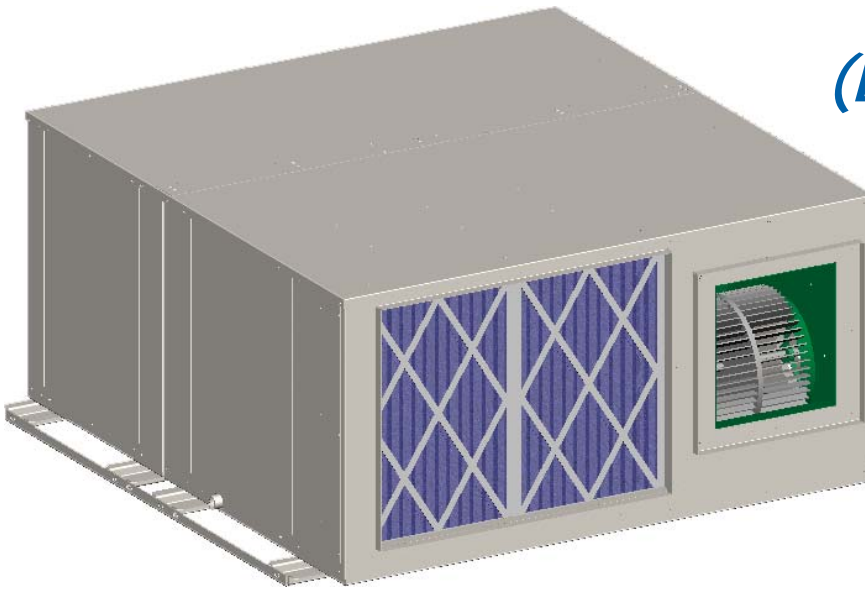


HK-OA™ Horizontal Outside Air A/C's

*Ceiling Mounted
(DX & CW Systems)*



1.5 to 30 Tons

***Ducted Same-Face Series
"Above-The-Ceiling"***



MEA230-06-E



Features & Benefits

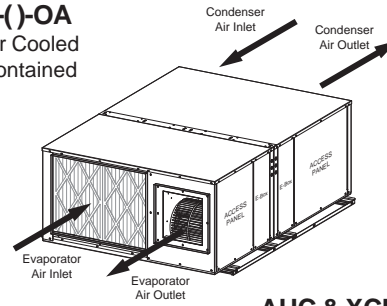
- 1.5 to 30 Tons
- Outside-Air Systems
 - 95°F DB / 78°F WB EAT
 - 55°F DB / 54°F WB LAT Off Coil
 - Hot Gas Reheat to Space Neutral
 - Precision Space Control via SCR Electric, Proportional Hot Water, Steam or Gas Fired Reheat / Heat
- Typical Applications
 - General Office Spaces
 - Conference Rooms
 - Restaurants / Retail Stores
 - Computer / Server Rooms
 - Morgues
 - Labs / Hospitals
- Ducted, Same-Face Air Pattern with High Static BD Blowers
- DX Air, Water & Glycol Cooled, Chilled Water & Free-Cooling
- Microprocessor Dew PT Control

AboveAir™ ceiling mounted air conditioners are the space saving environmental control solution to your comfort and precision cooling needs. Available in a wide variety of cooling methods and cabinet configurations including a full range of options, **AboveAir™** ceiling A/C's are a step above!

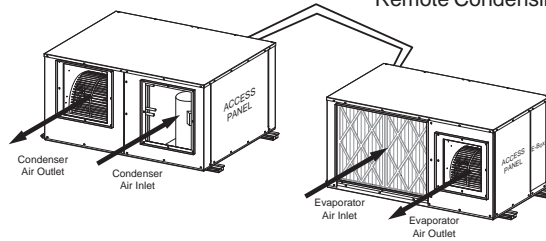
- ☑ R407c or Optional R410a Refrigerant
- ☑ Hidden above-the-ceiling installation
- ☑ Space saving "same-face" air pattern
- ☑ Variety of cooling methods
- ☑ Self-contained & split systems
- ☑ Flexible options and accessories
- ☑ Energy efficient operation
- ☑ Low sound operation

Air Cooled

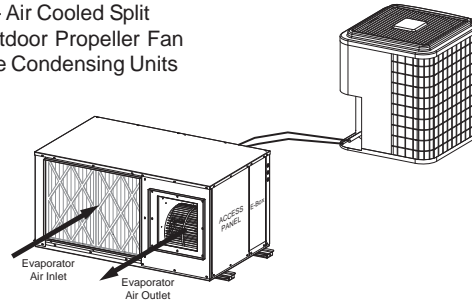
AAC(-)-OA
DX - Air Cooled
Self-Contained



AHC & XCU(-)-OA
DX - Air Cooled Split
with Indoor/Outdoor Centrifugal Blower
Remote Condensing Units

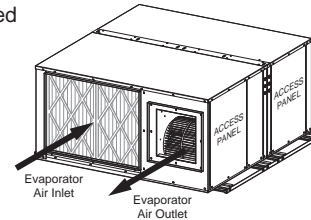


AHC & XPU(-)-OA
DX - Air Cooled Split
with Outdoor Propeller Fan
Remote Condensing Units



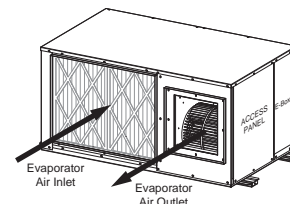
Water/Glycol Cooled (plus Free-Cooling)

AWC & AGC(-)-OA
DX - Water/Glycol
Cooled Self-Contained
(split available)



Chilled Water Systems

ACC(-)-OA
Chilled Water
Air Handling Units



Contents

Introduction	2
Model Nomenclature	2
Features and Benefits	3
Performance Data	3
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Guide Specifications	10-15

FEATURES & BENEFITS

Nominal Performance Data (LAT = 55°F DB / 54°F WB Off Cooling Coil)

HK™ Horizontal / VK™ Vertical Model	100% OA Outside-Air		60% Outside-Air		40% Outside-Air		20% Outside-Air	
	95°F DB / 78.0°F WB Mixed EAT		87.0°F DB / 71.8°F WB Mixed EAT		83.0°F DB / 68.7°F WB Mixed EAT		79.0°F DB / 65.6°F WB Mixed EAT	
	Total Evap Airflow Rate	Nom. Cooling Capacity	Total Evap Airflow Rate	Nom. Cooling Capacity	Total Evap Airflow Rate	Nom. Cooling Capacity	Total Evap Airflow Rate	Nom. Cooling Capacity
	CFM	TMBH / SMBH	CFM	TMBH / SMBH	CFM	TMBH / SMBH	CFM	TMBH / SMBH
A_C / VK_-036_-OA	435	36.3 / 18.9	630	36.1 / 21.9	790	36.0 / 24.0	1,040	36.1 / 27.1
A_C / VK_-048_-OA	575	48.0 / 25.0	840	48.1 / 29.2	1,055	48.1 / 32.1	1,385	48.0 / 36.1
A_C / VK_-060_-OA	720	60.1 / 31.3	1,050	60.2 / 36.5	1,315	60.0 / 40.0	1,730	60.0 / 45.1
A_C / VK_-072_-OA	865	72.2 / 37.6	1,260	72.2 / 43.8	1,580	72.1 / 48.1	2,080	72.1 / 54.3
A_C / VK_-090_-OA	1,080	90.2 / 47.0	1,570	90.0 / 54.6	1,975	90.1 / 60.1	2,600	90.1 / 67.8
A_C / VK_-096_-OA	1,150	96.0 / 50.0	1,675	96.0 / 58.3	2,100	95.8 / 63.9	2,770	96.0 / 72.3
A_C / VK_-120_-OA	1,440	120.2 / 62.6	2,100	120.4 / 73.0	2,630	120.0 / 80.0	3,460	119.9 / 90.3
A_C / VK_-144_-OA	1,725	144.0 / 75.0	2,515	144.1 / 87.5	2,160	98.5 / 65.7	4,155	144.0 / 108.4
A_C / VK_-180_-OA	2,160	180.3 / 93.9	3,140	180.0 / 109.2	3,950	180.2 / 120.2	5,195	180.1 / 135.5
A_C / VK_-199_-OA	2,390	199.5 / 103.9	3,475	199.2 / 120.9	4,370	199.3 / 133.0	5,750 *	199.3 / 150.0
A_C / VK_-216_-OA	2,675	223.3 / 116.3	3,895	223.2 / 135.5	4,895	223.3 / 149.0	6,440 *	223.2 / 168.0
A_C / VK_-240_-OA	2,875	240.0 / 125.0	4,190	240.2 / 145.7	5,262	240.0 / 160.2	6,925 *	240.1 / 180.7
A_C / VK_-300_-OA	3,600	300.5 / 156.5	5,235	300.0 / 182.1	6,580 *	300.1 / 200.3	8,655 *	300.0 / 225.8
A_C / VK_-360_-OA	4,315	360.2 / 187.6	6,280 *	359.9 / 218.4	7,895 *	360.1 / 240.3	10,385 *	360.0 / 270.9

Notes: 1) Data based on 95°F DB / 78°F WB Summer Outside-Air Temperature and 75°F DB / 62.5°F Space Temperature.
2) * - Available in VK Vertical model sizes only.



