

# TVFC

Dry and adiabatic cooling



## Key benefits

- Largest adiabatic capacity
- Highest degree of redundancy
- Unrivalled reliability



### TVFC cooler characteristics

Counter flow, adiabatic pre-cooling, axial fan, induced draft

### Capacity range

250 - 2000 kW

### Maximum entering fluid temperature

60°C

### Typical applications

- Small to medium HVAC and industrial applications
- Locations with limited water and space availability
- High temperature industrial applications



## Largest adiabatic capacity

- TVFC TrilliumSeries coolers offer **maximum thermal performance per m<sup>2</sup> footprint**, with an optimal air distribution over V-shaped coils with maximum heat transfer surface.
- TVFC TrilliumSeries coolers can be designed with a coil freeze-up safeguard that allows for operation with **pure water as process fluid**, providing on average **8% higher performance** than comparable systems with glycol solutions.
- Lowest system pump motor kW due to low hydraulic coil pressure drops for an **optimal system efficiency**.
- Synchronous EC motors with IE4+ efficiency; variable speed control for **maximum system efficiency**.

## Highest degree of redundancy

- TVFC TrilliumSeries coolers have a larger amount of fans that provide an **unmatched degree of backup capacity**.
- Optional internal partitioning panels create individual air intake ducts for each fan, which **eliminates thermal performance loss** due to the air bypassing the coil through an idle fan.
- The optional pre-cooler pump recirculation system with **adiabatic back up guarantee** (patent pending) in case of pump failure.
- Optimal controls guarantee **full performance** even with loss of controller or communication.

## Unrivalled reliability

- BAC's TVFC TrilliumSeries coolers come with all structural elements in **Baltibond hybrid coating**, a coating with a proven track record on evaporative cooling equipment. Designed for severe conditions it offers the same **reliable life expectancy** as stainless steel 304L.
- All critical components are located outside, providing **easy access at all times**.
  - Fan motors can be replaced in all **safety for both the intervening technician as well as for the unit**. Any risk of damage to critical components such as the heat exchangers and bottom panels is removed.
  - Pump maintenance is possible **during adiabatic operation**.
- Small motors and fans, increasing the **ease** with which they can be handled during replacement.
- Special anti-abrasive protection on the pads, to **ensure their durability** under harsh conditions.
- Epoxy coating (optional) on the coil fins **increases the resistance** against a humid environment, high chlorides and other corrosive agents.

## Saving water

- TrilliumSeries coolers **achieve annual water savings exceeding 90%** water compared to normal cooling towers by limited adiabatic operation.

## Top hygiene control



- No aerosol formation: TrilliumSeries coolers **minimize the Legionella risk**.
- TrilliumSeries coolers cool incoming air **without transferring water to the dry coil**.
- No continuously wet parts: all parts that come into contact with water are **fully drainable**, no water is stored in the unit during dry operation.

### Plug and Play with factory set custom controls

- **Proven controls** running for more than a decade.
- All site specific **parameters are factory set and tested** before the unit is shipped.
- 8 control strategies allowing you to **optimise the cooler to your specific needs**.

**Interested in the TVFC TrilliumSeries cooler to cool your process fluid?**

Contact your local [BAC representative](#) for more information.

### Downloads

- [TVFC compilation pdf \(EN\)](#)
- [S - TVFC \(EN\)](#)
- [M - TVFC \(EN\)](#)
- [R - TVFC \(EN\)](#)

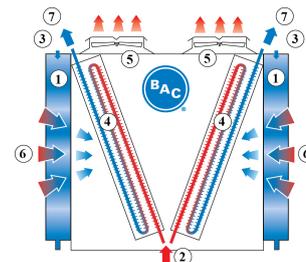
# TVFC

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## Principle of operation

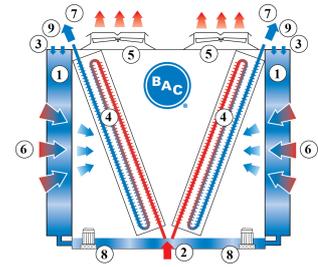
### Once through

The TVFC is a V-shaped dry cooler equipped with **adiabatic pre-coolers (1)** that cool the warm **process fluid (2)** by sensible heat transfer. **Water flows (3)** evenly over evaporative cooling pads located in front of the **dry finned coil (4)**. At the same time **axial (5) fans** draw **air (6)** through the pads where a portion of the water evaporates and cools down the saturated air. This increases the cooling capacity of the incoming air for cooling the process **fluid (7)** inside the coil.



