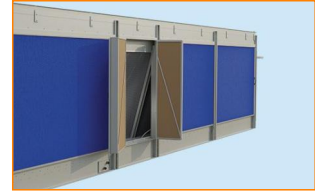


# Adiabatic Cooler - Model TRF

## Adiabatic cooling



## Key benefits

- Redundancy
- Optimized design
- Lowest maintenance and easy inspection



### TrilliumSeries Adiabatic Cooler - model TRF characteristics

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

### Capacity range

350 - 1600 kW

### Maximum entering fluid temperature

60°C

### Typical applications

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



## Redundancy

- **Large amount of fans** that provide an unmatched degree of **backup capacity** and guaranteed redundancy.
- Optional **internal partitioning panels** create individual air intake ducts for each fan, **eliminating thermal performance loss** due to air bypassing the coil through an idle fan.
- Pre-cooler pump recirculation system with **adiabatic backup guarantee** in case of pump failure.
- **Optimal controls** guarantee full performance even with loss of controller or communication.

## Optimized design

- Short gutter sections with diamond pattern holes and with pump distribution from the middle ensure an **optimal water distribution**.
- Separate panel with PLC interface.

## Lowest maintenance and easy inspection

- **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. **No risk of damage to critical components** such as heat exchangers and bottom panels.
- Pump **maintenance is possible during adiabatic operation** through large access doors in the pre-cooler.
- **Easy cleaning** for the water distribution system from the fan deck.

## Unrivalled reliability

- All structural elements are protected with [Baltibond hybrid coating](#), offering the same reliable life expectancy as stainless steel 304L.
- Special anti-abrasive protection on the pads ensures their **durability under harsh conditions**.
- Epoxy coating (optional) on the coils increases the **resistance against a humid environment**, high chlorides and other corrosive agents.

## Superb hygiene

- Without aerosol formation, TrilliumSeries Adiabatic Coolers- model TRF **minimize the Legionella risk**.
- 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.
- TrilliumSeries Adiabatic Coolers - model TRF cool incoming air without transferring water to the dry coil, **preventing possible uncontrolled algae growth and corrosion**.

## Plug and Play



- Already for more than a decade we provide **proven controls**.
- All site specific **parameters are factory set and tested** before the unit is shipped.
- Multiple control strategies allow to match any process needs at minimal operating costs.

**Interested in the TrilliumSeries Adiabatic Cooler - model TRF to cool your process fluid?**

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

## Downloads

- [TrilliumSeries Adiabatic Cooler - Model TRF \(brochure\)](#)
- [Spare Parts for TrilliumSeries adiabatic cooler - Model TRF](#)
- [Operating & Maintenance TRF](#)
- [Rigging & Installation TRF](#)



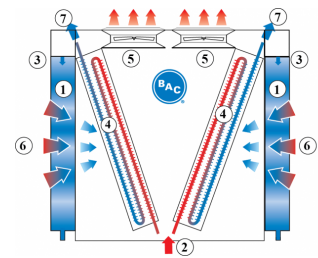
# Principle of Operation

## Adiabatic cooling

### Principle of Operation

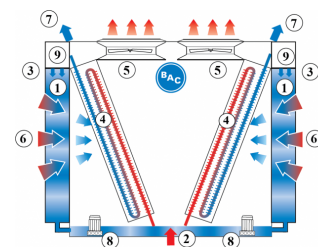
#### Once through

The TRF is a V-shaped TrilliumSeries adiabatic 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 TRF is a TrilliumSeries Adiabatic 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 TrilliumSeries Adiabatic Cooler - Model TRF to cool your process fluid?** Contact your local [BAC representative](#) for more information.



