

Polairis - Model PLF2

Closed circuit cooling towers



Key benefits

- Extremely reliable
- Superb hygiene
- Minimal maintenance and easy inspection

POLAIRIS 



Polairis PLF2 characteristics

- Counter flow, radial fan, forced draft

Capacity range

Up to 310 kW

Water distribution

Pressurized

Max. entering fluid temperature

82 °C

Typical applications

- Small to medium HVAC and light industrial applications with focus on reliability, energy efficiency and minimal maintenance
- Tight enclosures and sound critical installations
- Indoor installations
- Dry operation in winter time



Extremely reliable

- The Polairis™ closed circuit cooling tower's design incorporates all **experience** BAC acquired over the last decades with thousands of VXI units installed globally since 1978.
- Fan drive systems are located inside the unit, in the **dry air**, preventing condensation and eliminating corrosion issues and premature failures.
- Direct driven fans **eliminate potential mechanical failures**.
- Multiple, individually driven fans guarantee **redundancy**.
- The **thermal performance** of Polairis closed circuit cooling towers is tested and **certified by Eurovent**.
- **Baltibond hybrid coating** for maximum equipment life, with corrosion resistance equivalent to SST 304L.
- **Dry operation** possible.

Superb hygiene

- The **DiamondClear™ Design*** offers a **continuous self-cleaning operation**. During standstill the sloping surfaces fully drain, avoiding stagnant water and the risk of sedimentation of impurities.
- A completely encased collection basin eliminates any sunlight ingress, **preventing biological growth**.
- **Baltibond hybrid coating** for a smooth surface finish that **reduces biofilm development**.
- The floor is fully sloped towards the drain - also in the dry section - for **easy cleaning**.
- Water treatment system connections are provided as standard.

Minimal maintenance and easy to inspect

- Direct driven fans require **no maintenance** at all.
- The **DiamondClear™ Design*** offers a continuous self-cleaning operation. The **need for maintenance is minimized** by using fully sloping surfaces, a constant impact of falling spray water and high water velocities.
- The double blank-off wall guides the spray water into the collection basin, which makes it subject to higher turbulences. This turbulence **reduces the risk for sediments to settle down** and **reduces the need for collection basin cleaning**.
- Two large access doors are included in the default unit construction for **easy access to all critical components**.
- **Unmatched accessibility** to the basin, drives and fans in the dry section, via the mansized access door at ground level.
- Water distribution system is **easily accessible** from outside.
- **Baltibond hybrid coating** for a smooth surface finish that **facilitates internal cleaning**.

Flexible to install

- Fans are prewired to a terminal box to avoid time-consuming on-site wiring. Integrated electronics of EC motors **eliminate the need for external VFD's**, electronic filters and shielded cables.



- **Installation costs are reduced** since units are shipped in 2 factory-built sections with a rigid base frame that guarantees squareness for easy on-site assembly. Additionally, **single lifts are possible**.
- Single side air intake allows for **installation in confined spaces and next to solid walls**.
- Pressure capability of fans allows indoor installation with ductwork.
- Silent radial fans reduce the need for installation of sound attenuation.

Energy efficient

- EC motors have superior efficiency that exceeds the IE4 requirements.
- Integrated electronics of EC motors allow for **variable speed control** at a significantly **reduced power consumption** compared to AC motors with VFD.
- Optimized design with EC Fan Systems in combination with [DiamondClear™ Design](#) results in a uniform air distribution over the entire footprint of the coil, for **year-round optimal certified thermal performance**.

Low sound

- **Silent radial fans** are standard.
- Single side air inlet allows directing the quiet unit rear towards **noise sensitive areas**.
- Sound attenuation is available for the most **stringent sound requirements**.

* patent pending

Interested in the Polairis closed circuit cooling tower to cool your process water? Contact your local [BAC representative](#) for more information.

