

# VXC

## Evaporative Condensers



*Evaporative Condensers*

### Product Detail

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# VXC Evaporative Condensers

## Capacity

Single Model Capacity:

VXC : 60 kW - 6930 kW

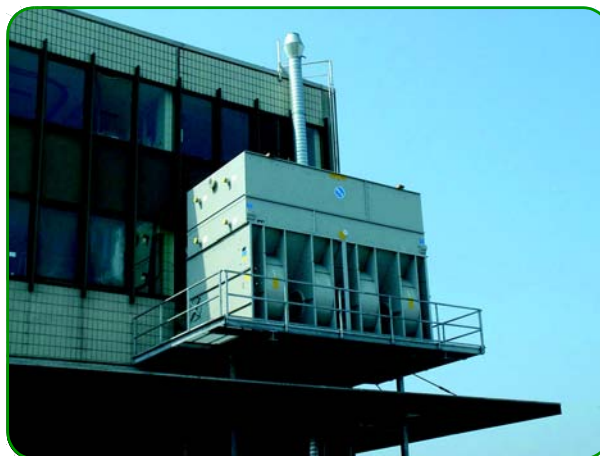
VXC-C : 950 kW - 1840 kW

## General Description

VXC Evaporative Condensers deliver fully rated thermal performance over a wide range of heat rejection and temperature requirements for various refrigerants. VXC and VXC-C models can be installed indoors and minimize sound levels. VXC-C models are designed to fit in standard dry van containers to minimize ocean freight costs. The Series VX occupies minimum floor space, provides year-round operating reliability and is ideal for sound sensitive applications.

## Key Features

- Suitable for indoor and outdoor installations
- Low sound
- Low ocean freight costs (VXC-C)
- Single side air inlet
- Low energy consumption
- Low installed cost
- Easy maintenance
- Reliable year-round operation
- Long service life
- Wide capacity range
- PED 97/23/EC coil design





Evaporative Condensers

*... because temperature matters*





# Benefits

## Wide Capacity Range

- **Evaporative condenser capacity** - The evaporative condensers are available in a broad range of unit capacities, with small capacity increments to permit close matching of unit size to design load. The VX line offers the widest selection of evaporative condensers in the industry to meet virtually every installation and application need.

## Installation and Application Flexibility

- **Indoor Installations** – Centrifugal fans can overcome the static pressure imposed by external ductwork, allowing these units to be installed indoors.

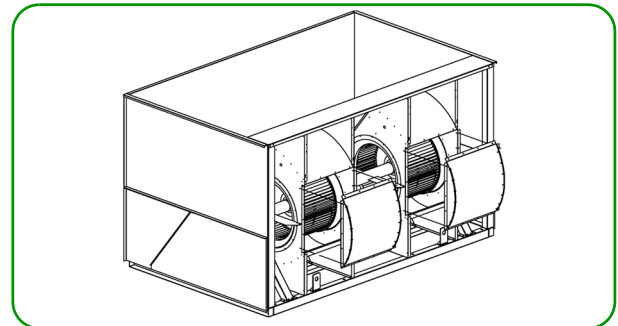
## Low Sound

- **Centrifugal Fan** - Centrifugal fans have inherently low sound characteristics.
- **Single Side Air Inlet** - Particularly sound-sensitive areas can be accommodated by facing the quiet side (back panel) to the sound-sensitive direction.

## Low Ocean Freight Cost

- **Size** - VXC-C models are designed to fit in standard closed box containers to minimize ocean freight costs. All containerized condenser models VXC-C are shipped in a bottom fan section and a top coil section, which fit together into a 40' box container, no crating required.

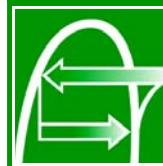
In order to fit the bottom fan section through the doors of the container, the fan enclosures are shipped loose inside the water basin area and are easily mounted on site.



VXC-C Model in Dry Van Container



Fan Enclosures are shipped loose



## Low Energy Consumption

- **Evaporative Cooling Equipment** minimizes the energy consumption of the entire system because it provides lower operating temperatures. The owner saves money while conserving natural resources and reducing environmental impact.
- **Evaporative Condensers** provide lower condensing temperatures and can offer significant kW savings over conventional air-cooled and water-cooled condensing systems.

## Low Installed Cost

- **Support** – All models mount directly on two parallel I-beams (supplied by others) and ship complete with motors and drives factory-installed and aligned.
- **Modular Design** – Large models ship in multiple sections to minimize the size and weight of the heaviest lift, allowing for the use of smaller, less costly cranes.

## Easy Maintenance

- **Internal Access** - The interior of the unit is easily accessible for adjusting the float valve, cleaning the strainer or flushing the basin.

## Reliable Year-Round Operation

- **V-Belt Drive** – The fans, motor, and drive system are located outside of the moist discharge airstream, protecting them from moisture, condensation and icing hence allowing a safe year-round operation.

## Long Service Life

- **Materials of Construction** – Various materials are available to meet the corrosion resistance, unit operating life, and budgetary requirements of any project (See section "Technical Resources, Materials of Construction" for more details)



The water level control is easily reached from the access door.

