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**Chilled water perimeter mounted units**

**TRF CW**

**for Data Centers**

Range: 33.4–257.1 kW



## Optimised internal design

The new chilled water air conditioners of the TRF CW series are particularly suitable for IT facilities where **temperature and air flow need to be continuously monitored**. The components of the TRF CW unit offer the most efficient solution for **Data Center cooling**, ensuring **reliability, precise control of thermo-hygrometric conditions** and the **flexibility** to adapt to different working conditions.

## Main Advantages

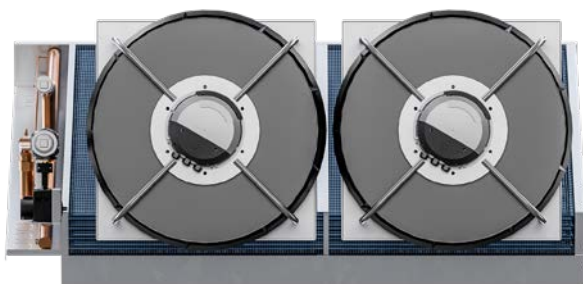
### Easier scheduled maintenance

The unit has been painstakingly designed to ensure frontal access to components. This makes routine maintenance easier in full compliance with safety standards.



### Double circuit

Chilled water units are also available with a double circuit. In this version, the supply is via two different hydraulic circuits that can offer the utmost operational continuity if one of the two circuits malfunctions. Each circuit is equipped with a regulating valve.



### Ventilation adjustment

Depending on the air distribution logic in the server room, it is possible to adjust the machine on-board ventilation system to ensure a constant air flow rate (airflow control) or a constant available overpressure ( $\Delta P$  control). The latter is particularly useful if a floating floor is used.

### Finned pack coil with hydrophilic coating

All models in the TRF CW range feature heat exchange coils with hydrophilic coating. This special coating - together with adequate adjustment of air through-flow speeds - helps condensate collection and outflow during the dehumidification process, preventing any dripping on the inside and outside of the unit.





### Accurate regulation with multiple types of valves

All units in the TRF CW range have as standard regulating valves fitted with 0-10V servo motor, selectable in 2-way execution, with variable or 3-way flow system or with servo motor with spring return. Pressure-independent valves can also be fitted on request. All these types of valves ensure the utmost adjustment accuracy while maintaining the system's hydronic balance

### New design: efficiency, flexibility and optimization of internal layout

Internal spaces have been completely redesigned for a better distribution of components. The new internal layout features a larger pack heat exchanger and a state-of-the-art fan for maximum air flow and efficiency. Following a painstaking dynamic fluid study, the filtering surface has also been expanded, now it is distributed over the entire coil to further reduce air pressure drops.



### Ventilation EC 2.0

EC PLUG fans, standard throughout the range, are adjustable using different logics: flow rate, overpressure, constant  $\Delta P$  and  $\Delta T$ . Their accurate adjustment allows an efficient use of power for ventilation and a consequent reduction of the system's PUE. The speed, with extended range, is adjusted via the Modbus protocol. Finally, the "emergency speed" function allows for fan operation even in the event of microprocessor malfunctions.

### Guaranteed flexibility

With three different types of heat exchangers, each optimised to a specific water  $\Delta T$  value (difference in water temperature between inlet/outlet), we ensure high flexibility in adapting to the system or liquid chillers already in operation, without compromising cooling performance:

#### Geometry "A"

for  $\Delta T = 5^\circ\text{C}$

#### Geometry "B"

for  $\Delta T = 8^\circ\text{C}$

#### Geometry "C"

for  $\Delta T = 12^\circ\text{C}$



## Technological components



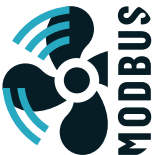
### Multi-protocol communication interface

HiRef units can be integrated with the customer's external supervision Building Management System (BMS), using the most popular communication protocols, including Modbus RTU, Modbus/IP, BacNet, LonWorks, SNMP.