# Construction details

## Adiabatic cooling

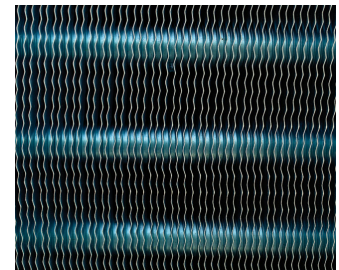
### Construction details

#### 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

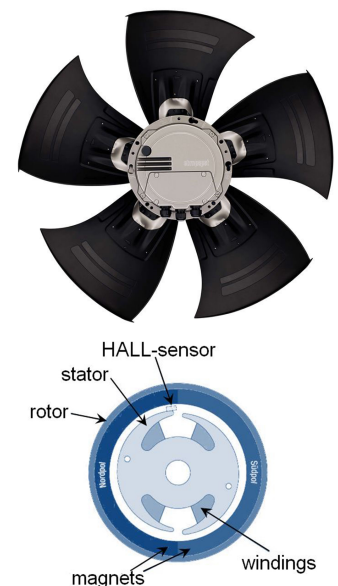
- The V-shaped finned coil is constructed of **staggered and seamless copper tubes** (12 mm diameter) with aluminium, rippled and corrugated fins.
- **2,5 mm fin spacing** for optimal air turbulence
- Thick and seamless copper headers and threaded steel connections
- Pressure tested at 15 bar
- **Try our option for aggressive environments:** special pre-coated anti-corrosion aluminium fins.



#### 3. Air movement system

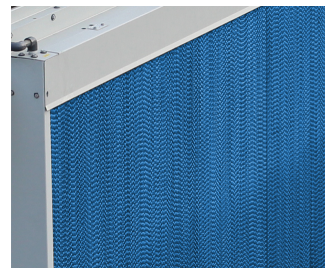
- **Axial fan** with exceptionally **compact direct drive** short integrated motor and fan guard.
- The **low profile fan** with fan guard features an **impeller and motor** and is balanced as a complete unit using dynamic single plane balancing. Balance grade is G6.3.
- Fan and motor totally **maintenance 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.



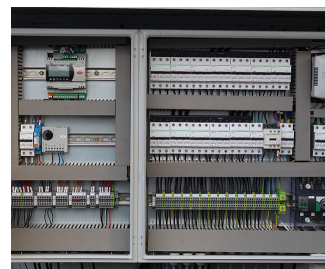
#### 4. Adiabatic pre-cooler

- 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.
- Equipped with an **internal heater** to prevent damage to the internal components inside the electrical panel for **ambient temperatures as low as -40°C**.
- **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



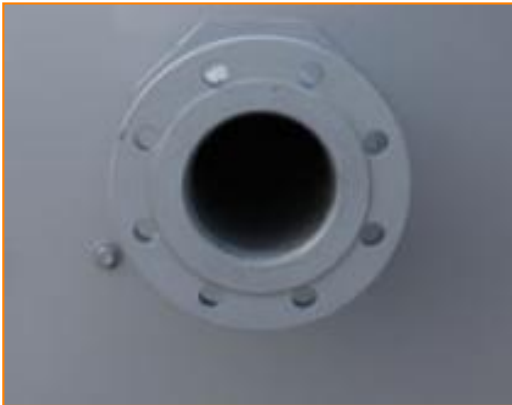
**Like to know more about the TrilliumSeries Adiabatic Cooler - Model TRF construction details?** Contact your [local BAC representative](#).

# Options and Accessories

## Adiabatic cooling

### Options and Accessories

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



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



Increase the coil's resistance against a harsh atmosphere.

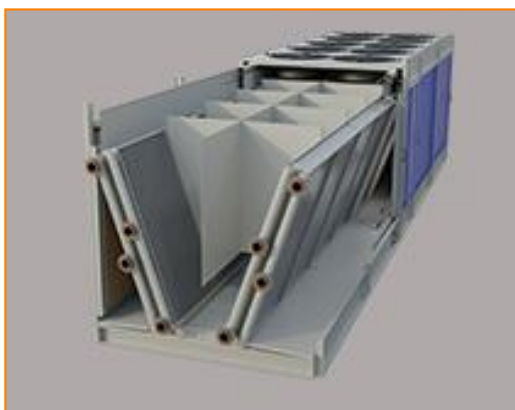




Allow for operation without any anti-freeze agents and avoid a coil freeze-up risk at the same time.