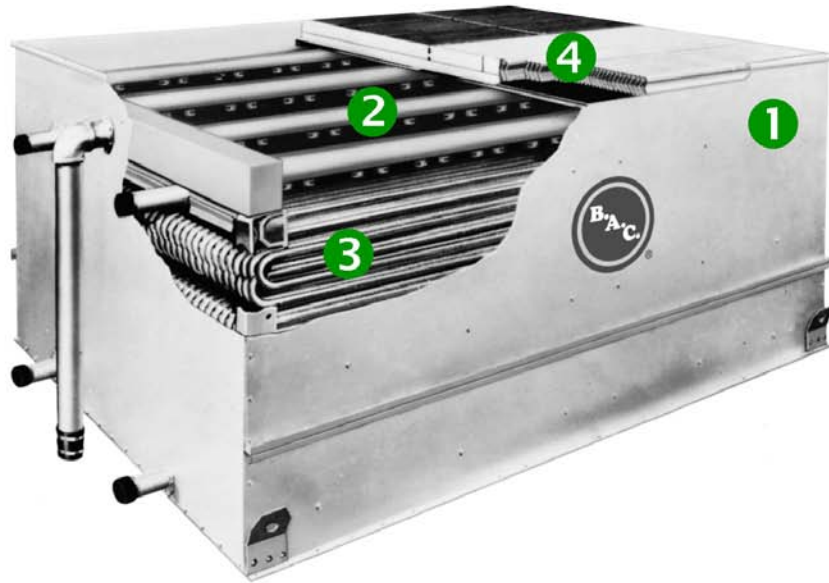


External V-belt drive system (shown here with panel removed)

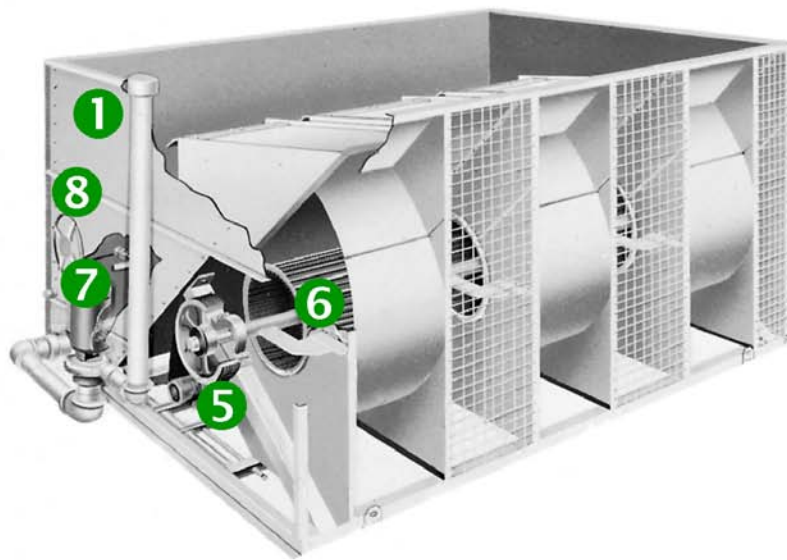
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# Construction Details

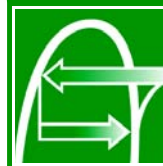


Upper Section



Lower Section





## 1. Heavy Duty Construction

- Z600 hot-dip galvanized steel panels

## 2. Water Distribution System

- Plastic spray header and branches
- Large orifice, non-clog nozzles
- Grommetted for easy maintenance

## 3. Coil

- Coil according to European Pressure Equipment Directive 97/23/EC
- Continuous serpentine, steel tubing
- Hot-dip galvanized after fabrication (HDGAF)
- Pneumatically tested at 34 bar standard coil
- Sloped tubes for free drainage of fluid

## 4. Drift Eliminators

- UV resistant non-corrosive material, impervious to rot, decay and biological attack
- Three distinct changes in air direction to reduce drift loss significantly
- Assembled in easy to handle sections, which can be removed for access to the equipment interior

## 5. Fan Drive System

- V-belt drive
- Heavy-duty bearings and fan motor

## 6. Centrifugal Fan(s)

- Quiet Operation

## 7. Recirculating Spray Pump

- Close coupled, bronze fitted centrifugal pump
- Totally enclosed fan cooled (TEFC) motor
- Bleed line with metering valve installed from pump discharge to overflow

## 8. Access Door

- Circular access door

## 9. Strainer (not shown)

- Anti-vortexing design to prevent air entrainment



# Custom Features and Options

## Construction Options

- **Standard Construction:**

Steel panels and structural elements are constructed of Z600 heavy-gauge hot-dip galvanized steel protected with the Baltiplus Corrosion Protection on the outside of the unit.

- **Optional BALTIBOND® Corrosion Protection System:**

The BALTIBOND® Corrosion Protection System, a hybrid polymer coating used to extend equipment life, is applied before assembly to all hot-dip galvanized steel components of the unit.

- **Optional Stainless Steel Construction:**

Steel panels and structural elements are constructed of stainless steel either type 304 or 316.

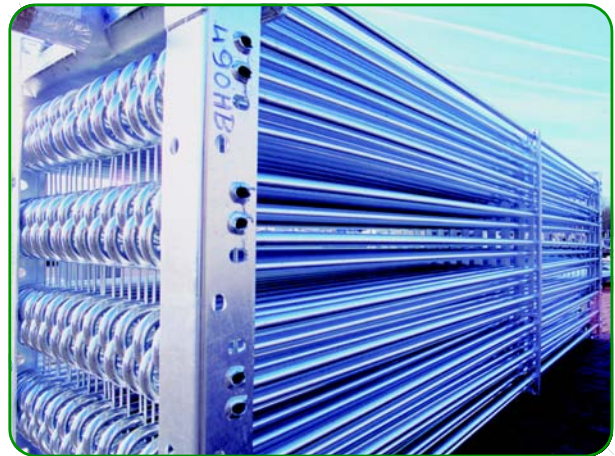
- **Optional Water-Contact Stainless Steel Cold Water Basin:**

A cost-effective alternative to an all stainless steel unit. The critical components in the cold water basin and the cold water basin itself are provided in stainless steel. The remaining components are protected with the BALTIBOND® Corrosion Protection System.

