

VFL

Closed circuit cooling towers



Key benefits

- Low height
- Easy installation
- Quiet

VFL characteristics

Counter flow, centrifugal fan, forced draft

Capacity range

up to 580 kW

Maximum entering fluid temperature

82°C

Typical applications

- Small to medium HVAC and industrial applications
- Low height requirements
- Tight enclosures and installations requiring a single air inlet
- Indoor installations
- Sound critical installations
- High temperature industrial application
- Dry operation in winter time



Low height

- **Very low height:** fits perfectly on **roof tops** or tight enclosures.

Easy installation

- VFL towers are factory-assembled. We ship in **one piece** for **easy on-site lifting and installation**.
- VFL offers high capacity and minimum operating weight. **Save on steel supports**, both underneath the equipment and in the building itself for rooftop installations.
- Single-side air inlet lets you install **next to solid walls**.
- Units housable **indoors** thanks to centrifugal fans allowing intake or discharge ductwork.

Ideal for a quiet operation

- VFL units include **quiet internal centrifugal fans** for minimal surrounding noise.
- Single-side air inlet, and a **quieter tower rear** for more noise-sensitive areas.
- Cut operation noise still further with factory-designed and tested **sound attenuators** or silencers.

Year-round reliable operation

- Various corrosion-resistant materials, including the unique [Baltibond hybrid coating](#) for guaranteed long service life.
- **Optional Baltiguard Drive System** for energy savings and less noise during low load (night). A perfect stand-by system in case of motor failure
- **Optional extended surface coil** with steel fins for **dry operation**.

Interested in the **VFL closed circuit cooling tower for cooling your process fluid**? Contact your local [BAC representative](#) for more information.

Downloads

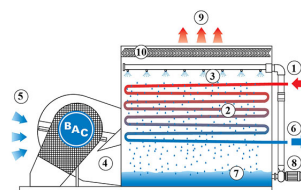
- [VFL closed circuit cooling tower](#)
- [Operating and Maintenance VFL](#)
- [Rigging and Installation VFL](#)

VFL

Closed circuit cooling towers

Principle of operation

Warm process fluid (1) enters through a **heat exchange coil (2)** and gets water sprayed on by the **spray system (3)** at the top of the cooling tower. At the same time the **centrifugal fan (4)** blows ambient **air upwards (5)** through the tower. During operation, heat is transferred from the internal circuit coil to the water, and then to the atmosphere as a portion of the water that evaporates. The cooled fluid then **exits (6)** the unit. The tower **sump (7)** or basin collects the remaining spray water. The spray water **pump (8)** recirculates the water up to the water spray system. The warm saturated **air (9)** leaves the tower through the **drift eliminators (10)**, which remove water droplets from the air.



You want to use the VFL closed circuit cooling tower to cool your process fluid? Contact your local [BAC representative](http://www.baltimoreaircoil.eu/en/products/VFL-principle-of-operation) for more information.

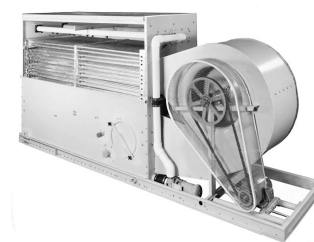
VFL

Closed circuit cooling towers

Construction details

1. Material options

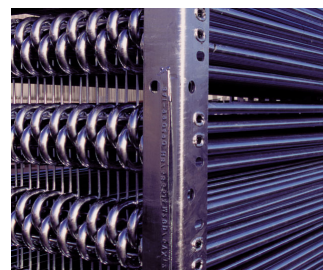
- Heavy-gauge hot-dip galvanized steel is used for external unit steel panels and structural elements featuring [Baltiplus Corrosion Protection](#). The unique [Baltibond hybrid coating](#) is an **optional extra**. A hybrid polymer coating for longer service life, applied pre-assembly to all hot-dip galvanized steel components of the unit.
- Optional [stainless steel](#) panels and structural elements of type 304 or 316 for extreme applications.
- Or the economical alternative: a **water-contact stainless steel cold water basin**. Its key components and the basin itself are stainless steel. The rest is protected with the Baltibond hybrid coating.



2. Heat transfer media

All hot dip galvanized and stainless steel coils are delivered with BAC's **Internal Coil Corrosion Protection**, to ensure an optimal internal corrosion protection and guaranteed quality.

- Our heat transfer media is a **cooling coil**. Its thermal performance is proven during comprehensive [lab thermal performance tests](#), and it offers you unrivalled system efficiency.
- The coil is constructed of continuous length of prime surface steel, hot-dip galvanized after fabrication. Designed for maximum 10 bar operating pressure according to PED.
- Try our **optional extended surface coils** with selected rows, finned at 3 to 5 fins per inch and hot-dip galvanized after fabrication, for dry operation during winter time.
- **Optional stainless steel coils** are in type 304L or 316L.



