefore, do not use energy wheels in applications involving toxic or hazardous air streams. The percentage of cross leakage depends on the pressure differentials across the wheel section. With Trane Horizon™ OAU energy wheels, the exhaust air transfer ratios are typically low (less than 4 percent).

### Condensate Drain Configuration

OAU units are selected based on dehumidification capability. As such, condensate can form at a high rate. Therefore, the OAU drain pan and condensate line are sized and designed accordingly. However, an often-overlooked element of proper condensate drainage is proper P-Trap and drain line sizing and installation. An incorrectly-designed and -installed P-Trap can restrict condensate flow or cause water in the condensate drain pan to “spit” or “geyser” which may cause condensate overflow. Carefully install and trap the drain pan to ensure adequate condensate removal under all conditions.

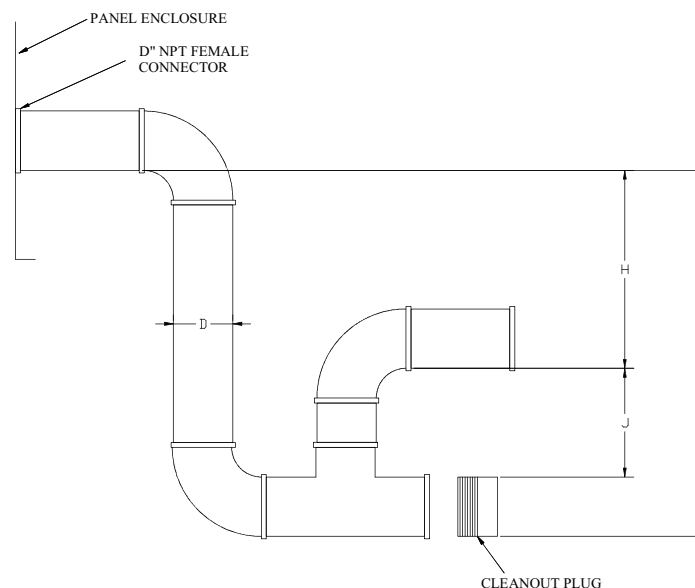
An evaporator condensate drain connection is provided on each unit. For more information, to the *Installation, Operation, and Maintenance* for your specific product:

- OAU-SVX004\*-EN (*Installation, Operation, and Maintenance: Horizon™ Outdoor Air Unit - Water Source Heat Pump - Model: OABE, OADE, OAKE, OANE*)

A condensate trap must be installed at the unit due to the drain connection being on the “negative pressure” side of the fan. Install the P-Trap using the guidelines in [Figure 12](#).

Pitch drain lines connected to P-Trap at least 1/2 inch for every 10 feet of horizontal run to assure proper condensate flow. Do not allow the horizontal run to sag causing a possible double-trap condition which could result in condensate backup due to “air lock”.

**Figure 12. Condensate trap installation**



D = PIPE DIAMETER  
H = INTERNAL STATIC PRESSURE (IN W.G.) + 1"  
J = H \* 0.5  
L = H + J + D

NOTES: 1. PITCH DRAIN AT LEAST 1/2" PER 10' HORIZONTAL RUN  
2. CONDENSATE DRAIN PAN WILL NOT DRAIN PROPERLY IF P-TRAP IS NOT PRIMED & OF ADEQUATE HEIGHT TO ALLOW FOR CABINET OPERATING NEGATIVE PRESSURE

## Application Considerations

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### Acoustical Considerations

Proper unit placement is critical to reducing transmitted sound levels from the OAU to the building. Therefore, consider acoustic concerns during the design phase and place the unit accordingly. The most economical means of avoiding an acoustical problem is to place the unit(s) away from acoustically critical areas. If possible, do not locate units directly above areas such as: offices, conference rooms, executive office areas, and classrooms. Instead, ideal locations to consider are: over corridors, utility rooms, toilets, or other areas where higher sound levels directly below the unit(s) are acceptable.

Follow these basic guidelines for unit placement to minimize sound transmission through the building structure.

1. Never cantilever the compressor side of the unit. A structural cross member or full perimeter roof curb, supported by roof structural members, must support this side of the unit.
2. Locate the unit's center of gravity close to or over column or main support beam.
3. If the roof structure is very light, replace roof joists by a structural shape in the critical areas described above.
4. If several units are to be placed on one span, stagger them to reduce deflection over that span.

It is impossible to totally quantify the building structure effect on sound transmission because it is dependent on how the roof and building members respond to the OAU's sound and vibration. However, following the guidelines listed above will help reduce sound transmissions.

### Clearance Requirements

Follow the recommended unit clearances to assure adequate serviceability, maximum capacity, and peak operating efficiency. Reducing unit clearances may result in condenser coil starvation or warm condenser air recirculation. If the recommended clearances are not possible on a particular job, consider the following:

- Do the clearances available allow for major service work, such as changing compressors or coils?
- Do the clearances available allow for proper outside air intake, exhaust air removal, and condenser airflow?
- If screening around the unit is used, is there a possibility of air recirculation from the exhaust to the outside air intake or from condenser exhaust to condenser intake.

Review any actual clearances that appear inadequate with your local Trane sales engineer.

When two or more units are placed side by side, increase the distance between the units to twice the recommended single unit clearance. Stagger the units for these two reasons:

1. To reduce span deflection if more than one unit is placed on a single span. Reducing deflection discourages sound transmission.
2. To assure proper exhaust air diffusion before contact with the adjacent unit's outside air intake.

### Duct Design

It is important to note that the rated capacities of the OAU can be met only if the unit is properly installed. A well-designed duct system is essential to meet these capacities.

Satisfactory air distribution throughout the system requires an unrestricted and uniform airflow from the OAU discharge duct.

However, when job conditions dictate installation of elbows near the OAU outlet, using guide vanes may reduce capacity loss and static pressure loss.



## Controls Sequence

For sequence of operation, please refer to the *Installation, Operation, and Maintenance* for your specific product:

- OAU-SVX004\*-EN (*Installation, Operation, and Maintenance: Horizon™ Outdoor Air Unit - Water Source Heat Pump - Model: OABE, OADE, OAKE, OANE*)



# Selection Procedure

## Horizon OAU WSHP Selection Procedure

The Horizon™ Outdoor Air Unit (OAU) is designed to efficiently dehumidify outdoor air. As such, the selection of an OAU is somewhat more complex than a standard recirculation rooftop. To make it easier, there is an online selection tool provided. Before launching the program, the following information about the specific project will be required:

1. Entering Air Temperature (DB/WB)
  - a. Summer
  - b. Winter
2. Entering Water Temperature (EWT) Cooling
3. Fluid Flow
4. Fluid Type (Water, Propylene, or Ethylene)
5. Volume Glycol (if Propylene or Ethylene is used)
6. EAT—Heating
7. EWT—Heating
8. Condenser Material (copper inner tubes are recommended for fresh and cooling tower water applications while cupro-nickel is recommended for ground and sea water applications)
9. CFM
  - a. Total CFM
  - b. Outdoor Air CFM
10. External Static Pressure
11. Altitude
12. Electrical Voltage/Phase/Hertz
13. Heat Type

After initial entry, the tool will search all possible options, and display those which may be acceptable. If a certain tonnage is not available given the project specifics, there is an option to view the reason for that unit's rejection. Of the units available, select the one that is most suited to the project, based on CFM, motor speed, or leaving air conditions. Leaving air conditions off the coil as well as unit leaving air temperature are displayed. For distributors, a price is displayed. The unit selected will be saved as its current configuration. If circumstances change after the unit is saved, the program will require a reconfiguration, at which time the price will be adjusted as well.



# General Data

**Table 4. OABE General Data—Cooling 3–5 Tons High Efficiency**

	<b>3 Tons</b>	<b>4 Tons</b>	<b>5 Tons</b>
	<b>OABE036A</b>	<b>OABE048A</b>	<b>OABE060A</b>
<b>Performance</b>			
Gross Cooling Capacity, Btu (kW)	41,800 (12.25)	57,439 (16.83)	70,304 (20.60)
Gross Heating Capacity, Btu (kW)	36,779 (10.78)	44,667 (13.09)	63,402 (18.58)
Nominal cfm (m <sup>3</sup> /h)	500–2000 (849–3398)	500–2000 (849–3398)	500–2000 (849–3398)
<b>Compressor</b>			
Number	1	1 / Scroll	1 / Scroll
Type	Scroll	1 / Scroll	1 / Scroll
<b>Fluid/Refrigerant Water Coil</b>			
Type	Coaxial	Coaxial	Coaxial
Connection Size/Circuit, in. (mm)	1 (25.4)	1 (25.4)	1 (25.4)
Pressure Drop/Circuit, ft wc (kPa)	4.3 (12.85)	6.4 (19.13)	4.8 (14.35)
Water Flow/Circuit, gpm (L/s)	9 (0.57)	12 (0.76)	15 (0.95)
<b>Indoor Coil</b>			
Type	High Performance	High Performance	High Performance
Tube Size—OD, in. (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
Face Area, ft <sup>2</sup> (m <sup>2</sup> )	4.17 (0.39)	4.17 (0.39)	4.17 (0.39)
Rows	4	4	4
FPI	12	12	12
Refrigerant Control	TXV	TXV	TXV
Drain Connection Size, in. (mm)	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)
<b>Indoor Fan</b>			
Type	Backward Curved	Backward Curved	Backward Curved
Number Used	1	1	1
Diameter	Varies	Varies	Varies
Drive Type	Direct Drive	Direct Drive	Direct Drive
Number Motors	1	1	1
Motor HP (kW), Standard—Oversized	2.68–4.0 (1.97–2.94)	2.68–4.0 (1.97–2.94)	2.68–4.0 (1.97–2.94)
Motor RPM	Varies	Varies	Varies
<b>Filters</b>			
Type Furnished	Varies	Varies	Varies
Evap Size, in. (Qty)	20 x 24 x 2 (2)	20 x 24 x 2 (2)	20 x 24 x 2 (2)
Type Furnished	MERV-8	MERV-8	MERV-8
ERV Size, in. (Qty)	20 x 24 x 2 (4)	20 x 24 x 2 (4)	20 x 24 x 2 (4)
<b>Refrigerant Charge, lb of R-410A</b>	See Nameplate	See Nameplate	See Nameplate



## General Data

### OABE Units

**Table 5. OABE General Data—Cooling 6–9 Tons High Efficiency**

	6 Tons	7 Tons	8 Tons	9 Tons
	OABE072A	OABE084A	OABE096A	OABE108A
<b>Performance</b>				
Gross Cooling Capacity, Btu (kW)	81,059 (23.76)	93,010 (27.26)	105,293 (30.86)	115,859 (33.95)
Gross Heating Capacity, Btu (kW)	75,344 (22.08)	85,183 (24.96)	100,455 (29.44)	108,943 (31.93)
Nominal cfm (m <sup>3</sup> /h)	625–3000 (1062–5097)	625–3000 (1062–5097)	625–3000 (1062–5097)	625–3000 (1062–5097)
<b>Compressor</b>				
Number	1	1	1	1
Type	Scroll	Scroll	Scroll	Scroll
<b>Fluid/Refrigerant Water Coil</b>				
Type	Coaxial	Coaxial	Coaxial	Coaxial
Connection Size/Circuit, in. (mm)	1 (25.4)	2 (50.8)	2 (50.8)	2 (50.8)
Pressure Drop/Circuit, ft wc (kPa)	6.3 (18.83)	8.2 (24.51)	5.9 (17.64)	7.4 (22.12)
Water Flow/Circuit, gpm (L/s)	18 (1.14)	21 (1.32)	24 (1.51)	27 (1.70)
<b>Indoor Coil</b>				
Type	High Performance	High Performance	High Performance	High Performance
Tube Size—OD, in. (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
Face Area, ft <sup>2</sup> (m <sup>2</sup> )	6.56 (0.61)	6.56 (0.61)	6.56 (0.61)	6.56 (0.61)
Rows	4	4	4	4
FPI	12	12	12	12
Refrigerant Control	TXV	TXV	TXV	TXV
Drain Connection Size, in. (mm)	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)
<b>Indoor Fan</b>				
Type	Backward Curved	Backward Curved	Backward Curved	Backward Curved
Number Used	1	1	1	1
Diameter	Varies	Varies	Varies	Varies
Drive Type	Direct Drive	Direct Drive	Direct Drive	Direct Drive
Number Motors	1	1	1	1
Motor HP (kW), Standard—Oversized	2.68–4.0 (1.97–2.94)	2.68–4.0 (1.97–2.94)	2.68–4.0 (1.97–2.94)	2.68–4.0 (1.97–2.94)
Motor RPM	Varies	Varies	Varies	Varies
<b>Filters</b>				
Type Furnished	Varies	Varies	Varies	Varies
Evap Size, in. (Qty)	20 x 24 x 2 (2)	20 x 24 x 2 (2)	20 x 24 x 2 (2)	20 x 24 x 2 (2)
Type Furnished	MERV-8	MERV-8	MERV-8	MERV-8
ERV Size, in. (Qty)	20 x 24 x 2 (4)	20 x 24 x 2 (4)	20 x 24 x 2 (4)	20 x 24 x 2 (4)
<b>Refrigerant Charge, lb of R-410A</b>				
	See Nameplate	See Nameplate	See Nameplate	See Nameplate

**Table 6. OADE General Data—Cooling 5–8 Tons High Efficiency**

	5 Tons Downflow	6 Tons Downflow	7 Tons Downflow	8 Tons Downflow
	OADE060A	OADE072A	OADE084	OADE096
<b>Performance</b>				
Gross Cooling Capacity, Btu (kW)	71,522 (20.96)	81,032 (23.75)	101,129 (29.64)	110,880 (32.50)
Gross Heating Capacity, Btu (kW)	63,292 (18.55)	74,463 (21.82)	82,750 (24.25)	101,852 (29.85)
Nominal cfm (m <sup>3</sup> /h)	625–1250 (1062–2124)	750–1500 (1274–2548)	875–1750 (1487–2973)	1000–2000 (1699–3398)
<b>Compressor</b>				
Number	1	1	1	2
Type	Scroll	Scroll	Scroll	Scroll
<b>Fluid/Refrigerant Water Coil</b>				
Type	Coaxial	Coaxial	Coaxial	Coaxial
Connection Size/Circuit, in. (mm)	1 (25.4)	1 (25.4)	1 (25.4)	1 (25.4)
Pressure Drop/Circuit, ft wc (kPa)	4.8 (14.35)	7.9 (23.61)	8.2 (24.51)	6.4/6.4 (19.13/19.13)
Water Flow/Circuit, gpm (L/s)	15 (0.95)	18 (1.14)	21 (1.32)	12/12 (0.76/0.76)
<b>Indoor Coil</b>				
Type	High Performance	High Performance	High Performance	High Performance
Tube Size—OD, in. (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
Face Area, ft <sup>2</sup> (m <sup>2</sup> )	6 (0.56)	6 (0.56)	6 (0.56)	9 (0.84)
Rows	4	4	4	4
FPI	12	12	12	12
Refrigerant Control	TXV	TXV	TXV	TXV
Drain Connection Size, in. (mm)	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)
<b>Indoor Fan</b>				
Type	Backward Inclined	Backward Inclined	Backward Inclined	Backward Inclined
Number Used	1	1	1	1
Diameter	Varies	Varies	Varies	Varies
Drive Type	Direct Drive	Direct Drive	Direct Drive	Direct Drive
Number Motors	1	1	1	1
Motor HP (kW), Standard—Oversized	1.0–3.0 (0.74–2.21)	1.0–3.0 (0.74–2.21)	1.0–3.0 (0.74–2.21)	1.0–5.0 (0.74–3.68)
Motor RPM	1750–3500	1750–3500	1750–3500	1750–3500
Motor Frame Size (Standard/Oversized)	Varies	Varies	Varies	Varies
<b>Filters</b>				
Type Furnished	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89
Number/Size Recommended				
<b>Refrigerant Charge, lb of R-410A</b>				
Downflow	See Nameplate	See Nameplate	See Nameplate	See Nameplate



## General Data

### OADE Units

**Table 7. OADE General Data—Cooling 10–15 Tons High Efficiency**

	10 Tons Downflow	12 Tons Downflow	15 Tons Downflow
	OADE120A	OADE144A	OADE180A
<b>Performance</b>			
Gross Cooling Capacity, Btu (kW)	143,044 (41.92)	162,064 (47.50)	202,258 (59.28)
Gross Heating Capacity, Btu (kW)	126,584 (37.10)	148,926 (43.65)	165,500 (48.50)
Nominal cfm (m <sup>3</sup> /h)	1250–2500 (2124–4247)	1500–3000 (2548–5097)	1500–3000 (2548–5097)
<b>Compressor</b>			
Number	2	2	2
Type	Scroll	Scroll	Scroll
<b>Fluid/Refrigerant Water Coil</b>			
Type	Coaxial	Coaxial	Coaxial
Connection Size/Circuit, in. (mm)	1 (25.4)	1.5 (38.1)	1.5 (38.1)
Pressure Drop/Circuit, ft wc (kPa)	4.8/4.8 (14.35/14.35)	7.9/7.9 (23.61/23.61)	8.2/8.2 (24.51/24.51)
Water Flow/Circuit, gpm (L/s)	15/15 (0.95/0.95)	18/18 (1.14/1.14)	21/21 (1.32/1.32)
<b>Indoor Coil</b>			
Type	High Performance	High Performance	High Performance
Tube Size—OD, in. (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
Face Area, ft <sup>2</sup> (m <sup>2</sup> )	9 (0.84)	9 (0.84)	9 (0.84)
Rows	4	4	4
FPI	12	12	12
Refrigerant Control	TXV	TXV	TXV
Drain Connection Size, in. (mm)	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)
<b>Indoor Fan</b>			
Type	Backward Inclined	Backward Inclined	Backward Inclined
Number Used	1	1	1
Diameter	Varies	Varies	Varies
Drive Type	Direct Drive	Direct Drive	Direct Drive
Number Motors	1	1	1
Motor HP (kW), Standard—Oversized	1.0–5.0 (0.74–3.68)	1.0–5.0 (0.74–3.68)	1.0–5.0 (0.74–3.68)
Motor RPM	1750–3500	1750–3500	1750–3500
Motor Frame Size (Standard/Oversized)	Varies	Varies	Varies
<b>Filters</b>			
Type Furnished	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89
Number/Size Recommended			
<b>Refrigerant Charge, lb of R-410A</b>			
Downflow	See Nameplate	See Nameplate	See Nameplate

**Table 8. OAGE General Data—Cooling 10–17 Tons High Efficiency**

	10 Tons Downflow	12 Tons Downflow	15 Tons Downflow	17 Tons Downflow
	OAGE120	OAGE144	OAGE180	OAGE210
<b>Performance</b>				
Gross Cooling Capacity, Btu (kW)	146,312 (42.88)	163,162 (47.82)	207,192 (60.72)	232,104 (68.02)
Gross Heating Capacity, Btu (kW)	132,672 (38.88)	150,140 (44.00)	193,968 (56.85)	219,778 (64.41)
Nominal cfm (m <sup>3</sup> /h)	1250–5000 (2124–8495)	1500–5000 (2549–8495)	1875–5000 (3186–8495)	2188–5000 (3717–8495)
<b>Compressor</b>				
Number	2	2	2	2
Type	Scroll	Scroll	Scroll	Scroll
<b>Fluid/Refrigerant Water Coil</b>				
Type	Coaxial	Coaxial	Coaxial	Coaxial
Connection Size/Circuit, in. (mm)	1 (25.4)	1.5 (38.1)	1.5 (38.1)	2 (50.8)
Pressure Drop/Circuit, ft wc (kPa)	3.5/3.5 (10.46/10.46)	4.7/4.7 (14.05/14.05)	3.2/3.2 (9.56/9.56)	3.3/3.3 (9.86/9.86)
Water Flow/Circuit, gpm (L/s)	15/15 (0.95/0.95)	18/18 (1.14/1.14)	21/21 (1.32/1.32)	26/26 (1.64/1.64)
<b>Indoor Coil</b>				
Type	High Performance	High Performance	High Performance	High Performance
Tube Size—OD, in. (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
Face Area, ft <sup>2</sup> (m <sup>2</sup> )	10 (0.93)	10 (0.93)	10 (0.93)	10 (0.93)
Rows	4	4	4	4
FPI	12	12	12	12
Refrigerant Control	TXV	TXV	TXV	TXV
Drain Connection Size, in. (mm)	1 (25.4)	1 (25.4)	1 (25.4)	1 (25.4)
<b>Indoor Fan</b>				
Type	Backward Inclined	Backward Inclined	Backward Inclined	Backward Inclined
Number Used	1–2	1–2	1–2	1–2
Diameter	Varies	Varies	Varies	Varies
Drive Type	Direct Type	Direct Type	Direct Type	Direct Type
Number Motors	1–2	1–2	1–2	1–2
Motor HP (kW), Standard—Oversized	2.67–8 (1.96–5.88)	2.67–8 (1.96–5.88)	2.67–8 (1.96–5.88)	2.67–8 (1.96–5.88)
Motor RPM	1750–3500	1750–3500	1750–3500	1750–3500
Motor Frame Size (Standard/Oversized)	Varies	Varies	Varies	Varies
<b>Filters</b>				
Type Furnished	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89
Number/Size Recommended				
<b>Refrigerant Charge, lb of R-410A</b>				
Downflow	See Nameplate	See Nameplate	See Nameplate	See Nameplate



## General Data

### OAGE Units

**Table 9. OAGE General Data—Cooling 20–30 Tons High Efficiency**

	20 Tons Downflow	22 Tons Downflow	25 Tons Downflow	30Tons Downflow
	OAGE240	OAGE264	OAGE300	OAGE360
<b>Performance</b>				
Gross Cooling Capacity, Btu (kW)	271,596 (79.60)	304,200 (89.15)	348,658 (102.18)	393,162 (115.22)
Gross Heating Capacity, Btu (kW)	258,316 (75.70)	287,230 (84.18)	318,944 (93.47)	367,512 (107.71)
Nominal cfm (m <sup>3</sup> /h)	2500–6050 (4248–10279)	2750–6050 (4672–10279)	3125–7500 (5309–12743)	3750–7500 (6371–12743)
<b>Compressor</b>				
Number	2	2	2	2
Type	Scroll	Scroll	Scroll	Scroll
<b>Fluid/Refrigerant Water Coil</b>				
Type	Coaxial	Coaxial	Coaxial	Coaxial
Connection Size/Circuit, in. (mm)	2 (50.8)	2 (50.8)	2 (50.8)	2 (50.8)
Pressure Drop/Circuit, ft wc (kPa)	4.1/4.1 (12.25/12.25)	4.6/4.6 (13.75/13.75)	5.8/5.8 (17.34/17.34)	8.2/8.2 (24.51/24.51)
Water Flow/Circuit, gpm (L/s)	30/30 (1.89/1.89)	33/33 (2.08/2.08)	37.5/37.5 (2.37/2.37)	45/45 (2.84/2.84)
<b>Indoor Coil</b>				
Type	High Performance	High Performance	High Performance	High Performance
Tube Size—OD, in. (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
Face Area, ft <sup>2</sup> (m <sup>2</sup> )	12 (1.11)	12 (1.11)	15 (1.39)	15 (1.39)
Rows	4	4	4	4
FPI	12	12	12	12
Refrigerant Control	TXV	TXV	TXV	TXV
Drain Connection Size, in. (mm)	1 (25.4)	1 (25.4)	1 (25.4)	1 (25.4)
<b>Indoor Fan</b>				
Type	Backward Inclined	Backward Inclined	Backward Inclined	Backward Inclined
Number Used	1–2	1–2	1–2	1–2
Diameter	Varies	Varies	Varies	Varies
Drive Type	Direct Drive	Direct Drive	Direct Drive	Direct Drive
Number Motors	1–2	1–2	1–2	1–2
Motor HP (kW), Standard—Oversized	2.67–8 (1.96–5.88)	2.67–8 (1.96–5.88)	2.67–8 (1.96–5.88)	2.67–8 (1.96–5.88)
Motor RPM	1750–3500	1750–3500	1750–3500	1750–3500
Motor Frame Size (Standard/Oversized)	Varies	Varies	Varies	Varies
<b>Filters</b>				
Type Furnished	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89
Number/Size Recommended				
<b>Refrigerant Charge, lb of R-410A</b>				
Downflow	See Nameplate	See Nameplate	See Nameplate	See Nameplate