## Recirculating

The TVFC is a V-shaped dry cooler equipped with **adiabatic pre-coolers (1)** that cool the warm **process fluid (2)** by sensible heat transfer. **Water flows (3)** evenly over evaporative cooling pads located in front of the **dry finned coil (4)**. With the **make up (9)** situated on top of the pads, adiabatic precooling of the air can also be guaranteed when the pump is not in operation. **Axial (5) fans** draw **air (6)** through the pads where a portion of the water evaporates and cools down the saturated air. This increases the cooling capacity of the incoming air for cooling the **process fluid (7)** inside the coil. The **recirculation system (8)** can further reduce the total water consumption.



**Want to use the TVFC TrilliumSeries cooler to cool your process fluid?** Contact your local [BAC representative](#) for more information.

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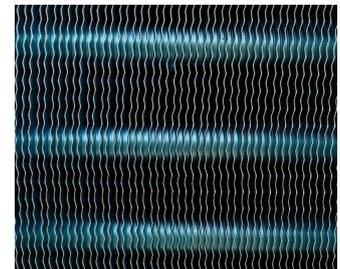
## Construction details

### 1. Material options

- Heavy-gauge hot-dip **galvanized steel** is used for unit steel panels and structural elements featuring [Baltibond Hybrid Coating](#).

### 2. Heat transfer media

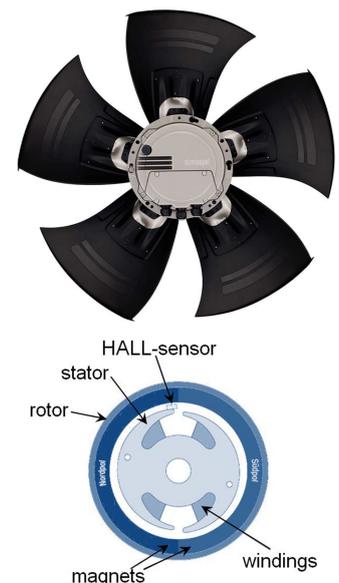
- The V-shaped finned coil is constructed of **staggered and seamless copper tubes** (10 mm diameter) with aluminium, rippled and corrugated fins.
- **2,5 mm fin spacing** for optimal air turbulence
- Thick and seamless copper headers and threaded steel connections
- Pressure tested at 15 bar
- **Try our option for aggressive environments:** special pre-coated anti-corrosion aluminium fins.



### 3. Air movement system

- **Axial fan** with exceptionally **compact direct drive** short integrated motor and fan guard.
- The **low profile fan** with fan guard features an **impeller and motor** and is balanced as a complete unit using dynamic single plane balancing. Balance grade is G6.3.
- Fan and motor totally **maintenance free**, and allow frequent starting.
- **Bearings seals and motor encapsulation** for long service life.
- The adiabatic units fitted with **EC motors** (EC in model number) provide an immense **reduction in power consumption**. The fans are piloted over an RS485 bus system by the controller supplied together with the electrical panel.

**Principle of operation:** the magnetic field of the permanent magnets in the outside rotor is used by the consecutively powered windings in the inside stator to let the fan run. The Hall-sensor detects where the magnetic field is strongest, which determines which set of windings will be activated.



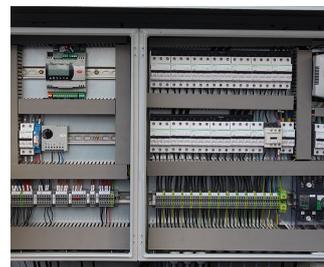
#### 4. Adiabatic pre-cooler

- Evaporative cooling pad of **impregnated cellulose** with different flute angles encased in bolted heavy gauge **stainless steel**.
- **Distribution pad on top** for complete pad wetting.
- **Once-through** water distribution system, no need for pumps, water drained to sewage.