Downloads

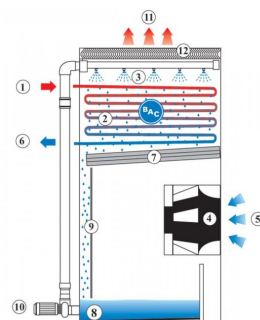
- [Polairis Closed Circuit Cooling Tower, Model PLF2 \(brochure\)](#)
- [Spare Parts for PLF2](#)
- [Retrofit Opportunities for PLF2](#)
- [Operating & Maintenance PLF2](#)
- [Rigging & Installation PLF2](#)

Closed circuit cooling towers

Principle of operation

Warm process fluid (1) circulates through an **heat exchanger coil (2)**, which is continuously wetted by the **spray system (3)** installed at the top of the closed circuit cooler. At the same time the **direct driven radial fans (4)**, located at the bottom of the unit, blow ambient **air (5)** upwards through the cooler.

During operation, heat is transferred from the process fluid to the spray water, and then to the atmosphere as a portion of the water that evaporates. The cooled process fluid then **exits the unit (6)**. The remaining spray water that falls on the **sloping channels (7)** continuously flows into the **sloping sump (8)**, where the water is collected. The **double blank-off wall (9)** guides the spray water into the collection basin, creating a turbulence flow. The **spray water pump (10)** recirculates the water up to the water spray system. The warm saturated **air (11)** leaves the cooler through the drift **eliminators (12)**, which remove water droplets from the air.



Interested in the Polairis closed circuit cooler? Contact your local [BAC representative](#) for more information.



Construction details

Closed circuit cooling towers

Construction details

1. Material options

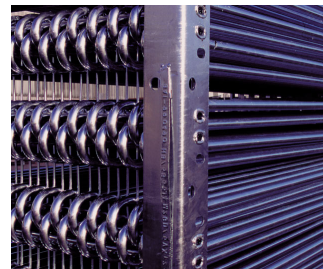
- The unique [Baltibond hybrid coating](#) is **standard for maximum equipment life**. This hybrid polymer coating is applied before assembly to all hot-dip galvanized steel components of the unit.
- Optional [stainless steel](#) panels and structural elements of type 304L or 316L for extreme applications.
- 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

- 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 prime surface steel, hot-dip galvanized after fabrication. Designed for maximum 10 bar operating pressure according to PED. Pneumatically tested at 15 bar.

- 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.



Try our Polairis coil options:

- **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.
- **Multiple circuit coils (split coils)** for different water or glycol circuits.
- **Stainless steel coils** are in type 304L or 316L.
- **High pressure coils** are designed for 28 bar operating pressure and pneumatically tested for 40 bar. Hot-dip galvanized after fabrication.

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

3. Air movement system

- The air movement system consists of **multiple, direct driven radial fans** made of aluminum, mounted on **EC motors with integrated control electronics**. They are completely **maintenance free** and guarantee **redundancy**.
- Air guiding channels installed above the fans allow a direct, vertical and **uniform air distribution** over the entire footprint of the condensing coil for **optimal heat transfer**.
- EC motors have an efficiency level that significantly **exceeds efficiency class IE4** and enable **speed control without an additional variable frequency drive** and shielded cables.
- The EC motors are wired to an IP66 terminal box, to avoid time-consuming on-site wiring.
- **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 easy inspection of the water distribution system.



4. Water distribution system

These consist of:

- **Spray branches** with wide non-clog plastic **nozzles**, secured by rubber **grommets**. You can easily remove, clean and flush both nozzles and spray branches from outside the unit.
- A [water collection system](#) with:
 - Sloping channels that are continuously cleaned through direct impact of falling spray water, minimizing the need for maintenance
 - A sloping and free draining cold water basin, a double blank-off wall to create high turbulences in the basin during operation, thereby reducing the need for cleaning.





Options and Accessories

Closed circuit cooling towers

Options and Accessories

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



Sound attenuation

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



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.



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**.



Heater package

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



Electric water level control package

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



Platform

To inspect and maintain from the top of the unit more **easily** and **safely**, platforms can be installed.



Ladder, safety cage and handrail

A ladder, safety cage and handrails **all facilitate access to the top of the unit** and safe inspection of your cooler.



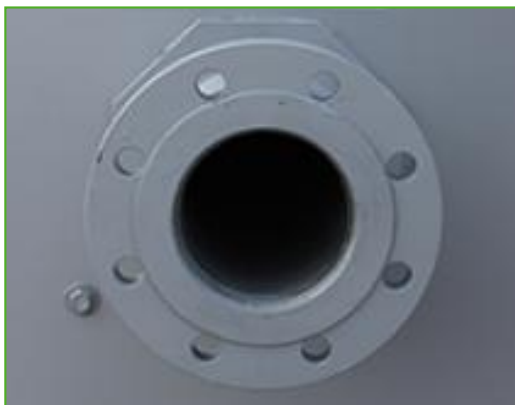
Discharge hood

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.



