MITSUBISHI ELECTRIC
HYDRONICS & IT COOLING SYSTEMS S.p.A.

IT COOLING

CHILLERS

TRCS-FC-Z

AIR COOLED CHILLERS WITH FREE-COOLING TECHNOLOGY, FROM 302 TO 1649 kW

rcitcooling.com

“THE GREATER PART OF PROGRESS IS THE DESIRE TO PROGRESS”

Lucio Anneo Seneca
Latin Philosopher
(4 BC - 64 AC)

TOP LEVEL EFFICIENCY

Strict energy consumption and environmental impact regulations continually push towards ever more efficient units.
Achieving the greatest energy savings and ensuring long-term sustainability are challenges that modern cooling systems need to tackle.

24/7 RELIABILITY

Reliability is key, especially when it comes to IT-cooling and process cooling applications. The uninterrupted operations of data centers, telecommunications infrastructures and manufacturing machineries depend on a steady and precise cooling load coverage.

SOME PROJECTS DON'T ACCEPT COMPROMISES, THEY SIMPLY DEMAND THE BEST TECHNOLOGY.

TRCS-FC-Z

THE NEW FOREFRONT OF THE PROGRESS

The power of the ultimate technological solutions
and a massive use of renewable resources have been merged to create TRCS-FC-Z.

Widest use of free-cooling

Capitalise the energy of the environment to cut the operating costs.

Unbeatable performance

Magnetic levitation compressors, flooded evaporator and EC fans for the highest energy saving.

Specific solutions for mission critical applications

- Fast restart
- Double power supply
- Energy meter
- THDi correction

Highest manufacturing quality

Over ten years of experience with magnetic levitation compressors and extensive expertise in the free-cooling technology.

EER over 4,0 (1)
over 5,0 (2)

TFC* over 2,0 °C (3)
over 10,0 °C (4)
TEMPERATURE

(1) Water (in/out) 15°C/10°C; Air (in) 30°C; Et. glycol 30%.
(2) Water (in/out) 27°C/20°C; Air (in) 30°C; Et. glycol 30%.

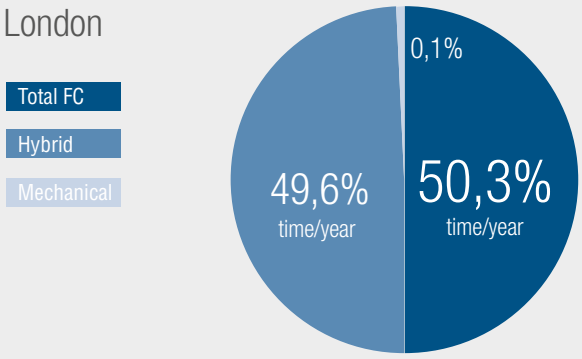
(3) Water (in/out) 15°C/10°C; Et. glycol 30%.
(4) Water (in/out) 27°C/20°C; Et. glycol 30%.