#### 5. Electrical panel and adiabatic controls

- Fully equipped **factory-installed electrical panel** with integrated motor controls and adiabatic controls as well as all the required circuit breakers and other auxiliary components.
- **Intelligent controls** featuring the possibility for:
  - An additional pre-programmed free cooling set-point
  - Day/night operation to limit the maximum fan speed to lower the sound levels
  - BMS communication with all common protocols
  - Possibility for a master/slave arrangement to further optimize multi-unit installations
  - Automatic cleaning cycle rinsing the pads in taxing environments
  - Possibility to force unit in dry operation in case water usage is prohibited



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

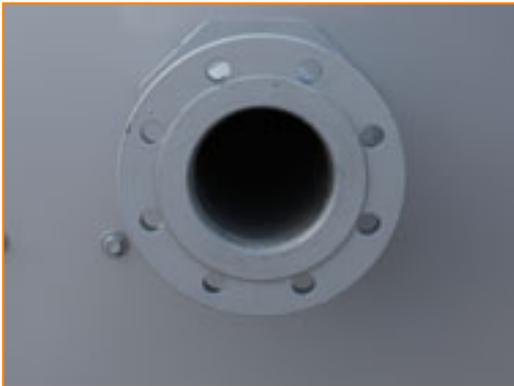


# TVFC

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## Options and accessories

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



### Flanges

Flanges facilitate **pipng connections** on-site. [Read more](#)



### Epoxy coating

Increase the coil's resistance against a harsh atmosphere. [Read more](#).



### Coil freeze-up safeguard

Allow for operation without any anti-freeze agents and avoid a coil freeze-up risk at the same time. [Read more](#).



## Sound reduction

Reducing noise at air intake and discharge points brings us closed to silent cooling equipment. [Read more.](#)



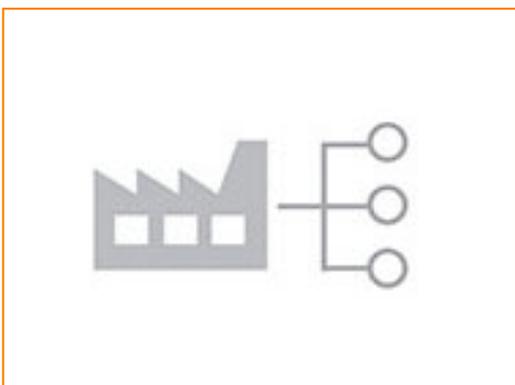
## Partitioning panels

Increase the degree of redundancy, providing a higher backup capacity for your installation. [Read more.](#)



## Recirculation pump

The recirculation pump helps to further cut down on water consumption. [Read more.](#)



## BMS supervision

This option integrates the adiabatic cooler's control system in your BMS system. [Read more.](#)



## Safety switch

Cuts power to motor with **safety in mind** during inspection or maintenance. [Read more.](#)



## Electrical panel heater

Protects electronic components in the electrical panel during extremely cold temperatures. [Read more.](#)

# TVFC

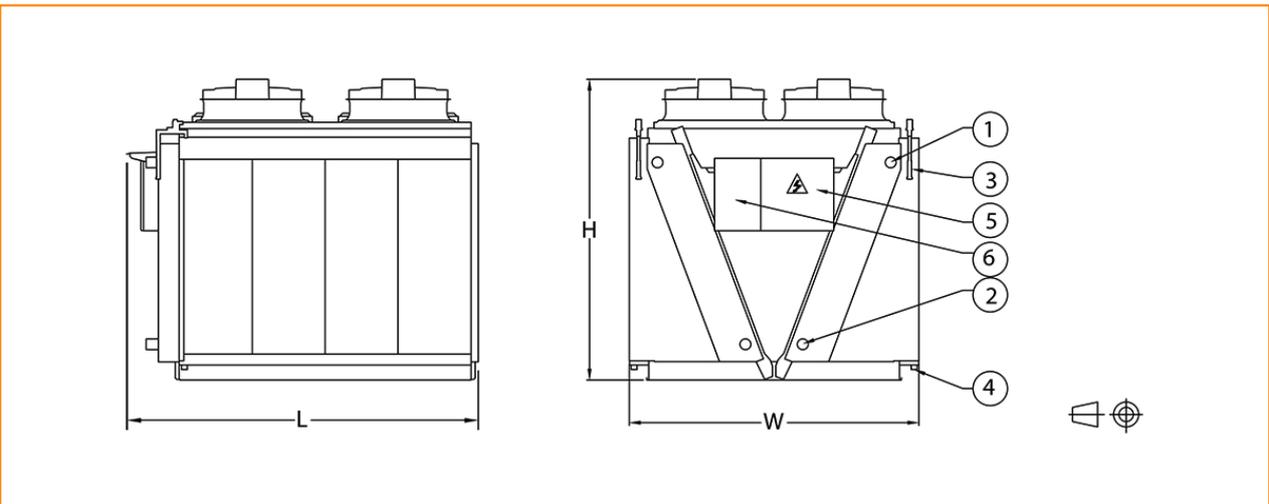
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## Engineering data