Standby pump

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



Flange

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



Water treatment equipment

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



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.



Clean out port

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



Sump sweeper piping

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



Special needs Polairis

Closed circuit cooling towers

Special needs Polairis

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

Plume control

Tap into abundant BAC plume control experience. For the Polairis line, we offer [plume abatement coils](#) with **reduced plume and extended dry operation periods**.

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](#)
- [Plume abatement coil](#)



Enhanced hygiene and water care

Water circulates in closed circuit coolers and it is important to avoid excessive accumulation of dissolved solids. The following options help keep your cooler clean:

- [Remote sump connection](#)
- [Water treatment equipment](#)
- [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 cooler and protect it against extreme weather for year-round reliability. The options below help keep your cooler running smoothly and reliably and facilitate maintenance.

- [Remote sump connection](#)
- [Water treatment equipment](#)
- [Clean out port](#)
- [Filters](#)
- [Electric water level control package](#)
- [Plume abatement coil](#)

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



PLF2-0403E-xxxxx-H

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 improvement, specifications, weights and dimensions are subject to change without notice.

General notes

1. Standard refrigerant in- and outlet connection sizes are ND100. Consult your local BAC representative for locations. Refrigerant connections are closed and coils are filled with an inert gas.
2. Unit height is indicative. For precise value refer to certified print.
3. Shipping/operating weights indicated are for units without accessories such as sound attenuators, discharge hoods, etc. Consult factory certified prints to obtain weight additions and the heaviest section to be lifted. Operating weights shown in the tables is based on total unit weight, weight of refrigerant operating charge and basin filled to overflow level.
4. Drawings show the standard right hand arrangement (air inlet side on the right when facing the connection end). Left hand arrangement can be supplied upon request.

[PLF2 cooling tower performance at standard conditions - 30% EG](#)

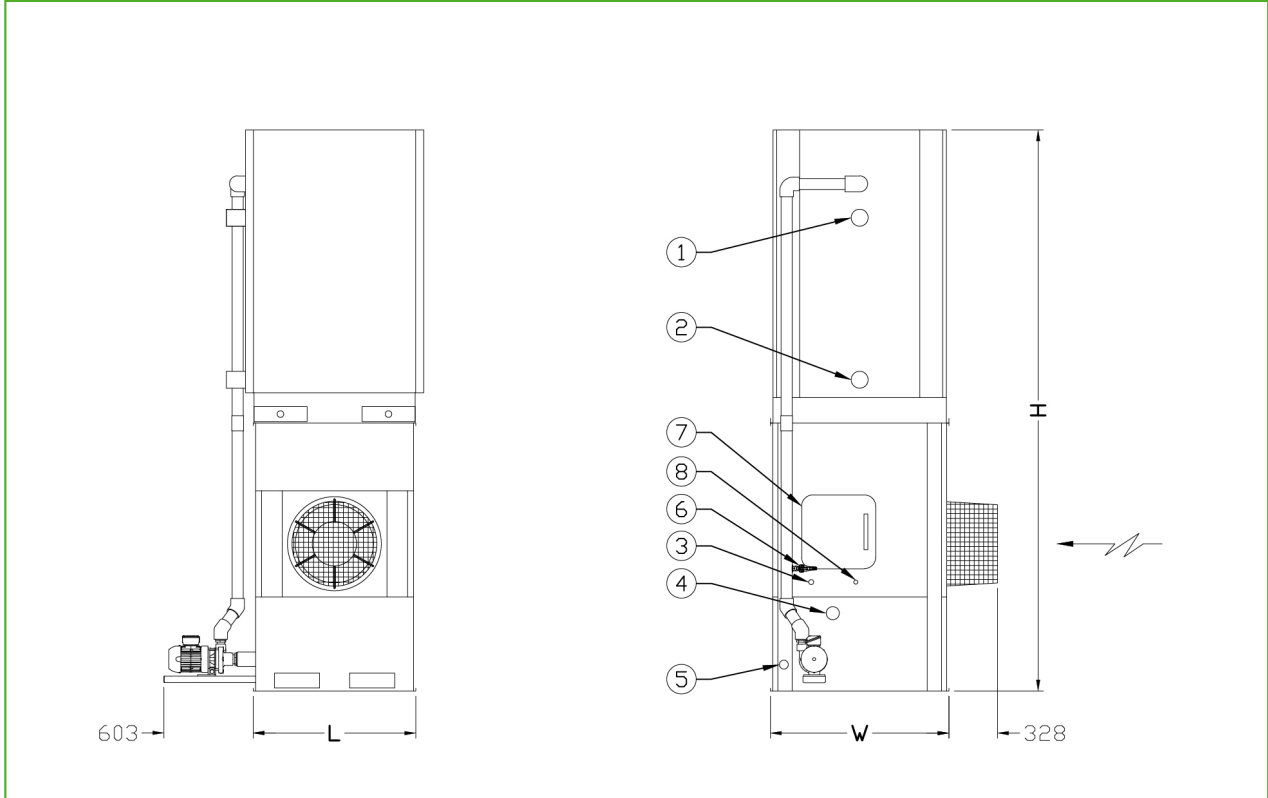
[PLF2 cooling tower performance at standard conditions - 30% PG](#)