### EC Radial Fans

Radial or centrifugal fans are characterised by backward blades. Air is taken in the axial direction, parallel to the rotation axis and delivered radially, perpendicular to the rotation axis. This type of fan does not require an external screw, has a high head and is suitable for use in indoor units where the air is often ducted and recirculated. They are driven by electronically commutated (EC) brushless permanent-magnet (BLDC) synchronous motors. The use of these motors reduces unit consumption, noise and footprint, improves the efficiency and life cycle of the system through accurate control of speed and acceleration, resulting in less heat dissipation. In addition, inrush currents and sparks are eliminated.



### Modbus controlled fans

The Modbus protocol, unlike the 0-10V signal, allows to not only control the speed of the fans, but also to capture, monitor and manage considerably more data and alarm information.



### Pressure independent valve (PICV)

The pressure independent valve (PICV) controls the automatic flow balance. Traditional valves are affected by the pressure in the system, causing variable flow rate circulation in the unit. When the system pressure changes, for example due to the shutdown or start-up of other units, the compensation system of this independent valve helps to keep the water flow constant and to always guarantee unit operation in the agreed project conditions.



### Fast restart

The fast restart function (on request) allows the unit to restart quickly after a mains power outage. This optional feature is available with dual power to minimise restart times.



### On-board Humidifier

Humidifiers are essential components for maintaining the right level of humidity in the server room and ensuring the proper functioning of the room equipment. Humidifiers with immersed electrodes can be installed in HiRef units, managed by proprietary software which, equipped with a special probe, keeps humidity levels at pre-established values.



### Variable geometry coil (Flexy)

Chilled water units can be selected based on the room working conditions. HiRef has designed three configurations of the heat exchange coils, each suitable for operation in commonly found operating conditions:

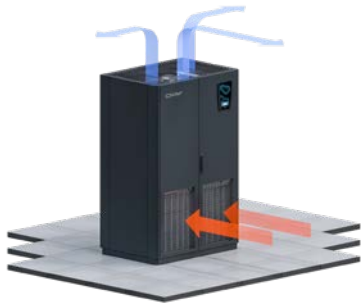
- **A:** Solution for systems with low  $\Delta T$  ( $\approx 5^\circ\text{C}$ ) and high water flow rates
- **B:** Solution for systems with moderate  $\Delta T$  ( $\approx 8^\circ\text{C}$ ) and average water flow rates
- **C:** Solution for systems with high  $\Delta T$  ( $\approx 12^\circ\text{C}$ ) and low water flow rates



### Double circuit

The chilled water units are also available in a double circuit version, fed from two different independent hydraulic circuits, able to offer maximum redundancy in case one of them should go out of service. Each circuit is equipped with its own regulating valve.

## Air flow configurations



Upflow



Downflow

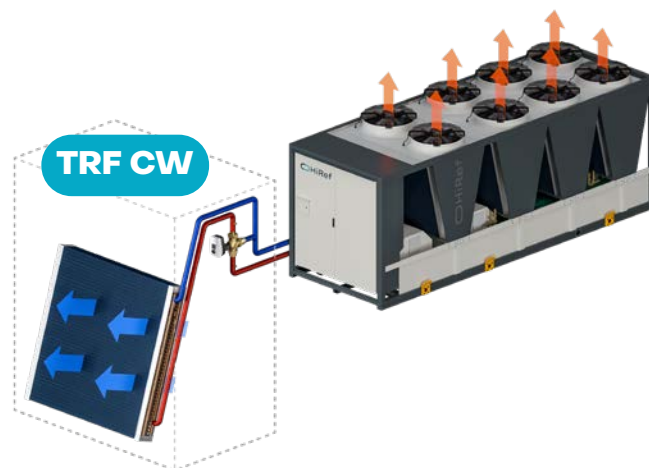


Displacement

## Types of system



CHILLED WATER



## Additional benefits

- Temperature control through heating and post-heating systems using electric heating elements, additional hot water coil or both
- Humidity control through dehumidification and humidification
- Humidifier installed on board the machine
- Fan speed modulation based on thermal load (constant  $\Delta T$ )
- Hydraulic connections from the bottom of the unit
- Broad choice of accessories including basic modules, plenums for ducting, plenums for direct Free-Cooling
- Air filter class G3 supplied as standard Air Filters G4, M5, F7
- Double power supply with automatic switch
- Double panelling only on the front doors or on the whole machine
- Instant reading of water flow rate, water inlet and outlet temperatures, or cooling capacity