**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.

**Last update:** 31 March 2018

### TVFC\_EC8022-D810\_EC8022-S810



1. Fluid outlet connection; 2. Fluid inlet connection; 3. Pre-cooler city water connection; 4. Pre-cooler water drain; 5. Electrical power panel; 6. Control panel.



Model	Nr. of Fans	Weights (kg)			Dimensions (mm)			Air Flow (m <sup>3</sup> /s)	Tube Internal Volume (dm <sup>3</sup> )	Surface (m <sup>2</sup> )	Connections
		Oper. Weight (kg)	Ship. Weight(kg)	Heaviest Section (kg)	L	W	H				
TVFC EC802 2-D810	4	1948	1598	1598	3097	2382	2490	24.8	240.0	1108.0	2
TVFC EC802 2-H810	4	1948	1598	1598	3097	2382	2490	24.8	240.0	1108.0	2
TVFC EC802 2-L810	4	1948	1598	1598	3097	2382	2490	24.8	240.0	1108.0	2
TVFC EC802 2-M810	4	1948	1598	1598	3097	2382	2490	24.8	240.0	1108.0	2
TVFC EC802 2-Q810	4	1948	1598	1598	3097	2382	2490	24.8	240.0	1108.0	2
TVFC EC802 2-S810	4	1948	1598	1598	3097	2382	2490	24.8	240.0	1108.0	2

# TVFC

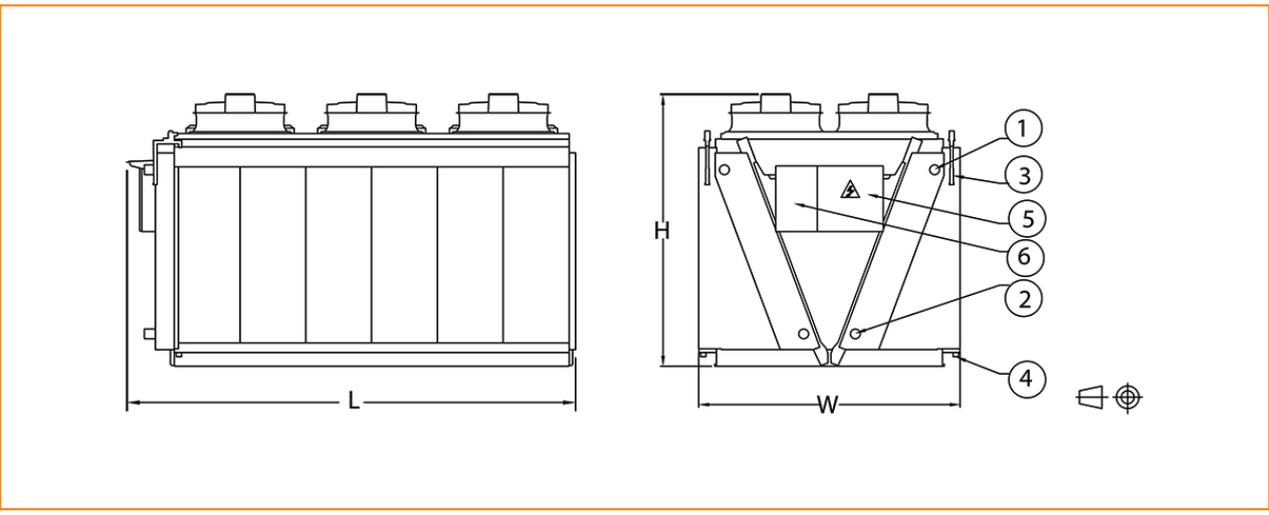
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### TVFC\_EC8023-D810\_EC8023-S810



1. Fluid outlet connection; 2. Fluid inlet connection; 3. Pre-cooler city water connection; 4. Pre-cooler water drain; 5. Electrical power panel; 6. Control panel.