Standard Features:

- MC-3000, Advanced Dew Pt Outside-Air Microprocessors w/ Alarms & BMS Options
- Multi-Row Deep Cooling Coils
- Modulating Hot Gas Reheat to 75°F LAT
- Scroll Compressors
- Modulating Flooded Head Pressure Control
- Hot Gas Bypass
- Suction-Line Accumulators
- 1" Closed-Cell Insulated Cooling Sections
- Adjustable Belt-Drive DWDI Blowers
- High Efficiency Air Filtration

Optional Features:

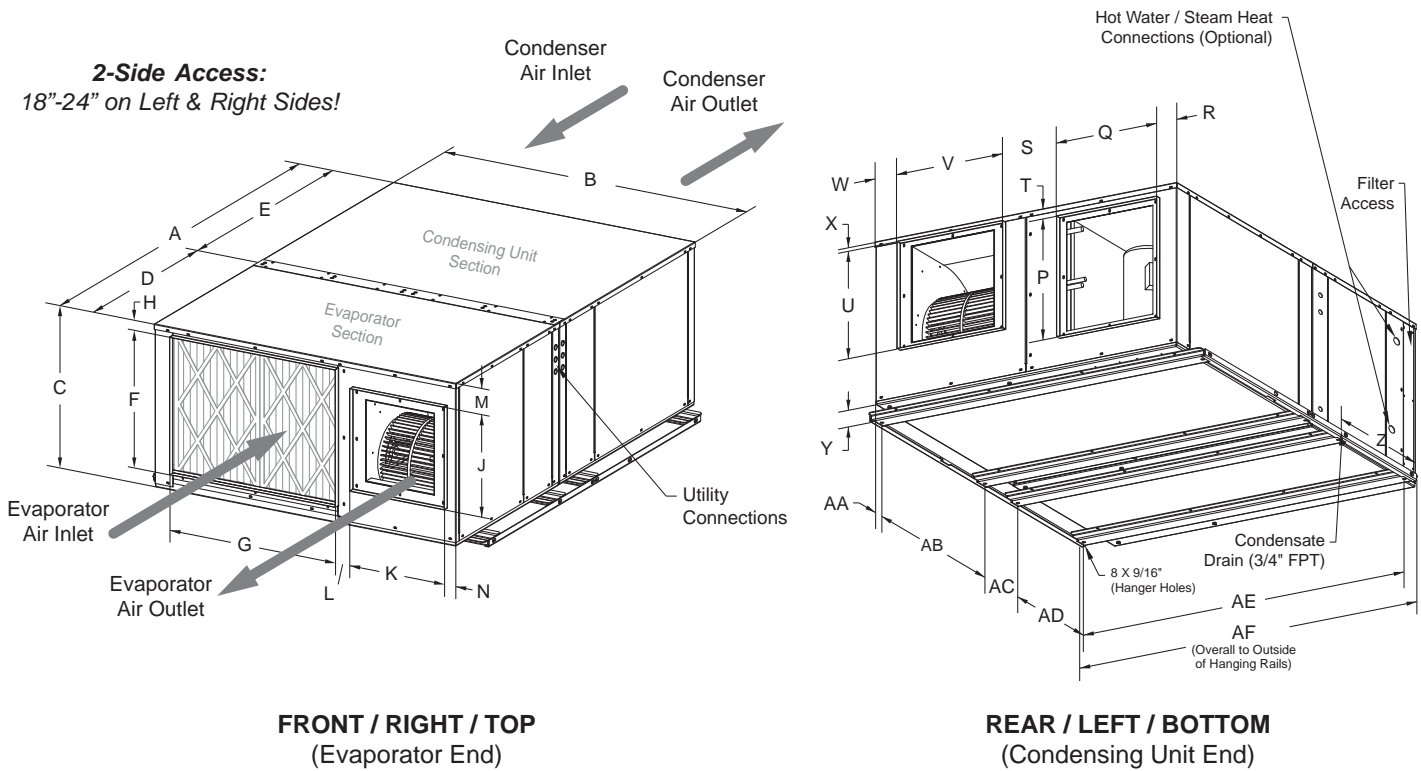
- Electric SCR Fired, Hot Water or Steam Pre &/or Post Heat
- Condensate Pumps
- Main Power Electrical Disconnects
- Firestats & Smoke Detectors
- Remote Water-Leak Detectors
- Compressor Sound Jackets
- Glycol Pump Packages & Drycoolers
- ... and more!



MEA229/230-06-E Approved

DX - Air Cooled, Self-Contained, Outside-Air A/C's

Models: AAC-018 thru 180_-OA, 1.5-15 Tons



FRONT / RIGHT / TOP
(Evaporator End)

REAR / LEFT / BOTTOM
(Condensing Unit End)

DIMENSIONS (inches)										
AAC-()-OA Model No.	A	B	C	D	E	F	G	H	J	K
018, 024 & 036	59	44	22	25	34	17-3/4	21-1/4	1-5/16	14	14
048, 060, 072, 090 & 096	74	54	27	32	42	22-1/4	29-3/4	1-5/8	17	15
120, 144 & 180 <small>see Note-1</small>	96	74	29	38	58	24-1/8	45-5/8	1-5/8	20	18
AAC-()-OA Model No.	L	M	N	P	Q	R	S	T	U	V
018, 024 & 036	2-1/32	2-9/16	3-1/2	16	16	2-3/4	6-7/8	2	16	16
048, 060, 072, 090 & 096	2-3/4	4-1/4	3-1/8	20	18	3	9-5/8	2	17-3/8	19
120, 144 & 180 <small>see Note-1</small>	3-3/8	2-1/4	3-1/2	24	30	2-3/4	14-1/8	2	18-1/4	23
AAC-()-OA Model No.	W	X	Y	Z	AA	AB	AC	AD	AE	AF
018, 024 & 036	2-3/8	1	1-1/8	17-1/4	5	24	8	17-1/2	47-1/2	50-1/2
048, 060, 072, 090 & 096	4-3/8	1-5/16	1-1/8	22-1/4	5	32	10	20-1/2	57-1/2	60-1/2
120, 144 & 180 <small>see Note-1</small>	4-1/8	2-7/8	1-1/8	26-1/4	5	48	10	23-1/2	77-1/2	80-1/2

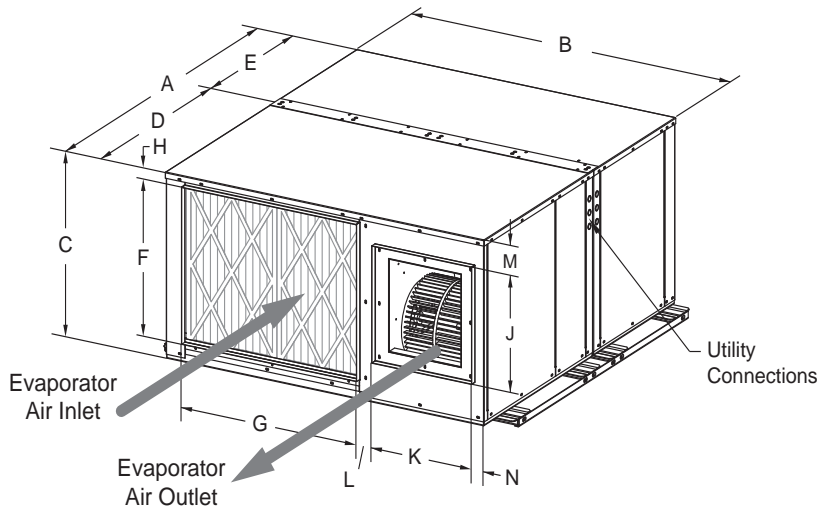
Note:

1) 10-15 Ton AAC/AAP model systems ship split from the factory split with a field packaged unit assembly kit. As a standard, 1-8 Ton AAC/AAP model systems ship from the factory as 1-piece units.