**Table 10. OAKE General Data—Cooling 12–20 Tons High Efficiency**

	12 Tons Downflow	15 Tons Downflow	17 Tons Downflow	20 Tons Downflow
	OAKE144A	OAKE180A	OAKE210A	OAKE240A
<b>Performance</b>				
Gross Cooling Capacity, Btu (kW)	164,280 (48.15)	208,912 (61.23)	239,236 (70.11)	279,374 (81.88)
Gross Heating Capacity, Btu (kW)	148,018 (43.38)	190,654 (55.88)	208,973 (61.24)	219,466 (64.32)
Nominal cfm (m <sup>3</sup> /h)	1500–3000 (2548–5097)	1875–3750 (3186–6371)	2125–4250 (3610–7221)	2500–5000 (4247–8495)
<b>Compressor</b>				
Number	2	2	2	2
Type	Scroll	Scroll	Scroll	Scroll
<b>Fluid/Refrigerant Water Coil</b>				
Type	Coaxial	Coaxial	Coaxial	Coaxial
Connection Size/Circuit, in. (mm)	1.5 (38.1)	1.5 (38.1)	2 (50.8)	2 (50.8)
Pressure Drop/Circuit, ft wc (kPa)	7.9/7.9 (23.61/23.61)	8.2/8.2 (24.51/24.51)	7.0/7.0 (20.92/20.92)	9.0/9.0 (26.90/26.90)
Water Flow/Circuit, gpm (L/s)	18/18 (1.14/1.14)	21/21 (1.32/1.32)	26.25/26.25 (1.66/1.66)	30/30 (1.89/1.89)
<b>Indoor Coil</b>				
Type	High Performance	High Performance	High Performance	High Performance
Tube Size—OD, in. (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
Face Area, ft <sup>2</sup> (m <sup>2</sup> )	9 (0.84)	10 (0.93)	16 (1.49)	16 (1.49)
Rows	4	4	4	4
FPI	12	12	12	12
Refrigerant Control	TXV	TXV	TXV	TXV
Drain Connection Size, in. (mm)	1 (25.4)	1 (25.4)	1 (25.4)	1 (25.4)
<b>Indoor Fan</b>				
Type	Backward Inclined	Backward Inclined	Backward Inclined	Backward Inclined
Number Used	1	1	1	1
Diameter	Varies	Varies	Varies	Varies
Drive Type	Direct Drive	Direct Drive	Direct Drive	Direct Drive
Number Motors	1	1	1	1
Motor HP (kW), Standard—Oversized	1–5.0 (0.74–3.68)	1.0–5.0 (0.74–3.68)	1–7.5 (0.74–5.52)	1–7.5 (0.74–5.52)
Motor RPM	1750–3500	1750–3500	1750–3500	1750–3500
Motor Frame Size (Standard/Oversized)	Varies	Varies	Varies	Varies
<b>Filters</b>				
Type Furnished	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89
Number/Size Recommended				
<b>Refrigerant Charge, lb of R-410A</b>				
Downflow	See Nameplate	See Nameplate	See Nameplate	See Nameplate



## General Data

### OAKE Units

**Table 11. OAKE General Data—Cooling 22–30 Tons High Efficiency**

	22 Tons Downflow	25 Tons Downflow	30 Tons Downflow
	OAKE264A	OAKE300A	OAKE360A
<b>Performance</b>			
Gross Cooling Capacity, Btu (kW)	314,806 (92.26)	348,788 (102.22)	394,638 (115.66)
Gross Heating Capacity, Btu (kW)	289,850 (84.95)	328,446 (96.26)	368,582 (108.02)
Nominal cfm (m <sup>3</sup> /h)	2750–5500 (4672–9344)	3125–6250 (5309–10619)	3750–7500 (6371–12742)
<b>Compressor</b>			
Number	2	2	2
Type	Scroll	Scroll	Scroll
<b>Fluid/Refrigerant Water Coil</b>			
Type	Coaxial	Coaxial	Coaxial
Connection Size/Circuit, in. (mm)	2 (50.8)	2 (50.8)	2 (50.8)
Pressure Drop/Circuit, ft wc (kPa)	11.7/11.7 (34.97/34.97)	13.2/13.2 (39.46/39.46)	18.6/18.6 (55.60/55.60)
Water Flow/Circuit, gpm (L/s)	33/33 (2.08/20.8)	37.5/37.5 (2.37/2.37)	45/45 (2.84/2.84)
<b>Indoor Coil</b>			
Type	High Performance	High Performance	High Performance
Tube Size—OD, in. (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
Face Area, ft <sup>2</sup> (m <sup>2</sup> )	16 (1.49)	20 (1.86)	20 (1.86)
Rows	4	4	4
FPI	12	12	12
Refrigerant Control	TXV	TXV	TXV
Drain Connection Size, in. (mm)	1 (25.4)	1 (25.4)	1 (25.4)
<b>Indoor Fan</b>			
Type	Backward Inclined	Backward Inclined	Backward Inclined
Number Used	1	1	1
Diameter	Varies	Varies	Varies
Drive Type	Direct Drive	Direct Drive	Direct Drive
Number Motors	1	1	1
Motor HP (kW), Standard—Oversized	1–7.5 (0.74–5.52)	1.0–15.0 (0.74–11.03)	1.0–15.0 (0.74–11.03)
Motor RPM	1750–3500	1750–3500	1750–3500
Motor Frame Size (Standard/ Oversized)	Varies	Varies	Varies
<b>Filters</b>			
Type Furnished	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89
Number/Size Recommended			
<b>Refrigerant Charge, lb of R-410A</b>			
Downflow	See Nameplate	See Nameplate	See Nameplate

**Table 12. OANE General Data—Cooling 30–40 Tons High Efficiency**

	30 Tons Downflow	35 Tons Downflow	40 Tons Downflow
	OANE360A	OANE420A	OANE480A
<b>Performance</b>			
Gross Cooling Capacity, Btu (kW)	407,716 (119.49)	481,429 (141.09)	487,406 (142.84)
Gross Heating Capacity, Btu (kW)	371,280 (108.81)	471,287 (138.12)	477,756 (140.02)
Nominal cfm (m <sup>3</sup> /h)	3750–7500 (6371–12742)	4375–8750 (7433–14866)	5000–10000 (8495–16990)
<b>Compressor</b>			
Number	2	3	3
Type	Scroll	Scroll	Scroll
<b>Fluid/Refrigerant Water Coil</b>			
Type	Coaxial	Coaxial	Coaxial
Connection Size/Circuit, in. (mm)	2 (50.8)	2.5 (63.5)	2.5 (63.5)
Pressure Drop/Circuit, ft wc (kPa)	18.6/18.6 (55.60/55.60)	10.4/9.2 (31.09/27.50)	16.0/13.7 (47.83/40.95)
Water Flow/Circuit, gpm (L/s)	45/45 (2.84/2.84)	31/63 (1.96/3.97)	39/78 (2.46/4.92)
<b>Indoor Coil</b>			
Type	High Performance	High Performance	High Performance
Tube Size—OD, in. (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
Face Area, ft <sup>2</sup> (m <sup>2</sup> )	22 (2.04)	28 (2.60)	28 (2.60)
Rows	4	4	4
FPI	12	12	12
Refrigerant Control	TXV	TXV	TXV
Drain Connection Size, in. (mm)	1-1/4 (31.75)	1-1/4 (31.75)	1-1/4 (31.75)
<b>Indoor Fan</b>			
Type	Backward Inclined	Backward Inclined	Backward Inclined
Number Used	1	1	1 or 2
Diameter	Varies	Varies	Varies
Drive Type	Direct Drive	Direct Drive	Direct Drive
Number Motors	1	1	1 or 2
Motor HP (kW), Standard—Oversized	1.5–15 (1.1–11.03)	1.5–15 (1.1–11.03)	2.0–15 (1.47–11.03)
Motor RPM	1750–3500	1750–3500	1750–3500
Motor Frame Size (Standard/Oversized)	Varies	Varies	Varies
<b>Filters</b>			
Type Furnished	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89
Number/Size Recommended			
<b>Refrigerant Charge, lb of R-410A</b>			
Downflow	See Nameplate	See Nameplate	See Nameplate



## General Data

### OANE Units

**Table 13. OANE General Data—Cooling 45–54 Tons High Efficiency**

	45 Tons Downflow	50 Tons Downflow	55 Tons Downflow
	OANE540A	OANE600A	OANE648A
<b>Cooling Performance</b>			
Gross Cooling Capacity, Btu (kW)	580,516 (170.13)	707,260 (207.28)	762,312 (223.41)
Gross Heating Capacity, Btu (kW)	535,250 (156.87)	696,574 (204.15)	722,794 (226.48)
Nominal cfm (m <sup>3</sup> /h)	5625–11250 (9557–19114)	6250–12500 (10619–21237)	6750–13500 (11468–22936)
<b>Compressor</b>			
Number	3	4	4
Type	Scroll	Scroll	Scroll
<b>Fluid/Refrigerant Water Coil</b>			
Type	Coaxial	Coaxial	Coaxial
Connection Size/Circuit, in. (mm)	2.5 (63.5)	2.5 (63.5)	2.5 (63.5)
Pressure Drop/Circuit, ft wc (kPa)	14.9/12.4 (44.54/37.06)	12.8/12.8 (38.26/38.26)	12.4/12.4 (37.06/37.06)
Water Flow/Circuit, gpm (L/s)	40/80 (2.52/5.05)	75/75 (4.73/4.73)	80/80 (5.05/5.05)
<b>Indoor Coil</b>			
Type	High Performance	High Performance	High Performance
Tube Size—OD, in. (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
Face Area, ft <sup>2</sup> (m <sup>2</sup> )	28 (2.60)	28 (2.60)	28 (2.60)
Rows	4	4	4
FPI	12	12	12
Refrigerant Control	TXV	TXV	TXV
Drain Connection Size, in. (mm)	1-1/4 (31.75)	1-1/4 (31.75)	1-1/4 (31.75)
<b>Indoor Fan</b>			
Type	Backward Inclined	Backward Inclined	Backward Inclined
Number Used	1 or 2	1 or 2	1 or 2
Diameter			
Drive Type	Direct Drive	Direct Drive	Direct Drive
Number Motors	1 or 2	1 or 2	1 or 2
Motor HP (kW), Standard—Oversized	2.0–15 (1.47–11.03)	3.0–15 (2.21–11.03)	3.0–15 (2.21–11.03)
Motor RPM	1750-3500	1750-3500	1750-3500
Motor Frame Size (Standard/Oversized)	Varies	Varies	Varies
<b>Filters</b>			
Type Furnished	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89	Refer to "OAU Filter Guide" in "Appendix," p. 89
Number/Size Recommended			
<b>Refrigerant Charge, lb of R-410A</b>			
Downflow	See Nameplate	See Nameplate	See Nameplate



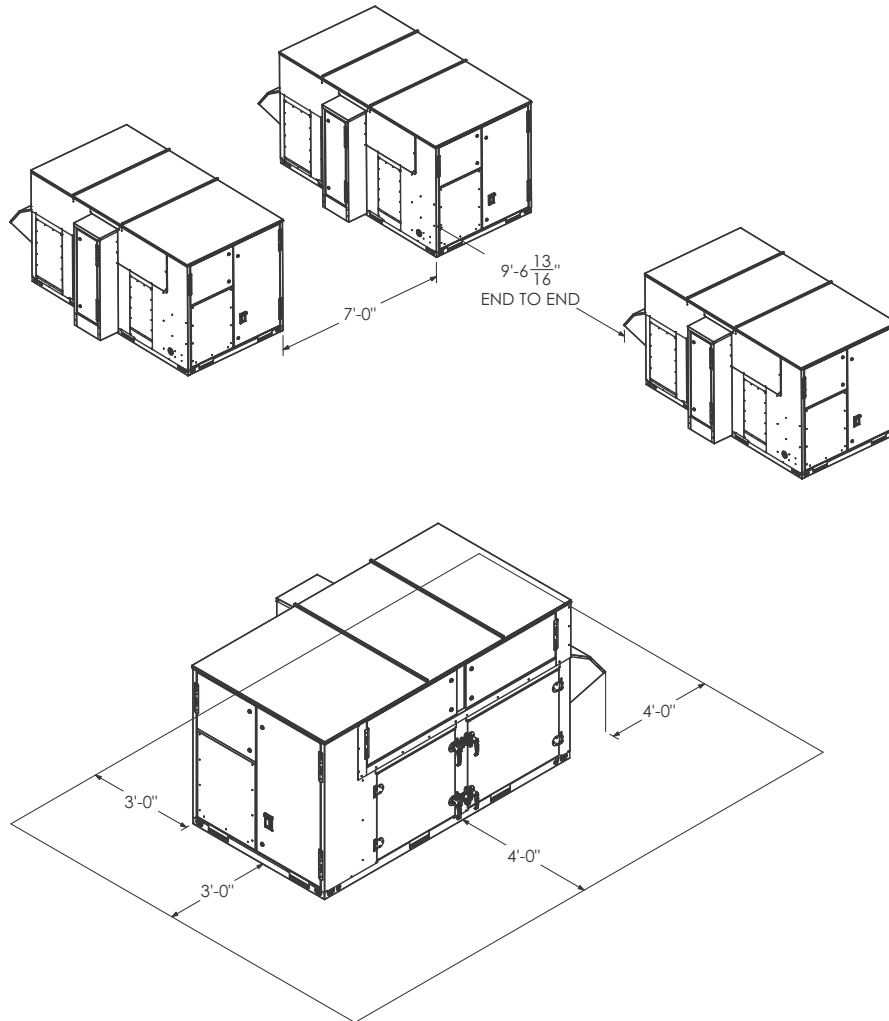
# Unit Clearances, Curb Dimensions, and Dimensional Data

## Outdoor WSHP Units

### OABE Units

#### Unit Clearances

Figure 13. Typical installation clearances for OABE unit

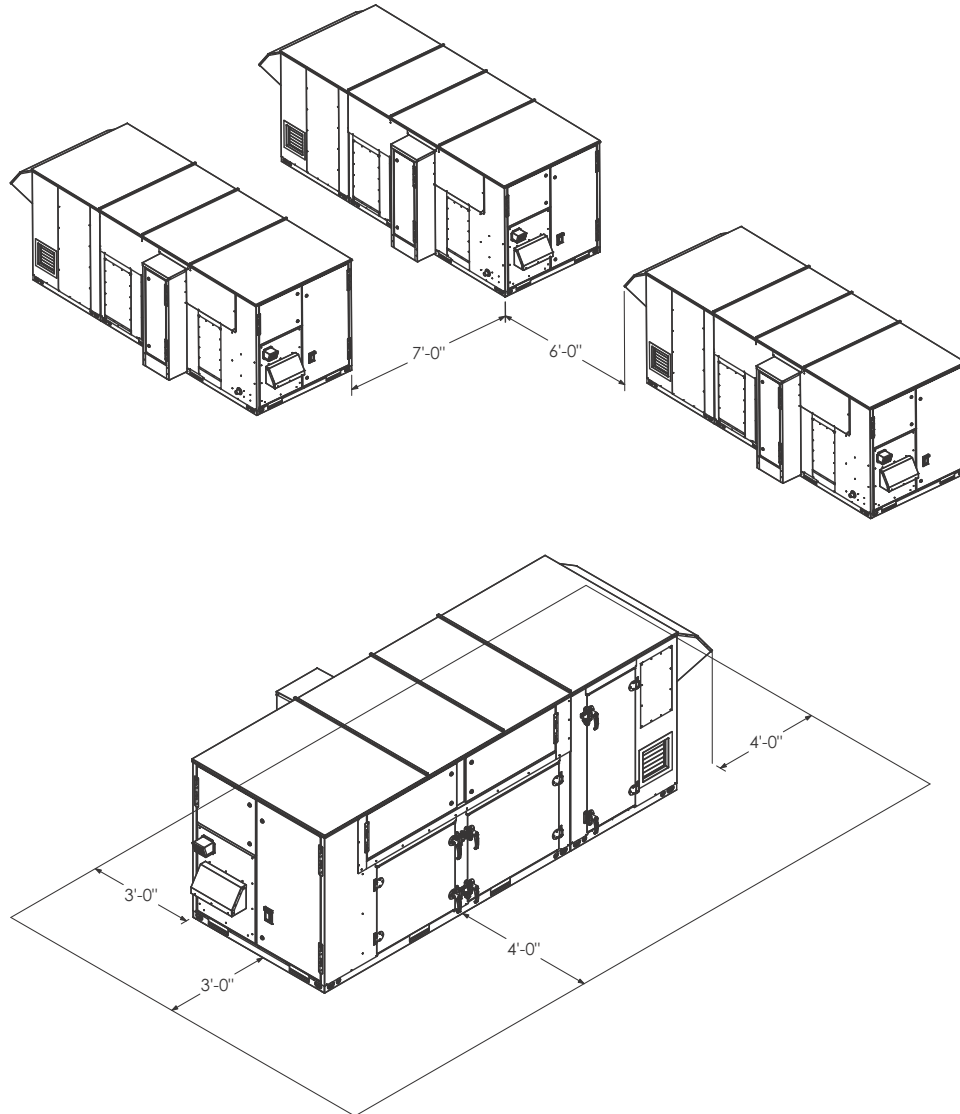




## Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OABE Units

Figure 14. Typical installation clearances for OABE unit with auxiliary cabinet



**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.

## Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OABE Units

### Curb Dimensions

Figure 15. Unit curb data for OABE 3-9 tons

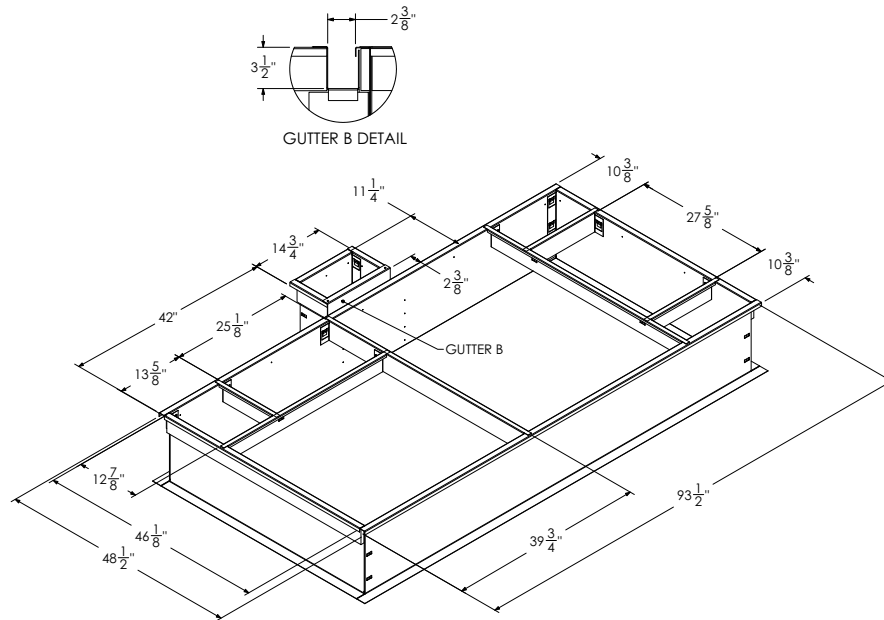
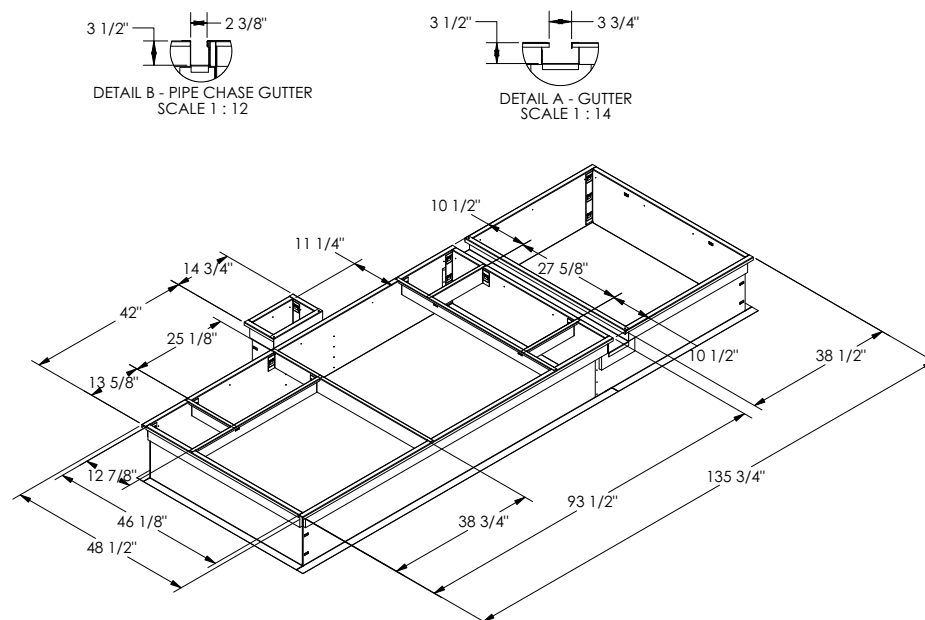


Figure 16. Unit curb data for OABE 3-9 tons with auxiliary cabinet



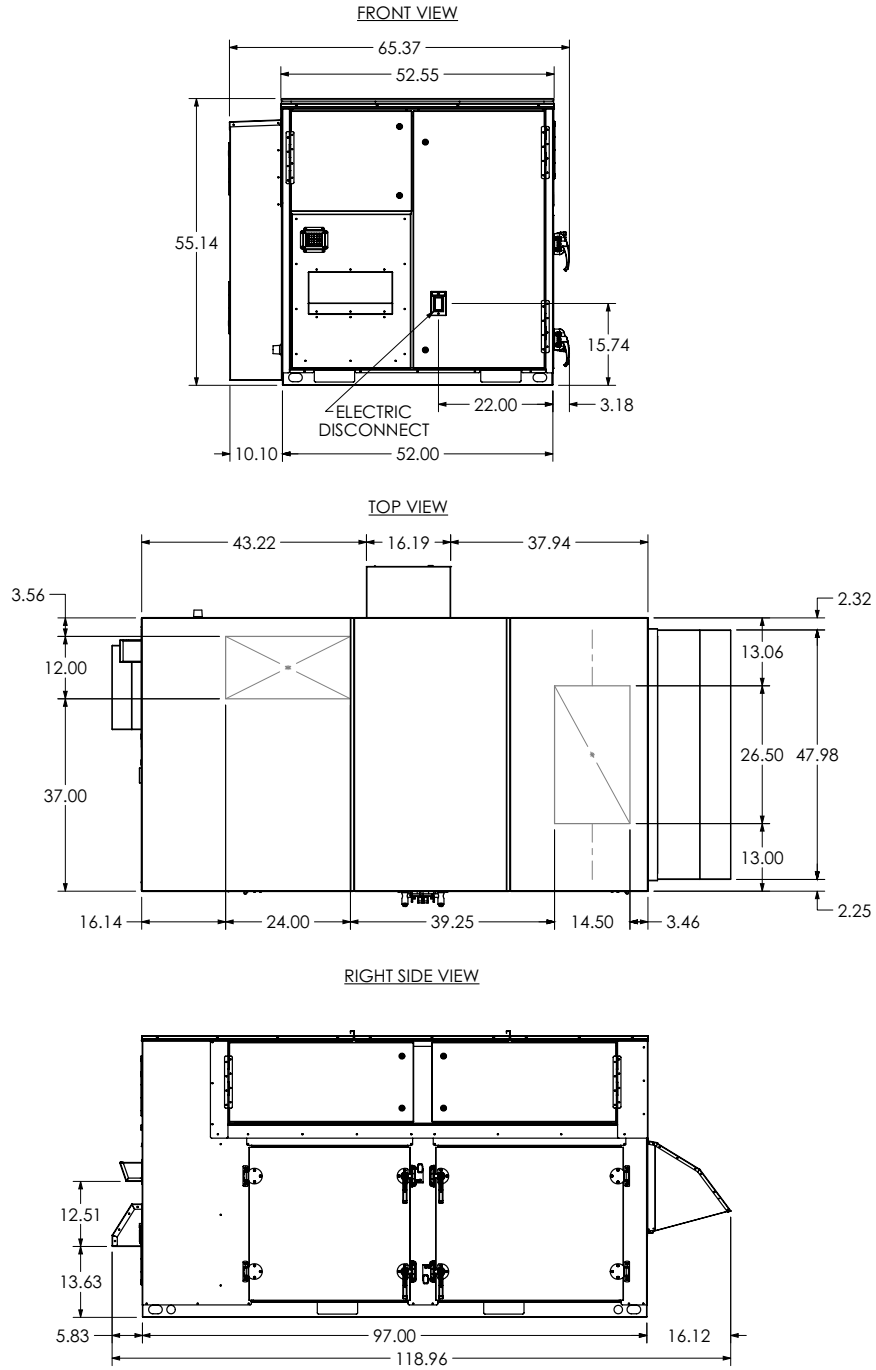
**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.

# Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OABE Units

## Dimensional Data

Figure 17. Unit dimensional data for OABE 3-9 tons (in.)