Model	Nr. of Fans	Weights (kg)			Dimensions (mm)			Air Flow (m <sup>3</sup> /s)	Tube Internal Volume (dm <sup>3</sup> )	Surface (m <sup>2</sup> )	Connections
		Oper. Weight (kg)	Ship. Weight(kg)	Heaviest Section (kg)	L	W	H				
TVFC EC802 3-D810	6	2719	2218	2218	4297	2382	2490	37.2	338.0	1662.0	2
TVFC EC802 3-H810	6	2719	2218	2218	4297	2382	2490	37.2	338.0	1662.0	2
TVFC EC802 3-L810	6	2719	2218	2218	4297	2382	2490	37.2	338.0	1662.0	2
TVFC EC802 3-M810	6	2719	2218	2218	4297	2382	2490	37.2	338.0	1662.0	2
TVFC EC802 3-Q810	6	2719	2218	2218	4297	2382	2490	37.2	338.0	1662.0	2
TVFC EC802 3-S810	6	2719	2218	2218	4297	2382	2490	37.2	338.0	1662.0	2

# TVFC

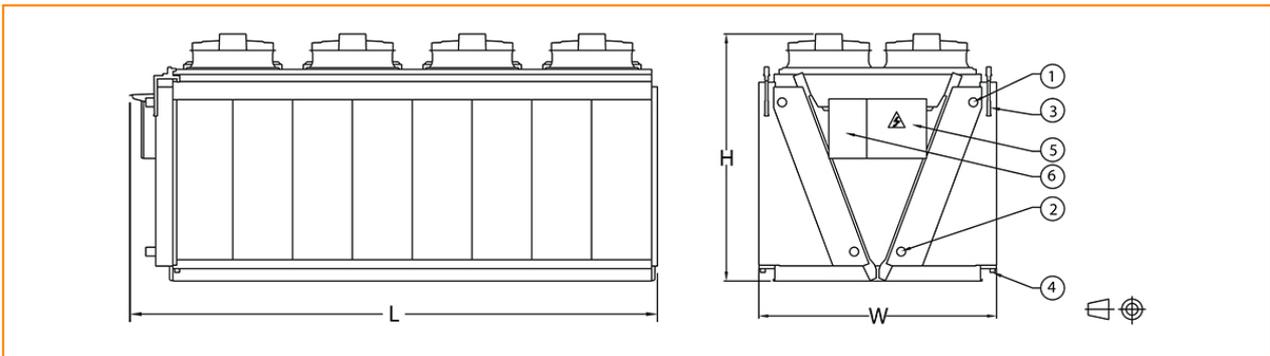
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### TVFC\_EC8024-D810\_EC8024-S810



1. Fluid outlet connection; 2. Fluid inlet connection; 3. Pre-cooler city water connection; 4. Pre-cooler water drain; 5. Electrical power panel; 6. Control panel.



Model	Nr. of Fans	Weights (kg)			Dimensions (mm)			Air Flow (m <sup>3</sup> /s)	Tube Internal Volume (dm <sup>3</sup> )	Surface (m <sup>2</sup> )	Connections
		Oper. Weight (kg)	Ship. Weight(kg)	Heaviest Section (kg)	L	W	H				
TVFC EC802 4-D810	8	3527	2874	2874	5497	2382	2490	49.5	434.0	2216.0	2
TVFC EC802 4-H810	8	3527	2874	2874	5497	2382	2490	49.5	434.0	2216.0	2
TVFC EC802 4-L810	8	3527	2874	2874	5497	2382	2490	49.5	434.0	2216.0	2
TVFC EC802 4-M810	8	3527	2874	2874	5497	2382	2490	49.5	434.0	2216.0	2
TVFC EC802 4-Q810	8	3527	2874	2874	5497	2382	2490	49.5	434.0	2216.0	2
TVFC EC802 4-S810	8	3527	2874	2874	5497	2382	2490	49.5	434.0	2216.0	2



