

HiRef

Innovators above
the standards

INDUSTRY

DATA CENTER



Air condensed perimeter mounted units

TREF DX A

for Data Centers

Range: 22.8-134.7 kW



The TREF DX series perimeter mounted units are direct expansion units with scroll on-off compressors designed to be installed in medium/large-sized premises such as server rooms and labs or for applications where **accurate control of thermo-hygrometric parameters and round-the-clock operation are required**. The top priority for internal design and for the choice of components is **energy efficiency** - to **optimise the system overall electricity** consumption with a positive impact on the Data Center Power Usage Effectiveness (PUE). Versatile and flexible range Thanks to different refrigerating configurations available, the TREF DX range is suitable for a number of applications in the field of Data Center air conditioning.

TREF A: Air condensing with remote condenser.

TREF W: Dry-Cooler or Evaporative tower water condensing.

TREF Z: Mains water condensing (15°C).

TREF F: Water condensing and indirect water Free-Cooling.

TREF D: Air condensing with remote condenser and Dual Cooling.

TREF K: Dry-Cooler or Evaporative tower water condensing and Dual Cooling.

TREF Q: Mains water condensing (15°C) and Dual Cooling.

TREF DX A units are air-condensed perimeter-mounted units in the TREF range; they are widely used for the cooling of Data Centers. The air-condensed solution offers a **simple system design**, thanks to the absence of auxiliary circuits and pumps; **the cooling circuit is managed by the cabinet**, and both the indoor unit and the remote condenser are **easy to install**.

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.



Efficiency

The performance, reliability and efficiency of HiRef units are guaranteed by using the best quality components and by cleverly designed internal and external layouts.

Green

HiRef is constantly committed to the search for refrigerants that have an increasingly reduced environmental impact. The use of ASHRAE Class A1 refrigerants, non-toxic and non-flammable, is essential for the "close control" application. All TREF DX A units are available with R134a and R513A refrigerants.

Dual circuit

Double-circuit versions are already available at low power levels. This solution offers maximum unit redundancy and ensures continuity of service, more precise refrigerating power and less absorption for partial Data Center loads.

Safety in the server room

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



Remote condensers

All units can be combined with HiRef remote condensers, choosing from different combinations to meet all system needs. Oversize remote condensers are ideal for warmer environments, where it is necessary to keep the condensing temperature under control, while the compact condensers on the other hand are small in terms of both size and consumption. The condensers, used with dual-circuit units, are available with a single cooling circuit for maximum reliability and redundancy of the system or with a double cooling circuit, to reduce installation spaces and costs.



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.



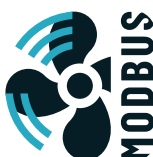
Scroll compressors

Scroll compressors include a mobile scroll, driven by the motor, which completes orbital revolutions and a fixed scroll that is coupled to it. The orbital motion creates a series of gas pockets that move from one scroll to the other. When moving closer to the centre of the scroll, where exhaust takes place, the gas is compressed to smaller and smaller volumes until the desired delivery pressure is reached. Scroll technology improves volumetric efficiency and flow continuity, reduces noise and leakage and eliminates harmful volumes and downtime.



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.



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.



Modulating hot gas post-heating

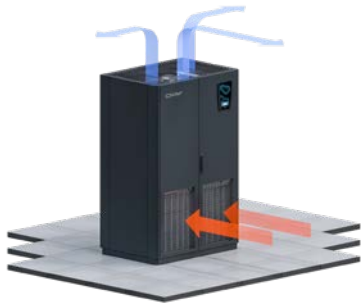
Post-heating by modulating hot gas controls the air temperature through the action of an additional coil, powered by the gas delivered by the compressor and partially bypassed by the condenser towards the coil. Unlike the On/Off version, the flow of hot gas is controlled by a diverter valve, which accurately regulates the flow rate required for post-heating. This option is only available for direct expansion units.



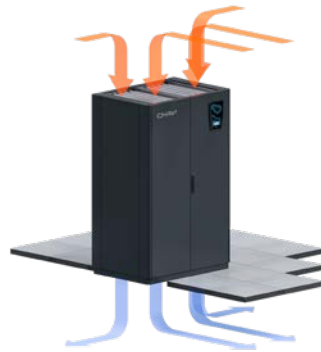
Low GWP refrigerant

The Global Warming Potential (GWP) index is a numerical indicator that identifies the environmental impact of a substance. It measures the extent to which a gas contributes to the greenhouse effect, in relation to carbon dioxide (CO₂) whose baseline value is equal to 1. This parameter is used to determine the amount in kilograms of CO₂ corresponding to the environmental impact of the release of a refrigerant gas into the atmosphere. The use of low GWP refrigerants, such as R513A, R454B, R1234ze, CO₂, allows the environmental impact of air conditioning systems to be significantly reduced.