*Note: See section Technical Resources, Material Options for more details on the materials described above.*

## Coil Configurations

Each coil is manufactured according to the European Pressure Equipment Directive (PED) 97/23/EC (For more details, refer to the Evaporative Condenser "Overview" section) BAC condenser coils are standard available at a design pressure of 23 bar, and are pneumatically tested at 34 bar.



Hot Dip Galvanized Coil

- **Standard Serpentine Coil:**

The standard condensing coil is constructed of continuous lengths of all prime surface steel, hot-dip galvanized after fabrication (HDGAF).

- **Multiple Circuit Coils (Split Coils):**

In general, multiple circuit coils are required primarily on halocarbon refrigerant systems where it is common practice to maintain individual compressor systems. Also, a circuit can be isolated to provide cooling of a water or glycol loop for compressor jacket cooling. A wide range of multiple circuit arrangements are available.

- **Optional Extended Surface Coil:**

Coils are available with selected rows finned at 3 to 5 fins per inch for wet/dry applications. The coil is hot-dip galvanized after fabrication (HDGAF).

- **Optional Stainless Steel Coil:**

Coils are available in Type 304L or 316L stainless steel for specialised applications.

- **Optional High Pressure Coil:**

Coils are available with a design pressure of 28 bar and pneumatically tested at 40 bar. The Coil is hot-dip galvanized after fabrication (HDGAF).

All coils are designed for low pressure drop with sloping tubes for free drainage of fluid.







## Fan Drive System

The fan drive system provides the cooling air necessary to reject heat from the system to the atmosphere. Centrifugal fans, forwardly curved, are driven by matched V-belts with taper lock sheaves.

## The Baltiguard Drive System

The BALTIGUARD<sup>®</sup> Drive System consists of two standard single-speed fan motors and drive assemblies. One drive assembly is sized for full speed and load, and the other is sized for approximately 2/3 speed and consumes only 1/3 of the design kilowatt power. This configuration allows the system to be operated like a two-speed motor, but with the reserve capacity of a standby motor in the event of failure. As a minimum, approximately 70% capacity will be available from the low kilowatt motor, even on a design wet-bulb day. Controls and wiring are the same, as those required for a two-speed, two-winding motor. Significant energy savings are achieved when operating at low speed during periods of reduced load and/or low wet-bulb temperatures.

## Low Sound Operation

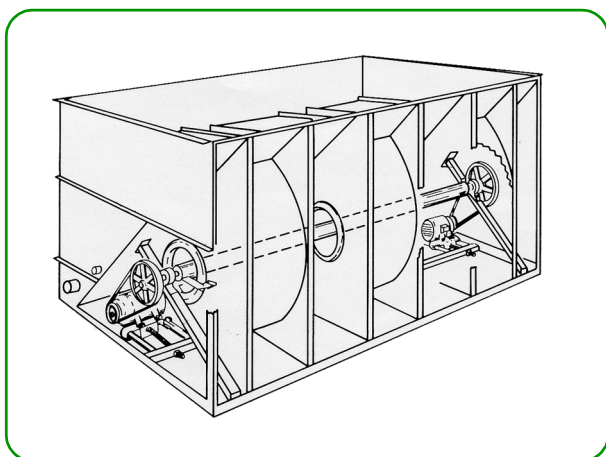
The low sound levels generated by BAC Products with centrifugal fans make them suitable for most installations. For situations when one direction is particularly sound sensitive, the unit can be oriented so that the side opposite the air inlet faces the sound-sensitive direction. Units with centrifugal fans are also available with factory designed, tested and rated sound attenuation for both the air inlet and discharge.



## Remote Sump Execution

The use of an auxiliary sump within a heated space is the most satisfactory way to protect sump water from freezing. When the circulating pump is shut off, all the water in the water distribution, in suspension and in the sump will drain freely to the auxiliary sump.

**Note:** For detailed information on the calculation of the remote sump tank, please refer to the section "Technical Resources, Selection of Remote Sump Tank".



**Baltiguard<sup>®</sup> Drive System**



**Unit with Intake and Discharge Sound Attenuation**

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# Accessories

## Ladder, Safety Cage and handrails

In the event the owner requires easy access to the top of the unit, the unit can be furnished with ladders extending from the base of the unit to the top, as well as safety cages, and handrail packages.

*Note: When these access options are employed, the unit must be equipped with steel drift eliminators.*

## Electric Water Level Control Package

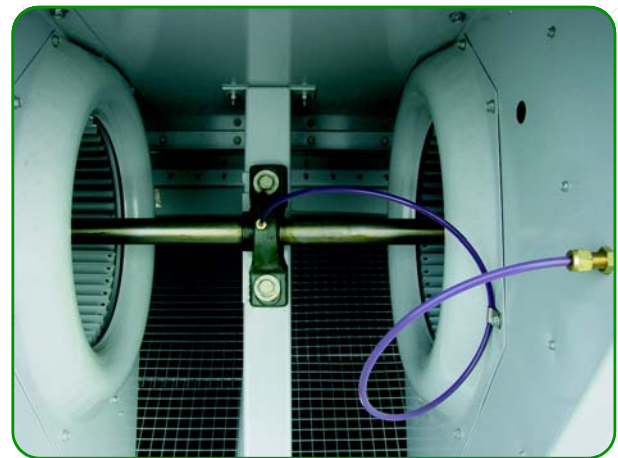
The electric water level control replaces the standard mechanical make-up valve when a more precise water level control is required. This package consists of a float switch mounted in the basin and a solenoid activated valve in the make-up water line. The valve is slow closing to minimize water hammer.

## Extended Lubrication Lines

Extended lubrication lines with grease fittings are available for lubrication of the fan shaft bearings.