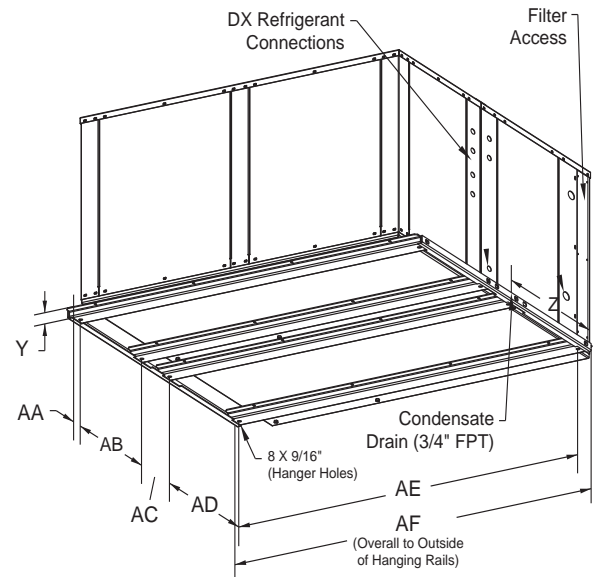
DX - Air Cooled Evaporators, Split Horizontal, Outside Air A/C's

Model: AEC-018 thru 360-_-OA, 1.5-30 Tons

3-Side Access:
18"-24" on Rear, Left & Right Sides!



FRONT / RIGHT / TOP

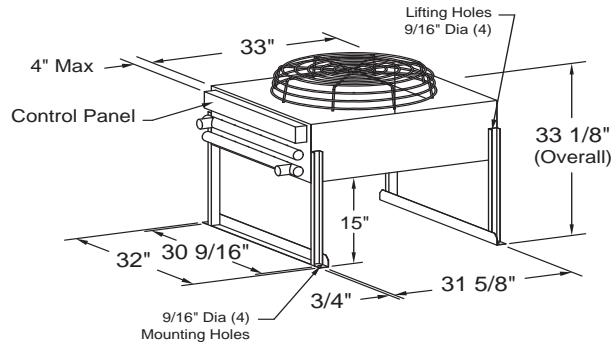


REAR / LEFT / BOTTOM

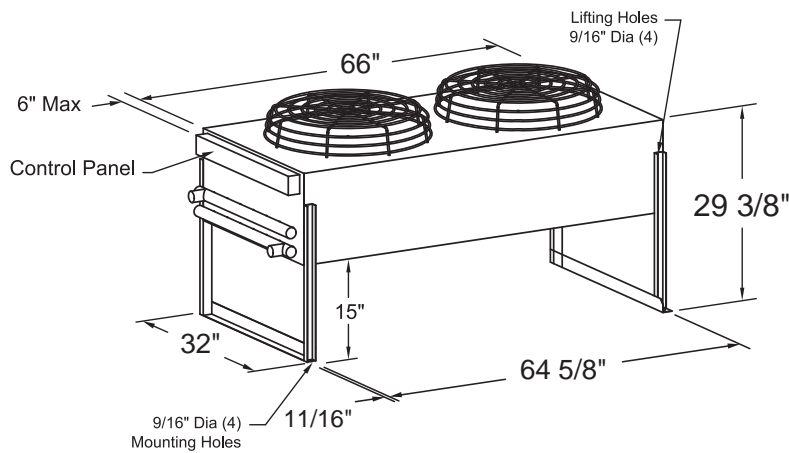
DIMENSIONS (inches)												
Cabinet Size	AEC-()_-OA Model No.	A	B	C	D	E	F	G	H	J	K	L
"A"	018 thru 072 (Up to 1200 CFM)	45	44	22	25	20	17-3/4	21-1/4	1-5/16	14	14	2-1/32
"B"	048 thru 180 (Up to 2500 CFM)	56	54	27	32	24	22-1/4	29-3/4	1-5/8	17	15	2-3/4
"C"	120 thru 300 (Up to 3850 TCFM)	62	74	29	38	24	24-1/8	45-5/8	1-5/8	20	18	3-3/8
"D"	180 thru 360 (Up to 4250 TCFM)	62	74	35	38	24	30-1/8	47-1/2	2-3/8	20	18	2-7/16
"E"	240 thru 360 (Up to 6450 TCFM)	68	82	40	38	30	35-3/16	52	2	20	18	3-1/2
Cabinet Size	AEC-()_-OA Model No.	M	N	Y	Z	AA	AB	AC	AD	AE	AF	
"A"	018 thru 072 (Up to 1200 CFM)	2-9/16	3-1/2	1-1/8	17-1/4	3	14	6	17-1/2	47-1/2	50-1/2	
"B"	048 thru 180 (Up to 2500 CFM)	4-1/4	3-1/8	1-1/8	22-1/4	3	18	8	20-1/2	57 1/2	60-1/2	
"C"	120 thru 300 (Up to 3850 TCFM)	2-1/4	3-1/2	1-1/8	26-1/4	3	18	8	23-1/2	77-1/2	80-1/2	
"D"	180 thru 360 (Up to 4250 TCFM)	8-1/4	3-1/2	1-1/8	26-1/4	3	18	8	23-1/2	77-1/2	80-1/2	
"E"	240 thru 360 (Up to 6450 TCFM)	13-1/4	5-1/2	1-1/8	26-1/4	3	18	8	23-1/2	85-1/2	88-1/2	