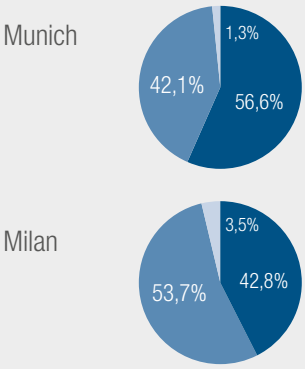
*TFC: Total Free-cooling

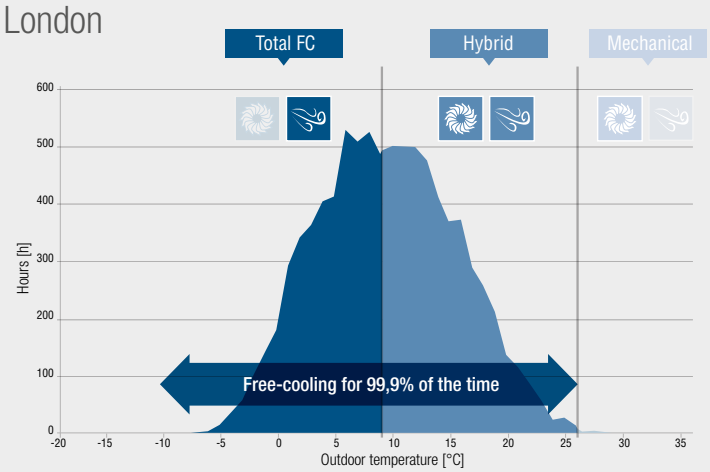
NATURAL EFFICIENCY TO COOL YOUR SYSTEM

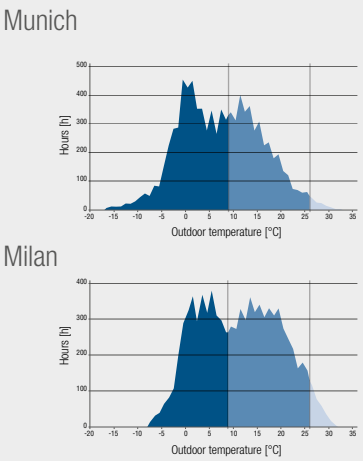
FREE-COOLING POTENTIAL: TEMPERATURE OCCURRENCE DISTRIBUTION

Wherever cooling demand is constant all year round, free-cooling provides significant energy saving opportunities.
In a cooling system located in London, working with favorable levels of water temperature (such as 27-20°C), the outdoor air alone can satisfy the cooling demand 50,3% of the time. 49,6% of the time, the outdoor air cooling capacity allows the chiller's compressors to run at part load, with a significant increase in efficiency.
For only 0,1% of the time, the unit works as an ordinary chiller.









Graphics above show the cumulative hours per year of a unit working 24/7 in either Mechanical, Hybrid or Total free-cooling. Operating water temperature (in/out) 27°C/20°C.

How RC masters free-cooling

RC's free-cooling chillers work in three different modes: Total free-cooling, Hybrid cooling, Mechanical cooling, according to outdoor air conditions and operating water temperature. As the outdoor air temperature drops 1 degree below the returning water temperature, a valve system redirects the water to the special coils and the benefits of the free-cooling begin.

Total free-cooling

- The outdoor air temperature is low enough to satisfy the entire cooling demand.
- Total cooling capacity is provided by the outdoor air in the free-cooling coils while the compressors are off.