## Basin Heaters

Units exposed to below freezing ambient temperatures require protection to prevent freezing of the water in the cold water basin when the unit is idle. Factory-installed heaters, which maintain the water temperature at 4°C, are a simple and inexpensive way of providing such protection. The heater package includes the heaters, a thermostat and a low level cut out switch to protect the heaters if the water level is too low. Standard electric heaters are selected for -18°C ambient temperature.



Extended Lubrication Lines

Model No. VXC	Heater -18°C (kW)
14-28	1 x 1,5
36-65	1 x 1,5
72-97	1 x 2,5
110-135	1 x 3
150-205	1 x 4
221-454	1 x 6
495-516	2 x 4
562-680	2 x 5
715-908	2 x 6
990-1032	4 x 4
1124-1360	4 x 5
1430-1608	4 x 6
S288-S350	1 x 6
S403-S504	2 x 4
S576-S700	2 x 6





Model No. VXC	Heater -18°C (kW)
S806-S1010	4 x 4
C220 - C287	1 x 6
C325 - C426	2 x 4

### Capacity Control Dampers

Modulating capacity control dampers are available to provide better leaving water temperature control than can be obtained from fan cycling alone. Fan discharge dampers consist of a single airfoil type damper blade located in the discharge of each fan housing. A standard electrical control package for dampers is available from BAC.

### Solid Bottom Panels

Factory-installed bottom panels are required when intake air is ducted to the unit.

### Discharge Hoods

Discharge hoods reduce the risk of re-circulation in tight enclosures by increasing discharge air velocity, and can be used to elevate the unit discharge above adjacent walls to comply with layout guidelines.

### Desuperheater

Desuperheaters can be used in R-717 systems with reciprocating compressors. They increase the capacity of the standard model and extend the dry operation capacity. They are also effective in reducing the occurrence of visible plumes.

### Steel Eliminators

Steel eliminators with Baltibond® Corrosion Protection System are available for specific applications.

### N2 Filling of the Coil

For prolonged shipment periods (ocean freight) or extended storage on site it is recommended to charge the coil(s) with nitrogen.

### Basin Sweeper Piping

Basin sweeper piping provides an effective method of preventing sediment from collecting in the cold water basin of the unit. A complete piping system, including nozzles, is provided in the unit basin for connection to side stream filtration equipment (Refer to section "Technical Resources, Filtration").



Basin Sweeper Piping

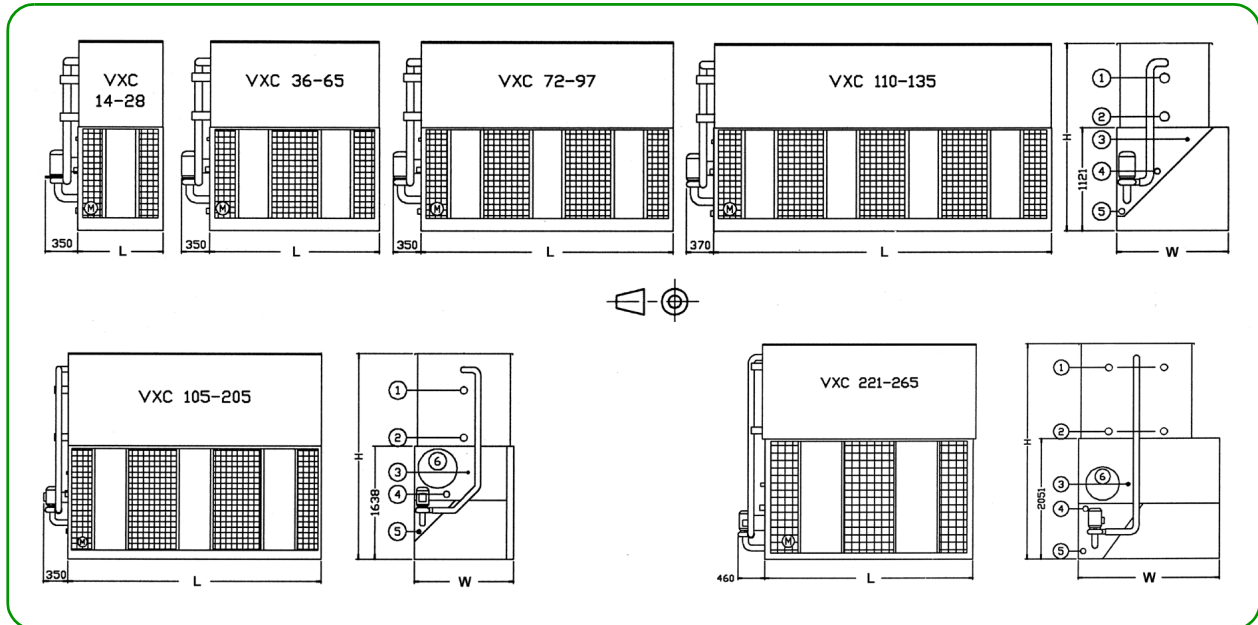
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# Engineering Data

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## VXC 14 - VXC 265



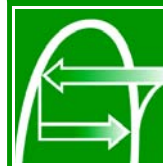
1. Refrigerant in ND 100; 2. Refrigerant out ND 100; 3. Make-up; 4. Overflow; 5. Drain; 6. Access (models 14 through 135 have the access door at the back); For VXC 14 through VXC 135 : make-up ND 25; overflow ND 50; drain ND 50.; For VXC 150 through VXC 265 : make-up ND 50; overflow ND 80; drain ND 50.