Remote Outdoor Propeller Fan Air Cooled Condensers

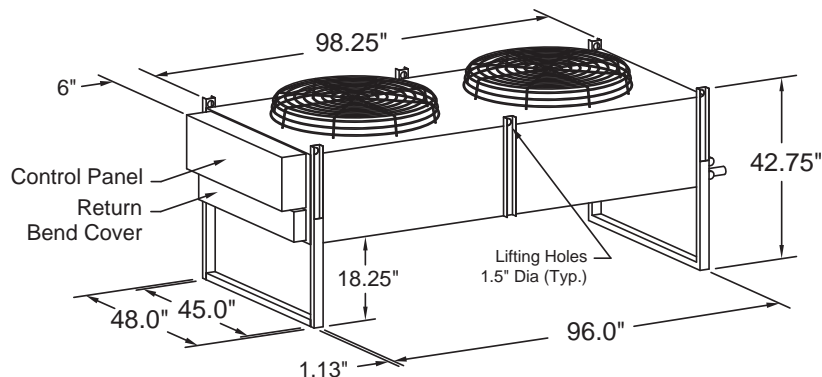
XP1-036 & 060



XP1/XP2-096,-120 & 144



XP2-180, 192, 240, 264, 300, 336, 372 & 432

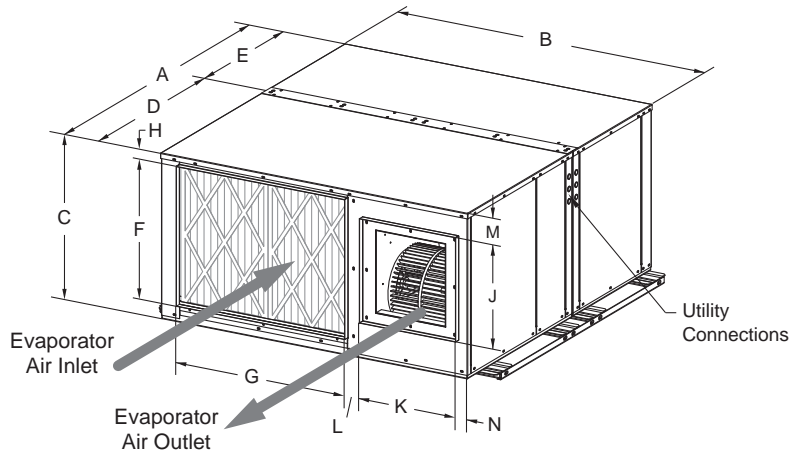


DX - Water / Glycol Cooled, Self-Contained Horizontal - Outside Air A/C's

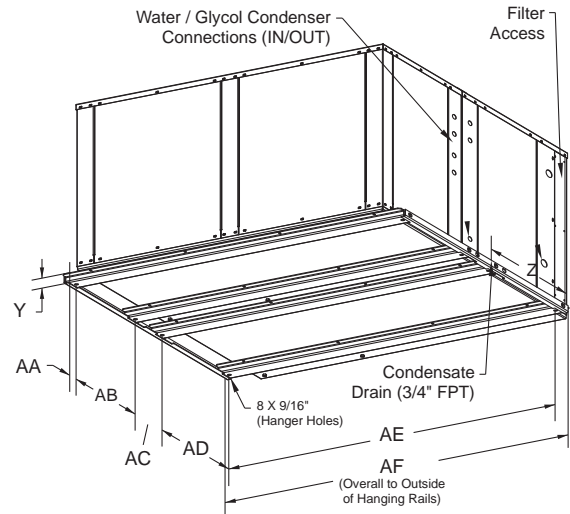
Model: AWC/AGC-018 thru 360-_-OA, 1.5-30 Tons

3-Side Access:

18"-24" on Rear, Left & Right Sides!



FRONT / RIGHT / TOP



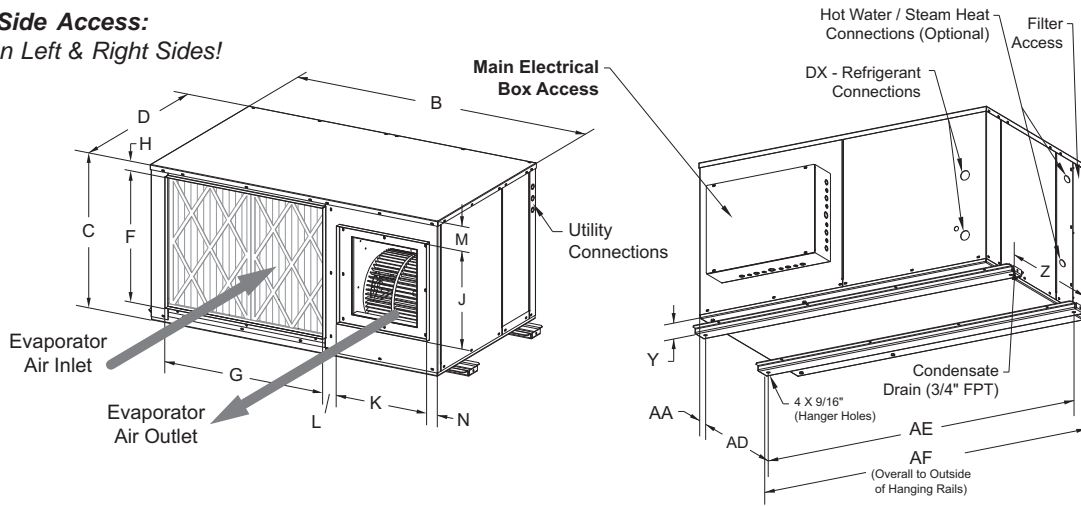
REAR / LEFT / BOTTOM

DIMENSIONS (inches)												
Cabinet Size	AWC/AGC-()_-OA Model No.	A	B	C	D	E	F	G	H	J	K	L
"A"	018 thru 072 (Up to 1200 CFM)	45	44	22	25	20	17-3/4	21-1/4	1-5/16	14	14	2-1/32
"B"	048 thru 180 (Up to 2500 CFM)	56	54	27	32	24	22-1/4	29-3/4	1-5/8	17	15	2-3/4
"C"	120 thru 300 (Up to 3850 TCFM)	62	74	29	38	24	24-1/8	45-5/8	1-5/8	20	18	3-3/8
"D"	180 thru 360 (Up to 4250 TCFM)	62	74	35	38	24	30-1/8	47-1/2	2-3/8	20	18	2-7/16
"E"	240 thru 360 (Up to 6450 TCFM)	68	82	40	38	30	35-3/16	52	2	20	18	3-1/2
Cabinet Size	AWC/AGC-()_-OA Model No.	M	N	Y	Z	AA	AB	AC	AD	AE	AF	
"A"	018 thru 072 (Up to 1200 CFM)	2-9/16	3-1/2	1-1/8	17-1/4	3	14	6	17-1/2	47-1/2	50-1/2	
"B"	048 thru 180 (Up to 2500 CFM)	4-1/4	3-1/8	1-1/8	22-1/4	3	18	8	20-1/2	57 1/2	60-1/2	
"C"	120 thru 300 (Up to 3850 TCFM)	2-1/4	3-1/2	1-1/8	26-1/4	3	18	8	23-1/2	77-1/2	80-1/2	
"D"	180 thru 360 (Up to 4250 TCFM)	8-1/4	3-1/2	1-1/8	26-1/4	3	18	8	23-1/2	77-1/2	80-1/2	
"E"	240 thru 360 (Up to 6450 TCFM)	13-1/4	5-1/2	1-1/8	26-1/4	3	18	8	23-1/2	85-1/2	88-1/2	

DX Split, Horizontal Air Handling Units

Models: AHC-018 thru 240-_-OA

2-Side Access:
18"-24" on Left & Right Sides!



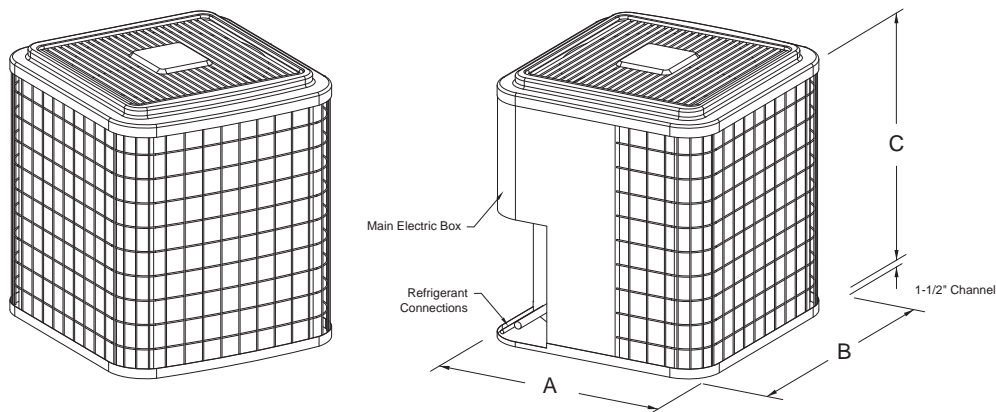
FRONT / RIGHT / TOP

REAR / LEFT / BOTTOM

DIMENSIONS (inches)																		
Cabinet Size	AHC(-)_-OA Model No.	B	C	D	F	G	H	J	K	L	M	N	Y	Z	AA	AD	AE	AF
"A"	018 thru 072 (Up to 1200 CFM)	44	22	25	17-3/4	21-1/4	1-5/16	14	14	2-1/32	2-9/16	3-1/2	1	17-1/4	3	17-1/2	47-1/2	50
"B"	048 thru 180 (Up to 2400 CFM)	54	27	32	22-1/4	29-3/4	1-5/8	17	15	2-3/4	4-1/4	3-1/8	1	22-1/4	5	20-1/2	57-1/2	60
"C"	120 thru 240 (Up to 3850 TCFM)	74	29	38	24-1/8	45-5/8	1-5/8	20	18	3-3/8	2-1/4	3-1/2	1	26-1/4	5	23-1/2	77-1/2	80