TRF CW		040	060	070	080	090	100	110	130	170	240
<b>VERSION A - AIR TEMPERATURE 24°C - RELATIVE HUMIDITY 50% / WATER TEMPERATURE IN 7°C OUT 12°C</b>											
COOLING CAPACITY	kW	38.1	58	64.4	80.8	85.3	105.5	103.1	137.2	177.2	257.1
SHR	-	0.86	0.79	0.82	0.78	0.81	0.77	0.83	0.77	0.77	0.74
EER	-	31.07	39.97	33.28	37.31	34.93	40.41	33.65	40.43	36.02	34.82
<b>VERSION A - AIR TEMPERATURE 30°C - RELATIVE HUMIDITY 35% / WATER TEMPERATURE IN 10°C OUT 15°C</b>											
COOLING CAPACITY	kW	43.3	59.6	67.9	80.8	89.9	104	112.3	133.7	172.7	236.3
SHR	-	1	0.99	1	0.99	1	0.97	1	0.99	0.99	0.94
EER	-	35.36	41.06	35.05	37.33	36.82	39.84	36.66	39.41	35.11	32.01
<b>VERSION A - AIR TEMPERATURE 35°C - RELATIVE HUMIDITY 30% / WATER TEMPERATURE IN 15°C OUT 20°C</b>											
COOLING CAPACITY	kW	43.7	58.6	68.2	80.2	89.3	102.3	112.9	133.9	172.9	237.5
SHR	-	1	1	1	1	1	1	1	1	1	1
EER	-	35.65	40.36	35.22	37.03	36.57	39.16	36.84	39.46	35.16	32.17
<b>VERSION B - AIR TEMPERATURE 30°C - RELATIVE HUMIDITY 35% / WATER TEMPERATURE IN 10°C OUT 18°C</b>											
COOLING CAPACITY	kW	38.9	55.2	63.3	74.8	82.4	98.4	104.8	126.3	163.1	229.5
SHR	-	1	1	1	1	1	1	1	1	1	0.96
EER	-	31.69	38	32.69	34.54	33.73	37.69	34.19	37.2	33.15	31.08
<b>VERSION B - AIR TEMPERATURE 35°C - RELATIVE HUMIDITY 30% / WATER TEMPERATURE IN 15°C OUT 23°C</b>											
COOLING CAPACITY	kW	39.1	55	63.4	75.3	82.4	98.1	104.9	125.9	162.6	228.4
SHR	-	1	1	1	1	1	1	1	1	1	1
EER	-	31.89	37.91	32.74	34.8	33.74	37.56	34.24	37.1	33.06	30.94
<b>VERSION C - AIR TEMPERATURE 30°C - RELATIVE HUMIDITY 35% / WATER TEMPERATURE IN 10°C OUT 22°C</b>											
COOLING CAPACITY	kW	33.4	49.8	54.4	67.5	73.2	87.6	90.1	111.8	144.4	210.2
SHR	-	1	1	1	1	1	1	1	1	1	1
EER	-	27.23	34.32	28.1	31.2	30	33.55	29.39	32.94	29.35	28.47
<b>VERSION C - AIR TEMPERATURE 35°C - RELATIVE HUMIDITY 30% / WATER TEMPERATURE IN 15°C OUT 27°C</b>											
COOLING CAPACITY	kW	33.9	50.1	56.5	67.9	73.9	87.9	91	112.3	145.1	210.6
SHR	-	1	1	1	1	1	1	1	1	1	1
EER	-	27.67	34.49	29.17	31.35	30.24	33.68	29.7	33.1	29.49	28.52
AIR FLOW	m <sup>3</sup> /h	10700		14500		18000		24000		18000	31000
FANS ABSORBED POWER	kW	1.2	1.5	1.9	2.2	2.4	2.6	3.1	3.4	4.9	7.4
POWER SUPPLY	-	400/3+N/50									
SOUND PRESSURE LEVEL at 2 meters free field	dB	61		67		72		66	67	72	71
DIMENSIONS [LxHxD]	mm	1010x2000x890		1270x2000x890		1760x2000x890		2020x2000x890			

Performance data relating to Downflow versions. | Also available with 60 Hz power supply. | Units also available in the models Upflow and Displacement, with the exception of size 240. | Height of model Displacement 2250 mm.

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