Model	Operating Weight (kg)	Shipping Weight (kg)	Heaviest Section Coil (kg)	Air Flow (m <sup>3</sup> /s)	Fan Motor (kW)	Water Flow (l/s)	Pump Motor (kW)	R717 Charge (kg)	L (mm)	W (mm)	H (mm)
VXC 14	660	600	580*	2,3	(1x) 1,5	2,2	(1x) 0,25	9	914	1207	2035
VXC 18	740	670	660*	2,2	(1x) 1,5	2,2	(1x) 0,25	11	914	1207	2245
VXC 25	830	760	480	2,5	(1x) 2,2	2,2	(1x) 0,25	15	914	1207	2467
VXC 28	900	830	540	2,4	(1x) 2,2	2,2	(1x) 0,25	19	914	1207	2683
VXC 36	1050	920	920*	4,6	(1x) 4,0	4,7	(1x) 0,37	16	1829	1207	2035
VXC 45	1170	1030	1030*	5,0	(1x) 4,0	4,7	(1x) 0,37	20	1829	1207	2245
VXC 52	1310	1160	700	4,8	(1x) 4,0	4,7	(1x) 0,37	29	1829	1207	2467
VXC 59	1330	1180	700	5,3	(1x) 5,5	4,7	(1x) 0,37	29	1829	1207	2467
VXC 65	1500	1330	860	5,5	(1x) 5,5	4,7	(1x) 0,37	36	1829	1207	2683
VXC 72	1810	1490	1000	5,8	(1x) 4,0	7,1	(1x) 0,75	41	2737	1207	2578
VXC 86	1820	1500	1000	7,5	(1x) 7,5	7,1	(1x) 0,75	41	2737	1207	2578
VXC 97	2080	1730	1200	7,1	(1x) 7,5	7,1	(1x) 0,75	50	2737	1207	2813
VXC 110	2240	1800	1200	10,4	(1x) 7,5	9,5	(1x) 0,75	59	3658	1207	2578
VXC 125	2510	2050	1440	9,9	(1x) 7,5	9,5	(1x) 0,75	66	3658	1207	2813
VXC 135	2540	2080	1440	10,9	(1x) 11,0	9,5	(1x) 0,75	73	3658	1207	2813
VXC 150	3210	2640	1720	13,3	(1x) 7,5	13,9	(1x) 1,5	77	3645	1438	3093
VXC 166	3240	2670	1720	15,8	(1x) 11,0	13,9	(1x) 1,5	77	3645	1438	3093
VXC 185	3670	2950	1980	15,7	(1x) 11,0	13,9	(1x) 1,5	104	3645	1438	3328
VXC 205	3980	3255	2240	16,9	(1x) 15,0	13,9	(1x) 1,5	111	3645	1438	3563
VXC 221	5860	4250	2630	21,9	(1x) 15,0	19,2	(1x) 2,2	109	3550	2397	3585
VXC 250	6390	4770	3150	21,2	(1x) 15,0	19,2	(1x) 2,2	145	3550	2397	3820
VXC 265	6435	4815	3150	22,7	(1x) 18,5	19,2	(1x) 2,2	145	3550	2397	3820

\* Unit normally ships in one piece.



