

# HiRef

Innovators above  
the standards

SERVICES

DATA CENTER

INDUSTRY



## Air condensed chillers

# TTX

with oil-free centrifugal compressors

Range: 281-1057 kW



The TTX range is the most innovative and efficient solution for air-condensed liquid chillers. The use of the oil-free centrifugal compressor in combination with new small-sized flooded exchangers (minimised water and refrigerant approach and reduction of refrigerant charge compared to traditional flooded heat exchangers) allows top efficiency values to be achieved, especially at partial loads. TTX range chillers can be used with the new HFO R1234ze refrigerant characterised by a very low environmental impact, minimising the TEWI of the entire system.

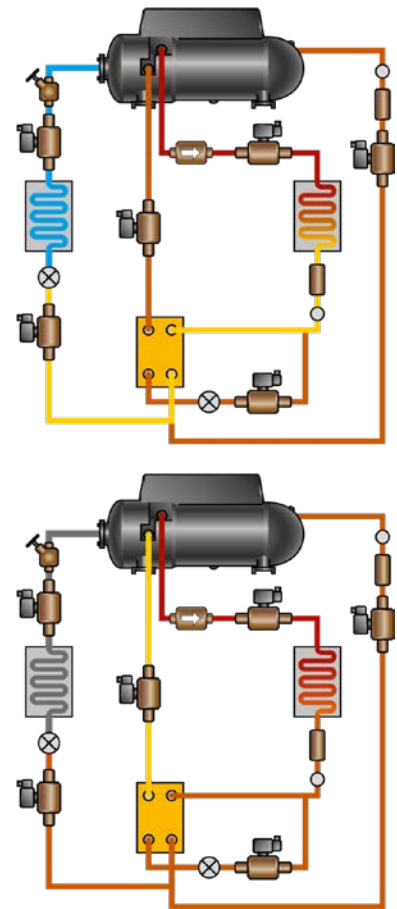
## Main advantages

### Top-class thermodynamic performance!

An effective combination of "oil-free" centrifugal compressor and flooded exchangers allows maximisation of thermal exchange efficiency; this is largely due to the absence of oil in the circuit and the reduced approach temperature between water and refrigerant (1K) as a result of no overheating in the evaporator. Cycle efficiency is enhanced by the centrifugal compressor, which provides ultra-high efficiency at partial loads, and by the economiser, which ensures intermediate regenerative exchange in the circuit.

### New refrigerant R1234ze

On request, TTX air condensed chillers can use the new HFO refrigerant with low GWP (GWPR1234ze=6 ), part of a wider Green Technology approach. (The standard version is with R134a).

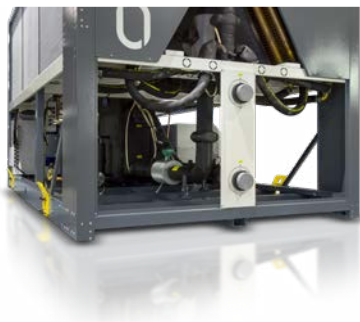
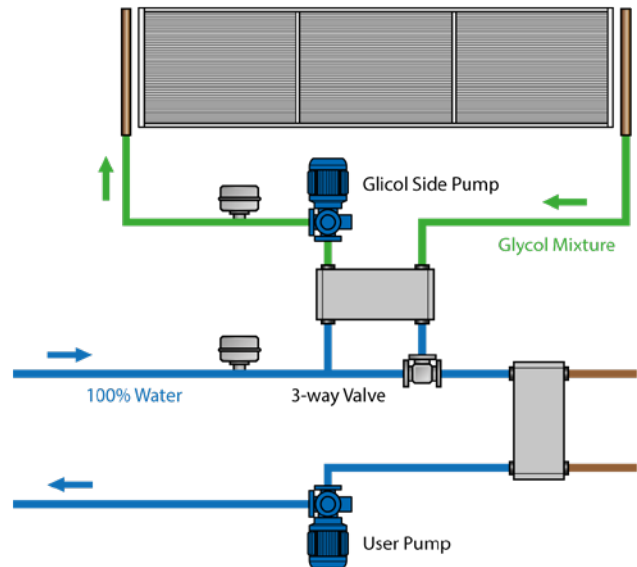


### Is the unit working?

Two different soundproofing systems are available: the most suitable one will depend on the importance of noise containment in the overall plant layout. Adopted technical solutions include fan speed control and compartmentalisation of compressors and pumping kits in a box internally lined with soundproofing material.