3. Air movement system

- With motor-driven centrifugal fan and a **V-belt drive**. You can easily remove the entire motor base for proper belt tensioning to ensure constantly correct belt alignment. Together with the **heavy duty fan shaft bearings** this guarantees optimal operational efficiency. Single- and multi speed **motors** available.
- **Centrifugal fan(s)** are forward-curved and nearly noiseless. Overcome external static pressure! Use [sound attenuators](#) and duct work etc. for air intake/discharge with no loss of thermal performance!
- **Our drift eliminators** come in UV-resistant plastic, which will not rot, decay or decompose and their performance is tested and **certified by Eurovent**. They are assembled in **easily handled and removable sections**, for optimal internal access.
- [Steel eliminators](#), protected with the unique [Baltibond hybrid coating](#), for optimal corrosion protection, are also available for specific applications.



4. Water distribution system

- These consist of:
 - A **header** and **spray branches** with wide non-clog plastic **nozzles**, secured by rubber **grommets**. You can easily remove, clean and flush both nozzles and spray branches.
 - A cold water basin with:
 - **strainers** which are easy to lift out and the anti-vortexing device also helps stop trapped air
 - mechanical **make up**
 - circular **access door**
 - Close coupled, bronze fitted centrifugal **spray pump** with totally enclosed fan cooled (TEFC) motor. Bleed line with metering valve installed from pump discharge to overflow.



Like to know more about the VFL construction details? Contact your [local BAC representative](#).

VFL

Closed circuit cooling towers

Options and accessories

Below is a listing of the main VFL options and accessories. If your required option or accessory is not listed, look no further than your [local BAC representative](#).



Plume abatement coil

A finned discharge coil is installed in your cooling tower discharge and piped in series with the wet coil. This **reduces or eliminates plumes** and **extends the dry cooling capacity**. [Read more](#)



Sound attenuation

Reducing noise at air intake and discharge points brings us closer to silent cooling equipment.

- The sound reductions obtained by HS sound attenuation are perfect for **residential** sound requirements.
- Heavy noise reductions can be achieved with HD sound attenuation, making it ideal for **rural** requirements.



Baltiguard drive system

With this, operate your system like a dual-speed motor, but with standby reserve capacity **to cope with any failure.**



Basin heater package

Thanks to our factory-installed heaters, the water stays at 4°C and **never freezes**, even during tower downtime and however cold it gets outside.



Remote sump connection

The best way to **prevent a sump freezing** is to use the auxiliary remote variety within a heated area. Shutting off the circulating pump allows all the water in the water distribution, as well as that in suspension and the sump to drain freely to the auxiliary sump.



Electric water level control package

For perfectly precise water level control, replace the standard mechanical valve with our electrical water level controller.



Discharge hood

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.



Positive closure dampers

Use positive closure dampers (PCD) **to minimize the heatloss due to convection** by preventing air flow through equipment that is shut down.



Steel drift eliminators

Steel drift eliminators are more **robust** than plastic alternatives.



Safety switch

Cuts power to motors **with safety in mind** during inspection or maintenance.



Clean out port

Clean out port **makes it easy to eliminate silt and sludge** from the cooling tower basin when cleaning and flushing the sump.



Pump relocation

Move the pump to the connection side and make it **more accessible** when using sound attenuation at the fan side.



Standby pump

Install a standby **reserve spray pump** as failure backup!



Filter

Separators and media filters efficiently **remove suspended solids** in the recirculating water, reducing system cleaning costs and optimizing water treatment results. Filtration helps you keep the recirculating water clean.



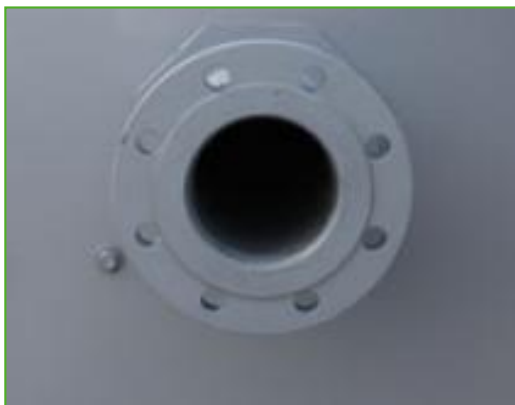
Sump sweeper piping

Sump sweeper piping **prevents sediment collecting in the cold water basin** of the unit. A complete piping system, including nozzles, is installed in the basin of the tower **for connection to side stream filtration** equipment.



Water treatment equipment

Devices to control water treatment are needed to ensure proper **cooling tower water care**. Not only does this help protect the components and fill pack, controlling corrosion, scaling and fouling, it also avoids the proliferation of harmful bacteria, including **legionella**, in the recirculating water.



Flanges

Flanges facilitate **piping connections** on-site.