[PLF2 cooling tower performance at standard conditions - water](#)

[PLF2 cooling tower - pressure drop](#)

Last update: 31/01/2022

PLF2-0403E-xxxxx-H



1. Fluid in ND100; 2. Fluid out ND100; 3. Make up ND40; 4. Overflow ND80; 5. Drain ND50; 6. Bleed ND25; 7. Treated Water In ND20; 8. Access door.



Model	Weights (kg)			Dimensions (mm)			Air Flow (m ³ /s)	Fan Motor (kW)	Water Flow (l/s)	Pump Motor (kW)	Coil Volume (L)
	Oper. Weight (kg)	Ship. Weight(kg)	Heaviest Section (kg)	L	W	H					
PLF2 0403E- 2D2AT- H	1113	794	429	1099	1207	3070	5.0	(1x) 4.05	1.7	(1x) 0.25	(1x) 77
PLF2 0403E- 3D2AT- H	1223	874	444	1099	1207	3305	4.7	(1x) 4.05	1.7	(1x) 0.25	(1x) 107
PLF2 0403E- 4D2AT- H	1327	948	519	1099	1207	3540	4.5	(1x) 4.05	1.7	(1x) 0.25	(1x) 137
PLF2 0403E- 5D2AT- H	1432	1022	593	1099	1207	3775	4.3	(1x) 4.05	1.7	(1x) 0.25	(1x) 167
PLF2 0403E- 6D2AT- H	1507	1068	638	1099	1207	3789	4.2	(1x) 4.05	1.7	(1x) 0.25	(1x) 198



PLF2-0406E-xxxxx-K

Closed circuit cooling towers

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[PLF2 cooling tower performance at standard conditions - 30% EG](#)