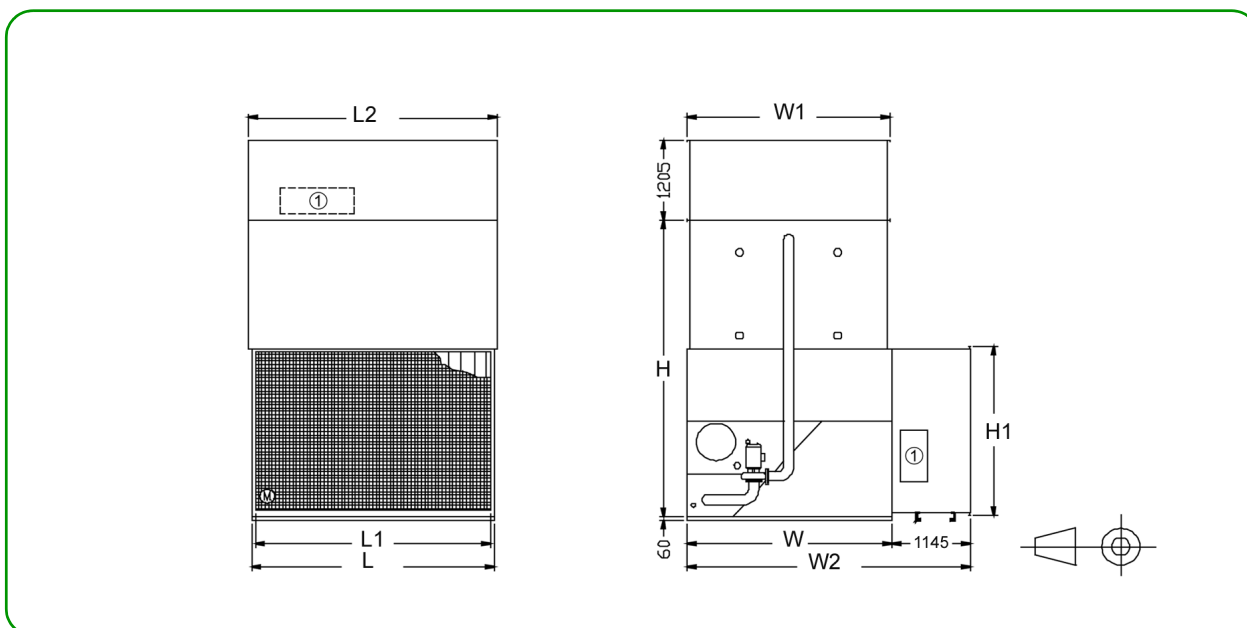




Evaporative Condensers

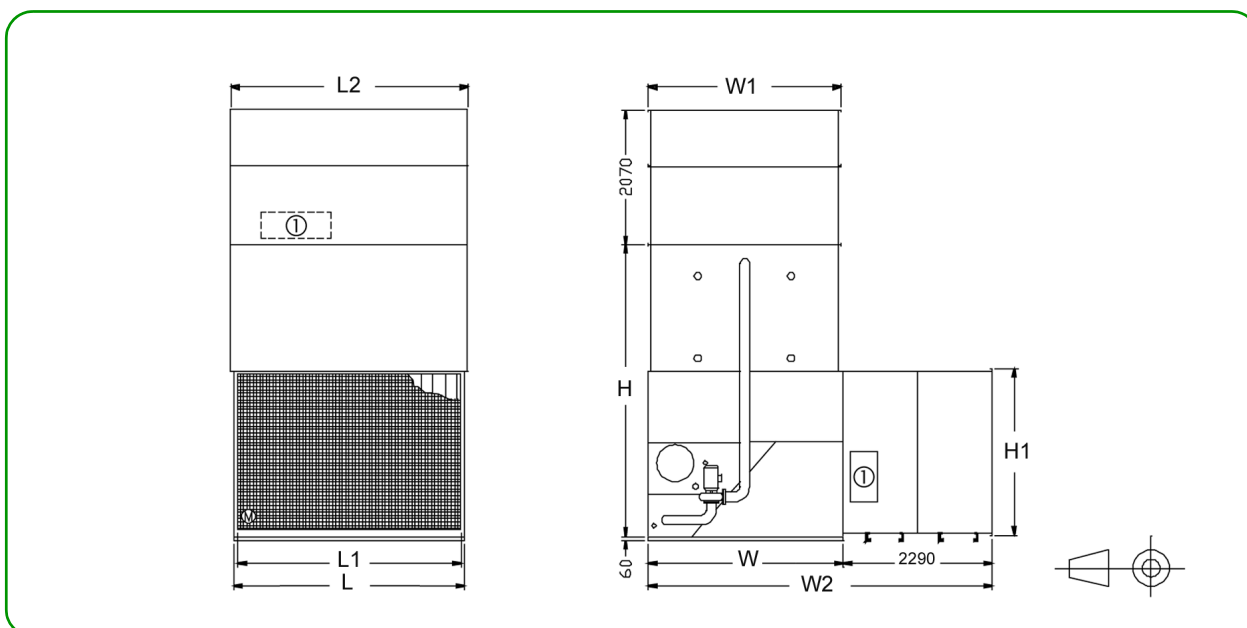
## Sound Attenuation

### XA + XB Sound Attenuation



1. Access Door; L= Unit Length; W= Unit Width; H.= Unit Height (see Engineering Data).

### XC Sound Attenuation



1. Access Door; L= Unit Length; W= Unit Width; H.= Unit Height (see Engineering Data).



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VXC	Unit + Atten. # pieces shipped	# Access doors <sup>(2)</sup> XA, XB, XC		Dimensions (mm)						Weights (kg)									
				W2		H1	W1		L1	L2	Intake + solid bottom			Discharge			Total		
				XA, XB, XC	Disch. Att.	Int. Att.	XA, XB	XC	XA, XB, XC			XA	XB	XC	XA	XB	XC	XA	XB
14 - 28	4 <sup>(1)</sup>	1	2	2352	N.A.	1090	1030	914	902	140	160	N.A.	130	150	N.A.	270	310	N.A.	
36 - 65	4 <sup>(1)</sup>	1	2	2352	N.A.	1090	1030	1829	1816	225	270	N.A.	175	220	N.A.	400	490	N.A.	
72 - 97	4	1	2	2352	N.A.	1090	1030	2737	2731	300	370	N.A.	280	350	N.A.	580	720	N.A.	
110 - 135	4	1	2	2352	N.A.	1090	1030	3658	3645	400	470	N.A.	360	420	N.A.	760	890	N.A.	
150 - 205	4	1	2	2583	3728	1600	1420	3645	3645	500	600	1200	440	520	1070	940	1120	2270	
221 - 265	4	1	2	3542	4687	2070	1955	3550	3645	690	820	1610	530	650	1330	1220	1470	2940	
S288 - S350	4	1	2	3542	4687	2070	2365	3550	3645	690	820	1610	660	800	1640	1350	1620	3250	
S403 - S504	4	2	2	3542	4687	2070	2365	5385	5480	960	1160	2270	830	1090	2240	1790	2250	4510	
S576 - S700	7	2	2	3542	4687	2070	2365	7226	7322	1380	1640	3220	1320	1600	3280	2700	3240	6500	
S806 - S1010	7	4	2	3542	4687	2070	2365	10903	10998	1920	2320	4540	1660	2180	4480	3580	4500	9020	
357 - 454	4	1	2	4145	5290	2560	2965	3550	3645	790	940	1850	710	880	1820	1500	1820	3670	
562 - 680	4	2	2	4145	5290	2560	2965	5388	5480	1080	1330	2590	900	1210	2490	1980	2540	5080	
714 - 908	7	2	2	4145	5290	2560	2965	7226	7322	1580	1880	3700	1420	1760	3640	3000	3640	7340	
1124 - 1360	7	4	2	4145	5290	2560	2965	10903	10994	2160	2660	5180	1800	2420	4980	3960	5080	10160	
495 - 516	4	1	2	4752	5897	2560	3575	3550	3645	840	990	1900	810	1030	2130	1650	2020	4030	
715 - 804	4	2	2	4752	5897	2560	3575	5388	5480	1150	1400	2660	1020	1410	2920	2170	2810	5580	
990 - 1032	7	2	2	4752	5897	2560	3575	7226	7322	1680	1980	3800	1620	2060	4260	3300	4040	8060	
1430 - 1608	7	4	2	4752	5897	2560	3575	10903	10994	2300	2800	5320	2040	2820	5840	4340	5620	11160	

<sup>(1)</sup> VXC 14, VXC 18, VXC-36 and VXC-45 + Attenuator are shipped in 3 pieces

<sup>(2)</sup> Intake Attenuator: Access opening is 775 mm high, 405 mm wide and is located at each end of the unit. Discharge Attenuator : Access opening is 405 mm high, 1170 mm wide and is located at blank off side of the unit (VXC14-28 has 650 mm width)

## Remote Sump Data

Refer to the "Technical Resources" section "Selection of Remote Sump" for Remote Sump Data.