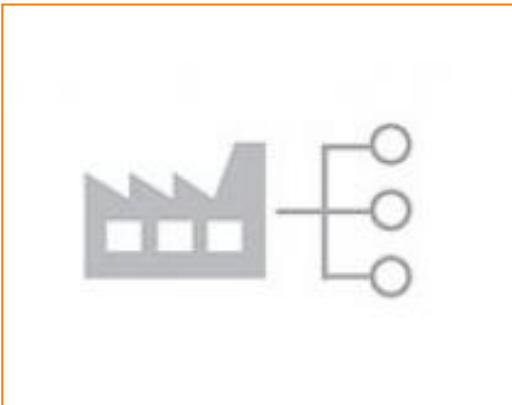
Reducing noise at air **intake and discharge points** brings us closed to silent cooling equipment.



Increase the degree of redundancy, providing a higher backup capacity for your installation.



The recirculation pump helps to further cut down on water consumption.



This option integrates the adiabatic cooler's control system in your BMS system.



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

# TRF-1010

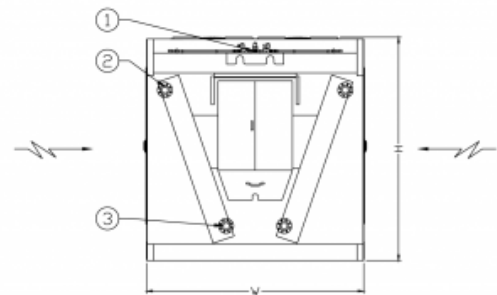
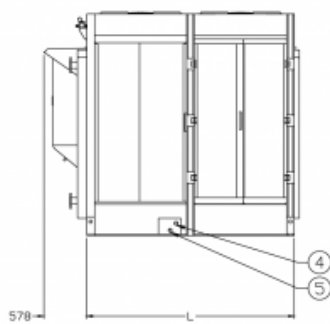
## Adiabatic cooling

### Engineering data

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**Last update:** 18/01/2022

### TRF-1010



1. Water supply;
2. Fluid outlet connection;
3. Fluid inlet connection;
4. Overflow;
5. Drain.



| 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    | Δ                            | Υ    |   |                           |             |
| TRF 1 010E-C80EL 17E | 4           | 3580              | 3030             | 3030                  | 3595            | 2985 | 2972 | 27.1                         | 27.1 | 342.0                                   | 1714.0                    | 2           |
| TRF 1 010E-C80E M17E | 4           | 3580              | 3030             | 3030                  | 3595            | 2985 | 2972 | 27.1                         | 27.1 | 342.0                                   | 1714.0                    | 2           |
| TRF 1 010E-C80E S17E | 4           | 3580              | 3030             | 3030                  | 3595            | 2985 | 2972 | 27.1                         | 27.1 | 342.0                                   | 1714.0                    | 2           |

# TRF-1014

## Adiabatic cooling

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**Last update:** 18/01/2022

### TRF-1014



1. Water supply; 2. Fluid outlet connection; 3. Fluid inlet connection; 4. Overflow; 5. Drain.



| 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    | Δ                            | Υ    |   |                           |             |
| TRF 1<br>014E-<br>C80EL<br>26E | 6           | 4935              | 4130             | 4130                  | 4935            | 2985 | 2972 | 41.0                         | 41.0 | 512.0                                   | 2584.<br>0                | 2           |
| TRF 1<br>014E-<br>C80E<br>M26E | 6           | 4935              | 4130             | 4130                  | 4935            | 2985 | 2972 | 41.0                         | 41.0 | 512.0                                   | 2584.<br>0                | 2           |
| TRF 1<br>014E-<br>C80E<br>S26E | 6           | 4935              | 4130             | 4130                  | 4935            | 2985 | 2972 | 41.0                         | 41.0 | 512.0                                   | 2584.<br>0                | 2           |