### Glycol-Free kit

The Free-Cooling versions can be selected with the “Glycol-Free” kit (on board the unit) to confine the water-antifreeze mix inside the finned coils. This solution maximises heat exchange efficiency at the evaporator with the exclusive use of pure water; it also dramatically reduces pumping costs.



### Maximum efficiency at partial loads

The adoption of oil-free centrifugal compressors, electronically controlled expansion valves, flooded heat exchangers, fan modulation and variable flow rate controlled with circulation pumps are all key features that make the TTX range particularly efficient at partial loads.

## Available versions



COOLING ONLY



FREE-COOLING

## Types of system



AIR/WATER

## Additional benefits

- Refrigerant R134a
- Available in versions: Liquid chiller and Free-Cooling chiller
- Energy efficiency class A
- Optional EC electronic switching fans
- Refrigerant leak sensor
- Water connections with Vic-Taulic quick couplings
- Dual day/night noise emission set-point

## Technological components



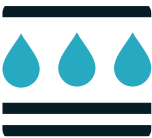
### Multi-protocol communication interface

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.



### Oil-Free Centrifugal Compressors

Oil-Free centrifugal compressors feature very high efficiency, reachable thanks to the absence of standard bearings and consequently, of oil. The shaft is supported, during operation, by magnetic levitation bearings, which results in the complete elimination of friction making lubricating fluid unnecessary. As there is no oil inside the compressor, there is also no oil inside the circuit, avoiding the typical exchanger clogging issues of oil-based systems. Centrifugal compressors are suitable for reduced pressure ratios compared to other compression technologies, they can be used with all low pressure refrigerants and are modulated with standard inverters.



### Spray flooded shell and tube

A spray flooded shell and tube construction guarantees effectiveness and efficiency thanks to the minimal approach temperature between refrigerant and water. It requires about 30% less refrigerant charge compared to traditional flooded shell and tube configurations: a solution that benefits the environment and results in costs savings, in terms of both CapEx and OpEx.



### 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.



### Axial fans

In axial fans air moves in a parallel direction to the rotation axis and allows large air flows to be processed. Thanks to their low head compared to radial fans, they are used on remote condensers and on components with free outlet into the atmosphere, where there are no high pressure drops due, for example, to ducting.



### Corrosion resistant material

The HiRef outdoor units are protected by a metal structure resistant to corrosion and weathering. They are also made of galvanised steel sheet, with epoxy-polyester powder coating, oven-polymerised at 180°C, to offer a C3 degree of protection. On request, it is possible to order specific paint finishing treatments or a metalwork structure built entirely in stainless steel, to obtain a higher degree of protection from high impact adverse weather events.



### Class A

Internal high-tech components suitably chosen and sized allow the units to operate with outstanding levels of efficiency.



### Super Low Noise

It is possible to choose between two soundproofing configurations: the Low Noise version and the Super Low Noise version. The latter is equipped with panels that shield the compressors, the entire refrigeration circuit and the hydraulic components (pumps, valves, etc.) to minimise any noise coming from valves, pipes and pumps. The Super Low Noise version combined with reduced ventilation speed allows the lowest sound levels on the market to be reached.



### 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 (CO<sub>2</sub>) whose baseline value is equal to 1. This parameter is used to determine the amount in kilograms of CO<sub>2</sub> 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, CO<sub>2</sub>, allows the environmental impact of air conditioning systems to be significantly reduced.



## Technical table

TTX		280CS	380CS	410CS	531CS	561CS	631CS	761CS	813CS	911CS	821CS	943CS	1064CS
<b>USER WATER VALUES 12/7°C, 35°C OUTSIDE AIR, 40% U.R.</b>													
<b>COOLING CAPACITY</b>	<b>kW</b>	281	380	414	529	562	661	759	809	909	829	943	1057
<b>TOTAL POWER INPUT</b>	<b>kW</b>	90	121	130	169	180	211	242	259	263	260	300	339
<b>EER</b>	-	3.12	3.14	3.19	3.12	3.12	3.14	3.14	3.12	3.46	3.19	3.15	3.12
<b>DIMENSIONS [LxHxD]</b>	<b>mm</b>	3065 x2652 x2256	4065 x2652 x2256	5065x2652x2256		6130 x2652 x2256	7130 x2650 x2256	8130x2650x2256		9130 x2650 x2256	10120x2650x2256		

Also available with 60 Hz power supply

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