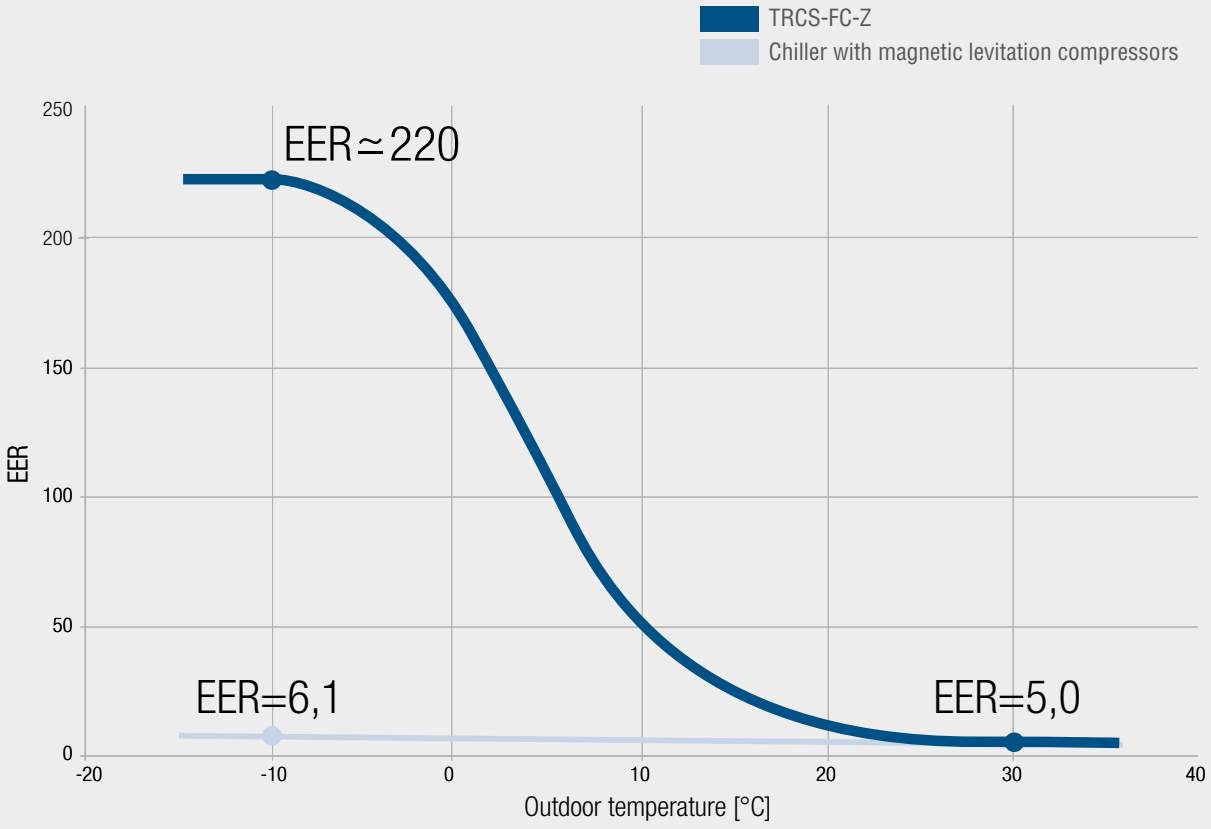
Maximum Energy Saving

FREE-COOLING TECHNOLOGY

THE ULTIMATE SOLUTION TO HARNESS THE FULL POTENTIAL OF RENEWABLE SOURCES

EFFICIENCY COMPARISON: TRADITIONAL CHILLER VS FREE-COOLING CHILLER

To understand how free-cooling can cut the energy bill of your cooling system, it is sufficient to compare the efficiency of a TRCS-FC-Z unit with the efficiency of a comparable technology chiller without free-cooling.
When the outdoor air temperature is too high to provide free-cooling, the EER (Energy Efficiency Ratio) of the two units are aligned.
But as the air temperature decreases, the gap between the units' efficiency becomes clear and even huge.
In total free-cooling mode, the compressors are off and very little energy is needed to provide the whole cooling capacity.



Note: Plant (side) cooling exchanger water (in/out) 27°C/20°C; Ethylene glycol 30%.

Hybrid cooling

- The outdoor air temperature is lower than the returning water temperature but not cold enough to achieve total free-cooling.
- Part of the cooling capacity is provided by the outdoor air while the rest is provided by the compressors.

Optimised Source Management

Mechanical cooling

- The outdoor air temperature is equal to or higher than the returning water temperature.
- Total cooling capacity is provided by the compressors, in the evaporator.

Conventional Chiller Operation

TRCS-FC-Z

FOR MISSION CRITICAL APPLICATIONS

Highest standards of reliability and reduced running costs, without any compromise.

In IT cooling applications and many telecommunication infrastructures, downtime costs are a crucial aspect. In all these applications, an interruption in the cooling supply may seriously compromise the technical equipment operation, causing unexpected shutdowns.

RC's approach to cooling dependability goes beyond the unit's accurate and sturdy design.
It also involves several devices and functions that maximise unit's uptime in case of emergency circumstances such as power supply outage.

FAST RESTART

Sometimes few seconds can determine the shutdown of the entire facility.

After a power failure, the cooling must be ensured as soon as possible. Fast Restart is the special function that ensures:

Immediate cooling start-up

Compressor start-up within 26"
after power is restored.

Accelerated cooling ramp-up

1000 kW are delivered within 6' 30"
after a voltage dip.

SMART PUMP MANAGEMENT

Free-cooling units lead to high energy savings but, because of their very nature, they always involve a water flow management issue: when the free-cooling is activated, the pressure drops suddenly increase due to the additional path throughout the free-cooling coils. This causes a significant change in the pump working conditions.

With the 2PS (2 Pump Speeds) function (opt), the unit adjusts the pump speed according to the free-cooling chiller operating mode, keeping the water flow steady without any energy waste nor hydraulic plant complication.