DX - Air Cooled, Outdoor Propeller Fan, Remote Condensing Units

Models: XPU-012 thru 090-_-OA



FRONT / LEFT / TOP

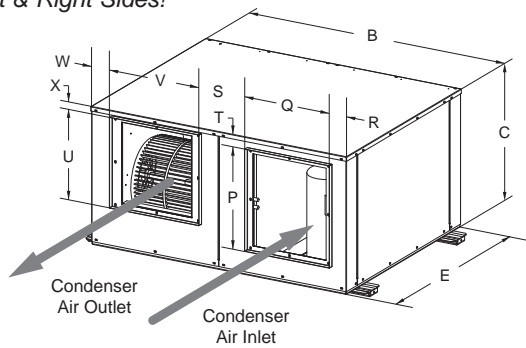
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XPU(-) Model Size	Dimensions		
	A	B	C
012, 018 & 024	25-3/4"	26-5/16"	28-7/16"
036	31-3/16"	31-3/16"	25-1/2"
048	35"	36-9/16"	35-3/4"
060	35"	35"	39-1/8"
072 & 081	33"	35"	38-1/2"
090	33"	35"	42-1/2"

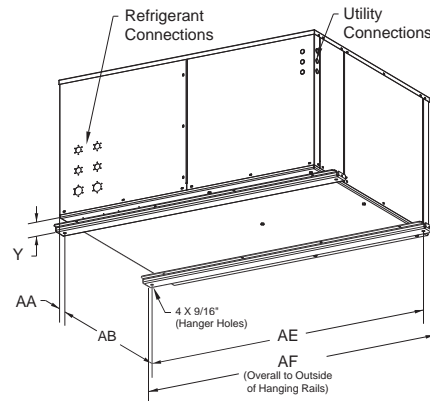
DX - Air Cooled, Indoor Horizontal Centrifugal Blower, Remote Condensing Units & Condensers

Models: XCU or XCX-018 thru 180-_-OA

2-Side Access:
18"-24" on Left & Right Sides!



FRONT / RIGHT / TOP



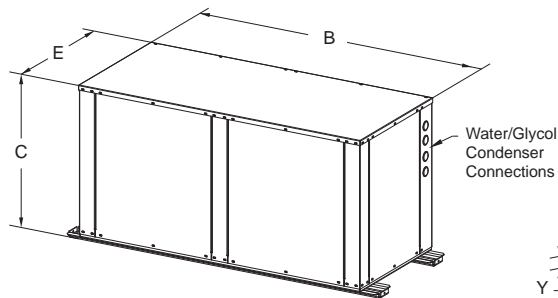
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DIMENSIONS(inches)																	
XCU & XCX-(-)OA Model No.	B	C	E	P	Q	R	S	T	U	V	W	X	Y	AA	AB	AE	AF
018, 024 & 036	44	22	34	16	16	2-3/4	6-7/8	2	16	16	2-3/8	1	1	5	24	47-1/2	50
048, 060, 072 & 096	54	27	42	20	18	3	9-5/8	2	17-3/8	19	4-3/8	1-5/16	1	5	32	57-1/2	60
120, 144 & 180	74	29	58	24	30	2-3/4	14-1/8	2	18-1/4	23	4-1/8	2-7/8	1	5	48	77-1/2	80

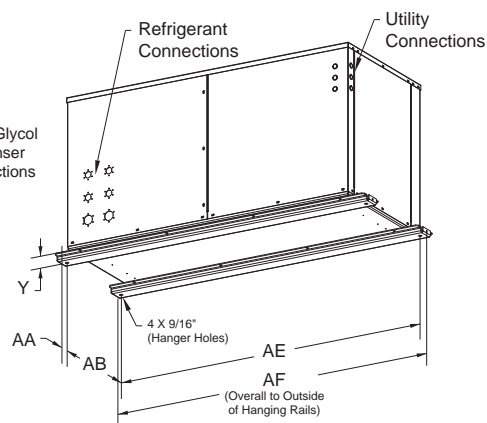
DX - Water/Glycol Cooled Indoor Horizontal, Remote Condensing Units

Models: XWU & XGU-018 thru 300-_-OA

3-Side Access:
18"-24" on Front, Right & Left Sides!



FRONT / RIGHT / TOP



REAR / LEFT / BOTTOM

DIMENSIONS(inches)									
Cabinet Size	XWU & XGU-(-) Model No.	B	C	E	Y	AA	AB	AE	AF
"A"	018 thru 072 (Single Compressors)	44	22	20	1	3	14	47-1/2	50
"B"	072 thru 144 (Dual Compressors)	54	27	24	1	3	18	57-1/2	60
"C"	180 thru 300 (Dual Compressors)	74	29	24	1	3	18	77-1/2	80

1.0 General

☑ 1.1 Summary



These specifications describe the requirements for a horizontal ceiling mounted air conditioner designed for 0 to 100% Outside-Air application. The system shall be designed to control space temperature and humidity.

The air conditioning manufacturer shall design and furnish all equipment in the quantities and configurations shown on the project plans and specifications.

The system shall be provided by AboveAir Technologies in Frederick, Maryland, USA. The system shall be listed by Intertek (ETL Semko), Inc. to conform with UL Std 1995 and be certified to CAN/CSA Std C22.2 No. 236 (Control No. 3091370). The system shall be NYC MEA230-06-E and Chicago Code Approved. The system model number shall be _____.

☑ 1.2 Design Requirements

The system shall be an AboveAir HK-OA™ Horizontal brand factory assembled and tested. Evaporator sections shall be designed for above the drop-ceiling installation. Remote condensing unit sections shall be designed for either outdoor or indoor above the drop-ceiling installation.

Evaporators and indoor remote condensing unit sections shall be designed for ducted same-face air distribution.

The system shall have a total cooling capacity of _____ BTU/H, and a sensible cooling capacity of _____ BTU/H, based on an entering air condition of _____ °F DB, and _____ °F WB, _____ % RH.

The evaporator section shall be designed for _____ Volt, _____ Phase, _____ Hertz main power supply. The remote condensing unit section (if applicable) shall be designed for _____ Volt, _____ Phase, _____ Hertz main power supply.

☑ 1.3 Submittals

Submittals shall be provided after manufacturer's receipt of a written purchase order and shall include: Detailed Performance and Electrical Data; Guide Specifications; and Dimensional Drawings.

☑ 1.4 Quality Assurance

The system shall be factory tested prior to shipment. Testing shall include, but shall not be limited to: system and component operational and functional testing; electrical "HiPot" insulation test; refrigerant and water piping circuit pressuring testing per UL 1995 Safety Standard for Heating and Cooling Equipment. The system shall be designed and manufactured according to world class quality standards.

2.0 Products

☑ 2.1 Standard Features / All Systems

☑ 2.1.1 Cabinet

The cabinet chassis and access panels shall be constructed of heavy gauge galvanized steel. Cabinet access panels shall rest in recessed pockets designed for minimum air leakage. The cabinet and access panels shall be lined with 2 lb/ft² high density sound and thermal insulation conforming to NFPA 90A and 90B.

☑ 2.1.2 Component Access

The unit shall be serviceable within the ceiling through large side access panels.

☑ 2.1.3 Electrical System

General:

The electrical system shall conform to National Electric Code (NEC) requirements according to UL 1995. The control circuit shall be a 24 VAC low voltage circuit.

The electrical system shall include, but not be limited to the following factory installed items: 24 VAC control transformer; terminal connections; grounding lug; overload protection; and starter/contactors for blower motor, compressor, humidifier and electric heater stage (if applicable).

Packaged Systems: (single point power) Self-Contained systems shall be designed for single point main power connection.

Split DX Systems: (separate power)

Split systems shall require separate main power supplies to the evaporator and condensing unit sections. The evaporator and condensing unit sections shall be electrically interlocked by a field wired 24 volt control signal.

Overflow Safety Float:

The system shall be provided with a factory installed float type condensate pan overflow safety switch. The circuit shall be designed to shut down all system water producing operations in the event of an overflow condition.

☑ 2.1.4 Air Distribution

The system air distribution shall be configured for a draw-through air pattern to provide even air distribution and maximum coil performance.