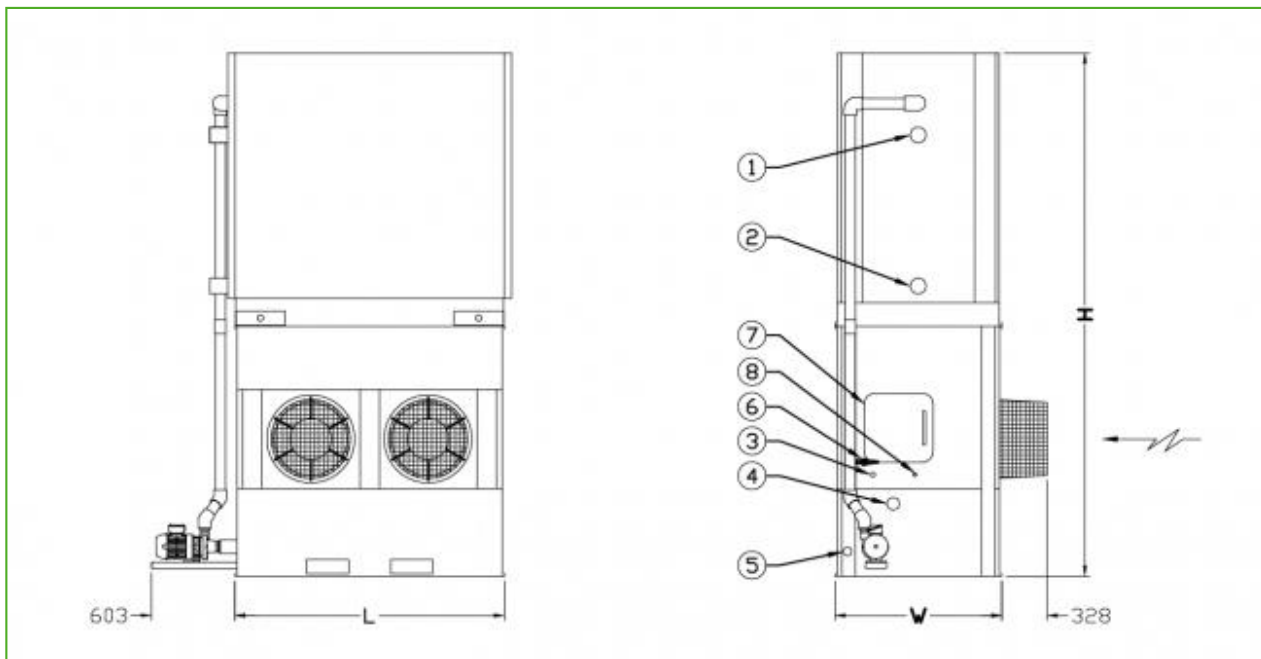
[PLF2 cooling tower performance at standard conditions - 30% PG](#)

[PLF2 cooling tower performance at standard conditions - water](#)

[PLF2 cooling tower - pressure drop](#)

Last update: 31/01/2022

PLF2-0406E-xxxxx-K



1. Fluid in ND100; 2. Fluid out ND100; 3. Make up ND40; 4. Overflow ND80; 5. Drain ND50; 6. Bleed ND25; 7. Treated Water In ND20; 8. Access door.



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)	L	W	H					
PLF2 0406E- 2D2AS- K	1930	1236	684	1950	1207	3070	9.8	(2x) 4.05	4.3	(1x) 0.37	(1x) 134
PLF2 0406E- 2D2AT- K	1930	1236	684	1950	1207	3070	9.8	(2x) 4.05	4.3	(1x) 0.37	(1x) 134
PLF2 0406E- 3D2AS- K	2114	1361	684	1950	1207	3305	9.3	(2x) 4.05	4.3	(1x) 0.37	(1x) 193
PLF2 0406E- 3D2AT- K	2114	1361	684	1950	1207	3305	9.3	(2x) 4.05	4.3	(1x) 0.37	(1x) 193
PLF2 0406E- 4D2AS- K	2292	1480	796	1950	1207	3540	8.9	(2x) 4.05	4.3	(1x) 0.37	(1x) 251
PLF2 0406E- 4D2AT- K	2292	1480	796	1950	1207	3540	8.9	(2x) 4.05	4.3	(1x) 0.37	(1x) 251
PLF2 0406E- 5D2AS- K	2470	1599	915	1950	1207	3775	8.6	(2x) 4.05	4.3	(1x) 0.37	(1x) 310
PLF2 0406E- 5D2AT- K	2470	1599	915	1950	1207	3775	8.6	(2x) 4.05	4.3	(1x) 0.37	(1x) 310
PLF2 0406E- 6D2AS- K	2614	1685	1001	1950	1207	3789	8.3	(2x) 4.05	4.3	(1x) 0.37	(1x) 369
PLF2 0406E- 6D2AT- K	2614	1685	1001	1950	1207	3789	8.3	(2x) 4.05	4.3	(1x) 0.37	(1x) 369



PLF2-0409E-xxxxx-L

Closed circuit cooling towers

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4. Drawings show the standard right hand arrangement (air inlet side on the right when facing the connection end). Left hand arrangement can be supplied upon request.