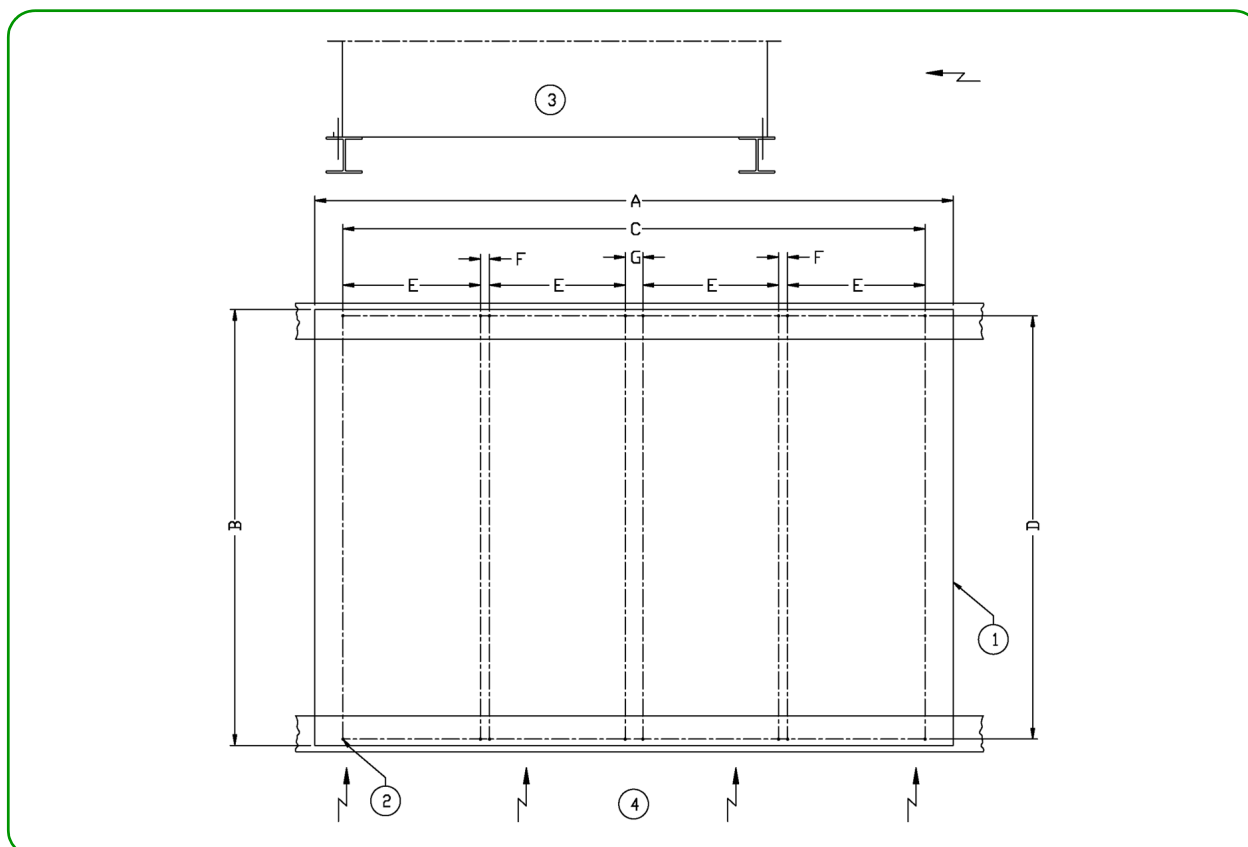
# Structural Support



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The recommended support arrangement for units consists of parallel I-beams running the full length of the unit, spaced as shown in the following drawing. Besides providing adequate support, the steel also serves to raise the unit above any solid foundation to ensure access to the bottom of the unit. To support units in an alternate steel support arrangement, consult your BAC Balticare Representative.

## Units without Sound Attenuation



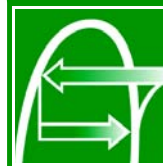
1. Outline of Unit; 2. Mounting holes  $\varnothing$  22 mm, 3. Unit; 4. Air Intake.

Model	A Unit Length (mm)	B Unit width (mm)	C Center dis. Length (mm)	D Center dis. Width (mm)	E (mm)	F (mm)	G (mm)	X Max. Deflection (mm)	Mounting holes
VXC 14-28	914	1207	750	1153	-	-	-	2	4
VXC 36-65	1829	1207	1664	1153	-	-	-	5	4
VXC 72-97	2737	1207	2572	1153	-	-	-	8	4
VXC 110-135	3658	1207	3492	1153	-	-	-	10	4
VXC 150-205	3645	1438	3492	1378	-	-	-	10	4
VXC 221-265	3550	2397	3238	2397	-	-	-	10	4
VXC S288-S350	3550	2397	3238	2327	-	-	-	10	4
VXC S403-S504	5385	2397	5074	2327	2486	102	-	13	8
VXC S576-S700	7226	2397	6914	2327	3238	438	-	13	8

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# Engineering Specifications



## General

**A. General:** Furnish and install, \_\_\_\_\_ factory assembled evaporative condenser(s) of counterflow blow-through design, with single side entry, conforming in all aspects to the specifications and schedule as shown on the plans.

**B. Capacity:** The evaporative condenser(s) shall be warranted by the manufacturer to have condensing capacity of \_\_\_\_\_ kW heat rejection, operating with \_\_\_\_\_ refrigerant and \_\_\_\_\_°C condensing temperature and \_\_\_\_\_°C entering wet-bulb temperature.