☑ 2.1.4.1 Evaporator Blower/Motor

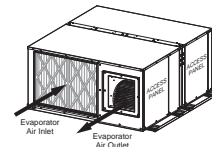


The evaporator blower assembly shall be designed for _____ CFM @ _____ inches external static pressure (e.s.p.)

The blower shall be the belt-driven centrifugal type, double width double inlet (DWDI), and statically and dynamically balanced to a minimum vibration level. The shaft shall be heavy duty steel with self-aligning ball bearings sized for an average 100,000 hours of service life.

The blower motor shall be _____ Hp at 1725 RPM (or 3450 RPM) and mounted on an adjustable base. Belts shall be sized for 200% of the motor horsepower rating. Motors shall have overload protection and a minimum NEMA service factor of 1.15.

☑ 2.1.4.2 Air Patterns (Same-Face)



Evaporators and indoor air cooled remote condensing unit sections shall be designed for ducted same-face air distribution. Air inlet and outlet connections shall include factory provided turned-out duct flanges for each of field duct connection.

2.1.4.3 Air Filtration

The filter(s) shall be 2 inch thick pleated and rated for 30% dust spot efficiency (based on ASHRAE 52.1). The filter(s) shall be serviceable through a side access panel without shutting down the system.

2.2 Direct Expansion Systems

2.2.1 DX - Evaporator Coils



The DX evaporator coil shall be constructed of copper tubes and aluminum fins. The system shall be designed for a draw-through air pattern for maximum heat transfer. Coil end-plates shall be hot dipped galvanized. The evaporator coil shall be mounted in an insulated stainless steel condensate drain pan.

2.2.2 Compressors



Each compressor shall be the high efficiency, low sound power scroll type. Each compressor shall be mounted on vibration isolators. Each compressor shall be complete with reversible positive oil pump, charging and service ports, internal spring isolation, and discharge gas vibration eliminator.

2.2.3 DX - Refrigeration Circuits



Each refrigeration circuit shall be pre-piped with refrigerant copper tubing. The refrigeration system shall include, but not be limited to: expansion valve with external equalizer; sight glass; refrigerant filter-drier; shraeder service valves and high & low refrigerant pressure safety switches.

2.2.4 Hot Gas Bypass

2.2.4.1 Hot Gas Bypass To Evap Coil Inlet
(Compressor located in Evap)



Each refrigerant circuit shall include a factory installed Hot gas bypass system to provide evaporator coil freeze-protection and capacity modulation control under low load conditions.

2.2.4.2 Hot Gas Bypass To Suction Line with Quench Valve
(Compressor Located in Remote Condensing Unit - 3rd Line Not Required!)



Each refrigerant circuit of the Split DX system shall be provided with a factory installed hot gas bypass system to include: hot gas (discharge) bypass; desuperheating quench; and hot gas & quench solenoid valves. The hot gas bypass system shall be designed to supply hot gas and liquid refrigerant to the suction line as required to provide coil freeze-protection and capacity modulation under low load conditions. All hot gas bypass components shall be factory installed and shall not require additional field refrigerant lines on split DX systems.

2.2.5 Suction-Line Accumulators



Each refrigerant circuit shall be provided with a factory installed Suction-Line Accumulator to prevent liquid slugging of the compressor and excessive refrigerant dilution of the compressor oil during low load conditions. The accumulator shall return refrigerant and oil to the compressor at a sufficient rate to

maintain both system operating efficiency and proper oil level. The accumulators shall be wrapped with a 1/2" closed-cell neoprene insulation to prevent sweating.

2.2.6 Modulating Flooded Head Pressure Control

Each refrigerant circuit shall be provided with a flooded headed pressure control system including a factory installed liquid refrigerant receiver, 3-way modulating head pressure control valve, compressor crankcase heater and cold-start time delay.

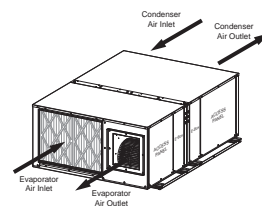
2.2.7 Modulating Variable Spd Fan Head Press. Control
(Propeller Fan Condensers)

Modulating Variable fan speed head pressure controls shall be factory installed within the propeller fan condenser. Each refrigerant circuit shall be included factory installed liquid refrigerant receiver, compressor cold start time delay relay and crankcase heater

2.3 Standard Features / Individual Systems

2.3.1 DX - Air Cooled Systems

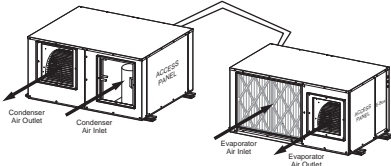
2.3.1.1 DX - Air Cooled (Self-Contained Systems) AAC-()-OA



The system shall be a self-contained, ceiling mounted air conditioner with factory mounted integral dx air cooled condensing unit with belt-driven centrifugal blower. The condensing unit shall be sized for full heat of rejection at 95°F ambient and be capable of operation to ___ °F low ambient air temperature

The system shall require only single point main power supply and ship from the factory with a full operating refrigerant charge (1-8 Ton units). AAC/P-012/096 models shall ship from the factory as one-piece units, while AAC/P-120/180 models shall ship split from the factory and require field packaged unit assembly and refrigerant charging.

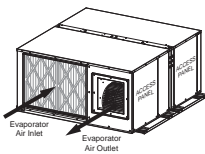
□ 2.3.1.2 DX - Air Cooled Split
(DX Evaporator & Indoor Remote Condenser)
AEC-()-OA & XCX-()-OA



The system shall be a split configuration with indoor ceiling mounted dx evaporator and remote indoor air cooled belt-driven centrifugal blower condenser. The compressor(s) shall be located in the evaporator section. The condense shall be sized for full heat of rejection at 95°F ambient and be capable of operation to ___ °F low ambient air temperature.

The system shall factory tested prior to shipment. The split evaporator and condenser sections shall ship separately from the factory with a dry-nitrogen holding charge for field sweat (copper) connection and refrigerant charging.

□ 2.3.1.3 DX - Air Cooled
Models: AEC-()-OA



The system shall be a split dx, horizontal ceiling mounted evaporator section for connection to a remote air cooled condenser. The compressor(s) shall be located in the evaporator section. The evaporator shall included, but not be limited to: evaporator coil; centrifugal belt-driven blower and blower motor; thermal expansion valve with rapid bleed port, shraeder service valves; compressor(s), refrigerant filter-drier and sight-glass; main power distribution block; grounding lug; 24 Vac control transformer; individual blower motor contactors; and terminal strip.

The system shall require only single point main power supply and ship from the factory with a dry-nitrogen holding charge for field sweat (copper) connection and refrigerant charging.

□ 2.3.1.4 DX - Air Cooled Remote Condensing Unit
(Outdoor Propeller Fan)
XP_-()

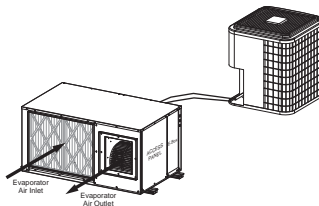


The system shall be an outdoor mounted remote air cooled direct-driven propeller fan(s) condenser. The remote condensing unit shall include, but not be limited to: condenser coil; direct drive propeller fan(s) and fan motor(s); close-meshed steel wire with vinyl coating fan guards; shraeder service valves; main power distribution block; grounding lug; dry-contact interlock for evaporator 24 Vac control signal; fan motor starters/contactors; and terminal strip.

The condenser shall be sized for full heat of rejection at 95°F ambient and be capable of operation to ___ °F low ambient air temperature.

The condenser shall ship from the factory with a dry-nitrogen holding charge for field sweat (copper) connection.

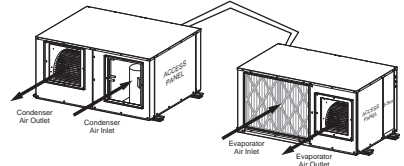
□ 2.3.1.5 DX - Air Cooled Split
(Air Handling & Outdoor Remote Condensing Units)
AHC-()-OA & XPU-()-OA



The system shall be a split configuration with indoor ceiling mounted dx air handling unit and a remote outdoor air cooled propeller fan condensing unit for each refrigerant circuit. Each compressor shall be located in the condensing unit. The condensing unit shall be sized for full heat of rejection at 95°F ambient and be capable of operation to ___ °F low ambient air temperature.