# TRF-1018

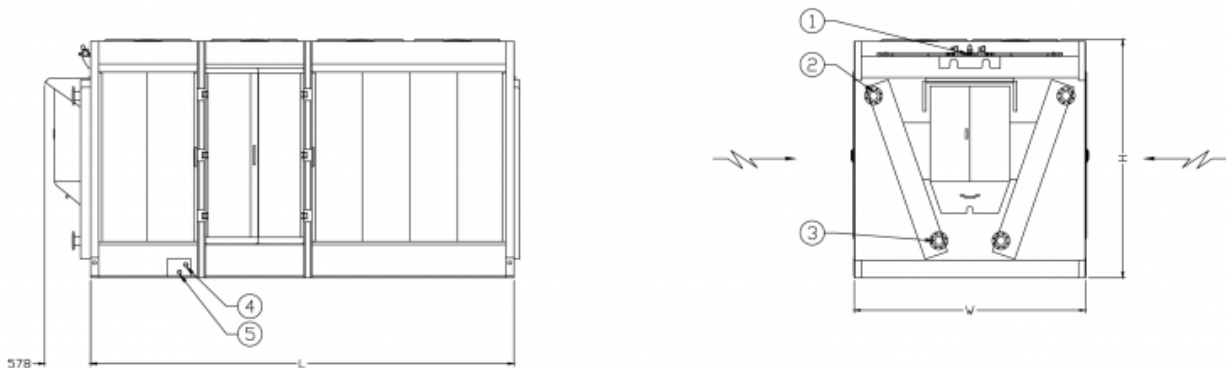
## Adiabatic cooling

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**Last update:** 18/01/2022

### TRF-1018



1. Water supply; 2. Fluid outlet connection; 3. Fluid inlet connection; 4. Overflow; 5. Drain.



| 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    | Δ                            | Υ    |   |                           |             |
| TRF 1<br>018E-<br>C80E<br>D34E | 8           | 6015              | 4940             | 4940                  | 6132            | 2985 | 2972 | 54.8                         | 54.8 | 664.0                                   | 3362.0                    | 2           |
| TRF 1<br>018E-<br>C80E<br>M34E | 8           | 6015              | 4940             | 4940                  | 6132            | 2985 | 2972 | 54.8                         | 54.8 | 664.0                                   | 3362.0                    | 2           |
| TRF 1<br>018E-<br>C80E<br>S34E | 8           | 6015              | 4940             | 4940                  | 6132            | 2985 | 2972 | 54.8                         | 54.8 | 664.0                                   | 3362.0                    | 2           |



# TRF-1022

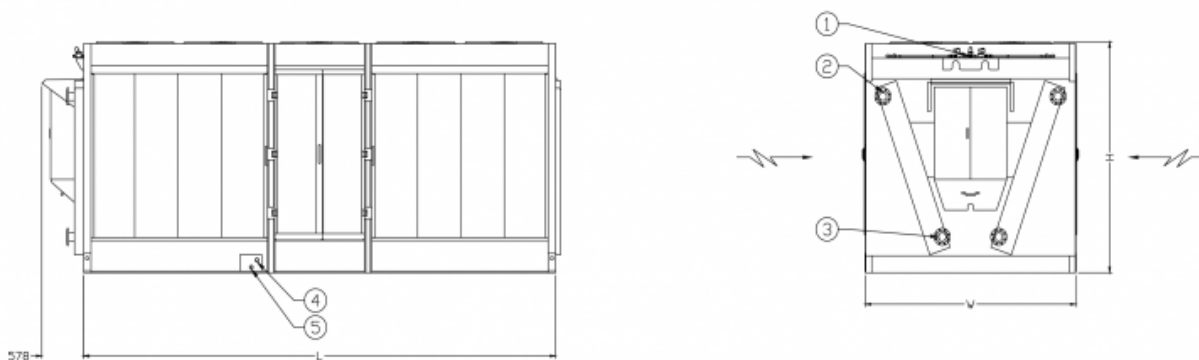
Adiabatic cooling

## Engineering data

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**Last update:** 18/01/2022

### TRF-1022



1. Water supply; 2. Fluid outlet connection; 3. Fluid inlet connection; 4. Overflow; 5. Drain.



| 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    | Δ                            | Υ    |   |                           |             |
| TRF 1<br>022E-<br>C80E<br>D43E | 10          | 7200              | 5900             | 5900                  | 7334            | 2985 | 2972 | 68.5                         | 68.5 | 818.0                                   | 4140.<br>0                | 2           |
| TRF 1<br>022E-<br>C80E<br>M43E | 10          | 7200              | 5900             | 5900                  | 7334            | 2985 | 2972 | 68.5                         | 68.5 | 818.0                                   | 4140.<br>0                | 2           |
| TRF 1<br>022E-<br>C80E<br>S43E | 10          | 7200              | 5900             | 5900                  | 7334            | 2985 | 2972 | 68.5                         | 68.5 | 818.0                                   | 4140.<br>0                | 2           |