VFL

Closed circuit cooling towers

Special needs?

Our ongoing [R&D](#) investment helps BAC offer you a complete set of solutions **for VFL closed circuit cooling towers that meet your needs**. Plus, we also cater for extra requirements such as:

Sound control

VFL uses a centrifugal fan in a V-design enclosure for better sound-control.

A quieter tower rear for more noise-sensitive areas.

Helping keep it near noiseless:

- [Sound attenuators](#)
- [Baltiguard drive system](#)

Plume control

Tap into abundant BAC plume control experience. For the VFL line, we offer [plume abatement coils](#) with **reduced plume**.

Check out our [BAC plume visualization software](#) for insight into **how your cooling equipment will plume** before installation. Helping you choose the best and most effective plume abatement solution.



Water savings

You need water for evaporative cooling. At BAC, however, we offer acclaimed and advanced water saving technologies. Helping in this aim are:

- [Electric water level control package](#)
- [Water treatment equipment](#)
- [Sump sweeper piping](#)
- Two-way valve control
- [Plume abatement coil](#)

BAC boasts a **complete water saving product range** for unrivalled water saving AND exceptional thermal efficiency, thanks to water saving technology. Hybrid wet/dry cooling towers are: [HXI](#), [HFL](#), [TrilliumSeries coolers](#).

Energy saving

VFL uses evaporative cooling technology for lower operating temperatures than other cooling methods. With the following options, reduce energy costs still further:

- [Baltiguard drive system](#)
- Thermostat

Enhanced hygiene and water care

Water circulates in evaporative cooling towers and it is important to avoid excessive accumulation of dissolved solids. The following options help keep your cooling tower clean:

- [Remote sump connection](#)
- [Water treatment equipment](#)
- [Sump sweeper piping](#)
- [Clean out port](#)
- [Filters](#)

To control biological growth and scale formation, the water quality of the circulated water should be checked regularly. [Water quality guidelines](#) can be found in the [Knowledge center](#) of the website.

Year-round reliable operation

Inspect and maintain your cooling tower and protect it against extreme weather for year-round reliability. The options below help keep your cooling tower running smoothly and reliably and facilitate maintenance.

- [Remote sump connection](#)
- [Water treatment equipment](#)
- [Sump sweeper piping](#)
- [Clean out port](#)
- [Filters](#)
- [Electric water level control package](#)

Do you too want to benefit from the above solutions? Contact your [local BAC representative](#) for more information.

VFL

Closed circuit cooling towers

Engineering data

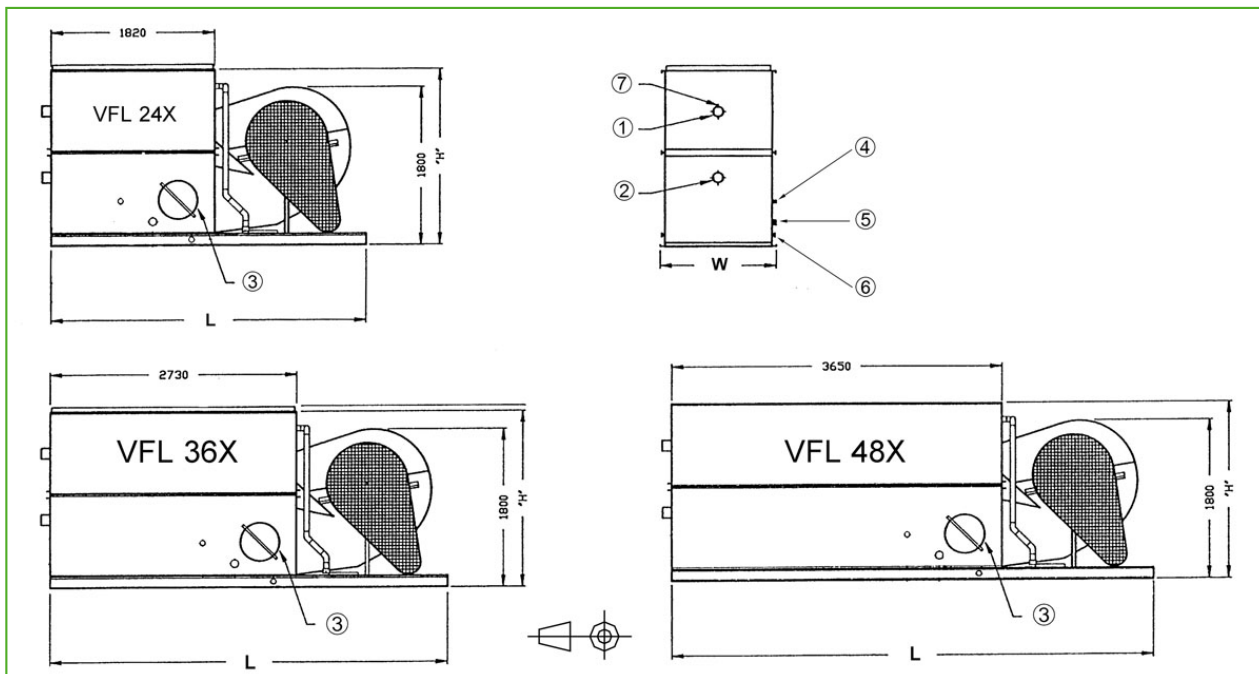
REMARK: Do not use for construction. Refer to factory certified dimensions & weights. This page includes data current at time of publication, which should be reconfirmed at the time of purchase. In the interest of product improvements, specifications, weights and dimensions are subject to change without notice.