Variable primary flow management
To leverage load variation

VPF
VARIABLE PRIMARY FLOW

2PS
2 PUMP SPEEDS

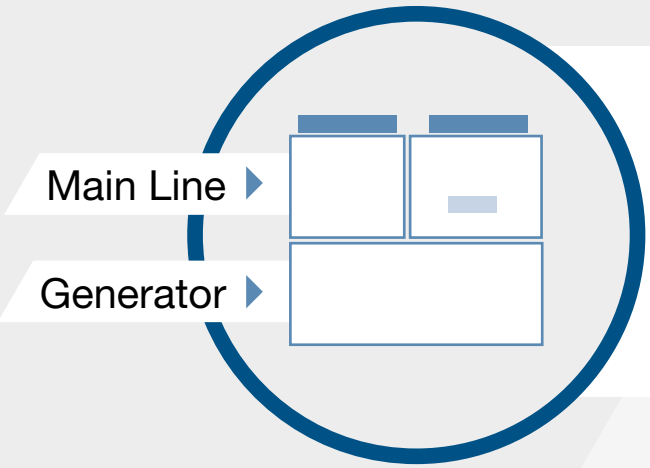
2 Pump Speed adjustment
Perfect for free-cooling units

The awareness of the most demanding application requirements and the commitment to improve their energy efficiency has led to the development of devoted solutions.

DOUBLE POWER SUPPLY

Redundancy increases uptime.

With the aim of enhancing cooling dependability, TRCS-FC-Z extends this concept also to the electrical supply.

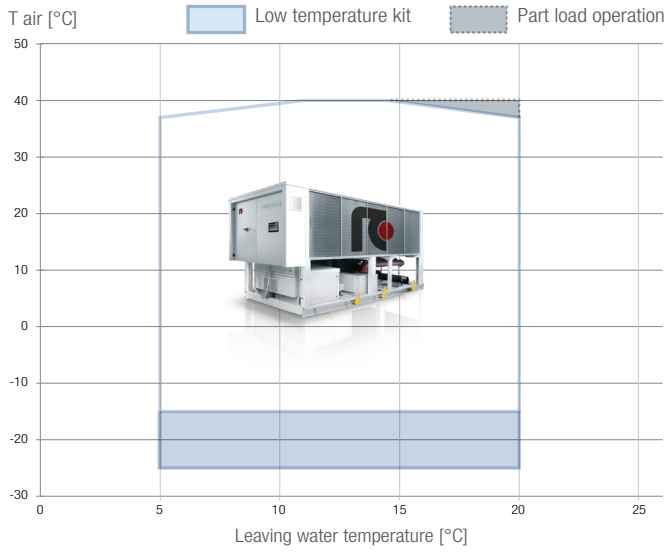


With the double power supply configuration, the unit is equipped with an ATS (Automatic Transfer Switch) and can be connected to two separate power lines (usually the mains and the auxiliary generator line). In case of a main line power outage, the ATS automatically switches over to the other line, granting uninterrupted power supply to the unit.

The double power supply makes TRCS-FC-Z suitable for TIER III and TIER IV* design topologies, the highest standards of reliability.

*Widely accepted within the uninterruptible industry, the Uptime Institute's TIER Performance Standards and Classifications are an objective basis for comparing the capabilities of a particular design topology against others or to compare groups of sites.

WIDE OPERATING RANGE



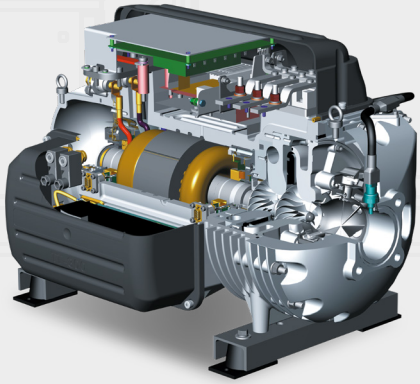
Driven by exponential growth of data exchange and rising power densities, data center design is changing dramatically over time. Cooling equipment needs to evolve together with the IT devices, always striving for reducing the running costs.

Modern infrastructures are designed to work with cooling water temperatures which are higher than traditional levels, significantly enhancing the overall efficiency of the cooling system.

TRCS-FC-Z has been developed to operate properly with leaving water temperature up to 20°C, ensuring outstanding energy savings and fully capitalising on free-cooling.