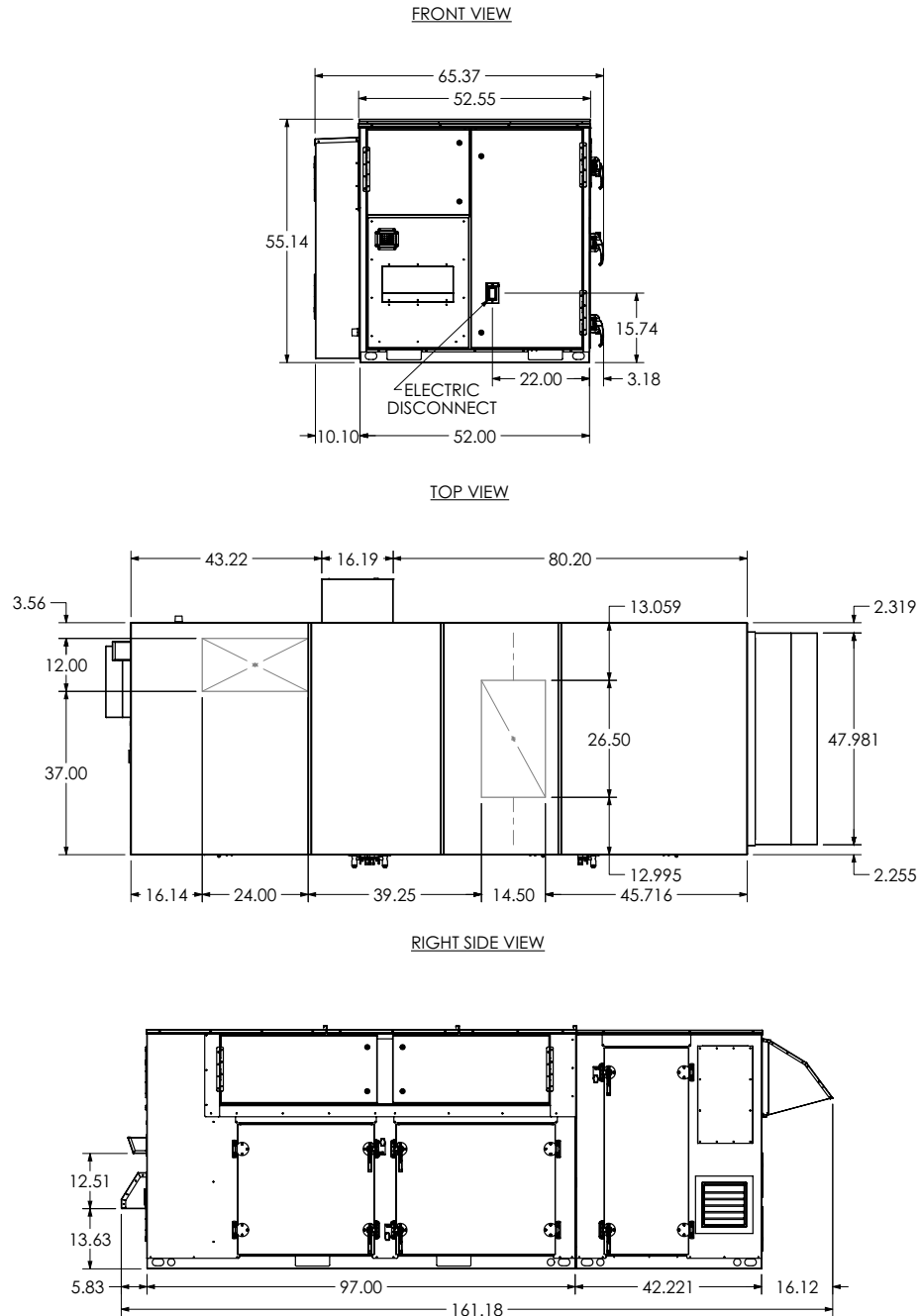




## Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OABE Units

**Figure 18. Unit dimensional data for OABE 3–9 tons with auxiliary cabinet (in.)**



**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.



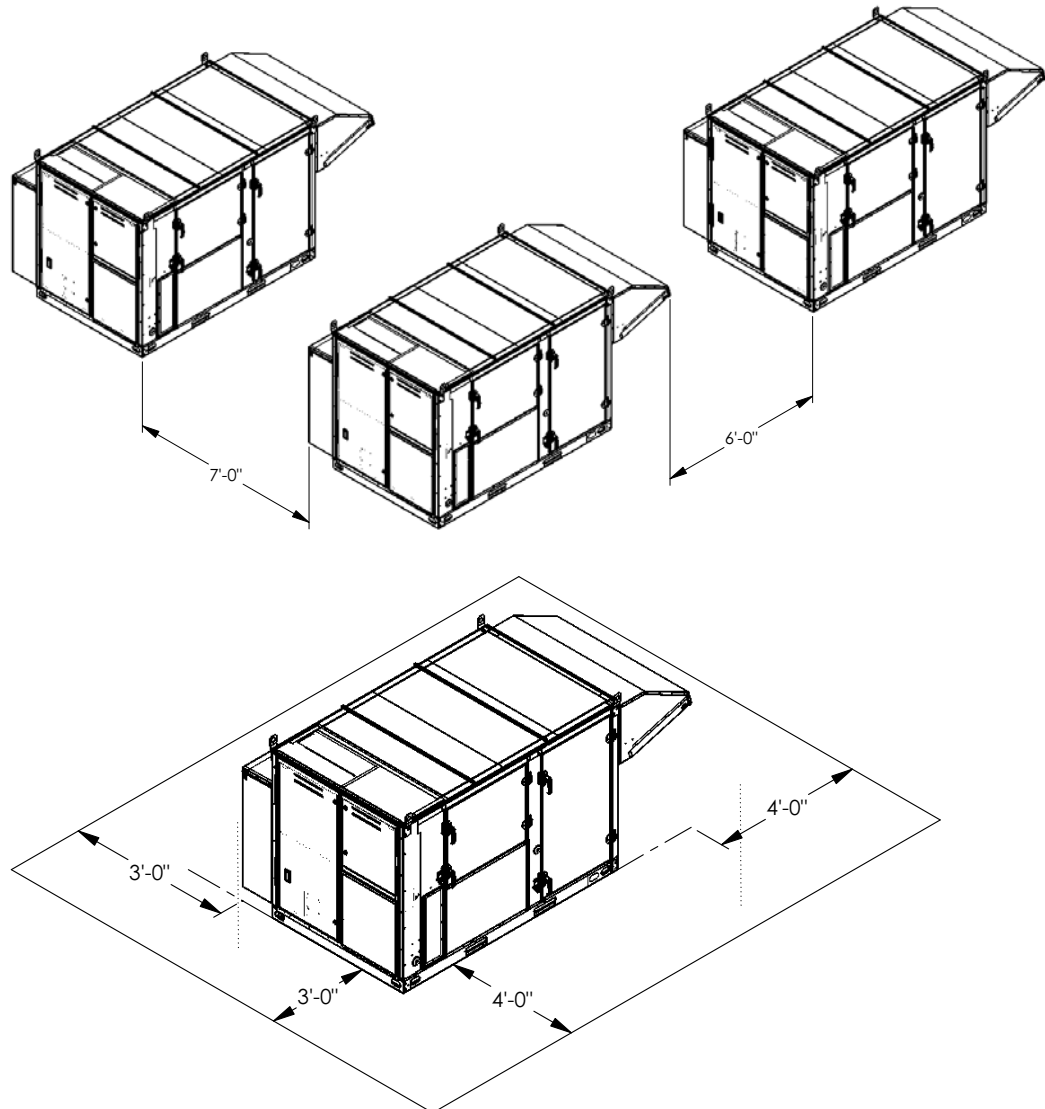
## Unit Clearances, Curb Dimensions, and Dimensional Data

*Outdoor WSHP Units: OADE Units*

### OADE Units

#### Unit Clearances

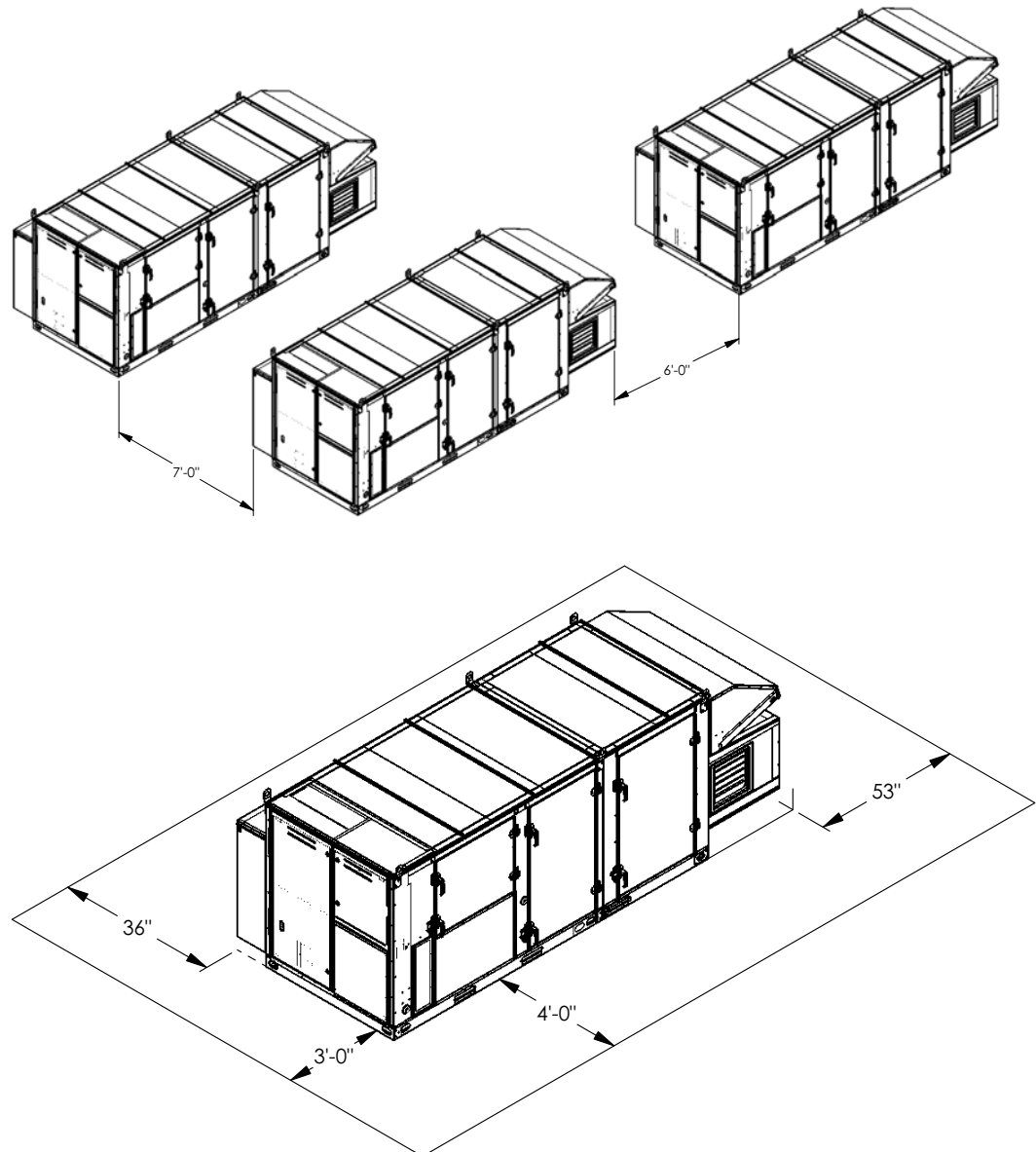
Figure 19. Typical installation clearances for OADE unit



## Unit Clearances, Curb Dimensions, and Dimensional Data

*Outdoor WSHP Units: OADE Units*

**Figure 20.** Typical installation clearances for OADE unit with auxiliary cabinet



**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.

# Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OADE Units

## Curb Dimensions

Figure 21. Unit curb data for OADE 5–15 tons

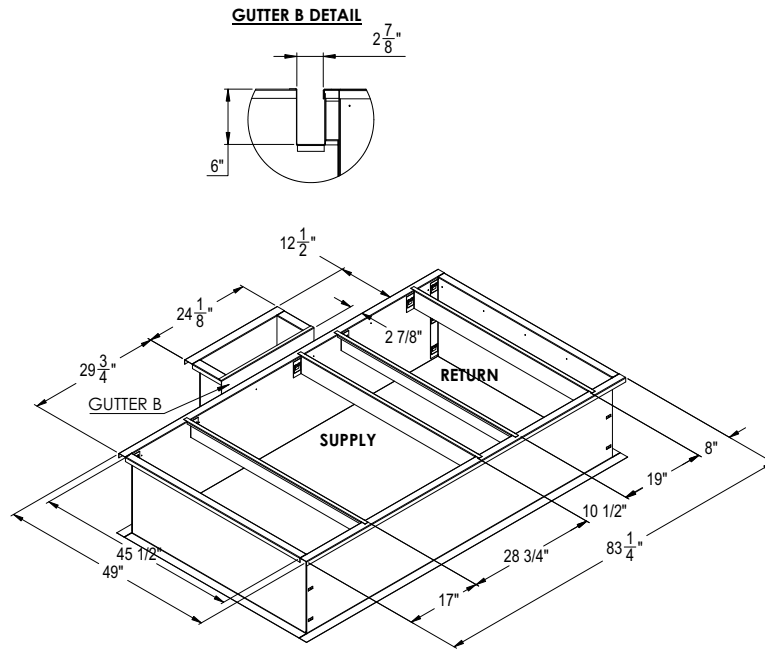
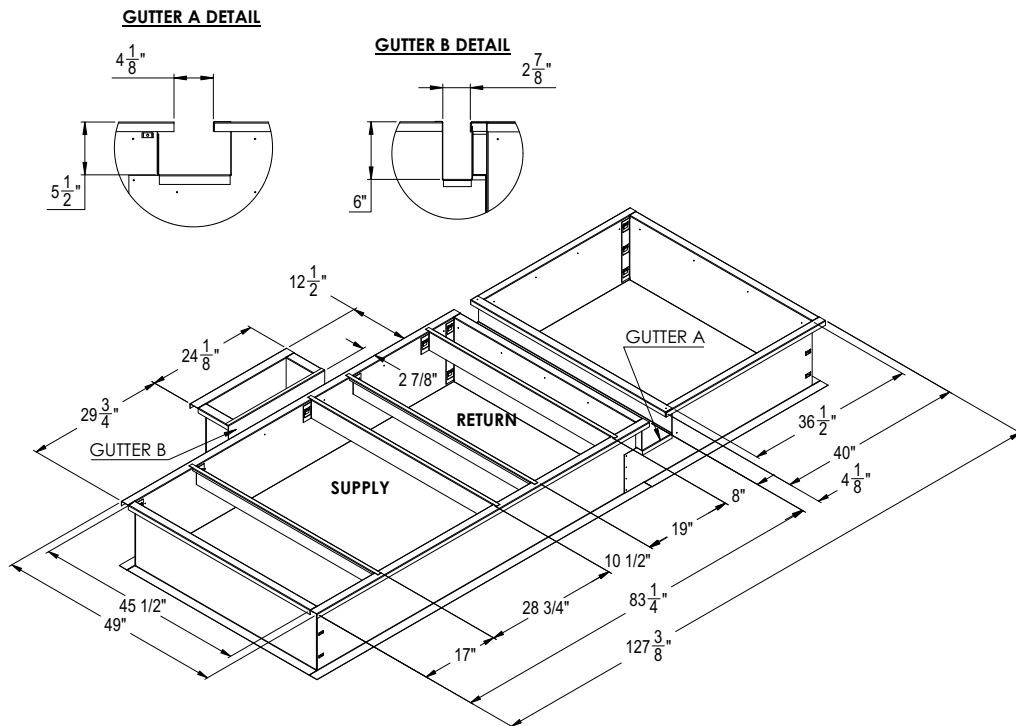


Figure 22. Unit curb data for OADE 5–15 tons with auxiliary cabinet



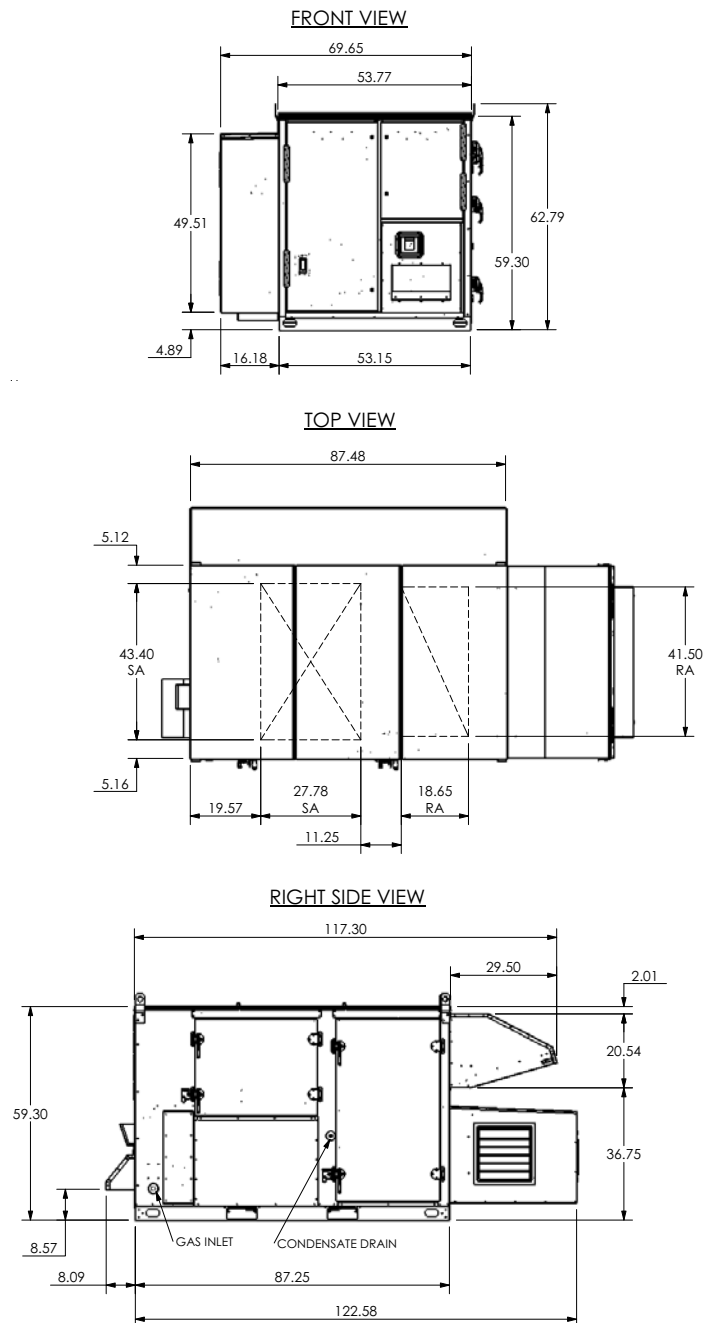
**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.

## Unit Clearances, Curb Dimensions, and Dimensional Data

*Outdoor WSHP Units: OADE Units*

### Dimensional Data

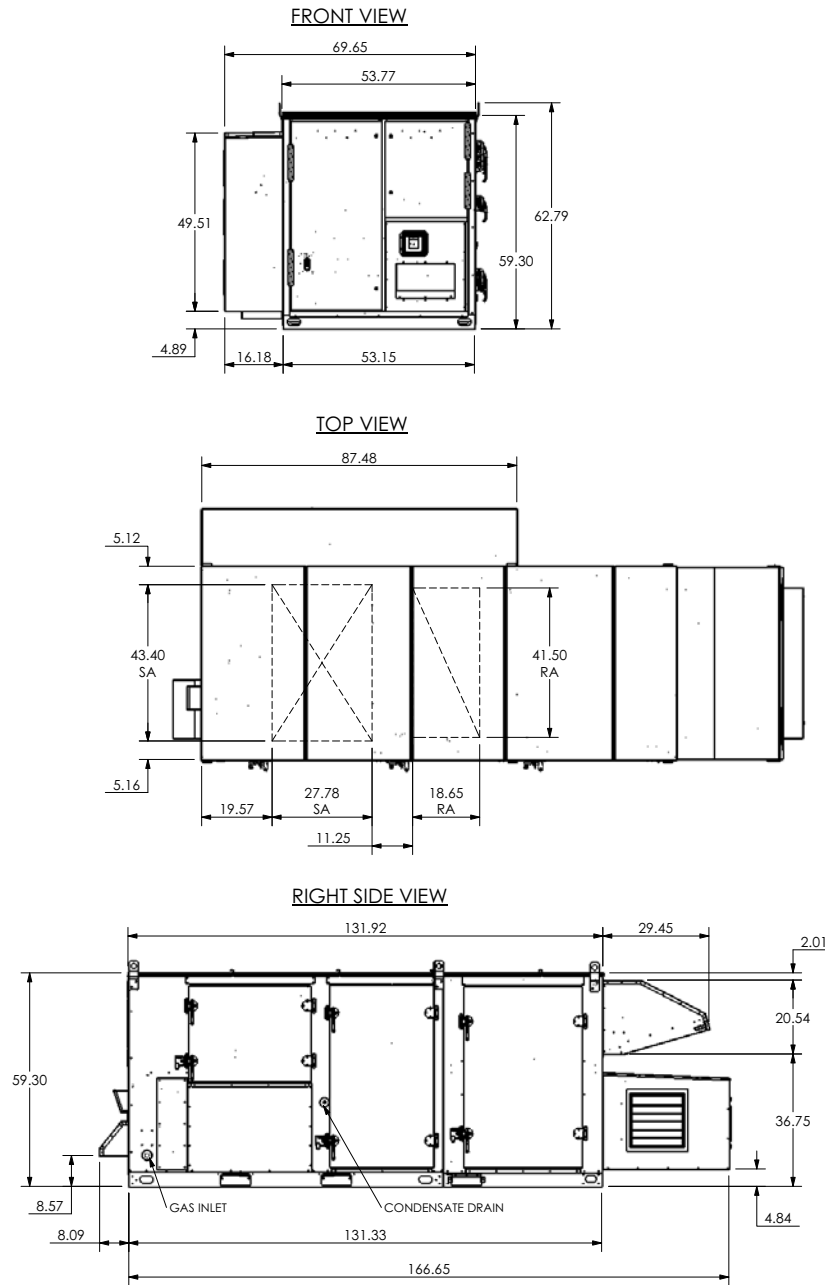
**Figure 23. Unit dimensional data for OADE 5–15 tons (in.)**



## Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OADE Units

Figure 24. Unit dimensional data for OADE 5–15 tons with auxiliary cabinet (in.)