General notes

1. All location dimensions for coil connections are approximate and should not be used for prefabrication of connection piping.
2. If discharge hoods with positive closure dampers are furnished, see table in section Engineering Data Straight Discharge Hood with PCD for added weight and height.
3. For external static pressure up to 125 Pa use next larger motor size.
4. For indoor applications of fluid coolers, the room may be used as a plenum with ductwork attached to the discharge only. If inlet ductwork is required, an enclosed fan section must be specified; consult your BAC Balticare representative for details.
5. Fan cycling results only in on-off operation. For additional steps of control, two-speed fan motors are available. More precise capacity control can be obtained with modulation fan discharge dampers or a BALTIGUARD® Drive System.
6. Make up, overflow, suction, drain connection and access door can be provided on side opposite to that shown; consult your BAC Balticare representative.
7. Shipping/operating weights indicated are for units without accessories such as sound attenuators, discharge hoods, plume abatement coils, etc. Consult factory certified prints to obtain weight additions and the heaviest section to be lifted.

Last update: 30/06/2019

VFL 24X-48X



1. Fluid in ND100; 2. Fluid out ND100; 3. Access door; 4. Make up ND25; 5. Overflow ND50 for VFL 24X and 36X and ND80 for VFL 48X; 6. Drain ND50; 7. Vent ND15

Model	Weights (kg)			Dimensions (mm)				Air Flow (m³/s)	Fan Motor (kW)	Water Flow (l/s)	Pump Motor (kW)	Coil Volume (L)
	Oper. Weight (kg)	Ship. Weight(kg)	Heaviest Section (kg)	L1	L2	W	H					
VFL 241-H	1950	1280	1280	3350	1820	1250	1855	7.6	(1x) 4.0	5.9	(1x) 0.55	(1x) 176
VFL 242-H	2220	1460	1460	3350	1820	1250	2015	7.4	(1x) 4.0	5.9	(1x) 0.55	(1x) 229
VFL 242-J	2230	1490	1490	3350	1820	1250	2015	8.1	(1x) 5.5	5.9	(1x) 0.55	(1x) 229
VFL 243-J	2470	1670	1670	3350	1820	1250	2230	7.9	(1x) 5.5	5.9	(1x) 0.55	(1x) 282
VFL 361-L	2800	1810	1810	4560	2730	1250	1855	12.7	(1x) 11.0	9.0	(1x) 0.75	(1x) 258
VFL 361-M	2810	1820	1820	4560	2730	1250	1855	13.8	(1x) 15.0	9.0	(1x) 0.75	(1x) 258
VFL 362-M	3130	2090	2090	4560	2730	1250	2090	13.4	(1x) 15.0	9.0	(1x) 0.75	(1x) 338
VFL 363-K	3470	2280	2280	4560	2730	1250	2350	10.8	(1x) 7.5	9.0	(1x) 0.75	(1x) 418
VFL 363-M	3540	2350	2350	4560	2730	1250	2350	13.0	(1x) 15.0	9.0	(1x) 0.75	(1x) 418
VFL 481-M	3490	2170	2170	5480	3650	1250	1855	15.1	(1x) 15.0	12.1	(1x) 1.1	(1x) 341
VFL 482-L	3930	2490	2490	5480	3650	1250	2090	13.6	(1x) 11.0	12.1	(1x) 1.1	(1x) 448
VFL 483-L	4390	2830	2830	5480	3650	1250	2350	13.4	(1x) 11.0	12.1	(1x) 1.1	(1x) 556
VFL 483-M	4400	2840	2840	5480	3650	1250	2350	14.6	(1x) 15.0	12.1	(1x) 1.1	(1x) 556
VFL 484-M	4860	3170	3170	5480	3650	1250	2560	14.3	(1x) 15.0	12.1	(1x) 1.1	(1x) 664