# TRF-1026

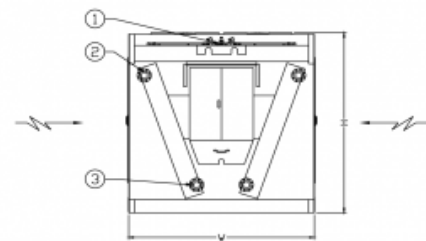
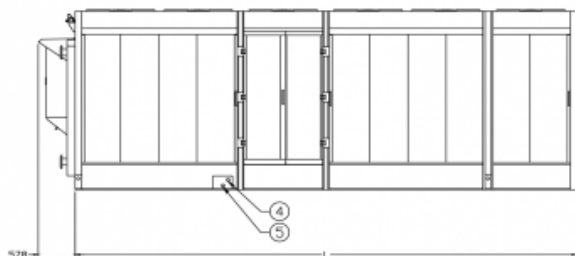
## Adiabatic cooling

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**Last update:** 18/01/2022

### TRF-1026



1. Water supply; 2. Fluid outlet connection; 3. Fluid inlet connection; 4. Overflow; 5. Drain.



| 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    | Δ                            | Υ    |   |                           |             |
| TRF 1<br>026E-<br>C80E<br>D51E | 12          | 8405              | 6810             | 6810                  | 8672            | 2985 | 2972 | 82.3                         | 82.3 | 988.0                                   | 5008.0                    | 2           |
| TRF 1<br>026E-<br>C80E<br>M51E | 12          | 8405              | 6810             | 6810                  | 8672            | 2985 | 2972 | 82.3                         | 82.3 | 988.0                                   | 5008.0                    | 2           |
| TRF 1<br>026E-<br>C80E<br>Q51E | 12          | 8405              | 6810             | 6810                  | 8672            | 2985 | 2972 | 82.3                         | 82.3 | 988.0                                   | 5008.0                    | 2           |

# TRF-1030

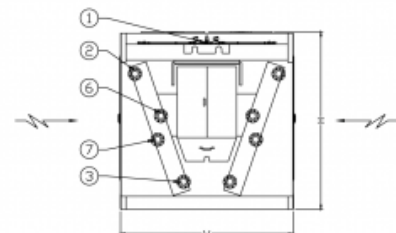
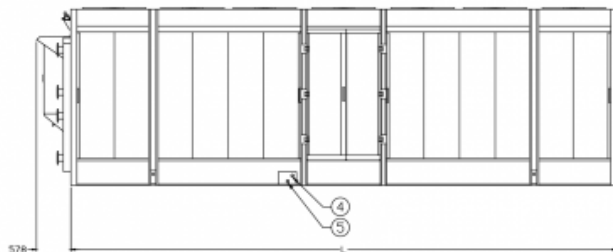
Adiabatic cooling

## Engineering data

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**Last update:** 18/01/2022

### TRF-1030



1. Water supply; 2. Fluid outlet connection; 3. Fluid inlet connection; 4. Overflow; 5. Drain.



| 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    | Δ                            | Υ    |   |                           |             |
| TRF 1<br>030E-<br>C80E<br>D60E | 14          | 9715              | 7840             | 7840                  | 10012           | 2985 | 2972 | 96.3                         | 96.3 | 1158.<br>0                              | 5876.<br>0                | 4           |
| TRF 1<br>030E-<br>C80E<br>D60E | 14          | 9715              | 7840             | 7840                  | 10012           | 2985 | 2972 | 96.3                         | 96.3 | 1158.<br>0                              | 5876.<br>0                | 4           |
| TRF 1<br>030E-<br>C80E<br>M60E | 14          | 9715              | 7840             | 7840                  | 10012           | 2985 | 2972 | 96.3                         | 96.3 | 1158.<br>0                              | 5876.<br>0                | 4           |