# TVFC

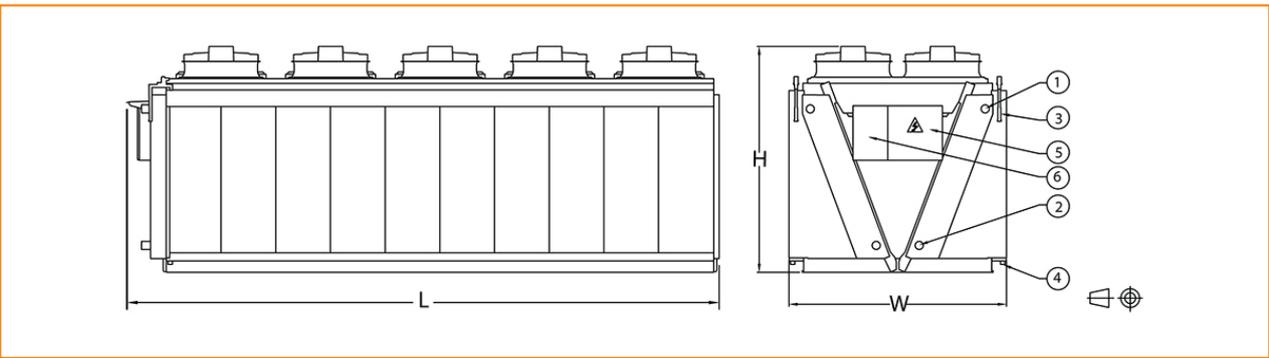
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### TVFC\_EC8025-D810\_EC8025-S810



1. Fluid outlet connection; 2. Fluid inlet connection; 3. Pre-cooler city water connection; 4. Pre-cooler water drain; 5. Electrical power panel; 6. Control panel.



Model	Nr. of Fans	Weights (kg)			Dimensions (mm)			Air Flow (m <sup>3</sup> /s)	Tube Internal Volume (dm <sup>3</sup> )	Surface (m <sup>2</sup> )	Connections
		Oper. Weight (kg)	Ship. Weight(kg)	Heaviest Section (kg)	L	W	H				
TVFC EC802 5-D810	10	4479	3652	3652	6697	2382	2490	61.9	554.0	2768.0	2
TVFC EC802 5-H810	10	4479	3652	3652	6697	2382	2490	61.9	554.0	2768.0	2
TVFC EC802 5-L810	10	4479	3652	3652	6697	2382	2490	61.9	554.0	2768.0	2
TVFC EC802 5-M810	10	4479	3652	3652	6697	2382	2490	61.9	554.0	2768.0	2
TVFC EC802 5-Q810	10	4479	3652	3652	6697	2382	2490	61.9	554.0	2768.0	2
TVFC EC802 5-S810	10	4479	3652	3652	6697	2382	2490	61.9	554.0	2768.0	2

# TVFC

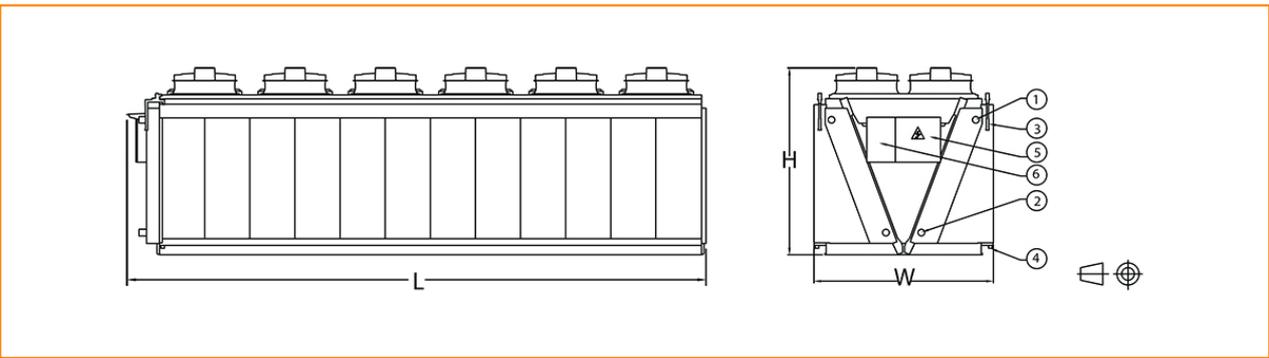
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### TVFC\_EC8026-D810\_EC8026-S810



1. Fluid outlet connection; 2. Fluid inlet connection; 3. Pre-cooler city water connection; 4. Pre-cooler water drain; 5. Electrical power panel; 6. Control panel.