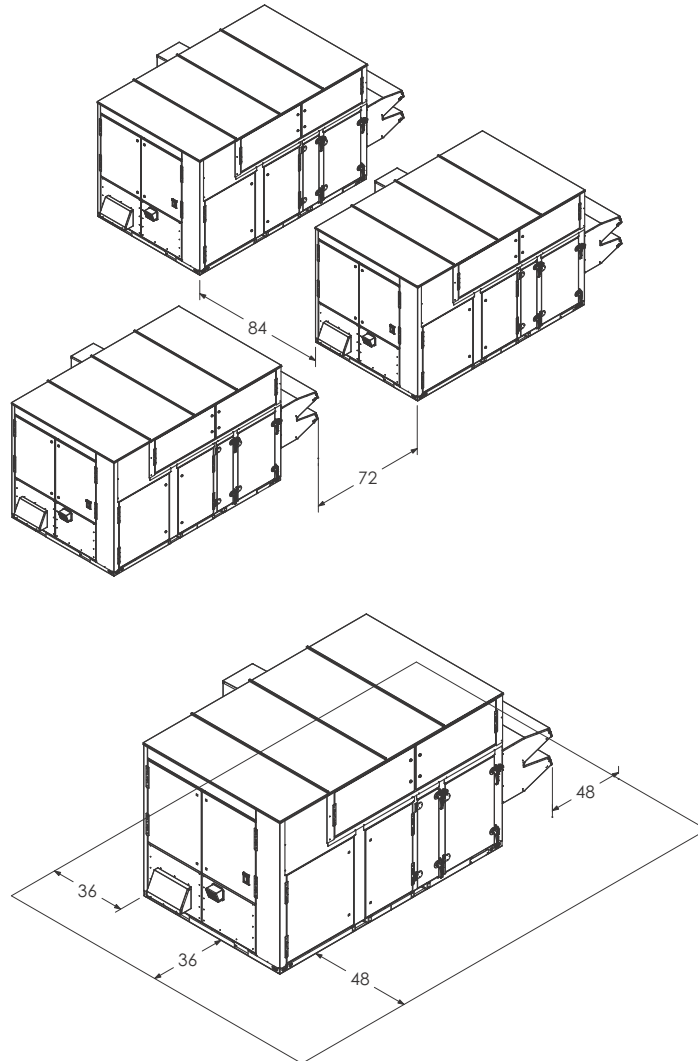


**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.

## OAGE Units

### Unit Clearances

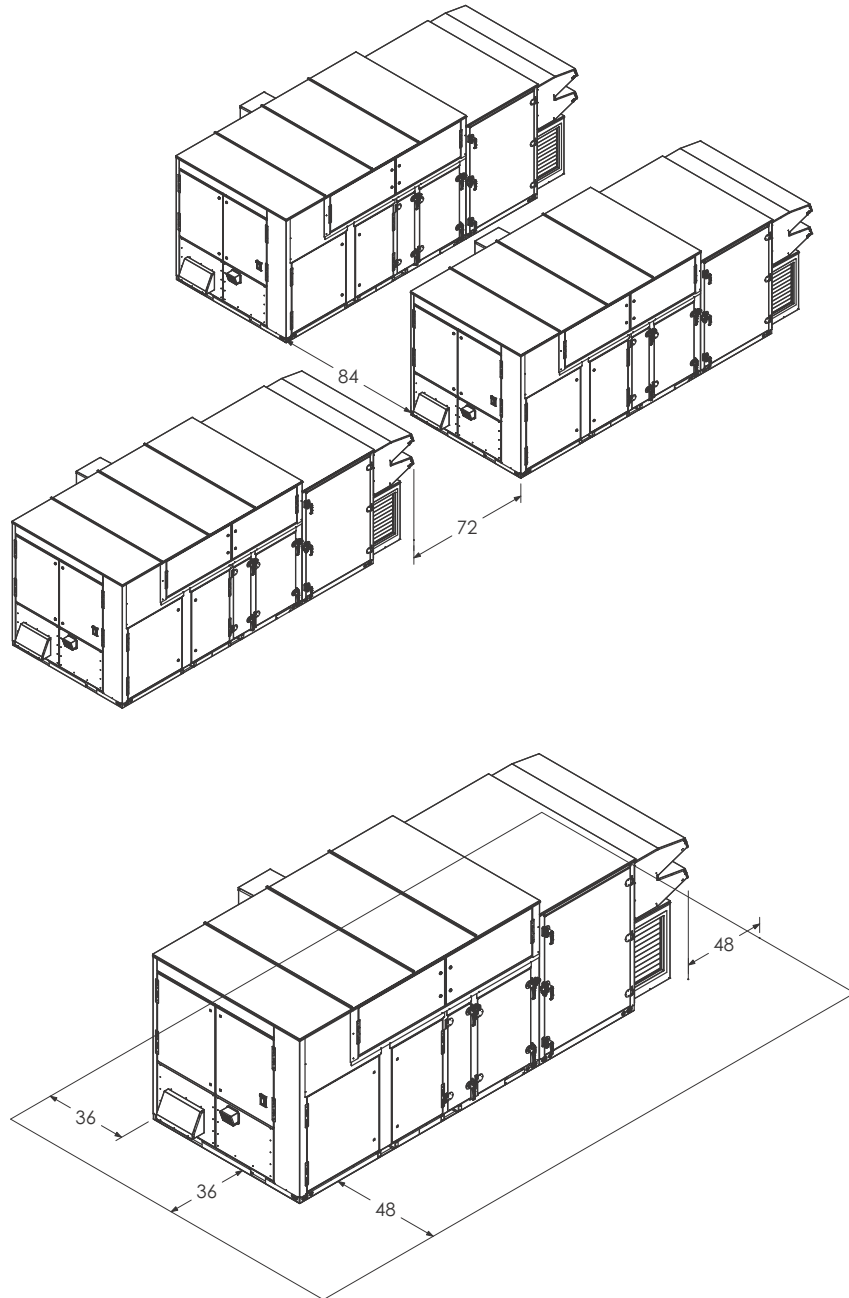
**Figure 25. Typical installation clearances for OAGE unit (in.)**



## Unit Clearances, Curb Dimensions, and Dimensional Data

*Outdoor WSHP Units: OAGE Units*

**Figure 26.** Typical installation clearances for OAGE unit with auxiliary cabinet (in.)



**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.



## Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OAGE Units

### Curb Dimensions

Figure 27. Unit curb data for OAGE (in.)

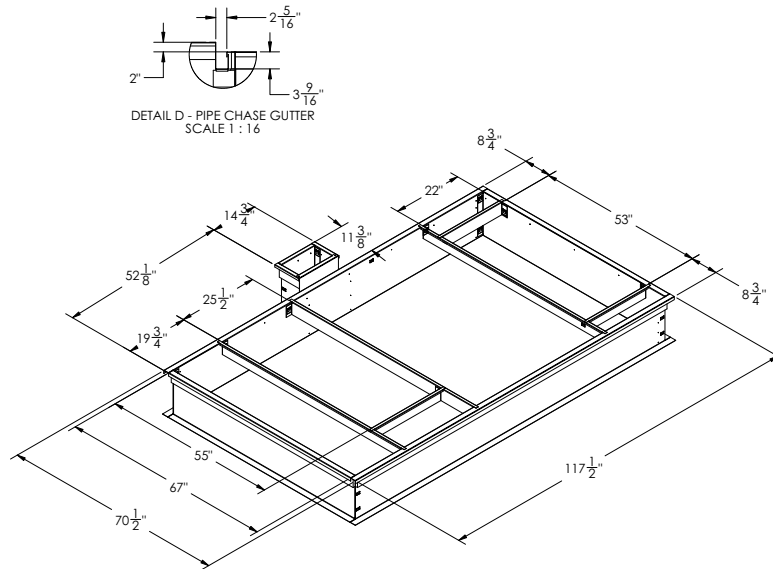
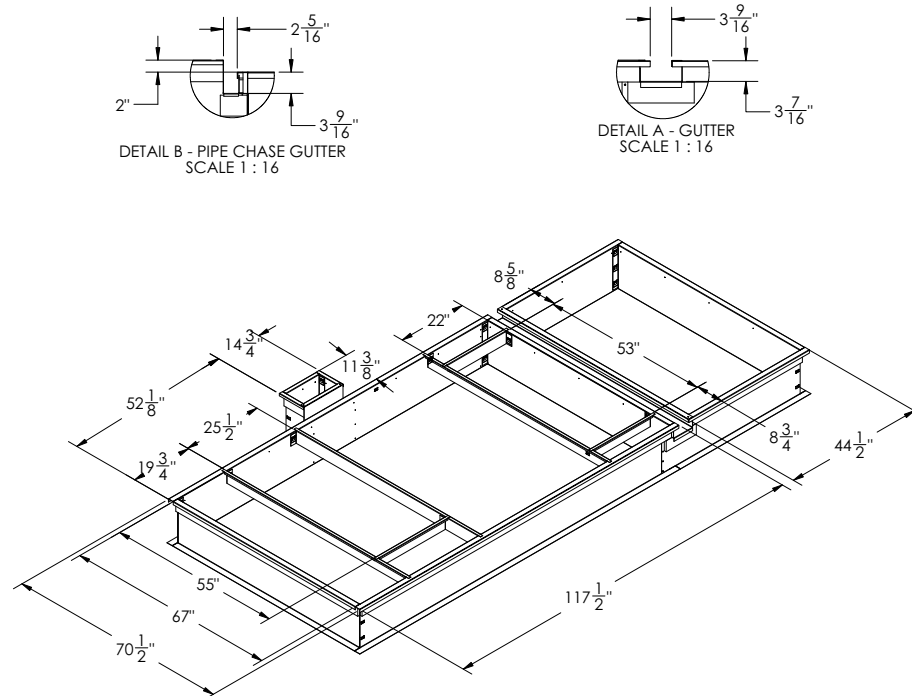


Figure 28. Unit curb data for OAGE with auxiliary cabinet (in.)



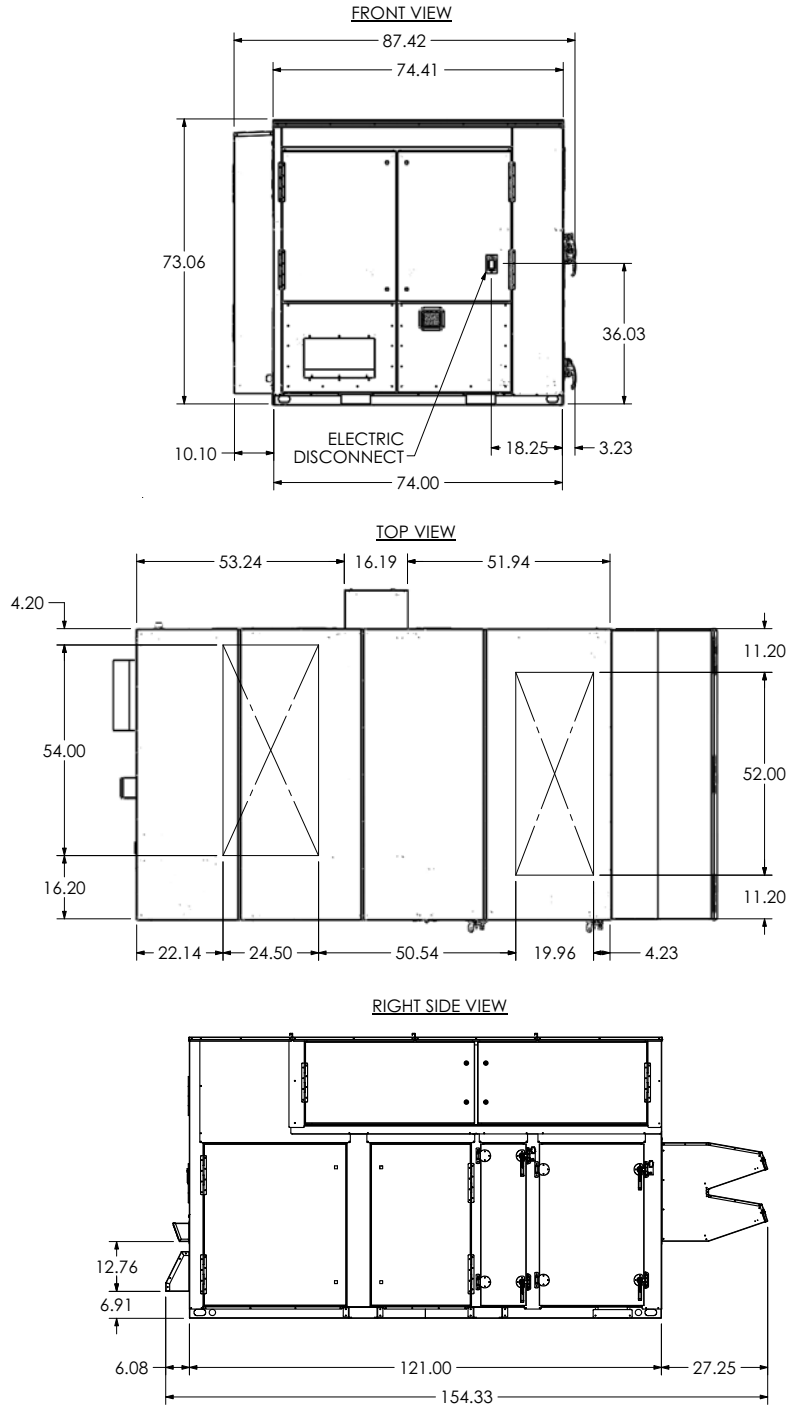
**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.

## Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OAGE Units

### Dimensional Data

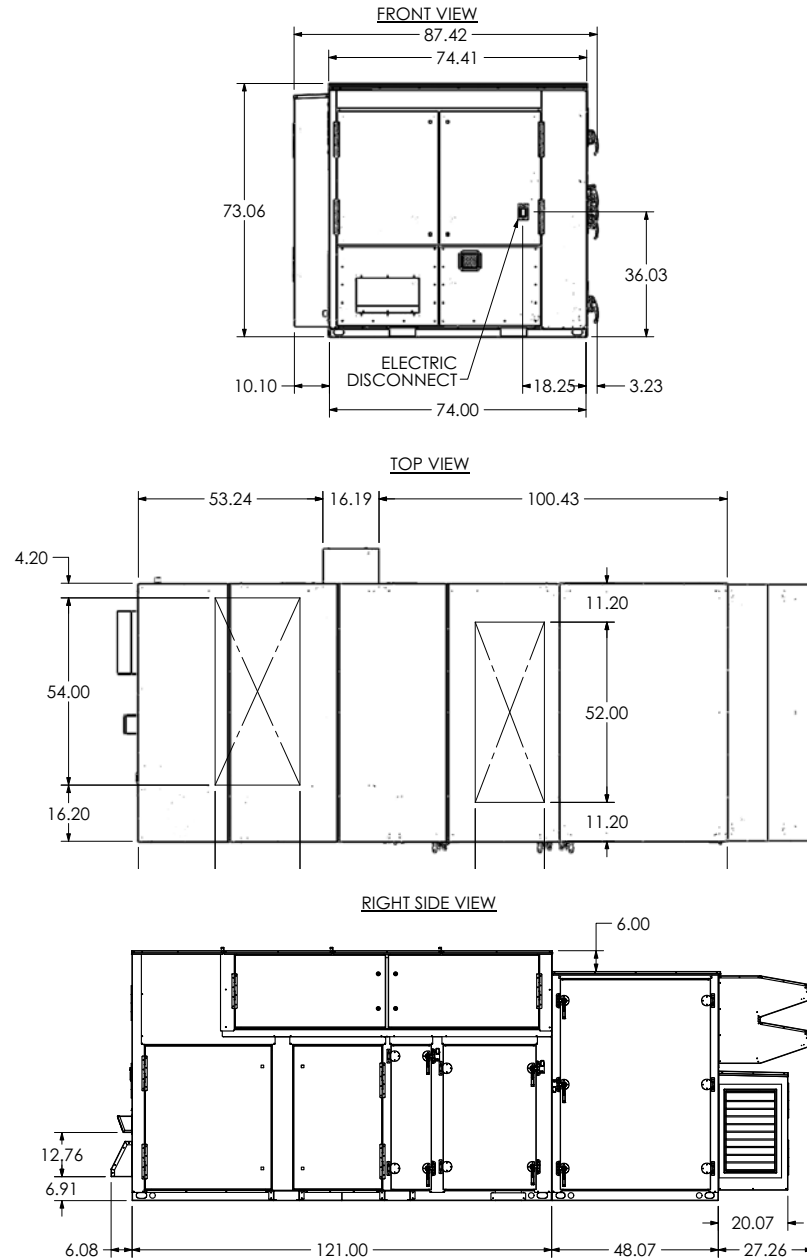
Figure 29. Unit dimensional data for OAGE (in.)



## Unit Clearances, Curb Dimensions, and Dimensional Data

*Outdoor WSHP Units: OAGE Units*

**Figure 30. Unit dimensional data for OAGE with auxiliary cabinet (in.)**



**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.



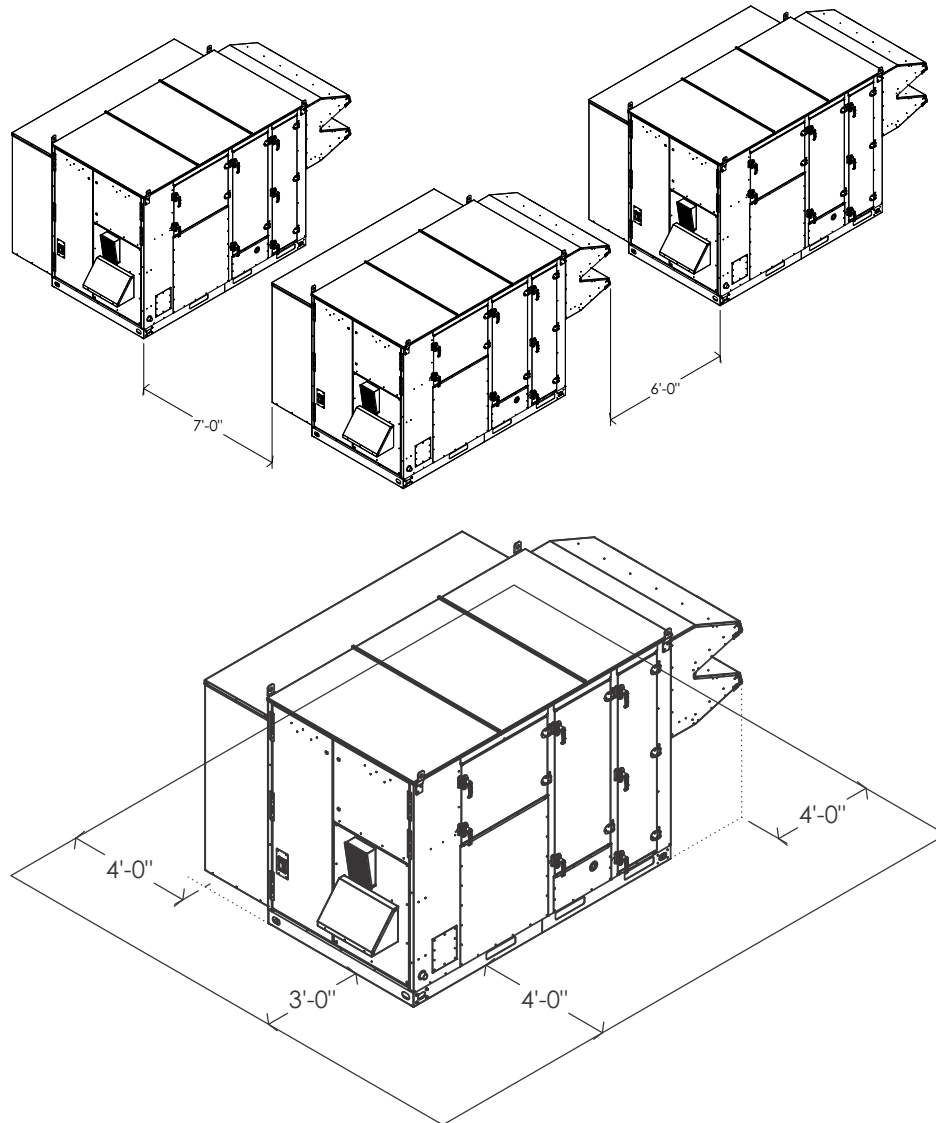
## Unit Clearances, Curb Dimensions, and Dimensional Data

*Outdoor WSHP Units: OAKE Units*

### OAKE Units

#### Unit Clearances

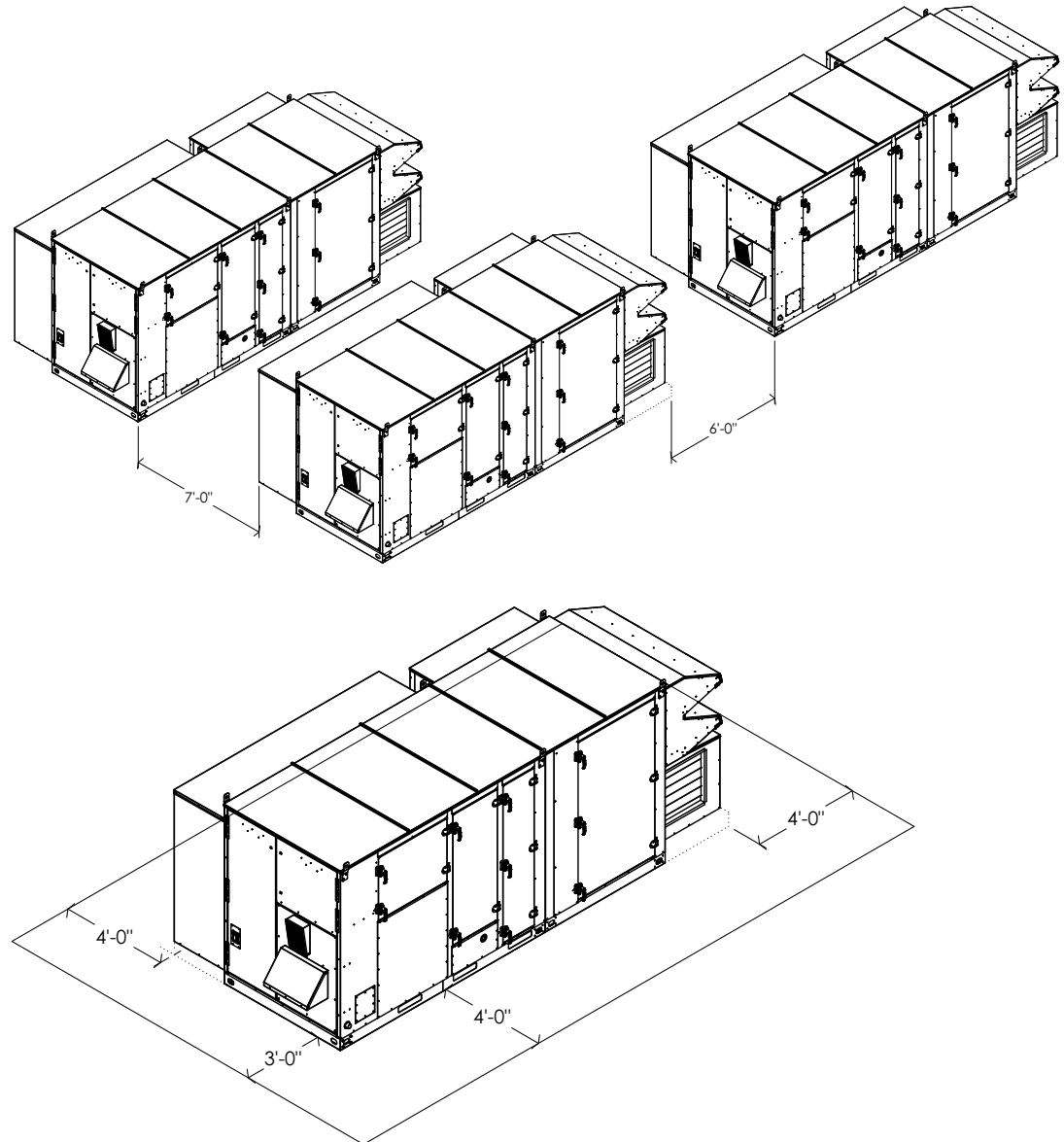
Figure 31. Typical installation clearances for OAKE unit



## Unit Clearances, Curb Dimensions, and Dimensional Data

*Outdoor WSHP Units: OAKE Units*

**Figure 32. Typical installation clearances for OAKE unit with auxiliary cabinet**



**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.

# Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OAKE Units

## Curb Dimensions

Figure 33. Unit curb data for OAKE 12–30 tons (in.)

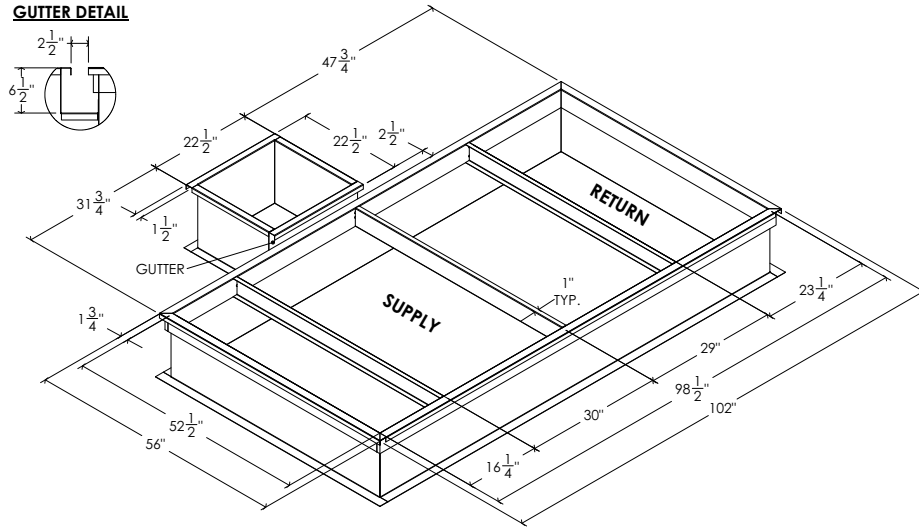
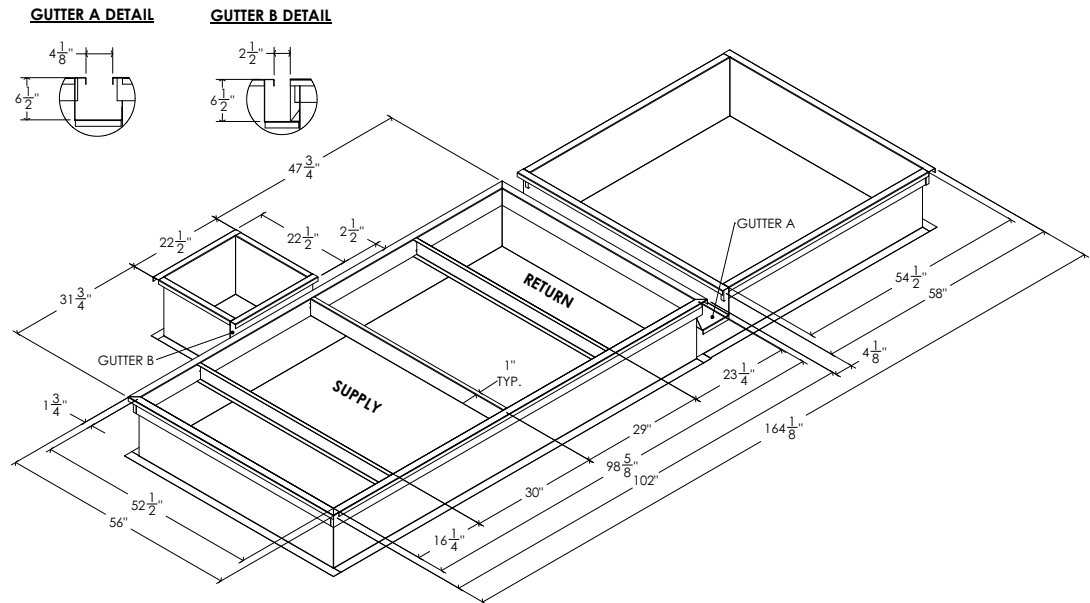


Figure 34. Unit curb data for OAKE 12–30 tons with auxiliary cabinet (in.)