[PLF2 cooling tower performance at standard conditions - 30% EG](#)

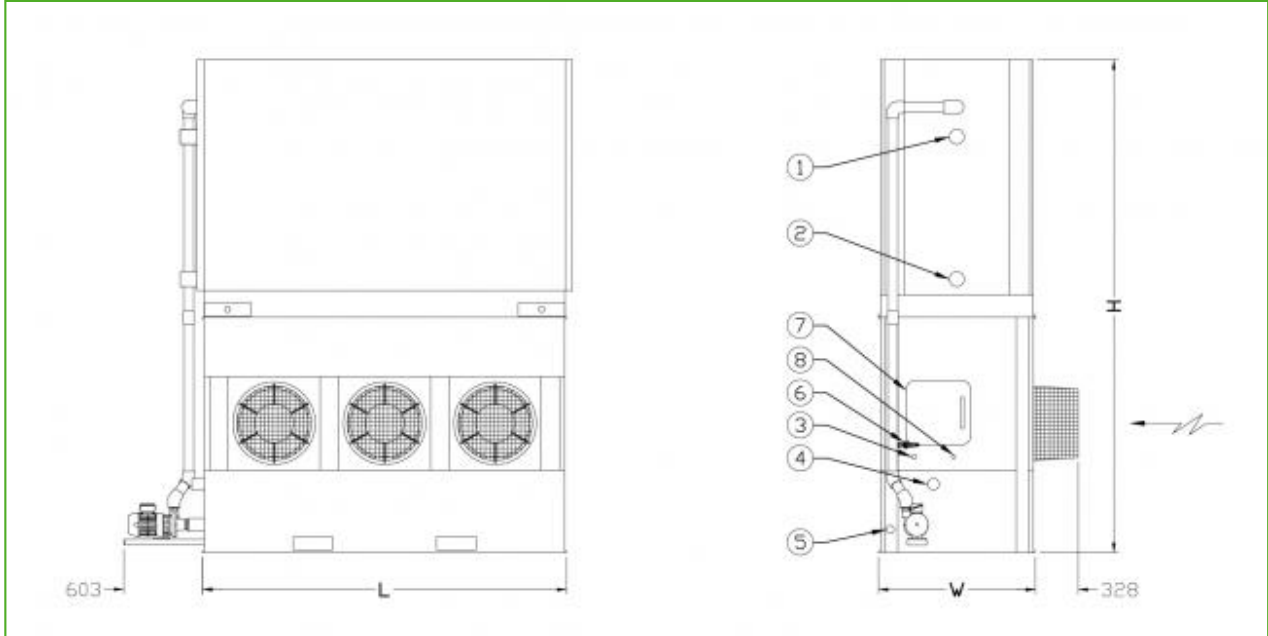
[PLF2 cooling tower performance at standard conditions - 30% PG](#)

[PLF2 cooling tower performance at standard conditions - water](#)

[PLF2 cooling tower - pressure drop](#)

Last update: 31/01/2022

PLF2-0409E-xxxxx-L



1. Fluid in ND100; 2. Fluid out ND100; 3. Make up ND40; 4. Overflow ND80; 5. Drain ND50; 6. Bleed ND25; 7. Treated Water In ND20; 8. Access door.



Model	Weights (kg)			Dimensions (mm)			Air Flow (m ³ /s)	Fan Motor (kW)	Water Flow (l/s)	Pump Motor (kW)	Coil Volume (L)
	Oper. Weight (kg)	Ship. Weight(kg)	Heaviest Section (kg)	L	W	H					
PLF2 0409E- 2D2AS- L	2620	1617	898	2799	1207	3070	14.7	(3x) 4.05	5.9	(1x) 0.75	(1x) 185
PLF2 0409E- 3D2AS- L	2875	1787	898	2799	1207	3305	14.0	(3x) 4.05	5.9	(1x) 0.75	(1x) 270
PLF2 0409E- 4D2AS- L	3125	1952	1054	2799	1207	3540	13.4	(3x) 4.05	5.9	(1x) 0.75	(1x) 355
PLF2 0409E- 5D2AS- L	3377	2120	1222	2799	1207	3775	12.9	(3x) 4.05	5.9	(1x) 0.75	(1x) 439
PLF2 0409E- 6D2AS- L	3580	2239	1340	2799	1207	3789	12.5	(3x) 4.05	5.9	(1x) 0.75	(1x) 524
PLF2 0409E- 7D2AS- L	3821	2395	1497	2799	1207	3980	12.1	(3x) 4.05	5.9	(1x) 0.75	(1x) 608



PLF2-0512E-xxxxx-M

Closed circuit cooling towers

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[PLF2 cooling tower performance at standard conditions - 30% EG](#)