The system shall factory tested prior to shipment. The air handling and condensing unit sections shall ship separately from the factory with a dry-nitrogen holding charge for field sweat (copper) connection and refrigerant charging.

□ 2.3.1.6 DX - Air Cooled Split
(Air Handler & Indoor Remote Condensing Unit)
AHC-()-OA & XCU-()-OA

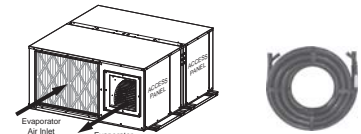


The system shall be a split configuration with indoor ceiling mounted dx air handling unit and remote indoor (optional outdoor) air cooled belt-driven centrifugal blower condensing unit. The compressor(s) shall be located in the condensing unit. The condensing unit shall be sized for full heat of rejection at 95°F ambient and be capable of operation to ___ °F low ambient air temperature.

The system shall factory tested prior to shipment. The air handling and condensing unit sections shall ship separately from the factory with a dry-nitrogen holding charge for field sweat (copper) connection and refrigerant charging.

□ 2.3.2 DX - Water Cooled

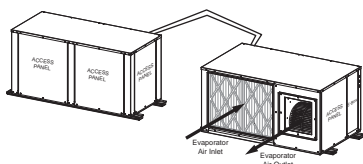
□ 2.3.2.1 DX - Water Cooled
(Self-Contained Systems)
AWC-()-OA



The system shall be a self-contained, horizontal ceiling mounted air conditioner with integral dx water / glycol cooled condensing unit. The system shall include a water cooled tube-in-tube coaxial condenser and factory installed flooded head pressure including liquid refrigerant receiver and modulating head pressure control valve. The water cooled condenser shall be designed to provide the total required system heat of rejection at ___°F entering condenser source temperature and ___°F leaving condenser source temperature.

The system shall require only single point main power supply and ship from the factory with a full operating refrigerant charge.

2.3.2.2 DX - Water Cooled Split
(Air Handling & Remote
Condensing Unit)
AHC(-)-OA & XWU(-)-OA



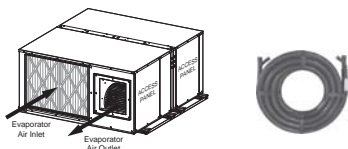
The system shall be a split configuration with indoor ceiling mounted dx air handling unit and remote indoor (optional outdoor) water cooled condensing unit. The compressor(s) shall be located in the condensing unit.

Each refrigerant circuit shall include a water cooled coaxial (or SS brazed-plate) condenser and factory installed flooded head pressure including liquid refrigerant receiver and modulating head pressure control valve. The water cooled condenser shall be designed to provide the total required system heat of rejection at ___°F entering condenser source temperature and ___°F leaving condenser source temperature. Source water shall be provided by a remote water source (by others).

The system shall factory tested prior to shipment. The air handling and condensing unit sections shall ship separately from the factory with a dry-nitrogen holding charge for field sweat (copper) connection and refrigerant charging.

2.3.3 DX - Glycol Cooled

2.3.3.1 DX - Glycol Cooled
(Self-Contained Systems)
AGC(-)-OA

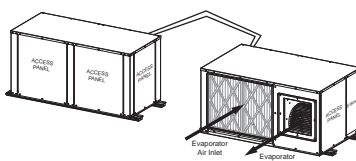


The system shall be a self-contained, horizontal ceiling mounted air conditioner with integral dx glycol cooled condensing unit. The system shall include a glycol cooled tube-in-tube coaxial condenser and factory installed flooded head pressure including liquid refrigerant receiver and modulating head pressure control valve. The condenser shall be designed to provide the total required system heat of rejection at 110°F entering glycol temperature and 120°F leaving glycol temperature based on 40% ethylene glycol solution. Source glycol shall be provided by a remote

glycol drycooler source (see AboveAir Technologies' FluidCool™ drycoolers).

The system shall require only single point main power supply and ship from the factory with a full operating refrigerant charge.

2.3.3.2 DX - Glycol Cooled Split
(Air Handling & Remote
Condensing Unit)
AHC(-)-OA & XGU(-)-OA



The system shall be a split configuration with indoor ceiling mounted dx air handling unit and remote indoor (optional outdoor) glycol cooled condensing unit. The compressor(s) shall be located in the condensing unit.

Each refrigerant circuit shall include a glycol cooled coaxial (or SS brazed-plate) condenser and factory installed flooded head pressure including liquid refrigerant receiver and modulating head pressure control valve. The condenser shall be designed to provide the total required system heat of rejection at 110°F entering glycol temperature and 120°F leaving glycol temperature based on 40% ethylene glycol solution. Source glycol shall be provided by a remote glycol drycooler source (see AboveAir Technologies' FluidCool™ drycoolers).

The system shall factory tested prior to shipment. The air handling and condensing unit sections shall ship separately from the factory with a dry-nitrogen holding charge for field sweat (copper) connection and refrigerant charging.

2.3.3.3 Glycol Pump Packages & Drycoolers
FC_(-) / PA(-)



Glycol condenser source shall be provided by a FluidCool™ brand remote air cooled glycol drycooler and Pump-All™ brand pump package.

The glycol drycooler shall be the outdoor mounted propeller fan type complete with factory installed aquastat fan cycling controls, motor starters with overload

protection and non-fused disconnect switch.

The glycol pump package shall be a (single or dual) pump package designed for outdoor installation complete with individual pump motor starters. Dual glycol pump packages shall be provided with manual lead-lag switch and field installed flow switch for automatic switchover to backup pump upon loss of flow.

An expansion tank and automatic air purger-vent shall be factory provided for field installation.

The drycooler shall provide _____ BTUH total heat rejection at a flow rate of _____ GPM with _____ °F EGT and _____ °F LGT at _____ °F ambient air temperature. Each pump shall be _____ Hp and shall be sized to provide _____ GPM @ _____ Ft. w.g. total system head. The glycol solution shall be _____ % (ethylene or propylene) by volume.

The drycooler and pump package shall be designed for _____ Volt, _____ Phase, _____ Hertz main power supply.

2.4 Options

2.4.2 CONTROL OPTIONS

2.4.2.1 MC-3000™, Advanced Microprocessor Dew Pt Controller w/ Alarms



The system shall be provided with a MC-3000™ advanced microprocessor based controller with 100% outside air dew point temperature control algorithm logic. The controller shall also include free-economizer cooling and proportional analog (0-10Vdc) reheat/heat control.

Select Features/Benefits:

- 4x20 Character Liquid Crystal Alpha-numerical Display
- User Configurable
- Run-Time Hours
- Current Unit Mode Status
- Alarm Status
- Digital & Analog Inputs / Outputs
- Temperature Anticipation
- Remote Stop / Start Contact
- Summary Alarm Contact
- Automatic or Manual (selectable) Restart After Power Loss

- Sequential Load After Restart
- Recovery Delay
- Compressor Short Cycle Timers
- Cold Start Time Delay
- Security Password Access
- Self-Diagnostics
- Service Mode

Unit Status Display

The control system shall display current unit functions and room status (if applicable):

- Current Dry Bulb Temp Set Point
- Current Relative Humidity Set Point
- System ON/OFF
- Cooling
- Heating
- Humidifying
- Dehumidifying
- Reheating
- Actual Room DB Temperature
- Actual Room Relative Humidity

Alarm Conditions:

Alarm conditions activate an audible and visual indicator plus close a summary alarm dry contact connection. The control system shall alert to the following alarm conditions (if applicable):

- High Temperature
- Low Temperature
- High Humidity
- Low Humidity
- Sensor Failure
- Summary Failure
- Loss of Air Flow
- Dirty Filter
- High Head Press
- Smoke Detection
- Firestat
- Leak Detection
- Sensor Failure
- Loss of Power

□ 2.4.2.1.1 BMS Communications

- ModBus RS485 Serial Connection
- BACnet over MS/TP (RS485 Serial)
- BACnet Over IP (Ethernet / EIA485)
- LonWorks FTT10 (RS485 Serial)

2.4.3 HEAT/REHEAT OPTIONS

□ 2.4.3.1 Hot Gas Reheat (Modulating)

The system shall be provided with a hot gas reheat coil with modulating control valve. The hot gas reheat coil shall be sized to provide free-energy space neutral leaving air temperature by offsetting the sensible cooling during dx compressor operation.