VFL

Closed circuit cooling towers

Engineering data

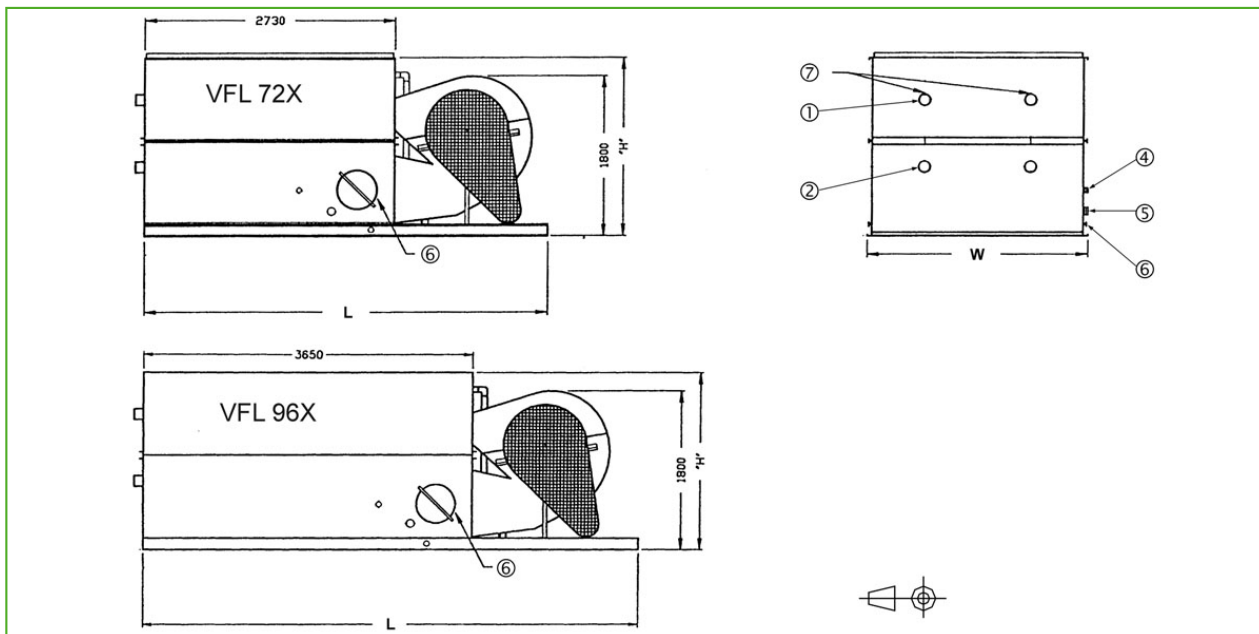
REMARK: Do not use for construction. Refer to factory certified dimensions & weights. This page includes data current at time of publication, which should be reconfirmed at the time of purchase. In the interest of product improvements, specifications, weights and dimensions are subject to change without notice.

General notes

1. All location dimensions for coil connections are approximate and should not be used for prefabrication of connection piping.
2. If discharge hoods with positive closure dampers are furnished, see table in section Engineering Data Straight Discharge Hood with PCD for added weight and height.
3. For external static pressure up to 125 Pa use next larger motor size.
4. For indoor applications of fluid coolers, the room may be used as a plenum with ductwork attached to the discharge only. If inlet ductwork is required, an enclosed fan section must be specified; consult your BAC Balticare representative for details.
5. Fan cycling results only in on-off operation. For additional steps of control, two-speed fan motors are available. More precise capacity control can be obtained with modulation fan discharge dampers or a BALTIGUARD® Drive System.
6. Make up, overflow, suction, drain connection and access door can be provided on side opposite to that shown; consult your BAC Balticare representative.
7. Shipping/operating weights indicated are for units without accessories such as sound attenuators, discharge hoods, plume abatement coils, etc. Consult factory certified prints to obtain weight additions and the heaviest section to be lifted.