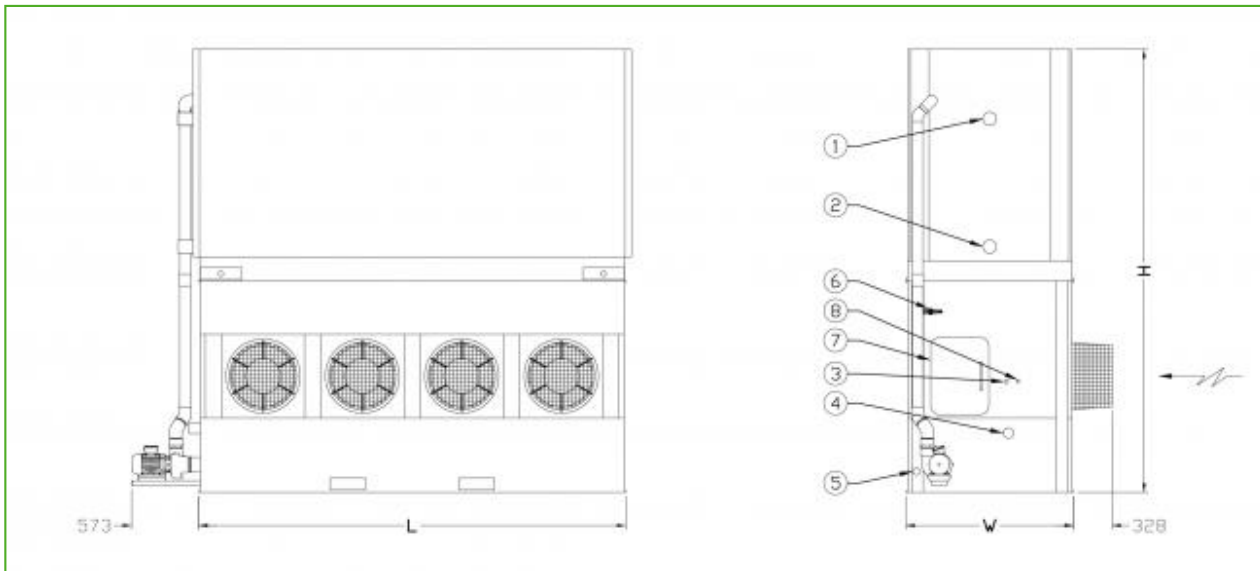
[PLF2 cooling tower performance at standard conditions - 30% PG](#)

[PLF2 cooling tower performance at standard conditions - water](#)

[PLF2 cooling tower - pressure drop](#)

Last update: 31/01/2022

PLF2-0512E-xxxxx-M



1. Fluid in ND100; 2. Fluid out ND100; 3. Make up ND40; 4. Overflow ND80; 5. Drain ND50; 6. Bleed ND25; 7. Treated water in ND20; 8. Access door.



Model	Weights (kg)			Dimensions (mm)			Air Flow (m ³ /s)	Fan Motor (kW)	Water Flow (l/s)	Pump Motor (kW)	Coil Volume (L)
	Oper. Weight (kg)	Ship. Weight(kg)	Heaviest Section (kg)	L	W	H					
PLF2 0512E- 2D2AS- M	3584	2173	1143	3651	1435	3070	21.6	(4x) 4.05	9.6	(1x) 1.5	(1x) 292
PLF2 0512E- 3D2AS- M	3972	2425	1282	3651	1435	3305	20.7	(4x) 4.05	9.6	(1x) 1.5	(1x) 427
PLF2 0512E- 4D2AS- M	4350	2667	1524	3651	1435	3540	20.0	(4x) 4.05	9.6	(1x) 1.5	(1x) 563
PLF2 0512E- 5D2AS- M	4729	2911	1768	3651	1435	3775	19.3	(4x) 4.05	9.6	(1x) 1.5	(1x) 699
PLF2 0512E- 6D2AS- M	5051	3098	1954	3651	1435	3789	18.8	(4x) 4.05	9.6	(1x) 1.5	(1x) 835
PLF2 0512E- 7D2AS- M	5420	3330	2187	3651	1435	3980	18.3	(4x) 4.05	9.6	(1x) 1.5	(1x) 970