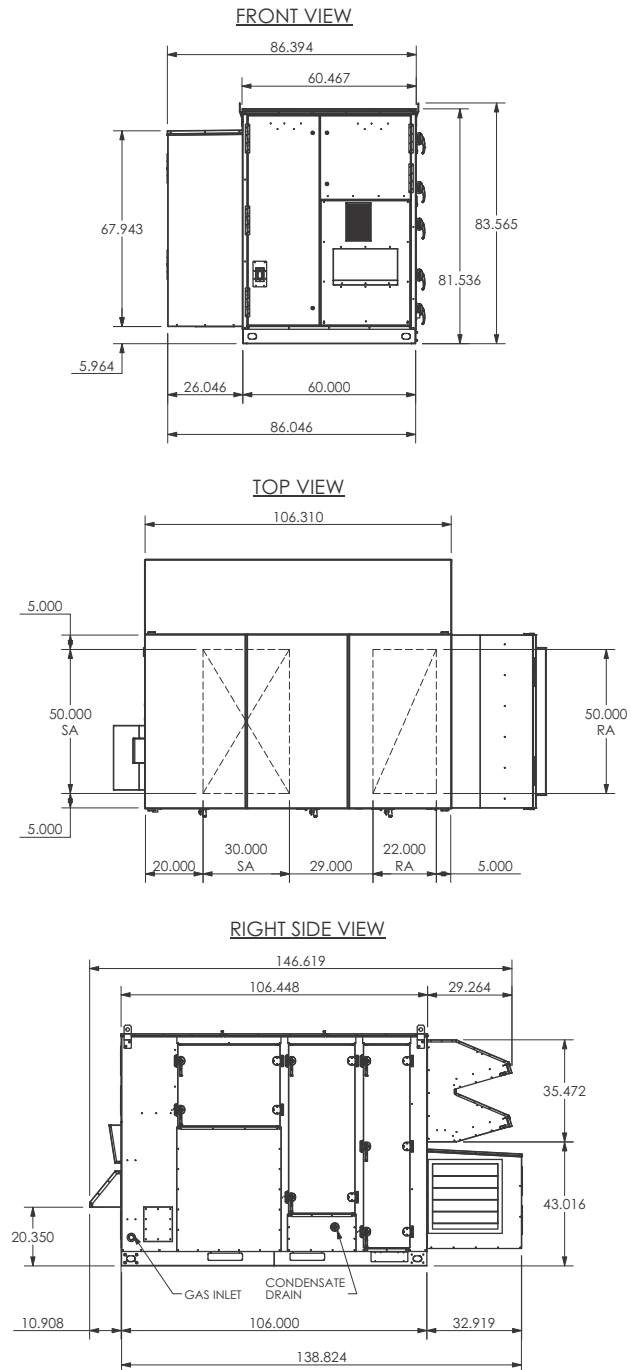
**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.

## Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OAKE Units

### Dimensional Data

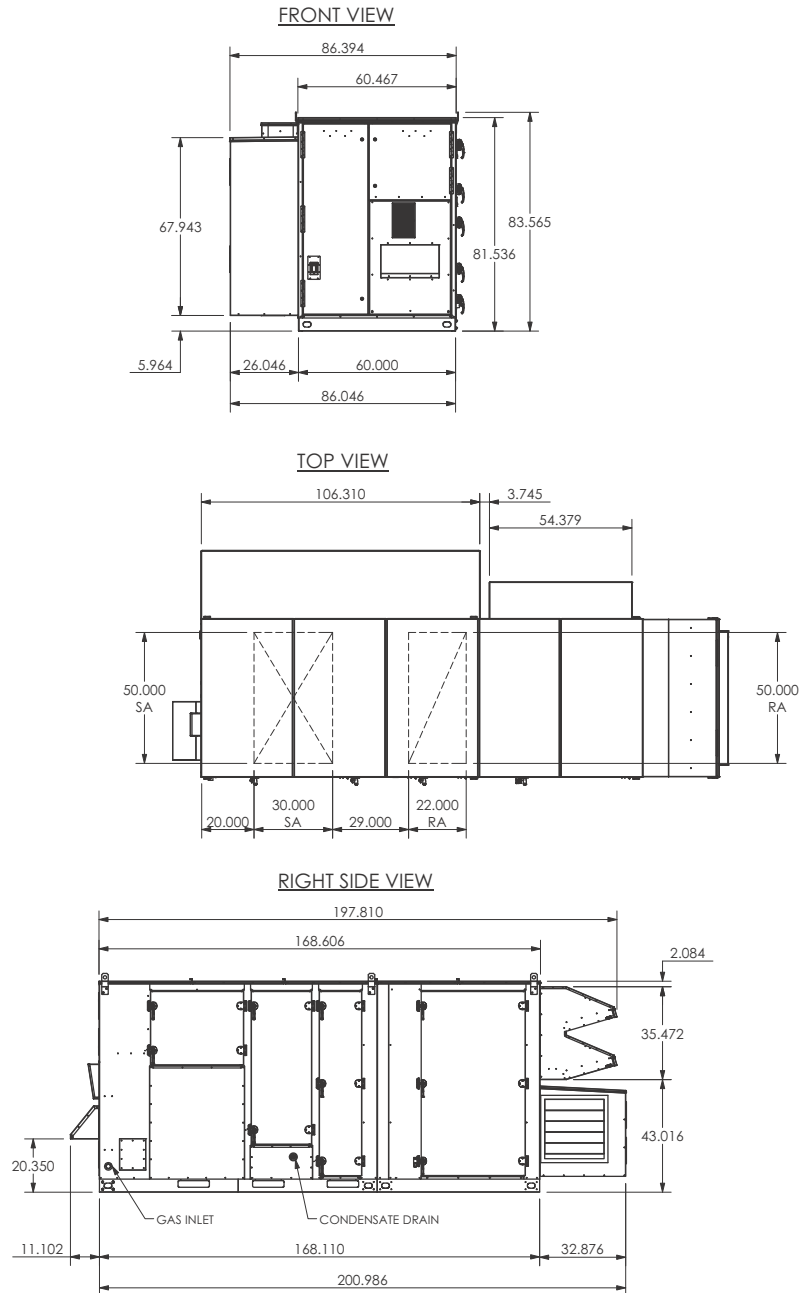
Figure 35. Unit dimensional data for OAKE 12–30 tons



## Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OAKE Units

Figure 36. Unit dimensional data for OAKE 12–30 tons with auxiliary cabinet



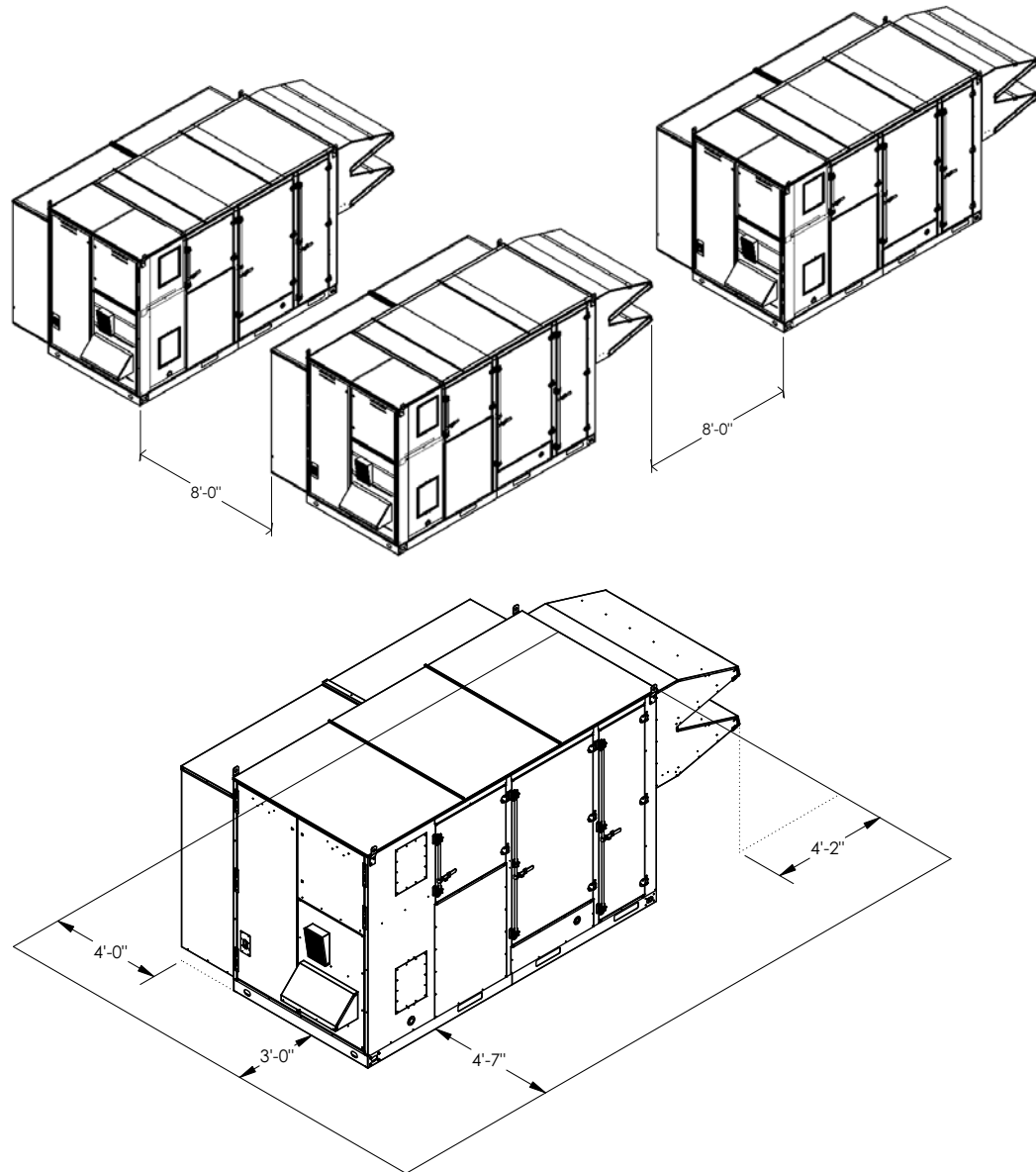
**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.



## OANE Units

### Unit Clearances

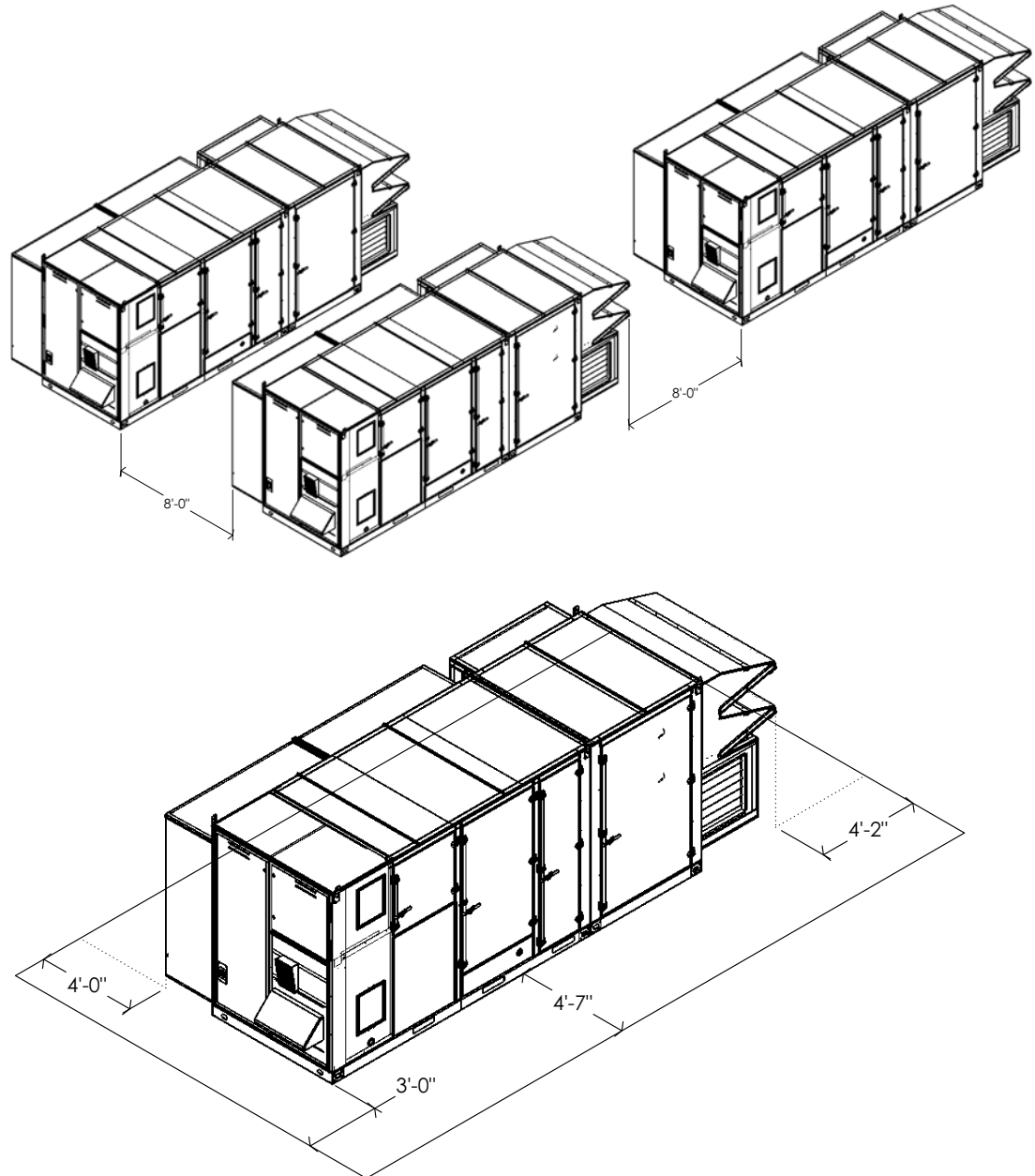
**Figure 37. Typical installation clearances for OANE unit**



## Unit Clearances, Curb Dimensions, and Dimensional Data

### Outdoor WSHP Units: OANE Units

**Figure 38. Typical installation clearances for OANE unit with auxiliary cabinet**



**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.

## Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OANE Units

### Curb Dimensions

Figure 39. Unit curb data for OANE 30–54 tons

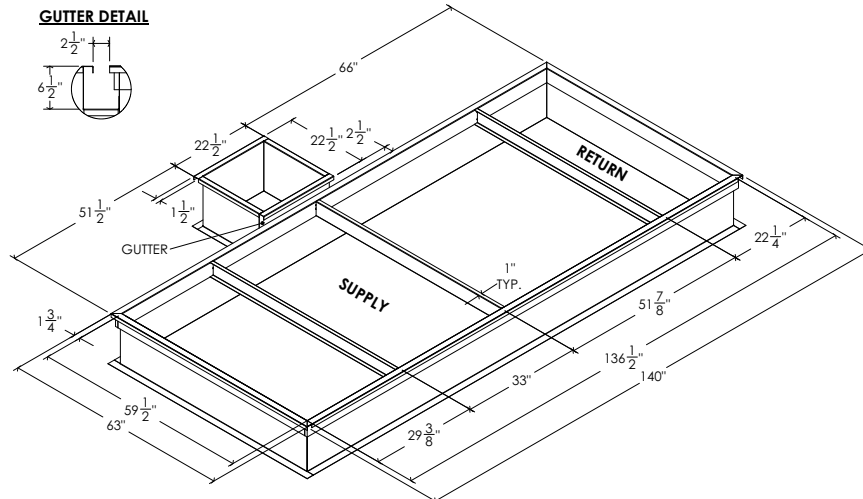
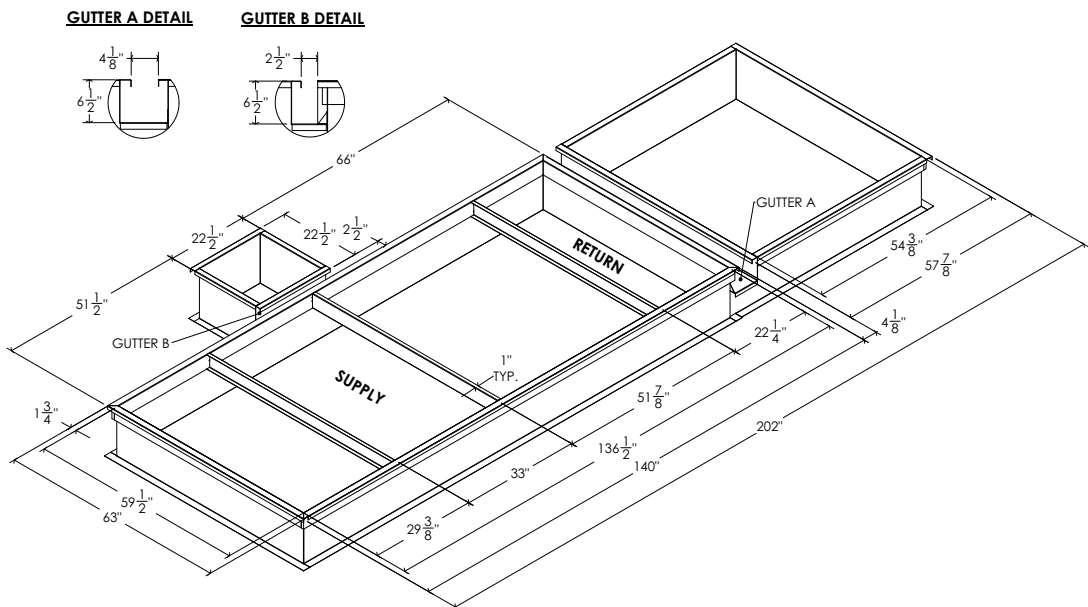


Figure 40. Unit curb data for OANE 30–54 tons with auxiliary cabinet



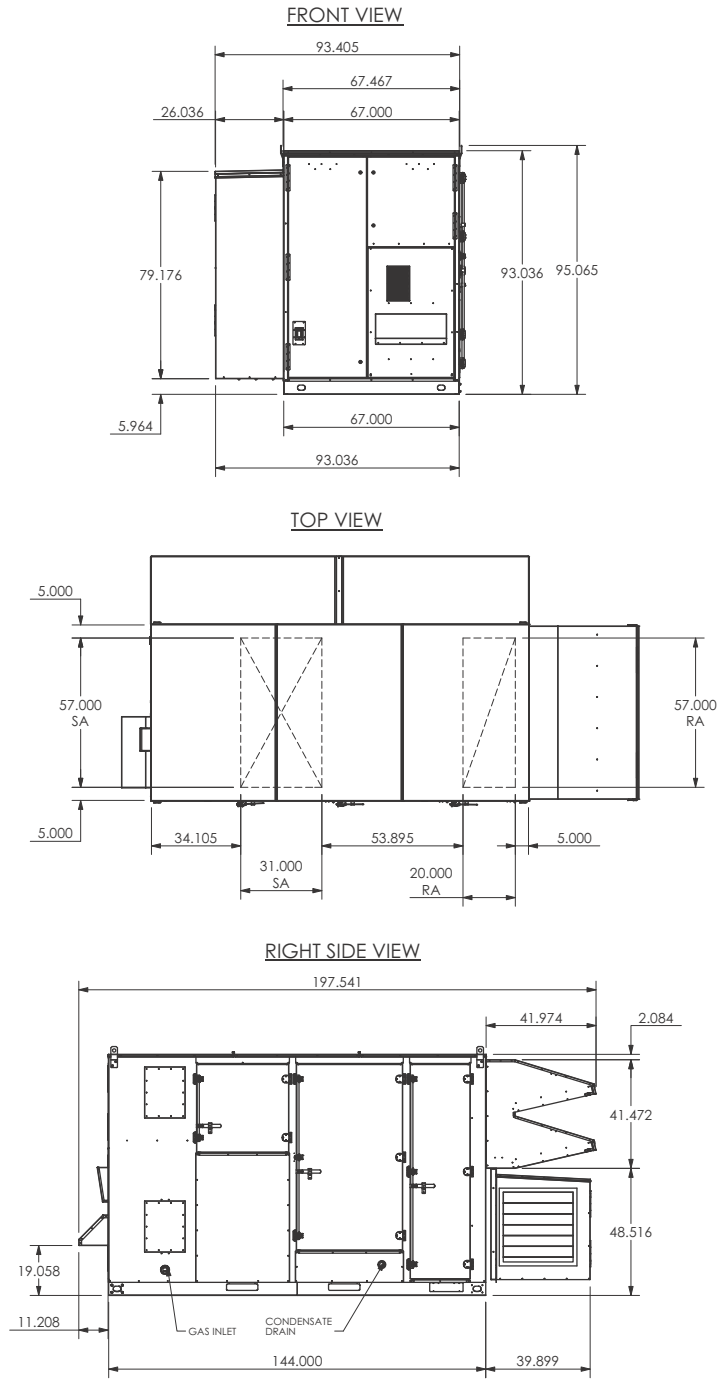
**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.

# Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OANE Units

## Dimensional Data

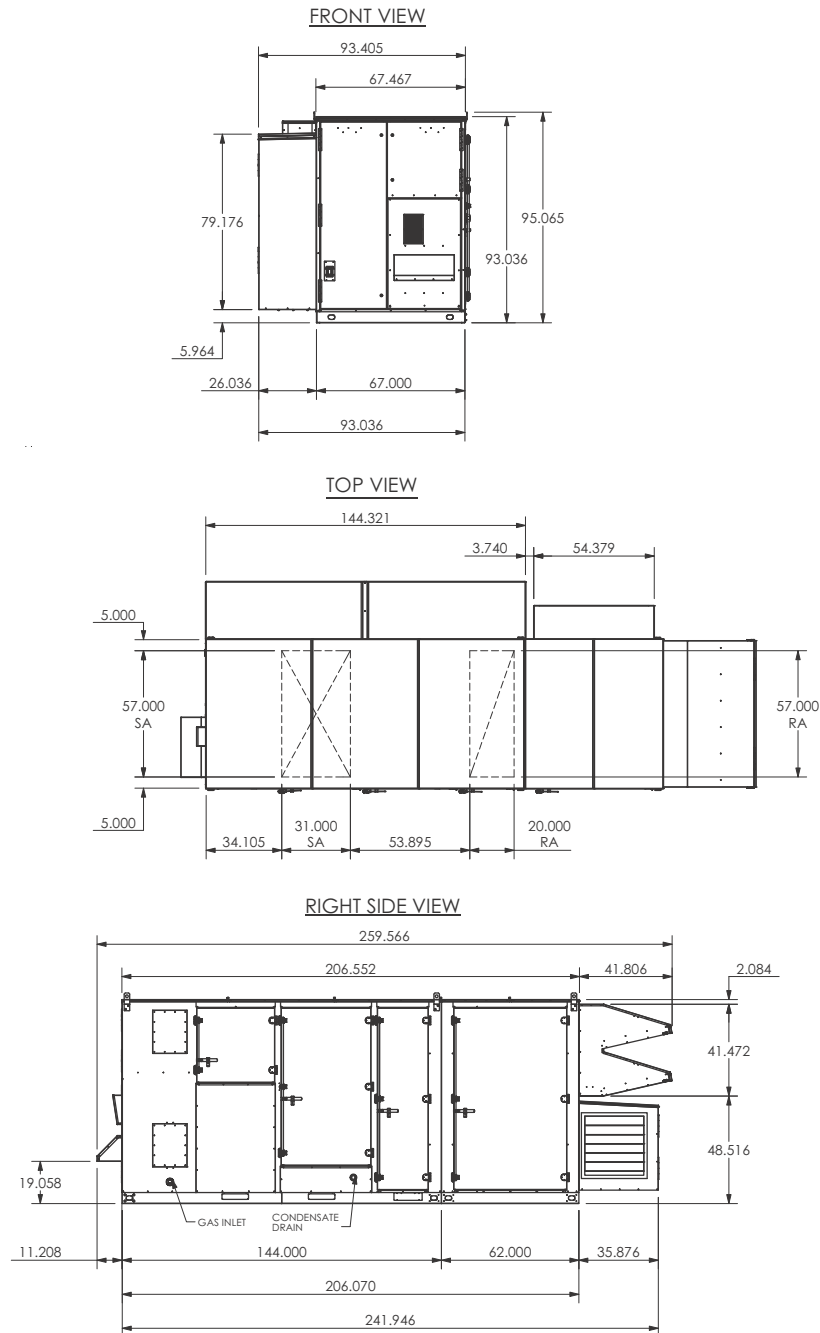
Figure 41. Unit dimensional data for OANE 30–54 tons



## Unit Clearances, Curb Dimensions, and Dimensional Data

Outdoor WSHP Units: OANE Units

**Figure 42. Unit dimensional data for OANE 30–54 tons with auxiliary cabinet**



**Note:** Certain options require auxiliary cabinet. Refer to project-specific unit submittals.

## Unit Clearances, Curb Dimensions, and Dimensional Data

Indoor WSHP Units: OABE Units

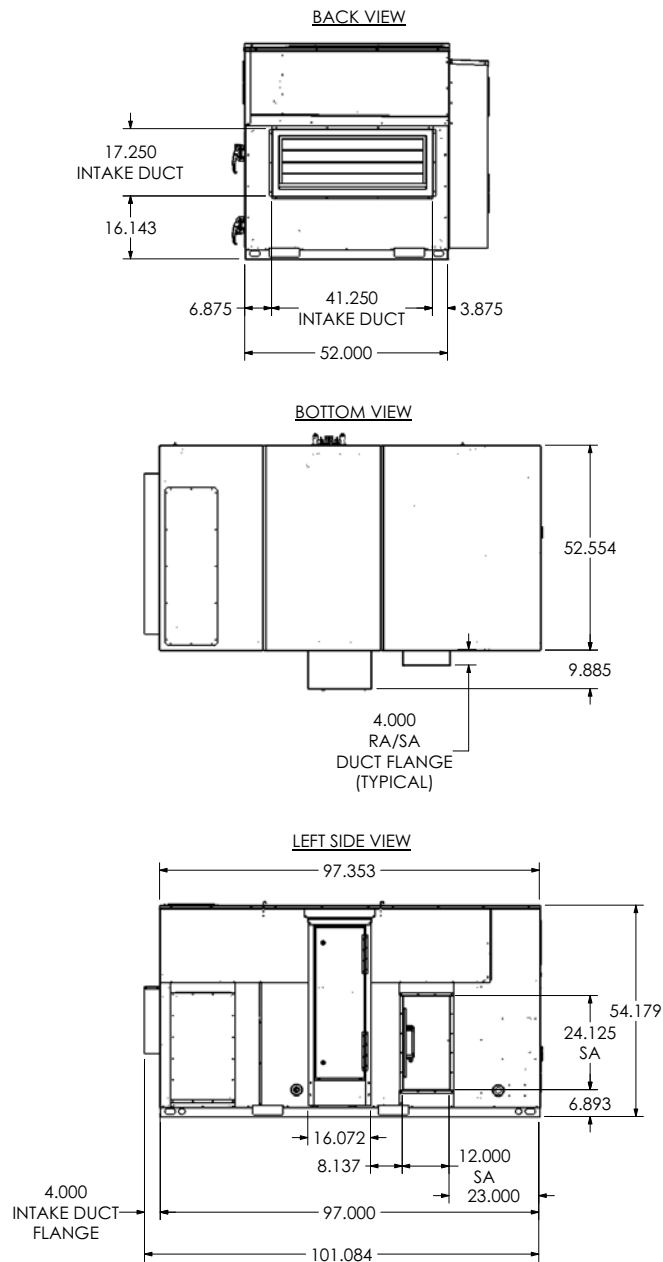
### Indoor WSHP Units

#### OABE Units

**Note:** Indoor units have the same clearances as outdoor units. Refer to p. 37 (outdoor OABE unit clearances).

#### Dimensional Data

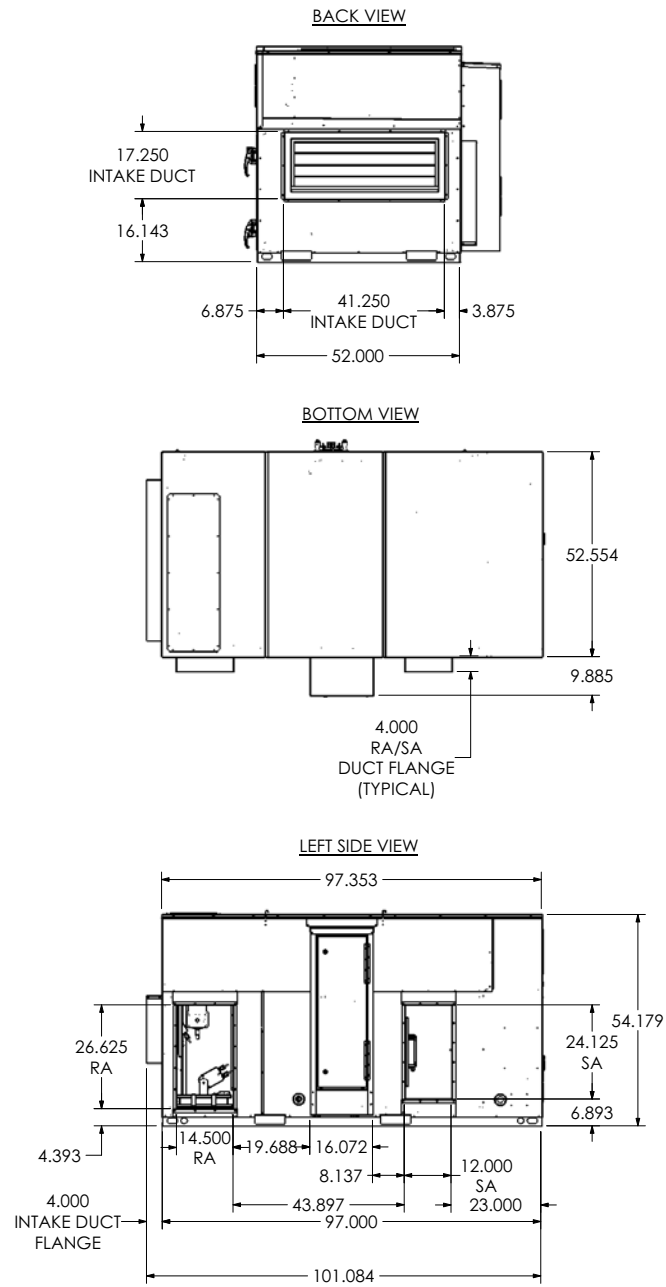
**Figure 43. Unit dimensional data for indoor OABE WSHP with horizontal supply and no return (in.)**



## Unit Clearances, Curb Dimensions, and Dimensional Data

*Indoor WSHP Units: OABE Units*

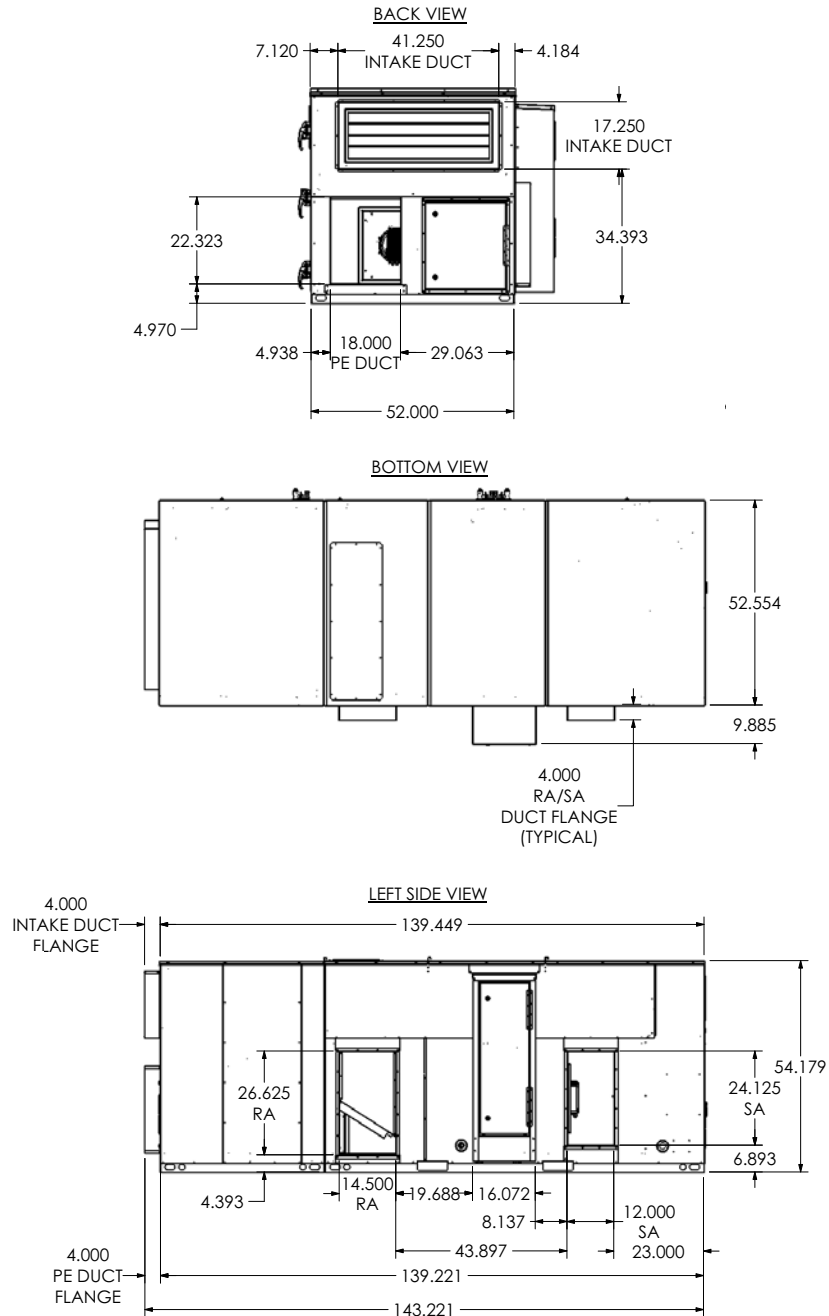
**Figure 44. Unit dimensional data for indoor OABE WSHP with horizontal supply/return (no ERV or exhaust fan) (in.)**



## Unit Clearances, Curb Dimensions, and Dimensional Data

Indoor WSHP Units: OABE Units

**Figure 45. Unit dimensional data for indoor OABE WSHP with horizontal supply/return and ERV or exhaust fan (in.)**





## Unit Clearances, Curb Dimensions, and Dimensional Data

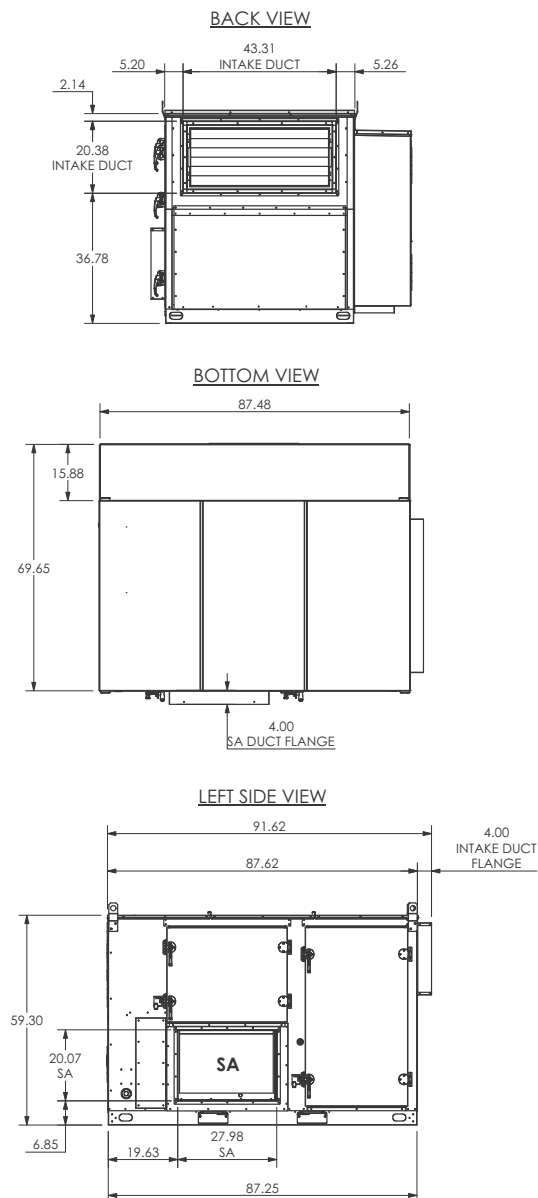
Indoor WSHP Units: OADE Units

### OADE Units

**Note:** Indoor units have the same clearances as outdoor units. Refer to p. 42 (outdoor OADE unit clearances).

### Dimensional Data

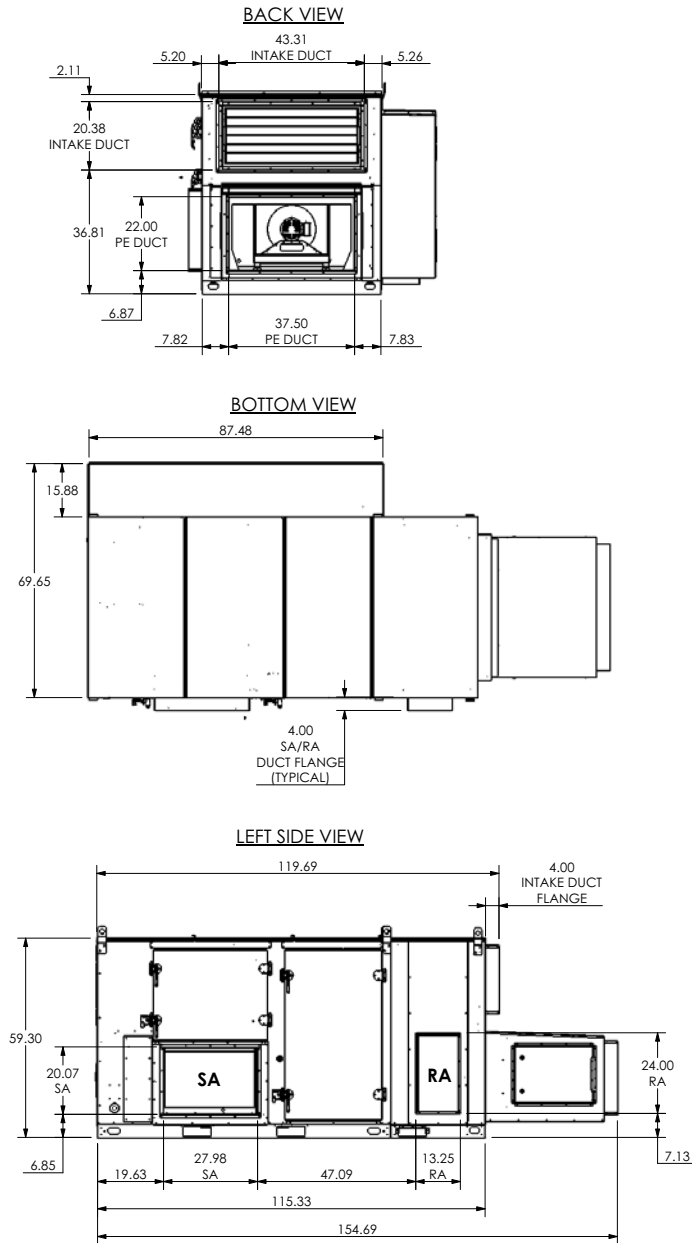
**Figure 46. Unit dimensional data for indoor OADE WSHP with horizontal supply and no return (in.)**



## Unit Clearances, Curb Dimensions, and Dimensional Data

Indoor WSHP Units: OADE Units

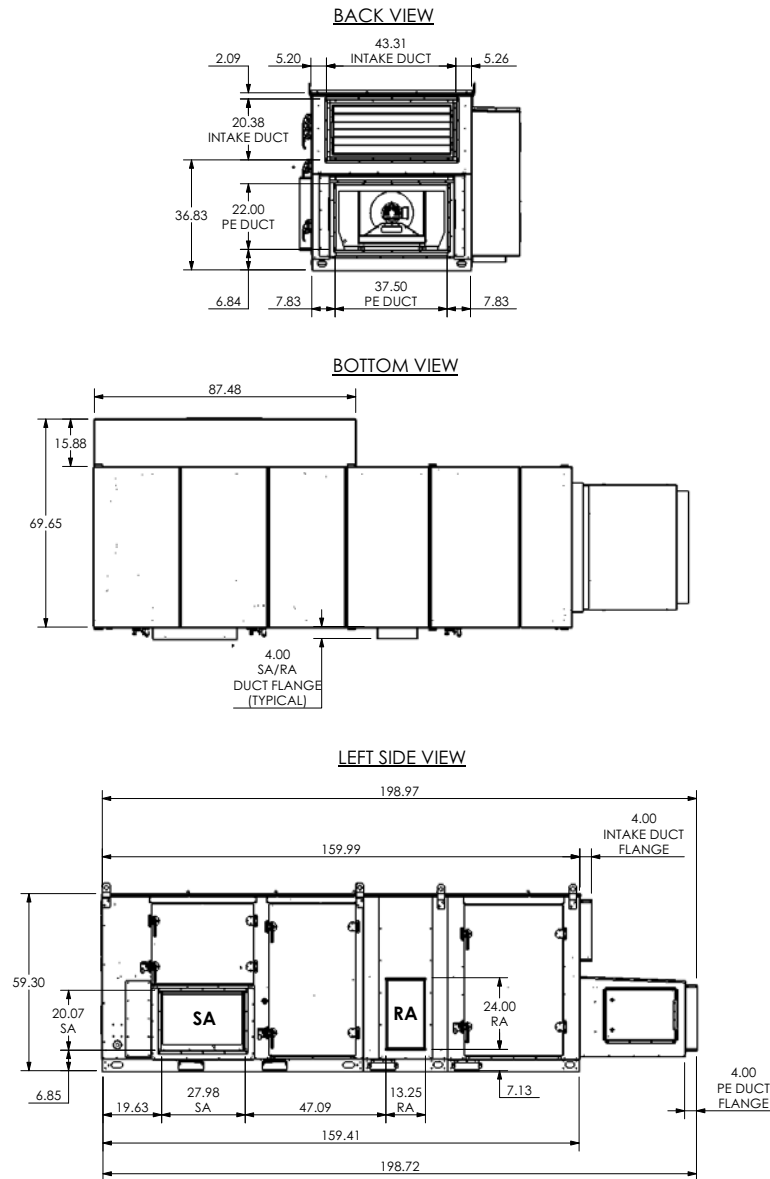
**Figure 47. Unit dimensional data for indoor OADE WSHP with horizontal supply/return (no ERV) (in.)**



## Unit Clearances, Curb Dimensions, and Dimensional Data

*Indoor WSHP Units: OADE Units*

**Figure 48. Unit dimensional data for indoor OADE WSHP with horizontal supply/return and ERV (in.)**



## Unit Clearances, Curb Dimensions, and Dimensional Data

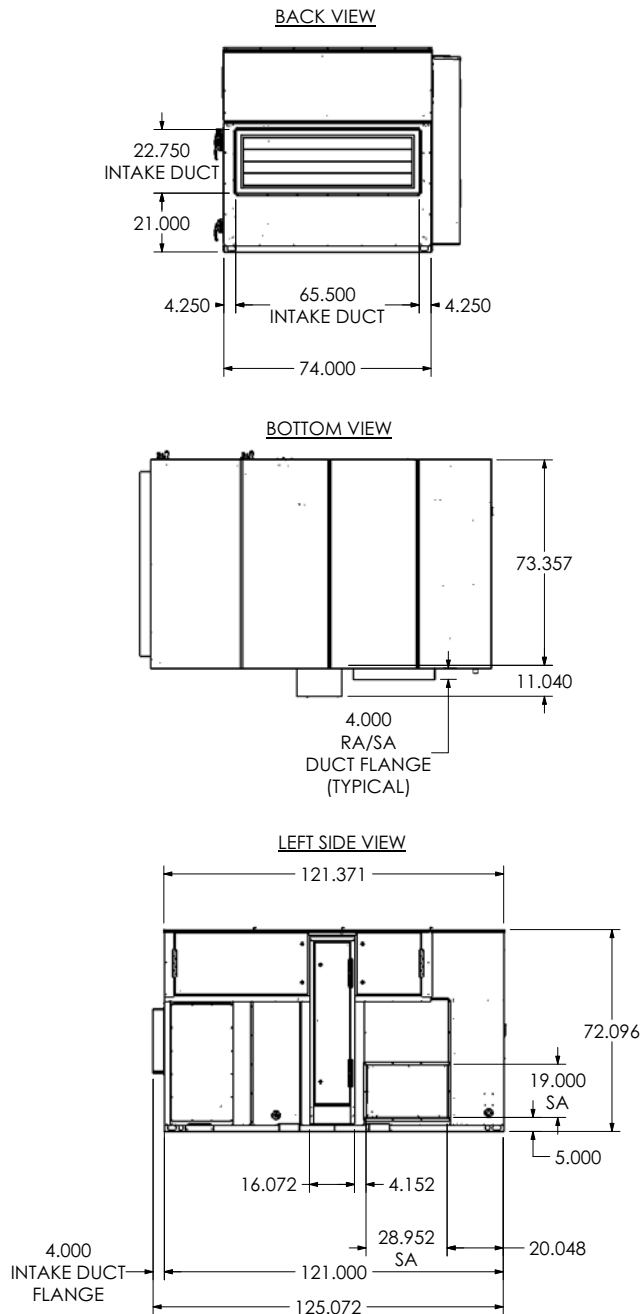
### Indoor WSHP Units: OAGE Units

### OAGE Units

**Note:** Indoor units have the same clearances as outdoor units. Refer to p. 47 (outdoor OAGE unit clearances).

### Dimensional Data

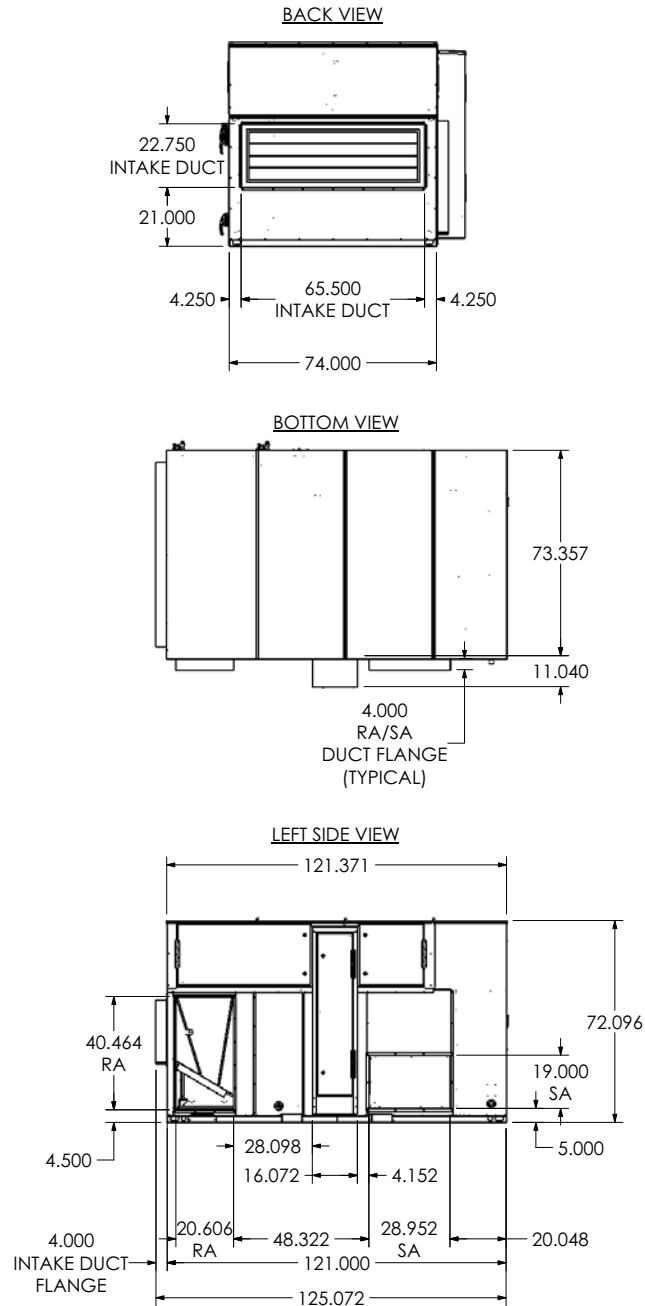
**Figure 49. Unit dimensional data for indoor OAGE WSHP with horizontal supply and no return (in.)**