# TRF-1034

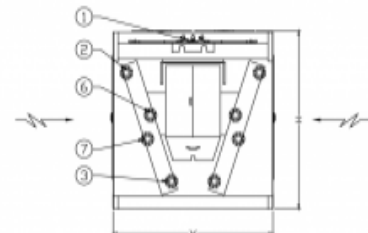
Adiabatic cooling

## Engineering data

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**Last update:** 18/01/2022

### TRF-1034



1. Water supply; 2. Fluid outlet connection; 3. Fluid inlet connection; 4. Overflow; 5. Drain.



| 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    | Δ                            | Υ     |   |                           |             |
| TRF 1<br>034E-<br>C80E<br>D68E | 16          | 10775             | 8690             | 8690                  | 11215           | 2985 | 2972 | 110.0                        | 110.0 | 1312.0                                  | 6654.0                    | 4           |
| TRF 1<br>034E-<br>C80E<br>M68E | 16          | 10775             | 8690             | 8690                  | 11215           | 2985 | 2972 | 110.0                        | 110.0 | 1312.0                                  | 6654.0                    | 4           |
| TRF 1<br>034E-<br>C80E<br>Q68E | 16          | 10775             | 8690             | 8690                  | 11215           | 2985 | 2972 | 110.0                        | 110.0 | 1312.0                                  | 6654.0                    | 4           |



# TRF-1038

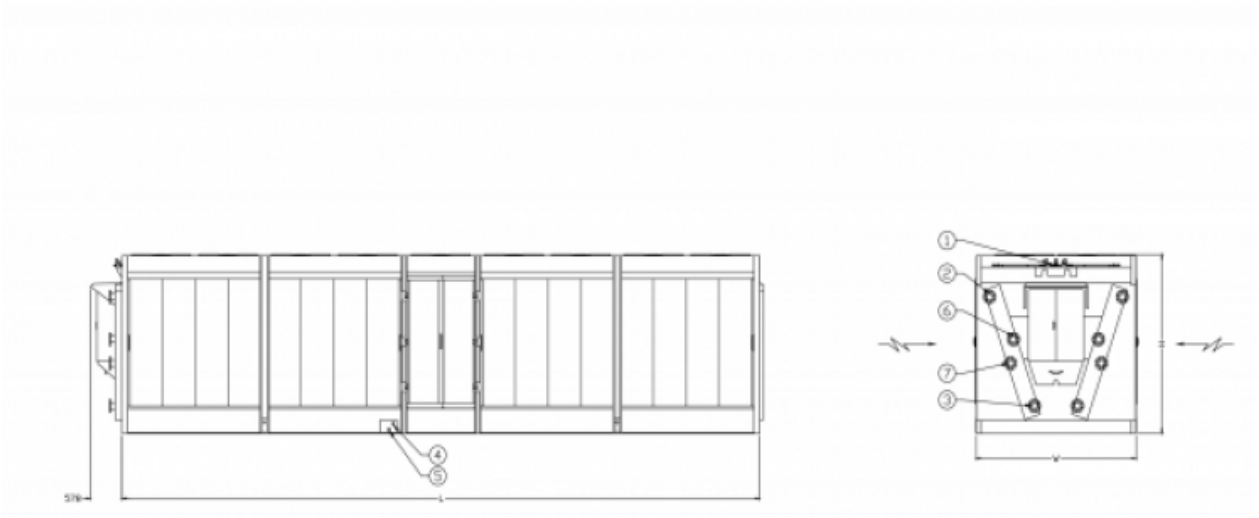
Adiabatic cooling

## Engineering data

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**Last update:** 18/01/2022

### TRF-1038



1. Water supply; 2. Fluid outlet connection; 3. Fluid inlet connection; 4. Overflow; 5. Drain.



| 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    | Δ                            | Υ     |   |                           |             |
| TRF 1<br>038E-<br>C80E<br>D77E | 18          | 11855             | 9540             | 9540                  | 12415           | 2985 | 2972 | 123.5                        | 123.5 | 1464.<br>0                              | 7432.<br>0                | 4           |
| TRF 1<br>038E-<br>C80E<br>M77E | 18          | 11855             | 9540             | 9540                  | 12415           | 2985 | 2972 | 123.5                        | 123.5 | 1464.<br>0                              | 7432.<br>0                | 4           |
| TRF 1<br>038E-<br>C80E<br>Q77E | 18          | 11855             | 9540             | 9540                  | 12415           | 2985 | 2972 | 123.5                        | 123.5 | 1464.<br>0                              | 7432.<br>0                | 4           |