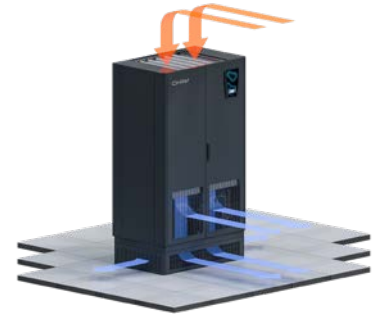
Air flow configurations



Upflow



Downflow

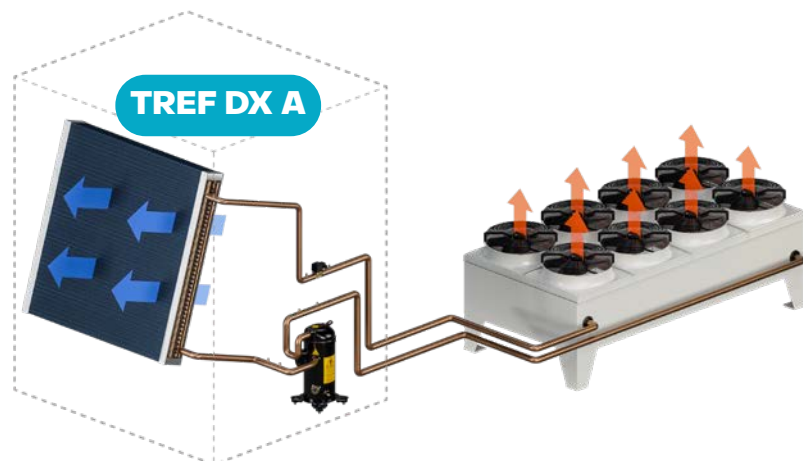


Displacement

Types of system



AIR/AIR



Additional benefits

- Refrigerant R410A: Also available with R513A and R134a
- EC Fans
- Scroll inverter and on-off compressors
- Temperature control through heating and post-heating systems with electric heating elements, hot water and hot gas
- Humidity control through dehumidification and humidification
- 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
- Constant flow (airflow control) or constant available overpressure (ΔP control) ventilation modulation
- Electronic expansion valves
- Long distance kits for optimal operation in the case of large distances between indoor and outdoor units
- Low temperature kits for optimal operation in the case of installation in particularly cold environments

Technical table

TREF DX A		0201	0251	0281	0311	0401	0272	0302	0362	0422
AIR TEMPERATURE 24°C - RELATIVE HUMIDITY 50% / OUTDOOR AIR TEMPERATURE 35°C										
COOLING CAPACITY	kW	22.8	26.1	30.2	34.1	41.4	27.4	35.8	39.1	44.1
SHR	-	0.99	0.95	0.92	0.86	0.97	1	1	0.98	0.95
EER	-	3.82	4.26	4.03	4.31	3.91	4.48	4.37	3.89	3.77
TOTAL POWER INPUT	kW	7.1	7.2	8.8	9.2	12.5	8.1	10.2	12	13.7
AIR TEMPERATURE 30°C - RELATIVE HUMIDITY 35% / OUTDOOR AIR TEMPERATURE 35°C										
COOLING CAPACITY	kW	25.6	28.7	33	36.4	45.5	30.1	41	44.5	48.6
SHR	-	1	1	1	1	1	1	1	1	1
EER	-	4.12	4.64	4.32	4.55	4.22	4.88	4.84	4.3	4.05
TOTAL POWER INPUT	kW	7.3	7.3	8.9	9.3	12.7	8.1	10.4	12.3	14
AIR FLOW	m ³ /h	6800			7280			12950		
POWER SUPPLY	-	400/3+N/50								
SOUND PRESSURE LEVEL at 2 meters free field	dB	55	56	58	63	59	61	62	65	
DIMENSIONS [LxHxD]	mm	1010x2000x805			1270x2000x805			1760x2000x805		

TREF DX A		0452	0532	0592	0602	0692	0762	0852	1002	1204	
AIR TEMPERATURE 24°C - RELATIVE HUMIDITY 50% / OUTDOOR AIR TEMPERATURE 35°C											
COOLING CAPACITY	kW	49	58.3	63.8	65	75.6	83.1	89.6	98.7	126.6	
SHR	-	0.91	0.9	0.85	0.9	0.89	0.86	0.92	0.87	0.81	
EER	-	3.76	3.97	3.75	3.77	4	3.73	4.21	3.97	3.66	
TOTAL POWER INPUT	kW	15	17.3	19.6	20.3	22	25.4	24.6	28.2	37.3	
AIR TEMPERATURE 30°C - RELATIVE HUMIDITY 35% / OUTDOOR AIR TEMPERATURE 35°C											
COOLING CAPACITY	kW	52.8	62.3	67.5	70.9	81.4	88.3	97.7	106.8	134.7	
SHR	-	1	1	1	1	1	1	1	1	0.99	
EER	-	3.98	4.18	3.92	4.03	4.21	3.93	4.54	4.18	3.87	
TOTAL POWER INPUT	kW	15.2	17.5	19.8	20.7	22.4	25.6	24.9	28.9	37.5	
AIR FLOW	m ³ /h	12950	14150			19415			21500	24000	
POWER SUPPLY	-	400/3+N/50									
SOUND PRESSURE LEVEL at 2 meters free field	dB	65	67			68			76	80	
DIMENSIONS [LxHxD]	mm	1760 x2000 x805	2020x2000x805			2510x2000x805			2510x2000x950	3160 x2000 x950	

Performance data relating to Downflow versions with R410A refrigerant combined with standard HiRef remote condenser. | Also available with 60 Hz power supply. | Height of model Displacement 2250 mm.

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