Last update: 30/06/2019

VFL 72X-96X



1. Fluid in ND100; 2. Fluid out ND100; 3. Access door; 4. Make up ND40; 5. Overflow ND80; 6. Drain ND50; 7. Vent ND15.

Model	Weights (kg)			Dimensions (mm)				Air Flow (m³/s)	Fan Motor (kW)	Water Flow (l/s)	Pump Motor (kW)	Coil Volume (L)
	Oper. Weight (kg)	Ship. Weight(kg)	Heaviest Section (kg)	L1	L2	W	H					
VFL 721-L	5150	3150	3150	4560	2730	2400	1855	20.0	(1x) 11.0	17.9	(1x) 1.1	(2x) 258
VFL 721-M	5160	3160	3160	4560	2730	2400	1855	21.8	(1x) 15.0	17.9	(1x) 1.1	(2x) 258
VFL 721-O	5190	3190	3190	4560	2730	2400	1855	24.6	(1x) 22.0	17.9	(1x) 1.1	(2x) 258
VFL 722-N	5880	3700	3700	4560	2730	2400	2090	22.8	(1x) 18.5	17.9	(1x) 1.1	(2x) 338
VFL 722-O	5900	3720	3720	4560	2730	2400	2090	24.0	(1x) 22.0	17.9	(1x) 1.1	(2x) 338
VFL 723-L	6610	4210	4210	4560	2730	2400	2350	19.3	(1x) 11.0	17.9	(1x) 1.1	(2x) 418
VFL 723-O	6650	4250	4250	4560	2730	2400	2350	23.4	(1x) 22.0	17.9	(1x) 1.1	(2x) 418
VFL 724-O	7320	4790	4790	4560	2730	2400	2560	22.9	(1x) 22.0	17.9	(1x) 1.1	(2x) 498
VFL 961-P	6520	3850	3850	5480	3650	2400	1855	28.7	(1x) 30.0	24.2	(1x) 2.2	(2x) 341
VFL 962-N	7285	4360	4360	5480	3650	2400	2090	24.5	(1x) 18.5	24.2	(1x) 2.2	(2x) 448
VFL 962-O	7310	4400	4400	5480	3650	2400	2090	25.9	(1x) 22.0	24.2	(1x) 2.2	(2x) 448
VFL 962-P	7400	4500	4500	5480	3650	2400	2090	28.3	(1x) 30.0	24.2	(1x) 2.2	(2x) 448
VFL 963-O	8210	5060	5080	5480	3650	2400	2350	25.6	(1x) 22.0	24.2	(1x) 2.2	(2x) 556
VFL 963-P	8310	5160	5160	5480	3650	2400	2350	27.9	(1x) 30.0	24.2	(1x) 2.2	(2x) 556
VFL 964-P	9300	5810	5810	5480	3650	2400	2560	27.4	(1x) 30.0	24.2	(1x) 2.2	(2x) 664

VFL

Closed circuit cooling towers

Engineering data

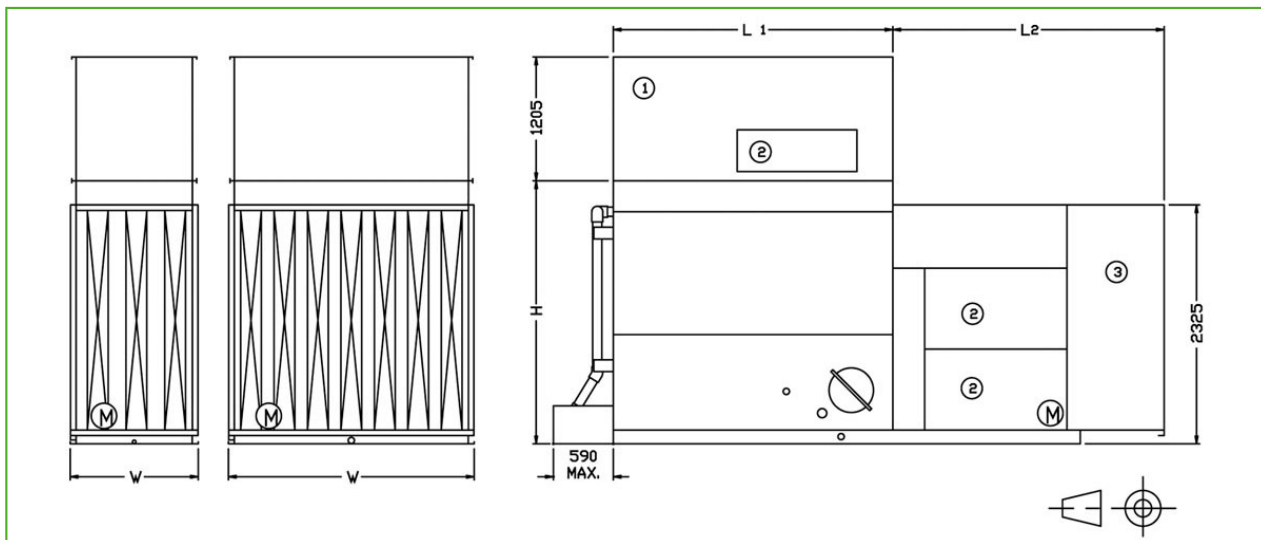
REMARK: Do not use for construction. Refer to factory certified dimensions & weights. This page includes data current at time of publication, which should be reconfirmed at the time of purchase. In the interest of product improvements, specifications, weights and dimensions are subject to change without notice.

General notes

1. All location dimensions for coil connections are approximate and should not be used for prefabrication of connection piping.
2. If discharge hoods with positive closure dampers are furnished, see table in section Engineering Data Straight Discharge Hood with PCD for added weight and height.
3. For external static pressure up to 125 Pa use next larger motor size.
4. For indoor applications of fluid coolers, the room may be used as a plenum with ductwork attached to the discharge only. If inlet ductwork is required, an enclosed fan section must be specified; consult your BAC Balticare representative for details.
5. Fan cycling results only in on-off operation. For additional steps of control, two-speed fan motors are available. More precise capacity control can be obtained with modulation fan discharge dampers or a BALTIGUARD® Drive System.
6. Make up, overflow, suction, drain connection and access door can be provided on side opposite to that shown; consult your BAC Balticare representative.
7. Shipping/operating weights indicated are for units without accessories such as sound attenuators, discharge hoods, plume abatement coils, etc. Consult factory certified prints to obtain weight additions and the heaviest section to be lifted.