TECHNOLOGICAL CHOICES

**Extreme efficiency and absolute reliability:
the secret formula is cutting-edge technologies and deep know-how.**

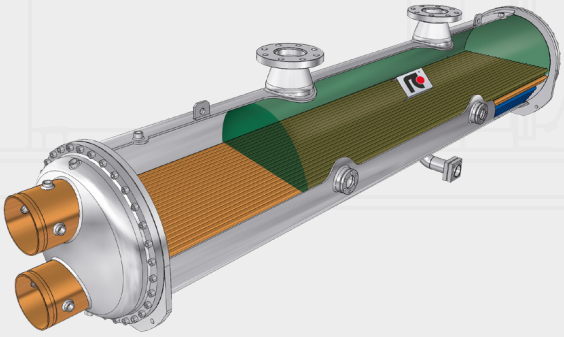


CENTRIFUGAL COMPRESSOR WITH MAGNETIC LEVITATION

THE EXPERTISE MAKES THE DIFFERENCE

These top level technology compressors bring enormous benefits in terms of efficiency, adjustments, vibrations and weight. Magnetic levitation eliminates the need for lubricant, its delicate management and heat exchange penalisation. Partial load efficiency, which is crucial during the hybrid operation, is therefore strongly increased.

A profound knowledge is necessary to harness such a concentration of technology and here is where RC IT Cooling brand really makes the difference thanks to its 10-year experience in magnetic levitation compressors units and thousands of projects all over the world.



FLOODED EVAPORATOR

THE EXCELLENCE IN HEAT EXCHANGE

Designed and built internally, the geometry of the flooded evaporator grants optimum temperature distribution along the shell, hence highly efficient heat exchange and low refrigerant pressure drops.

Allowing the over-heating surface to be eliminated, the flooded evaporation delivers unbeatable heat exchange efficiency, but it also requires maximum care in keeping the exact liquid refrigerant level. This could become tricky in case of wide variations of the evaporator cooling load, which in these units happens again and again due to free-cooling contribution. RC units ensure a fully reliable way out thanks to specific design solutions and proprietary electronic expansion valve control algorithms.

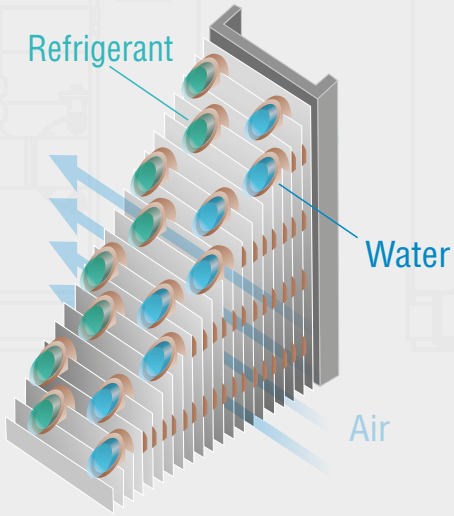
ADVANCED CONTROL

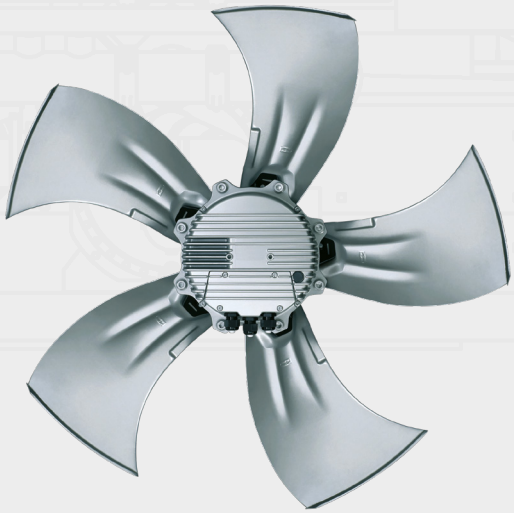
The controller features proprietary settings that ensure fast adaptive responses to different dynamics, in all operating modes.

The interface is intuitive and user-friendly thanks to the adoption of LED icons for a full and immediate status display of the various circuits.

Standard interface

RC BRAND MANUFACTURING QUALITY IN EVERY DETAIL





SPECIAL COILS

KEEP THE EFFICIENCY UP OVER TIME

Free-cooling efficacy is strictly related to the effectiveness of the air/water direct heat exchange. Nevertheless, an efficient air/refrigerant coil is necessary for proper condensation.

A special coil, made of both refrigerant and water tubes, achieves both goals. This particular configuration, instead of two separate finned coils, also prevents fin spacing misalignment and dust and dirt accumulation. Hence low pressure drops and high heat exchange efficiency will last.

EC FANS

HOLD THE REINS ON AIR FLOW RATE

Managing both free-cooling and condensation with rough air flow regulation would mean a significant energy loss due to unfavourable condensation pressure or not capitalising on free-cooling.