(Note: Hot Gas Reheat is not available on systems with compressor located in remote condensing unit section.)

□ 2.4.3.2 Electric Reheat/Heat

□ 2.4.3.2.1 Electric Heat and/or Reheat (factory installed)



An electric heating system shall be factory installed within the A/C unit. Heater elements shall be the low-watt density finned-tubular type. The heater shall be complete with individual heater stage starter/contactor and overheat safeties. Systems incorporating factory installed electric heaters shall require only single point power to the main unit power distribution. The electric heat shall have a capacity of _____ BTU/H and a KW rating of ___ KW, controlled in ___ stgs.

□ 2.4.3.2.2 Electric Duct Heater

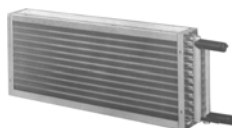


An electric duct mounted heater shall be factory provided for field installation. The duct heater shall be the open wire nichrome element type complete with individual heater stage starter/contactor, air flow switch and overheat safeties. The duct heater shall require a separate main power supply from the unit. The electric heat shall have a capacity of _____ BTU/HR and a KW rating of ___ KW, controlled in ___ stages.

□ 2.4.3.2.3 SCR Fired Electric Heater

The electric heat shall be controlled through a "zero firing" silicon control rectifier (SCR) with an extruded aluminum heat sink and solid state logic system to provide close dry bulb temperature control of the leaving conditioned air temperature. The electric heat shall have a capacity of _____ BTU/HR and a KW rating of ___ KW.

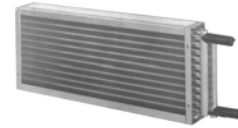
□ 2.4.3.2.4 Hot Water Heat / Reheat



A Hot Water Heating system shall be factory provided. The hot water heating system shall be complete a factory installed aluminum fin, copper tube hot

water coil and field installed 2-way motorized hot water control valve. Hot water shall be provided by a remote source at the specified flow rate and temperature. The hot water heating system shall have a rated capacity of _____ BTUH @ _____ GPM, _____ °F EWT.

□ 2.4.3.2.5 Steam Heat / Reheat



A Steam Heating system shall be factory provided. The steam heating system shall be complete a factory installed aluminum fin, copper tube steam coil and field installed 2-way motorized steam rated control valve. Steam piping specialties shall be field provided. Steam shall be provided by a remote source at the specified temperature and pressure. The steam heating system shall have a rated capacity of _____ BTUH @ _____ psig saturated steam.

□ 2.4.3.4 Heat Pump Option

The system shall include a factory installed heat pump heating cycle including reversing valve, automatic defrost cycle (if applicable) and remote wall mounted temperature controller with auxiliary heating control capability. The heat pump mode heating capacity shall be _____ BTUH.

2.5 Accessories

□ 2.5.1 CO2 Sensor (Wall or Duct Mtd)



A non-dispersive infrared carbon dioxide (CO2) sensor shall be factory provided for unit or field (duct or wall) installation. The CO2 sensor shall measure environmental carbon dioxide levels for use in demand-controlled ventilation, air-quality monitoring, and other HVAC applications in accordance with ASHRAE standards. Fully isolated analog outputs and a convenient center wiring terminal shall make installation both simple and trouble-free. The analog output shall be jumper-selectable, 4-20 mA or 0-10 VDC, over the industry standard 0-2000 ppm

CO2 range. LCD display and control relay with adjustable setpoint shall be provided.

FEATURES:

- 24 VAC/VDC power
- 0-10 VDC or 4-20 mA analog output, jumper selectable
- 0-2000 ppm CO2 range
- Wall and Duct Mtd Sampling versions
- Isolation of output and power
- Compact, attractive enclosure
- Control relay with adjustable setpoint
- Simple single-point calibration

□ 2.5.2 Condensate Pump



A condensate pump shall be factory provided for field installation. The condensate pump shall be provided with dual internal float switches: one for pump operation initiation and the other for pump reservoir overflow safety. The condensate pump shall be powered through A/C unit main power via Optional "Condensate Pump Fused Powered Terminal Connection".

□ 2.5.3 Main Power, Non-Fused Disconnect



A main power non-fused disconnect shall be factory provided for field installation. The disconnect shall be NEMA rated for indoor or outdoor installation as required.

□ 2.5.4 Firestat



A Firestat shall be factory provided for field installation in the return air duct and wired to the A/C unit electrical control panel. The Firestat shall shut-down all A/C system operations upon sensing a high return air temperature condition.

□ 2.5.5 Smoke Detector



A Smoke Detector shall be factory provided for field installation in the return air duct and wired to the A/C unit electrical control panel. The Smoke Detector shall shut-down all A/C system operations upon activation.

□ 2.5.6 Remote Water-Leak Detector

A remote water-leak detector shall be factory provided for field installation. The remote water-leak detector shall be wired to shut down all A/C unit water producing functions upon sensing a water leak.

□ 2.5.7 Hanging Spring Vibration Isolators

Each horizontal ceiling mounted section shall be provided with spring vibration hanging isolators sized for the total distributive weight of the unit.

□ 2.5.8 Compressor Acoustic / Sound Jackets

Each compressor shall be provided with a factory installed compressor sound jacket with snap closure system for ease of removal and reinstallation. Sound jackets shall have a noise reduction coefficient (NRC) of 85 per ASTM and C-423 and a sound transmission lost (STC) of 11 per ASTM E-90.



Ceiling Air Conditioners

SpotCool™ - 2x4 T-Bar "Spot-Cooler" Comfort & Precision Ceiling Mounted A/C's

HK™ Horizontal - Hi-Static Ducted "Same-Face" Comfort & Precision Ceiling Mounted A/C's

HK-OA™ - Horizontal Up to 100% DOAS High-Percentage Outside Air Ceiling Mounted A/C's

Floor Air Conditioners

VK™ Vertical - SCAV, Vertical Floor Mounted Self-Contained & Split Comfort Constant Air Volume and Variable Air Volume (VAV) A/C's & Heat Pumps

VK-OA™ - Vertical Up to 100% DOAS High-Percentage Outside Air Vertical Floor Mounted A/C's

MissionCritical™ - Precision Vertical Floor Mounted Computer Room A/C's

VK™ Console - Vertical Floor Console Mounted Self-Contained & Split A/C's & Heat Pumps

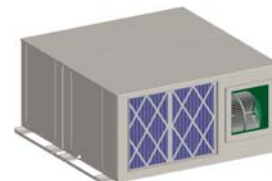
Remote Heat Rejection

FluidCool™ - Indoor & Outdoor Remote Glycol Drycoolers

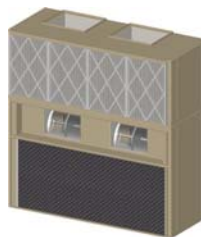
PumpAll™ - Single, Dual & Triplex Standard & Variable (VFD) Speed Glycol Pump Packages



**2x4 "Spot-Cooler"
Ceiling Mounted A/C's**
(1 to 3 Tons)



**Ducted "Same-Face"
Ceiling Mounted A/C's**
(1 to 30 Tons)



**Comfort - Packaged & Split
Vertical Floor Mounted
Air Conditioners**
(1 to 30 Tons)



**Precision - Vertical Floor
Mounted Computer Room
Air Conditioners**
(1 to 30 Tons)

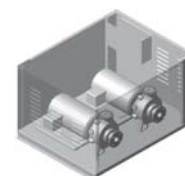


**VK-Console™ - Up-Flow & Down-Flow
Floor Console Mounted Air Conditioners**
(1 to 5 Tons)



**Remote Air Cooled
Condensers, Condensing Units
& Glycol Drycoolers**
(1 to 180 Tons of THR)

**Single, Dual & Triplex
Glycol Pump Packages**
(1/2 to 50 HP)



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