Last update: 30/06/2019

Sound attenuation HS



1. Discharge attenuator; 2. Access door; 3. Intake attenuator; W & H= Unit Dimensions (See Engineering Data).



Model	Dimensions (mm)		Weights (kg)		
	L2	L	Intake	Discharge	Total
VFL 24X	2390	1820	460	215	675
VFL 36X	2640	2730	465	295	760
VFL 48X	2640	3650	465	365	830
VFL 72X	2640	2730	665	465	1130
VFL 96X	2640	3650	665	565	1230

VFL

Closed circuit cooling towers

Engineering data

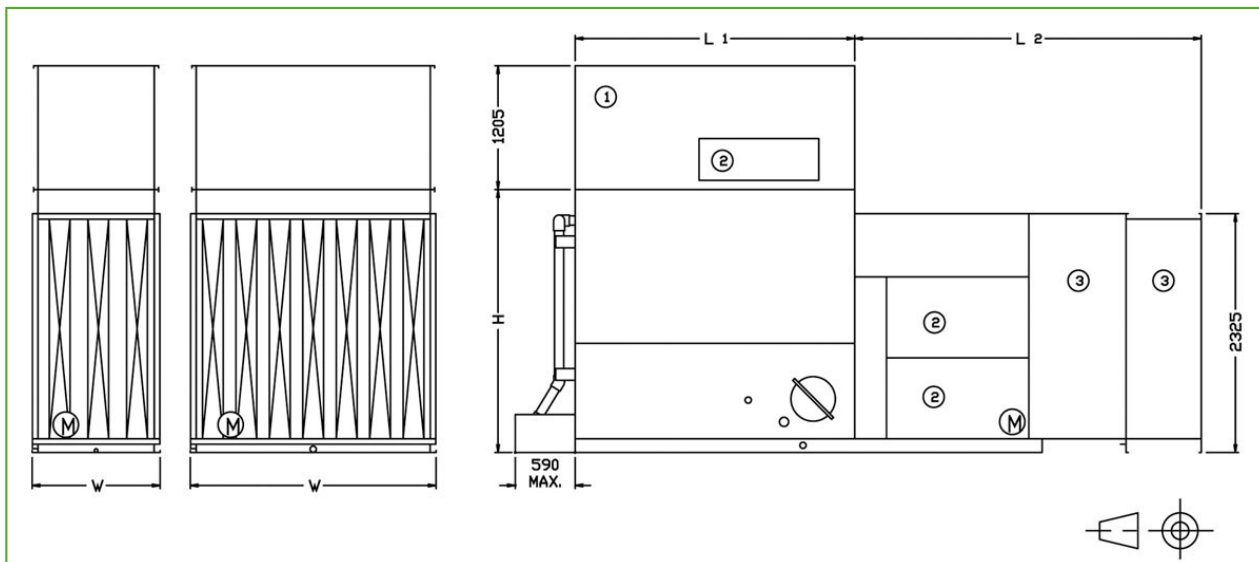
REMARK: Do not use for construction. Refer to factory certified dimensions & weights. This page includes data current at time of publication, which should be reconfirmed at the time of purchase. In the interest of product improvements, specifications, weights and dimensions are subject to change without notice.

General notes

1. All location dimensions for coil connections are approximate and should not be used for prefabrication of connection piping.
2. If discharge hoods with positive closure dampers are furnished, see table in section Engineering Data Straight Discharge Hood with PCD for added weight and height.
3. For external static pressure up to 125 Pa use next larger motor size.
4. For indoor applications of fluid coolers, the room may be used as a plenum with ductwork attached to the discharge only. If inlet ductwork is required, an enclosed fan section must be specified; consult your BAC Balticare representative for details.
5. Fan cycling results only in on-off operation. For additional steps of control, two-speed fan motors are available. More precise capacity control can be obtained with modulation fan discharge dampers or a BALTIGUARD® Drive System.
6. Make up, overflow, suction, drain connection and access door can be provided on side opposite to that shown; consult your BAC Balticare representative.
7. Shipping/operating weights indicated are for units without accessories such as sound attenuators, discharge hoods, plume abatement coils, etc. Consult factory certified prints to obtain weight additions and the heaviest section to be lifted.