Model	Nr. of Fans	Weights (kg)			Dimensions (mm)			Air Flow (m <sup>3</sup> /s)	Tube Internal Volume (dm <sup>3</sup> )	Surface (m <sup>2</sup> )	Connections
		Oper. Weight (kg)	Ship. Weight(kg)	Heaviest Section (kg)	L	W	H				
TVFC EC802 6-D810	12	5332	4355	4355	7897	2382	2490	74.3	650.0	3322.0	2
TVFC EC802 6-H810	12	5332	4355	4355	7897	2382	2490	74.3	650.0	3322.0	2
TVFC EC802 6-L810	12	5332	4355	4355	7897	2382	2490	74.3	650.0	3322.0	2
TVFC EC802 6-M810	12	5332	4355	4355	7897	2382	2490	74.3	650.0	3322.0	2
TVFC EC802 6-Q810	12	5332	4355	4355	7897	2382	2490	74.3	650.0	3322.0	2
TVFC EC802 6-S810	12	5332	4355	4355	7897	2382	2490	74.3	650.0	3322.0	2

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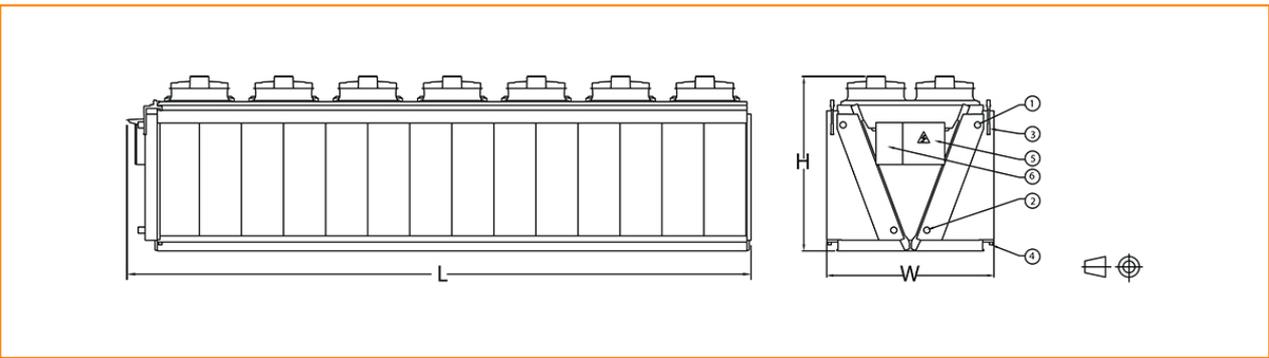
Dry and adiabatic cooling

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**Last update:** 31 March 2018

### TVFC\_EC8027-D810\_EC8027-S810



1. Fluid outlet connection; 2. Fluid inlet connection; 3. Pre-cooler city water connection; 4. Pre-cooler water drain; 5. Electrical power panel; 6. Control panel.



Model	Nr. of Fans	Weights (kg)			Dimensions (mm)			Air Flow (m <sup>3</sup> /s)	Tube Internal Volume (dm <sup>3</sup> )	Surface (m <sup>2</sup> )	Connections
		Oper. Weight (kg)	Ship. Weight(kg)	Heaviest Section (kg)	L	W	H				
TVFC EC802 7-D810	14	6144	5016	5016	9098	2382	2490	86.7	746.0	3876.0	2
TVFC EC802 7-H810	14	6144	5016	5016	9098	2382	2490	86.7	746.0	3876.0	2
TVFC EC802 7-L810	14	6144	5016	5016	9098	2382	2490	86.7	746.0	3876.0	2
TVFC EC802 7-M810	14	6144	5016	5016	9098	2382	2490	86.7	746.0	3876.0	2
TVFC EC802 7-Q810	14	6144	5016	5016	9098	2382	2490	86.7	746.0	3876.0	2
TVFC EC802 7-S810	14	6144	5016	5016	9098	2382	2490	86.7	746.0	3876.0	2