## Unit Clearances, Curb Dimensions, and Dimensional Data

*Indoor WSHP Units: OAGE Units*

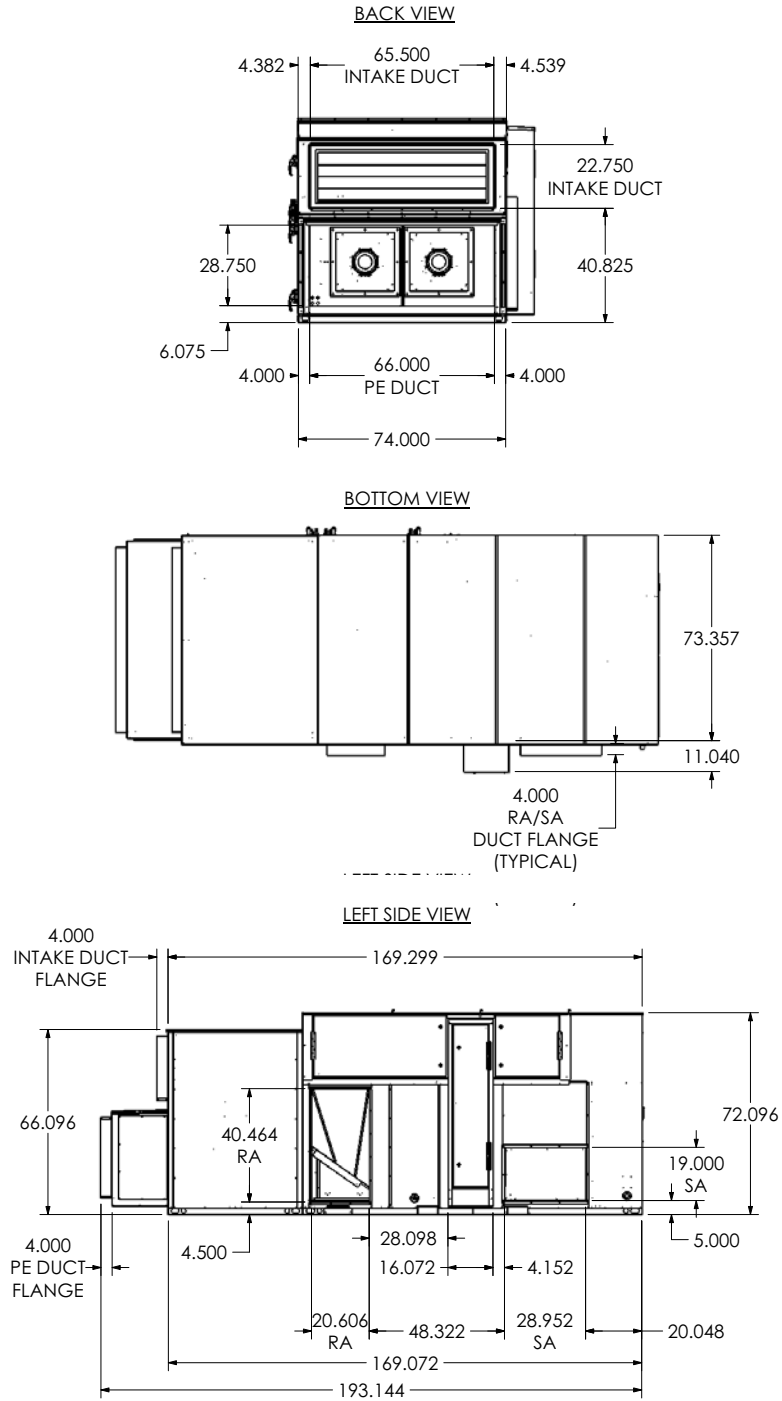
**Figure 50. Unit dimensional data for indoor OAGE WSHP with horizontal supply/return (no ERV or exhaust fan) (in.)**



## Unit Clearances, Curb Dimensions, and Dimensional Data

Indoor WSHP Units: OAGE Units

**Figure 51. Unit dimensional data for indoor OAGE WSHP with horizontal supply/return and ERV or exhaust fan (in.)**



## Unit Clearances, Curb Dimensions, and Dimensional Data

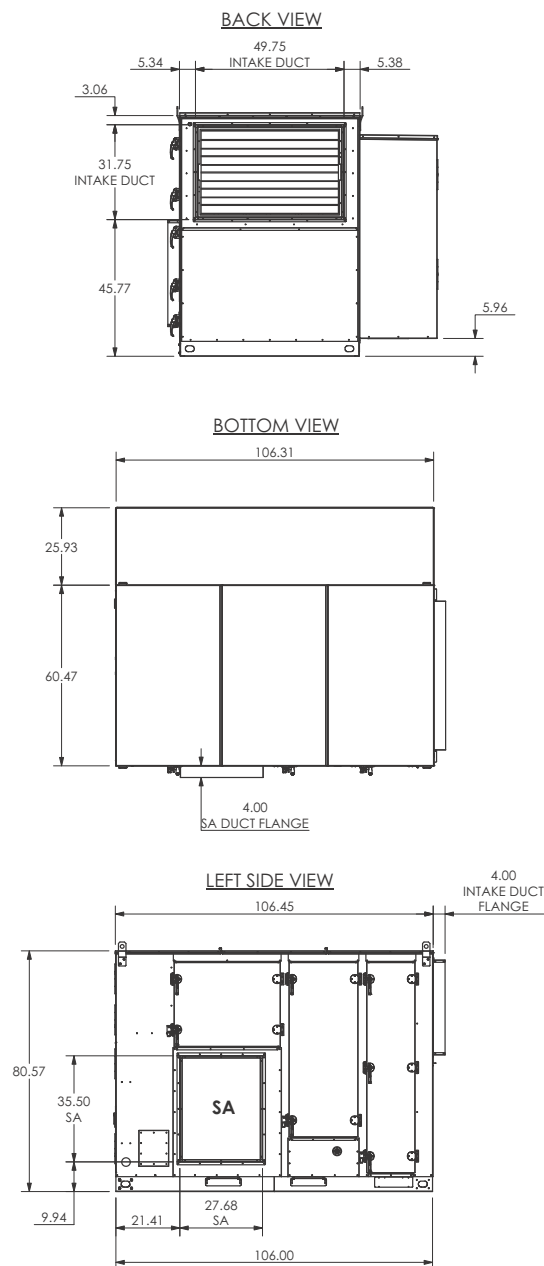
Indoor WSHP Units: OAKE Units

### OAKE Units

**Note:** Indoor units have the same clearances as outdoor units. Refer to p. 52 (outdoor OAKE unit clearances).

### Dimensional Data

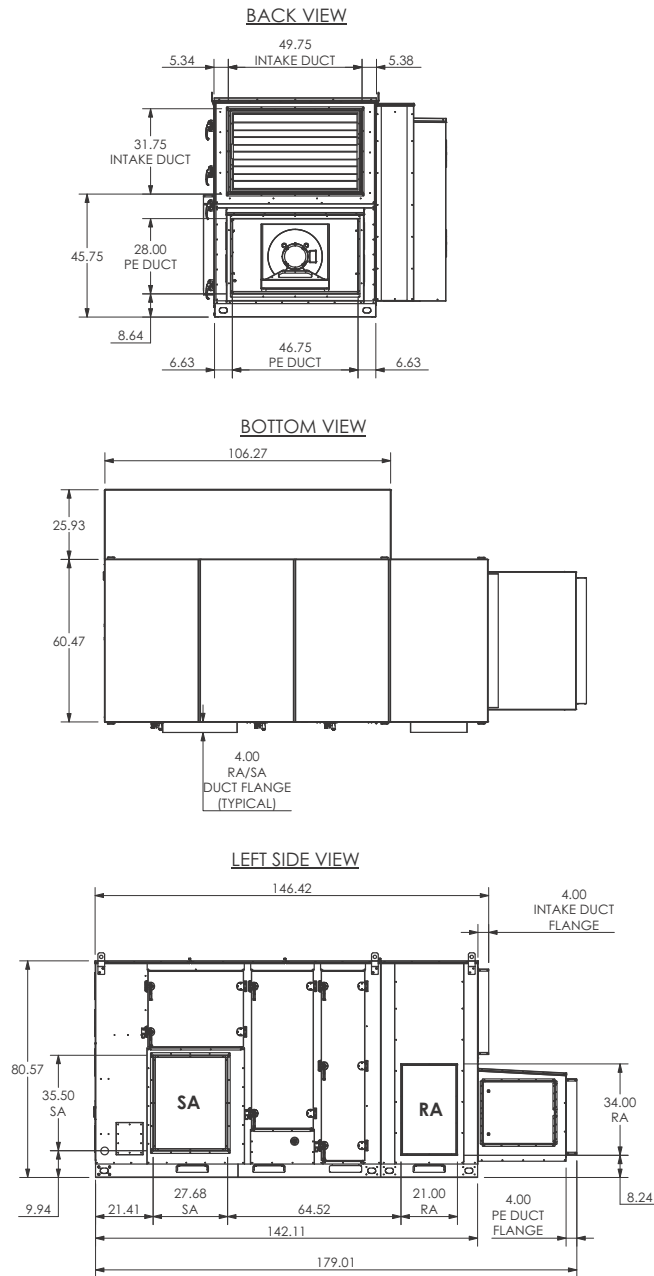
**Figure 52. Unit dimensional data for indoor OAKE WSHP with horizontal supply and no return (in.)**



## Unit Clearances, Curb Dimensions, and Dimensional Data

Indoor WSHP Units: OAKE Units

**Figure 53. Unit dimensional data for indoor OAKE WSHP with horizontal supply/return (no ERV) (in.)**

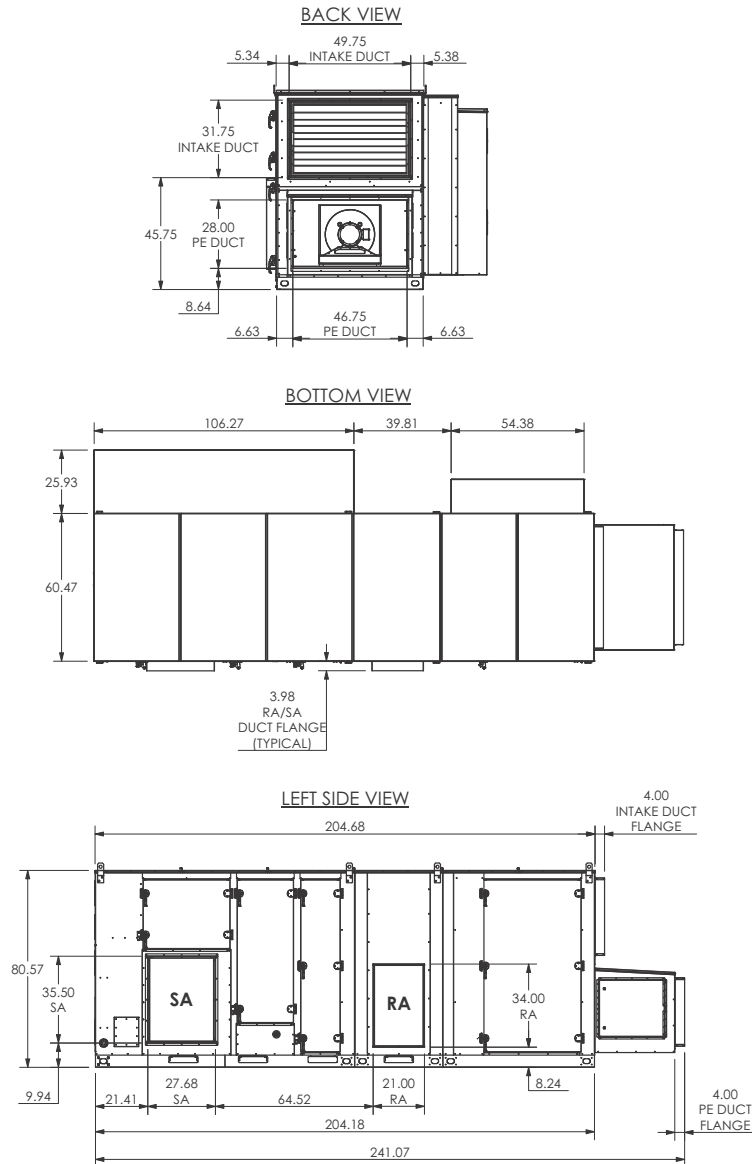




## Unit Clearances, Curb Dimensions, and Dimensional Data

Indoor WSHP Units: OAKE Units

**Figure 54. Unit dimensional data for indoor OAKE WSHP with horizontal supply/return and ERV**



## Unit Clearances, Curb Dimensions, and Dimensional Data

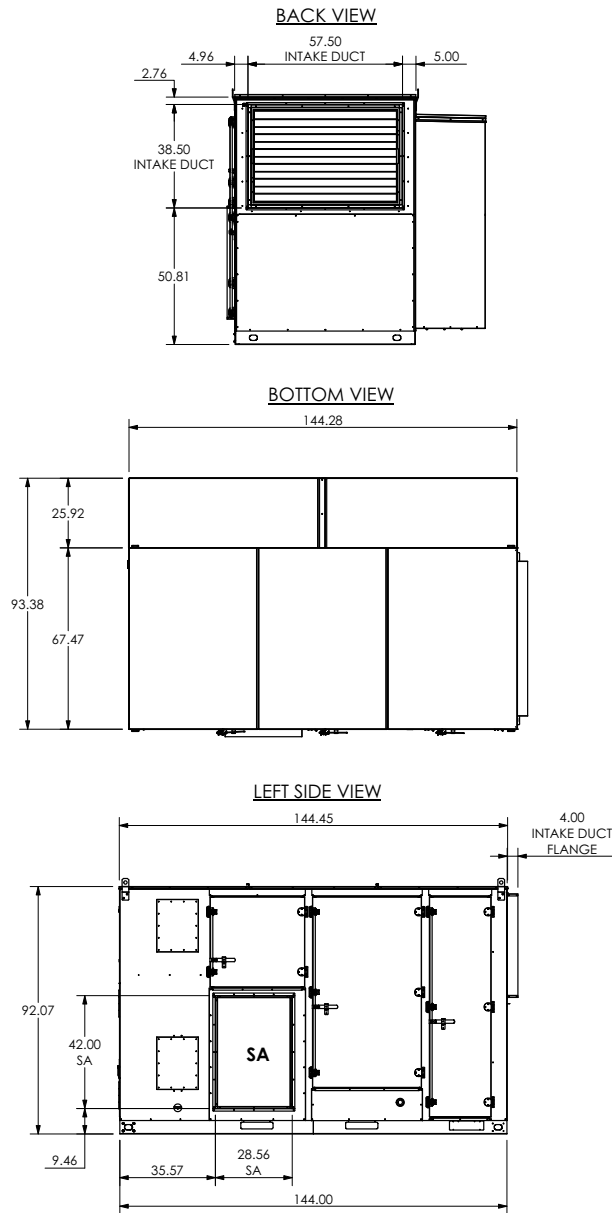
### Indoor WSHP Units: OANE Units

### OANE Units

**Note:** Indoor units have the same clearances as outdoor units. Refer to p. 57 (outdoor OANE unit clearances).

### Dimensional Data

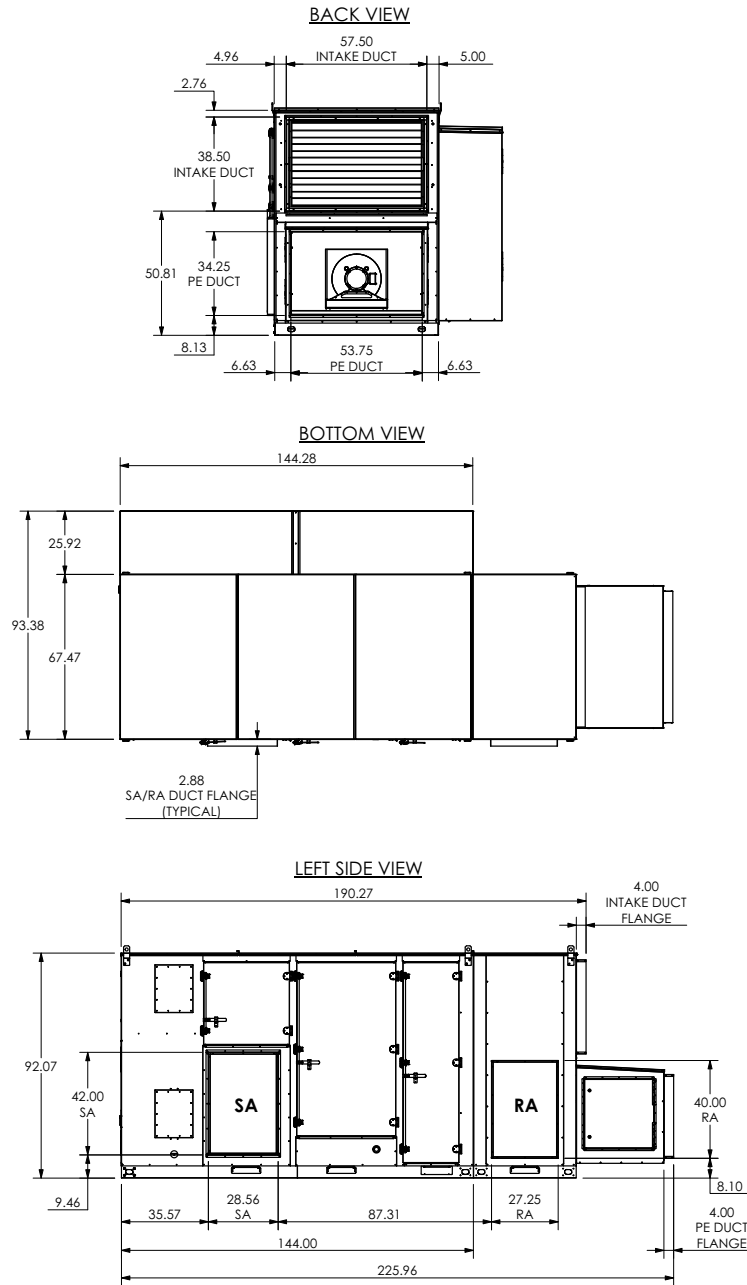
**Figure 55. Unit dimensional data for indoor OANE WSHP with horizontal supply and no return (in.)**



## Unit Clearances, Curb Dimensions, and Dimensional Data

*Indoor WSHP Units: OANE Units*

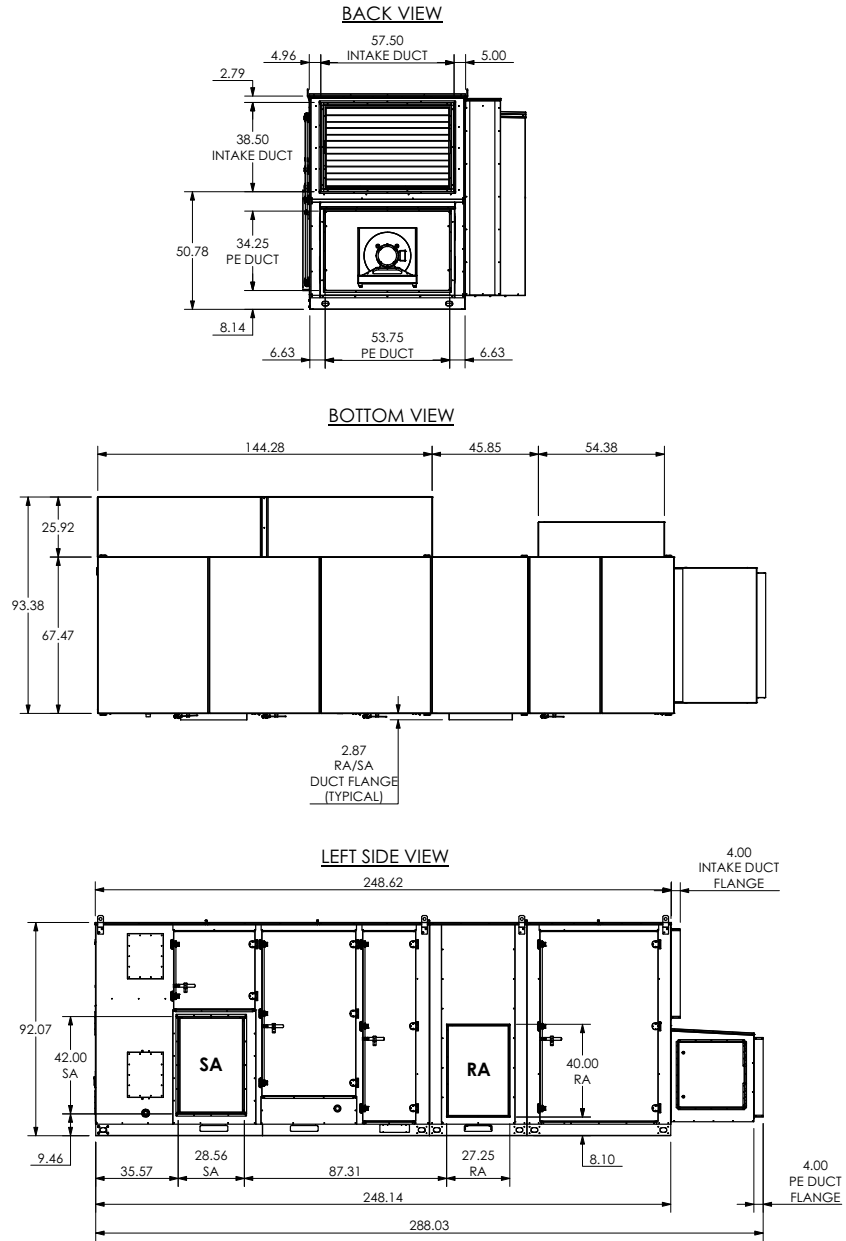
**Figure 56. Unit dimensional data for indoor OANE WSHP with horizontal supply/return (no ERV) (in.)**