Last update: 30/06/2019

Sound attenuation HD



1. Discharge attenuator; 2. Access door; 3. Intake attenuator; W & H = Unit dimensions (See Engineering Data).



Model	Dimensions (mm)		Weights (kg)		
	L2	L	Intake	Discharge	Total
VFL 24X	3125	1820	655	235	890
VFL 36X	3375	2730	660	315	975
VFL 48X	3375	3650	660	385	1045
VFL 72X	3375	2730	980	500	1480
VFL 96X	3375	3650	980	605	1585

VFL

Closed circuit cooling towers

Engineering data

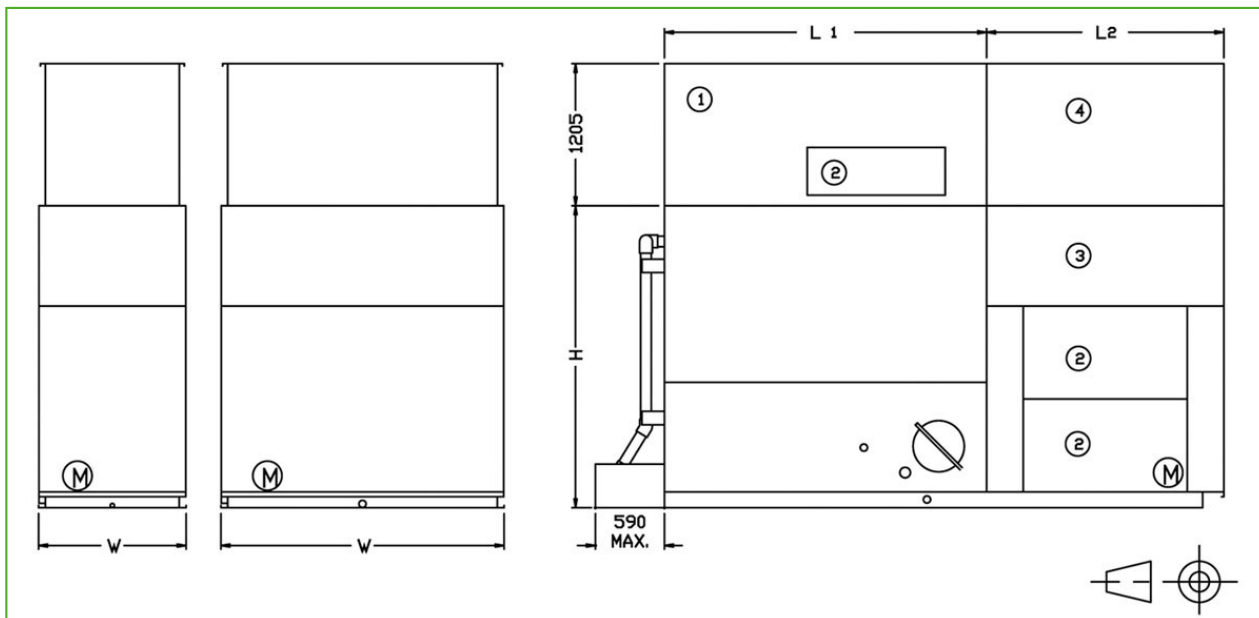
REMARK: Do not use for construction. Refer to factory certified dimensions & weights. This page includes data current at time of publication, which should be reconfirmed at the time of purchase. In the interest of product improvements, specifications, weights and dimensions are subject to change without notice.

General notes

1. All location dimensions for coil connections are approximate and should not be used for prefabrication of connection piping.
2. If discharge hoods with positive closure dampers are furnished, see table in section Engineering Data Straight Discharge Hood with PCD for added weight and height.
3. For external static pressure up to 125 Pa use next larger motor size.
4. For indoor applications of fluid coolers, the room may be used as a plenum with ductwork attached to the discharge only. If inlet ductwork is required, an enclosed fan section must be specified; consult your BAC Balticare representative for details.
5. Fan cycling results only in on-off operation. For additional steps of control, two-speed fan motors are available. More precise capacity control can be obtained with modulation fan discharge dampers or a BALTIGUARD® Drive System.
6. Make up, overflow, suction, drain connection and access door can be provided on side opposite to that shown; consult your BAC Balticare representative.
7. Shipping/operating weights indicated are for units without accessories such as sound attenuators, discharge hoods, plume abatement coils, etc. Consult factory certified prints to obtain weight additions and the heaviest section to be lifted.

Last update: 30/06/2019

Sound attenuation VS



1. Discharge attenuator; 2. Access door; 3. Intake attenuator; 4. Plenum; W & H = Unit Dimensions (See Engineering Data).



Model	Dimensions (mm)		Weights (kg)		
	L2	L	Intake	Discharge	Total
VFL 24X	2010	1820	N.A.	N.A.	725
VFL 36X	2010	2730	N.A.	N.A.	830
VFL 48X	2010	3650	N.A.	N.A.	915
VFL 72X	2010	2730	N.A.	N.A.	1205
VFL 96X	2010	3650	N.A.	N.A.	1310