**C. Warranty:** The manufacturer's standard equipment warranty shall be for a period of one year from the date of startup or eighteen months from the date of shipment, whichever ends first.

**D. Quality Assurance:** The manufacture shall have Management System certified by an accredited registrar as complying with the requirements of ISO-9001:2000 to ensure consistent quality of products and services.

## Products

### 1.0 Evaporative Condenser Materials and Components

**General:** All steel panels and structural elements shall be constructed from heavy-gauge, Z600 hot-dip galvanized steel, with

cut edges given a protective coating of zinc-rich compound.

### 2.0 Coil Casing Assembly

The evaporative condenser shall include a coil casing section consisting of a refrigerant condensing coil, a spray water distribution system, and drift eliminators as indicated by the manufacturer.

1. The refrigerant condensing coil shall be fabricated of all prime surface steel at the manufacturer's own facility, and hot-dip galvanized after fabrication.

a. The refrigerant condensing coil shall be tested at 34 bar air pressure under water.

b. The refrigerant condensing coil shall be designed for low pressure drop with sloping tubes for free drainage of liquid refrigerant.

c. The refrigerant condensing coil shall be according to European Pressure Equipment Directive 97/23/EC.

2. Water shall be distributed evenly over the coil at a minimum flow rate of 14 kPa to ensure complete wetting of the coil at all times by large-diameter, non-clog, 360° plastic distribution nozzles spaced across the coil face area in plastic material spray branches. Nozzles shall utilize a two-stage diffusion pattern to provide overlapping, umbrella spray patterns that create multiple intersection points with adjacent nozzles.

Spray branches and nozzles shall be held in place by snap-in rubber grommets, allowing quick removal of individual nozzles or complete branches for cleaning or flushing.

3. Removable plastic material drift eliminators shall be positioned to prevent moisture from leaving the evaporative condenser and incorporate a minimum of three (3) changes in air direction.

### 3.0 Pan Assembly

The evaporative condenser shall include a pan assembly consisting of cold water basin with pump assembly and fan assemblies with single side air inlet and integral air plenum.

1. The cold water basin shall include: a drain/clean-out connection; a steel strainer; a brass make-up valve; overflow connection; and a water recirculation pump assembly.

a. Drain/clean-out connection shall be located in the cold water basin to allow removal of recirculating water.

b. Lift-out steel strainer shall be supplied with perforated openings sized smaller than the water distribution nozzle orifices and an integral anti-vortexing hood to prevent air entrainment.

c. Brass make-up valve shall be supplied with a large-diameter plastic float arranged for easy adjustment.

d. Overflow connection shall be provided in the cold water basin to protect against recirculating water spillage.

e. Water recirculation pump shall be a close-coupled, bronze-fitted centrifugal pump equipped with a mechanical seal, mounted on the basin and piped from the suction strainer to the water distribution system.

i. The pump shall be installed so that it may drain freely when the basin is drained.

ii. The pump assembly shall include an integral metering valve and bleed line to control the bleed rate from the pump discharge to the overflow connection.

iii. The pump motor shall be totally enclosed fan cooled (TEFC) type suitable for \_\_\_\_\_ V, \_\_\_\_\_ phase \_\_\_\_\_ Hz electrical service.

f. On installations requiring a remote sump, the evaporative condenser shall be modified to accommodate the use of an independent sump and pump for recirculating water (by others)

i. The recirculating water pump, steel strainer, make-up valve, and integral bleed line assemblies shall be omitted from the evaporative condenser scope of supply.

ii. The evaporative condenser shall be supplied with a cold water basin outlet sized and located as indicated on the drawings for gravity drain to the remote sump.

iii. The water distribution system shall have an operating pressure of 14 kPa at the evaporative condenser spray water inlet connection.

2. Air shall enter the evaporative condenser through the centrifugal fan assemblies and integral air plenum.

a. Fans and motors shall be located in the dry entering airstream to provide greater reliability and ease of maintenance.

b. Fan housings shall have curved inlet rings for efficient air entry and rectangular discharge cowls that extend into the pan to increase fan efficiency and prevent water from entering the fans.

c. Fan(s) shall be heavy-duty, centrifugal flow type mounted on a steel shaft with heavy-duty, self-aligning, relubricatable bearings with cast iron housings, designed for a minimum L10 life of 40 000 hours.

d. Fan motor(s) shall be totally enclosed fan cooled (TEFC) type, suitable for \_\_\_\_\_ V, \_\_\_\_\_ phase, \_\_\_\_\_ Hz electrical service and shall be mounted on an easily adjusted, heavy-duty motor base. Special moisture protection shall be furnished on the windings, shafts, and bearings.



#### 4.0 Optional Equipment Specifications

**A.** Evaporative condenser shall be provided with basin heaters to prevent freezing of the water in the cold water basin when the evaporative condenser is idle.

1. The basin heaters shall be selected to maintain +4°C basin water temperature at -18°C ambient temperature.
2. Basin heaters shall be electric immersion type controlled by a remote thermostat with the sensing bulb located in the basin water.
3. Basin heaters shall be provided with a factory-installed low water level cutout switch to prevent heater operation unless the heater elements are fully submerged.

**B.** Evaporative condenser shall be provided with a factory assembled, field-installed access ladder and handrails to provide access to the top of the evaporative condenser.

**C.** Evaporative condenser shall be supplied with the Baltiguard Drive System to improve part load efficiency and provide system redundancy in case of a motor failure.

1. The Baltiguard® Drive System shall include the main fan motor as listed in the manufacturer's published literature and a pony motor sized for approximately 1/3 of design kW and 2/3 of design fan speed to optimize energy savings during non-design load conditions.