# Unit Clearances, Curb Dimensions, and Dimensional Data

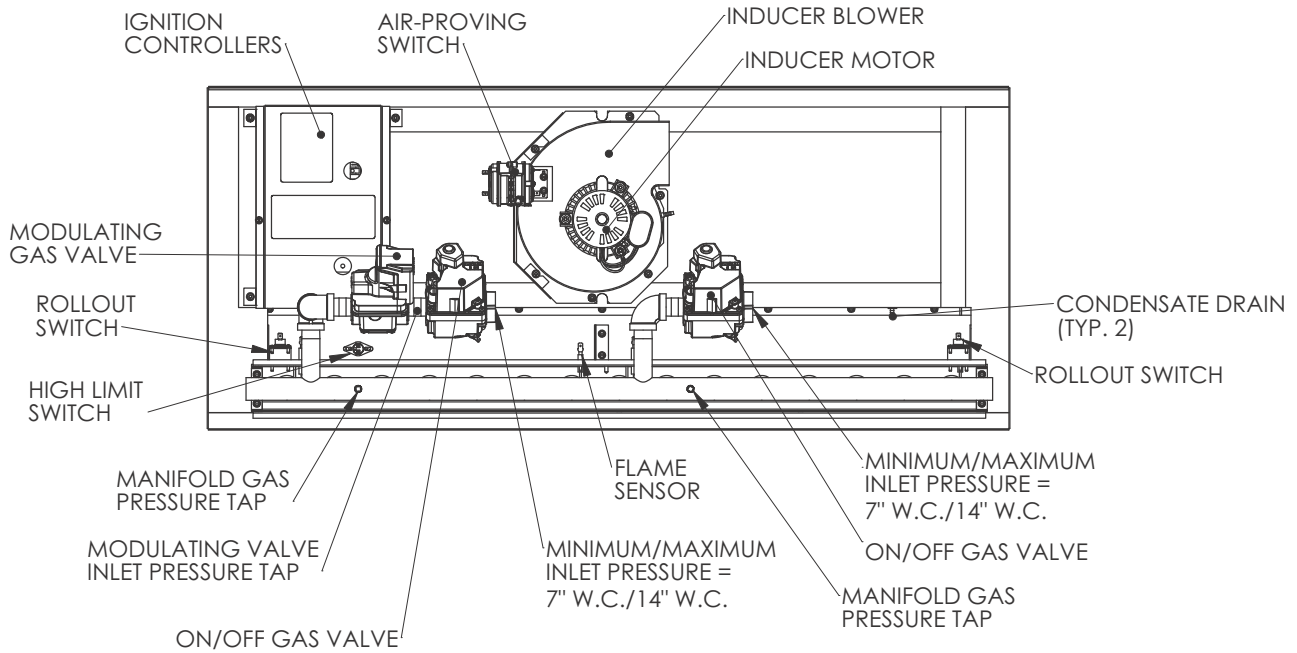
Indoor WSHP Units: OANE Units

**Figure 57. Unit dimensional data for indoor OANE WSHP with horizontal supply/return and ERV (in.)**



# Indirect-fired Gas Heater

**Figure 58. Indirect gas-fired heater components and inlet pressure requirements**





# Unit Weight

## Unit Weight

**Table 14. Typical unit weights—units without auxiliary cabinet**

Model Number	Operating Weight (lb)		Shipping Weight (lb)	
	Min	Max	Min	Max
OABE036*	1172	1356	1420	1604
OABE048*	1189	1373	1437	1621
OABE060*	1189	1373	1437	1621
OABE072*	1237	1421	1485	1669
OABE084*	1237	1421	1485	1669
OABE096*	1269	1453	1517	1701
OABE108*	1313	1497	1561	1745
OADE060*	1614	2078	1614	2078
OADE072*	1639	2158	1639	2158
OADE084*	1639	2158	1639	2158
OADE096*	1669	2364	1669	2364
OADE120*	1669	2364	1669	2364
OADE144*	1718	2413	1718	2413
OADE180*	1416	2249	1416	2249
OAGE120*	2456	2964	2456	2964
OAGE144*	2506	3014	2506	3014
OAGE180*	2512	3021	2512	3021
OAGE210*	2676	3184	2676	3184
OAGE240*	2752	3278	2752	3278
OAGE264*	2788	3314	2788	3314
OAGE300*	2908	3444	2908	3444
OAGE360*	2930	3466	2930	3466
OAKE144*	2685	3350	2685	3350
OAKE180*	2521	3186	2521	3186
OAKE210*	2803	3620	2803	3620
OAKE240*	2831	3648	2831	3648
OAKE264*	2831	3648	2831	3648
OAKE300*	2835	3695	2835	3695
OAKE360*	2909	3769	2909	3769
OANE360*	4631	5614	4631	5614
OANE420*	4946	5929	4946	5929
OANE480*	5039	6051	5039	6051
OANE540*	5106	6063	5106	6063
OANE600*	5270	6352	5270	6352
OANE648*	5282	6364	5282	6364

**Note:** Minimum and maximum weights vary widely due to the highly configurable nature of the product.

**Table 15. Typical unit weights—units with auxiliary cabinet**

Model Number	Operating Weight (lb)		Shipping Weight (lb)	
	Min	Max	Min	Max
OABE036*	1657	1841	1905	2089
OABE048*	1674	1858	1922	2106
OABE060*	1674	1858	1922	2106
OABE072*	1722	1906	1970	2154
OABE084*	1722	1906	1970	2154
OABE096*	1754	1938	2002	2186
OABE108*	1798	1982	2046	2230
OADE060*	2601	3065	2601	3065
OADE072*	2571	3090	2571	3090
OADE084*	2603	3122	2603	3122
OADE096*	2695	3390	2695	3390
OADE120*	2695	3390	2695	3390
OADE144*	2744	3439	2744	3439
OADE180*	2442	3275	2442	3275
OAGE120*	4402	5111	4402	5111
OAGE144*	4361	5161	4361	5161
OAGE180*	4367	5167	4367	5167
OAGE210*	4531	5331	4531	5331
OAGE240*	4606	5424	4606	5424
OAGE264*	4643	5460	4643	5460
OAGE300*	4763	5590	4763	5590
OAGE360*	4784	5612	4784	5612
OAKE144*	4068	4733	4068	4733
OAKE180*	3947	4612	3947	4612
OAKE210*	4487	5304	4487	5304
OAKE240*	4515	5332	4515	5332
OAKE264*	4515	5332	4515	5332
OAKE300*	4499	5359	4499	5359
OAKE360*	4507	5367	4507	5367
OANE360*	6607	7590	6607	7590
OANE420*	6922	7905	6922	7905
OANE480*	7015	8027	7015	8027
OANE540*	7082	8039	7082	8039
OANE600*	7227	8309	7227	8309
OANE648*	7239	8321	7239	8321

**Note:** Minimum and maximum weights vary widely due to the highly configurable nature of the product.



## Unit Weight

**Table 16. Typical unit weights—units with horizontal return section—no auxiliary cabinet**

Model Number	Operating Weight (lb)		Shipping Weight (lb)	
	Min	Max	Min	Max
OABE036*	1172	1356	1420	1604
OABE048*	1189	1373	1437	1621
OABE060*	1189	1373	1437	1621
OABE072*	1237	1421	1485	1669
OABE084*	1237	1421	1485	1669
OABE096*	1269	1453	1517	1701
OABE108*	1313	1497	1561	1745
OADE060*	1959	2423	1959	2423
OADE072*	1984	2503	1984	2503
OADE084*	1984	2503	1984	2503
OADE096*	2014	2709	2014	2709
OADE120*	2014	2709	2014	2709
OADE144*	2063	2758	2063	2758
OADE180*	2063	2758	2063	2758
OAGE120*	2456	2964	2456	2964
OAGE144*	2506	3014	2506	3014
OAGE180*	2512	3021	2512	3021
OAGE210*	2676	3184	2676	3184
OAGE240*	2752	3278	2752	3278
OAGE264*	2788	3314	2788	3314
OAGE300*	2908	3444	2908	3444
OAGE360*	2930	3466	2930	3466
OAKE144*	3200	3865	3200	3865
OAKE180*	3036	3701	3036	3701
OAKE210*	3318	4135	3318	4135
OAKE240*	3346	4163	3346	4163
OAKE264*	3346	4163	3346	4163
OAKE300*	3350	4210	3350	4210
OAKE360*	3424	4284	3424	4284
OANE360*	5241	6224	5241	6224
OANE420*	5556	6539	5556	6539
OANE480*	5649	6661	5649	6661
OANE540*	5716	6673	5716	6673
OANE600*	5880	6962	5880	6962
OANE648*	5892	6974	5892	6974

**Note:** Minimum and maximum weights vary widely due to the highly configurable nature of the product.



**Table 17. Typical unit weights—units with horizontal return section and auxiliary cabinet**

Model Number	Operating Weight (lb)		Shipping Weight (lb)	
	Min	Max	Min	Max
OABE036*	1657	1841	1905	2089
OABE048*	1674	1858	1922	2106
OABE060*	1674	1858	1922	2106
OABE072*	1722	1906	1970	2154
OABE084*	1722	1906	1970	2154
OABE096*	1754	1938	2002	2186
OABE108*	1798	1982	2046	2230
OADE060*	2946	3410	2946	3410
OADE072*	2916	3435	2916	3435
OADE084*	2948	3467	2948	3467
OADE096*	3040	3735	3040	3735
OADE120*	3040	3735	3040	3735
OADE144*	3089	3784	3089	3784
OADE180*	3089	3784	3089	3784
OAGE120*	4402	5111	4402	5111
OAGE144*	4402	5161	4402	5161
OAGE180*	4367	5167	4367	5167
OAGE210*	4531	5331	4531	5331
OAGE240*	4606	5424	4606	5424
OAGE264*	4643	5460	4643	5460
OAGE300*	4763	5590	4763	5590
OAGE360*	4784	5612	4784	5612
OAKE144*	4583	5248	4583	5248
OAKE180*	4583	5248	4583	5248
OAKE210*	5002	5819	5002	5819
OAKE240*	5030	5847	5030	5847
OAKE264*	5030	5847	5030	5847
OAKE300*	5055	5874	5055	5874
OAKE360*	5063	5882	5063	5882
OANE360*	7217	8200	7217	8200
OANE420*	7532	8515	7532	8515
OANE480*	7625	8637	7625	8637
OANE540*	7692	8649	7692	8649
OANE600*	7837	8919	7837	8919
OANE648*	7849	8931	7849	8931

**Note:** Minimum and maximum weights vary widely due to the highly configurable nature of the product.

## Rigging

For rigging instructions, please refer to the *Installation, Operation, and Maintenance* for your specific product:

- OAU-SVX004\*-EN (*Installation, Operation, and Maintenance: Horizon™ Outdoor Air Unit - Water Source Heat Pump - Model: OABE, OADE, OAKE, OANE*)



# Mechanical Specifications

## Horizon Outdoor Air Mechanical Specifications

### General

The supply and return openings shall be available as vertical airflow (OAD, OAK, or OAN), vertical/horizontal airflow (OAG), or convertible (OAB) between vertical/horizontal. Cooling performance shall be rated in accordance with ETL testing procedures. All units shall be factory assembled, internally wired, fully charged with R-410A, and 100 percent run tested to check cooling operation, fan and blower rotation, and control sequence before leaving the factory. Wiring internal to the unit shall be colored and numbered for simplified identification. Units shall be ETL listed and labeled, classified in accordance to UL 1995/CAN/CSA No. 236-M40 for Central Cooling Air Conditioners. Canadian units shall be CSA Certified.

### Casing

Unit casing shall be constructed of zinc-coated, heavy gauge, galvanized steel. Exterior surfaces shall be cleaned, phosphatized, and finished with a weather-resistant baked enamel finish. Unit's surface shall be tested 672 hours in a salt spray test in compliance with ASTM B117. Unit shall have a 2-inch thick Antimicrobial Insulation with an R-value of 13. All insulation edges shall be either captured or sealed. The unit's base pan shall have no penetrations within the perimeter of the curb other than the raised downflow supply/return openings to provide an added water integrity precaution, if the condensate drain backs up. The top cover shall be one piece construction or, where seams exist, it shall be double-hemmed and gasket-sealed. The ribbed top adds extra strength and enhances water removal from unit top.

### Drain Pan

The drain pan is a single-walled assembly made of Type 304 stainless steel. It is sloped in two planes and is fully drainable. The coils are mounted above the drain pan to allow easy inspection and cleaning of the drain pan.

## Refrigeration and Dehumidification Systems

### Digital Scroll Compressors

Digital scroll compressors are direct-drive, hermetic compressors with centrifugal type oil pumps. Motor shall be suction gas-cooled and shall have a voltage utilization range of plus or minus 10 percent of unit nameplate voltage. Internal overloads shall be provided with the scroll compressors. Crankcase heaters shall be included. Compressor shall be able to fully modulate from 10 percent to 100 percent.

### Evaporator Coils

Refer to [Figure 59](#). Internally finned copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. Coils shall be leak tested at the factory to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested to 500 psig and pressure tested to 500 psig. Evaporator coil will have four interlaced rows for superior sensible and latent cooling.

**Figure 59. Evaporator and reheat coil**



### Condenser—Water Cooled (Copper/Steel or 90/10 CuNi Condenser Tubes)

The condenser coils utilize a coaxial “tube in tube” design. Water flows through the inner tube while refrigerant flows in the annulus between the inner and outer tubes. The coils have a convoluted multi-lead inner tube which has increased heat transfer surface area per unit length yet still permits full flow of both water and refrigerant around its entire periphery for improved performance. Turbulence imparted by the convolutions to both the water and refrigerant flows further enhances the thermal performance, while inhibiting the accumulation of deposits on the surfaces.

## Mechanical Specifications

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### Total Energy Wheel (Composite)

The rotating wheel heat exchanger is composed of a rotating cylinder in an insulated cassette frame complete with seals, drive motor, and drive belt. The total-energy recovery wheel is coated with silica gel desiccant permanently bonded by a patented and proprietary process without the use of binders or adhesives, which may degrade desiccant performance. The substrate is a lightweight polymer and will not degrade nor require additional coatings for application in marine or coastal environments. Coated segments are washable with detergent or alkaline coil cleaner and water. Desiccant will not dissolve nor deliquesce in the presence of water or high humidity. As the wheel rotates between the ventilation and exhaust air streams it picks up sensible and latent heat energy and releases it into the colder air stream. The driving force behind the exchange is the difference in temperatures between the opposing air streams which is also called the thermal gradient. Bypass dampers will be provided on both the outside and exhaust air paths.

### Total Energy Wheel (Aluminum)

The rotor media shall be lightweight and be made of aluminum. The rotor media shall be coated to prohibit corrosion; etched or oxidized surfaces are not acceptable. All surfaces must be coated with a non-migrating adsorbent layer of desiccant prior to being formed into the honeycomb media structure to insure that all surfaces are coated and that adequate latent capacity is provided. The desiccant must be designed for the adsorption of water vapor. The media shall be cleanable with low temperature steam, hot water or light detergent without degrading the latent recovery. Bypass dampers will be provided on both the outside and exhaust air paths.

**Figure 60. Total-energy wheel module**

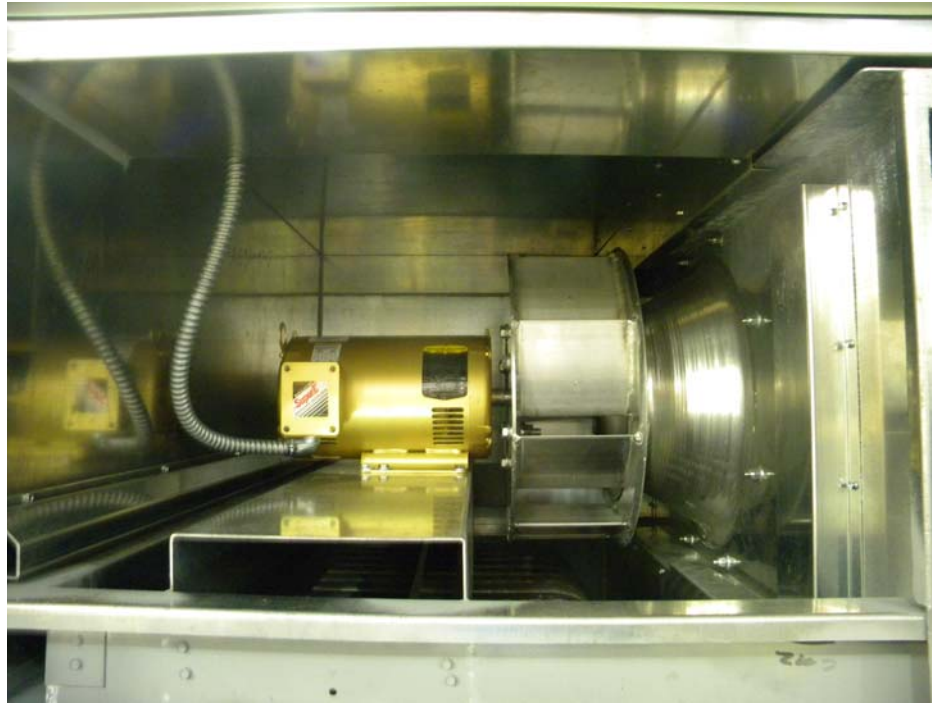


### Supply and Exhaust Fan and Motors (OAD, OAK, and OAN)

Fan motor shall be direct drive type with factory installed Variable Frequency Drive. All motors shall be thermally protected. All indoor fan motors meet the U.S. Energy Policy Act of 2005 (EPACT). Neoprene vibration isolators will be placed under the supply and exhaust fan base.

Refer to [Figure 61](#).

**Figure 61. Indoor fan and motor**



### Supply and Exhaust Fan and Motors (OAB and OAG)

Fan shall be a high efficiency backward curved impeller. The motor shall be an electronic commuted motor (ECM) with integrated power electronics.

### Dampers— Low Leak

The outside air damper has a unit-controlled actuator with parallel-blades. The blade construction is a 14-gage galvanized steel, roll-formed airfoil-type.

## Electrical and Controls

### Controls

Unit is completely factory-wired with necessary controls and contactor pressure lugs for power wiring. Units will provide an external location for mounting fused disconnect device. Micro-processor controls are provided for all 24-volt control functions. The resident control algorithms will make all heating, cooling and/or ventilating decisions in response to electronic signals from sensors measuring outdoor temperature and humidity. The control algorithm maintains accurate temperature control, minimizes drift from set point, and provides better building comfort. A centralized micro-processor (RTRM) will provide anti-short cycle timing for a higher level of machine protection. Terminals are provided for a field installed dry contact or switch closure to put the unit in the Occupied or Unoccupied modes.

### Options

#### Electric Heating Option

Primary heat is supplied using Electric Resistance heaters. Heaters shall meet the requirements of the National Electrical Code and shall be listed by Underwriters Laboratories for zero clearance to combustible surfaces and for use with heat pumps and air conditioning equipment. Heating elements shall be open coil, 80 percent nickel, 20 percent chromium, Grade A resistance wire. Type C alloys containing iron or other alloys are not acceptable. Coils shall be machine crimped into stainless steel terminals extending at least 1 inch into the air stream and all terminal hardware shall be stainless steel. Coils shall be supported by ceramic bushings staked into supporting brackets. Heater frames and terminal boxes shall be corrosion resistant steel. Unless otherwise indicated, the terminal box shall be NEMA 1 construction and shall be provided with a hinged, latching cover. Heaters shall be furnished with a disc type, automatic reset thermal cutout for primary over temperature protection. All heaters shall also be furnished with disc type, load-carrying manual reset thermal cutouts, factory wired in series with heater stages for secondary protection. Heat limiters or other fusible over temperature devices are not acceptable. Control will be SCR type. Unit shall be suitable for use with Electric Resistance Heat. Refer to [Figure 62](#).

**Figure 62. ER Heater**



#### Gas-Fired Heating Option

Primary heat is supplied using indirect fired gas heating. The heating section shall have a progressive tubular heat exchanger design using stainless steel burners and Type 409 stainless steel tubes. An induced draft combustion blower shall be used to pull the combustion products through the firing tubes. The heater shall use a direct spark ignition (DS) system. On initial call for heat, the combustion blower shall purge the heat exchanger for 20 seconds before ignition. After three unsuccessful ignition attempts, the entire heating system shall be locked out until manually reset at the thermostat/zone sensor. Units shall be comply with the California requirement for low NO<sub>x</sub> emissions. Unit shall be suitable for use with Natural Gas.

### Hydronic Heat Option

A factory installed one, two, or three row hydronic heating coil will be provided downstream of the fan. The unit controller provides a modulating output to control a factory-provided/field-installed water valve and accepts a low temperature limit input signal. Openings in the unit side panels for piping must also be field constructed.

### Condenser Hot Gas Reheat

This option shall consist of a modulating hot-gas reheat coil located on the leaving air side of the evaporator coil pre-piped and circuited with a low pressure switch. For detailed unit control and operational modes, please refer to the Sequence of Operations in the *Installation, Operation, and Maintenance* for your specific product:

- OAU-SVX004\*-EN (*Installation, Operation, and Maintenance: Horizon™ Outdoor Air Unit - Water Source Heat Pump - Model: OABE, OADE, OAKE, OANE*)

### Return Air

Air returns vertically through the unit base for the OAD, OAK, and OAN cabinets. The OAB and OAG cabinets can be provided with either horizontal or vertical return. Dampers are low-leak. Each damper has a unit-controlled actuator. Inputs are provided for unoccupied economizer control, based upon a comparison of the outside air stream to a dry bulb reference point. Refer to [Figure 63](#).

**Figure 63. Return air damper**



### Corrosion-Inhibiting Coating

Options include stainless steel interior walls with prepainted exterior walls, ECO-coated coils, and stainless steel coil housing.

### Filters

Adjustable 6-inch filter rack with options for 2-inch MERV-8, 2-inch MERV-13, and 4-inch MERV-14 installed just upstream of the evaporator coil. In addition, 2-inch aluminum mesh mist eliminators are located in the intake hood for OAD, OAG, OAK, and OAN; a bird screen is provided for OAB.

## Mechanical Specifications

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Other options include 120 V UVC downstream of the evaporator coil, and 2-inch, 24 V electrostatic filters.

### Filter Status Switch

This option indicates when filters require cleaning or replacement. The Filter Status switch triggers an information-only diagnostic message on the human interface and will allow continued unit operation.

### Non-Fused Disconnect Switch

A 3-pole, molded case, disconnect switch with provisions for through the base electrical connections shall be installed. The disconnect switch will be installed in the unit in a water tight enclosure. Wiring will be provided from the switch to the unit high voltage terminal block. The switch will be UL/CSA agency recognized. The disconnect switch will be sized per NEC and UL guidelines but will not be used in place of unit overcurrent protection.

### Convenience Outlet

A convenience outlet is provided on the control side of the unit. The GFI outlet is 115 volt, and capable of manual resetting.

**Figure 64. Convenience outlet**



### Roof Mounting Curb

The roof mounting curb is fabricated of 14-gage galvanized steel with a nominal 2-inch x 2-inch nailer setup. The curb ships knocked down with a curb gasket. Curb height options are 14 or 24 inches.





# Appendix

## OAU Filter Guide

Table 18. OABE Units

Evaporator					
Thickness	MERV	Qty	Height	Width	
2 in.	8, 13	2	20	24	
4 in.	14	2	20	24	
Auxiliary Module					
Return Air					
Thickness	MERV	Qty	Height	Width	
2 in.	8	4	20	24	
Outside Air					
Thickness	MERV	Qty	Height	Width	
2 in.	8	4	20	24	

Table 19. OADE Units

Evaporator					
Thickness	MERV	Qty	Height	Width	
2 in.	8, 13	2	16	20	
		2	16	25	
4 in.	14	2	16	20	
		2	16	25	
Auxiliary Module					
Return Air					
Thickness	MERV	Qty	Height	Width	
2 in.	8	2	20	24	
Outside Air					
Thickness	MERV	Qty	Height	Width	
2 in.	8	2	20	24	
Inlet					
Thickness	Material	Qty	Height	Width	
2 in.	Aluminum Mesh	3	16	25	

Table 20. OAGE Units

Evaporator					
Thickness	MERV	Qty	Height	Width	
2 in.	8	2	16	20	
		4	16	25	
2 in.	13	2	16	20	
		4	16	25	
4 in.	14	2	16	20	
		4	16	25	
Auxiliary Module					
Return Air					
Thickness	MERV	Qty	Height	Width	
2 in.	8	2	16	20	
		4	16	25	

**Appendix**


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**Table 20. OAGE Units**

<b>Outside Air</b>					
Thickness	MERV	Qty	Height	Width	
2 in.	8	2	16	20	
		4	16	25	
<b>Inlet</b>					
Thickness	Material	Qty	Height	Width	
2 in.	Aluminum Mesh	6	16	24	

**Table 21. OAKE Units**

<b>Evaporator</b>					
Thickness	MERV	Qty	Height	Width	
2 in.	8, 13	9	20	18	
4 in.	14	6	20	25	
<b>Auxiliary Module (46XX ERV)</b>					
<b>Return Air</b>					
Thickness	MERV	Qty	Height	Width	
2 in.	8	2	25	20	
		1	25	16	
<b>Outside Air</b>					
Thickness	MERV	Qty	Height	Width	
2 in.	8	2	25	20	
		1	25	16	
<b>Auxiliary Module (58XX/ 64XX ERV)</b>					
<b>Return Air</b>					
Thickness	MERV	Qty	Height	Width	
2 in.	8	8	20	18	
<b>Outside Air</b>					
Thickness	MERV	Qty	Height	Width	
2 in.	8	8	20	18	
<b>Inlet</b>					
Thickness	Material	Qty	Height	Width	
2 in.	Aluminum Mesh	6	20	20	

**Table 22. OANE Units**

<b>Evaporator</b>					
Thickness	MERV	Qty	Height	Width	
2 in.	8, 13	9	24	20	
4 in.	14	9	24	20	
<b>Auxiliary Module (58XX ERV)</b>					
<b>Return Air</b>					
Thickness	MERV	Qty	Height	Width	
2 in.	8	6	18	20	
<b>Outside Air</b>					
Thickness	MERV	Qty	Height	Width	
2 in.	8	6	18	20	
<b>Auxiliary Module (68XX / 74XX ERV)</b>					
<b>Return Air</b>					
Thickness	MERV	Qty	Height	Width	
2 in.	8	8	25	20	
<b>Outside Air</b>					
Thickness	MERV	Qty	Height	Width	
2 in.	8	8	25	20	
<b>Inlet</b>					
Thickness	Material	Qty	Height	Width	
2 in.	Aluminum Mesh	10	16	25	



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