EC fans are efficient and silent and have the capability to adjust their rotational speed continuously. Their accurate and quick air flow regulation allows RC IT Coolings 's control functions to perform at their best, granting the best possible unit operation in any condition.

THE BRAIN BEHIND THE SUCCESS

As an option, a 7" touch screen color display interface is available with a USB port, for quick and easy application updates and downloading of all registered variables in graphic form.

Optional touch screen interface

TRCS-FC-Z

0211 - 1204

High efficiency air cooled chiller with free-cooling (302-1649 kW)

VERSIONS

K Compact units
CA High efficiency units

CONFIGURATIONS

\- Standard
NG No Glycol

ACCESSORIES

- Leak detector with automatic refrigerant migration
- Energy meter with BMS interface
- Electromagnetic compatibility (EMC) - EN6100-6-3 for residential environments

FREE C. | HFC R134a | VSPEED | COOLING | CENTRIF. | FLOODED | EC AXIAL

TRCS-FC-Z /K			0211	0351	0452	0552	0652	0712	0903	0953	1003	1164	1204
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE													
COOLING ONLY (GROSS VALUE)													
Cooling capacity		kW	302	483	594	689	943	980	1185	1253	1421	1578	1649
Total power input		kW	87,1	141	179	181	285	275	320	373	425	455	461
EER		kW/kW	3,47	3,43	3,33	3,81	3,31	3,56	3,70	3,36	3,35	3,47	3,58
COOLING ONLY (EN14511 VALUE)													
Cooling capacity	(2)(3)	kW	300	479	590	684	936	973	1177	1246	1411	1567	1637
EER	(2)(3)	kW/kW	3,36	3,31	3,23	3,67	3,21	3,44	3,59	3,28	3,25	3,36	3,46
SEPR HT	(4)(5)		6,66	6,54	6,39	6,64	6,43	6,58	6,45	6,28	6,32	6,30	6,31
TOTAL FREE-COOLING (GROSS VALUE)													
Cooling capacity	(6)	kW	302	483	594	689	943	980	1185	1253	1421	1578	1649
EER	(6)	kW/kW	59,25	50,28	49,52	67,55	56,15	51,05	49,38	52,21	53,83	50,58	52,85
Total free-cooling temperature	(6)	°C	-1,9	-2,5	-1,9	-1,4	-2,7	-1,4	-1,2	-2,7	-2,5	-1,6	-1,8
COOLING ONLY (16°C/10°C)													
Cooling capacity	(7)	kW	302	483	594	689	943	980	1185	1253	1421	1578	1649
Total power input	(7)	kW	87,1	141	179	181	285	275	320	373	425	455	461
EER	(7)	kW/kW	3,47	3,43	3,33	3,81	3,31	3,56	3,70	3,36	3,35	3,47	3,58
COOLING ONLY (23°C/15°C)													
Cooling capacity	(8)	kW	346	541	680	769	1051	1103	1327	1407	1588	1787	1847
Total power input	(8)	kW	91,2	144	187	183	290	281	324	382	434	469	469
EER	(8)	kW/kW	3,80	3,77	3,64	4,20	3,62	3,92	4,09	3,69	3,66	3,81	3,94
EXCHANGERS - HEAT EXCHANGER USER SIDE IN REFRIGERATION													
Water flow	(3)	l/s	16,01	25,57	31,48	36,50	49,98	51,93	62,78	66,38	75,30	83,61	87,35
Pressure drop	(2)(3)	kPa	86,0	98,6	89,3	104	104	107	91,8	80,2	103	106	115
REFRIGERANT CIRCUIT													
Compressors nr.		N°	1	1	2	2	2	2	3	3	3	4	4
No. Circuits		N°	1	1	1	1	1	1	2	2	2	2	2
Refrigerant charge		kg	120	140	260	260	320	320	430	520	520	540	540
NOISE LEVEL													
Sound Pressure	(9)	dB(A)	56	61	62	58	63	63	64	64	65	65	65
Sound power level in cooling	(10)(11)	dB(A)	88	93	94	91	96	96	97	97	98	98	98
SIZE AND WEIGHT													
Length	(12)	mm	4000	4000	4900	6400	7000	7900	10600	11200	11200	13000	13600
Width	(12)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	(12)	mm	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(12)	kg	3430	3850	5080	5820	6340	6900	9750	10260	10530	12290	12350

TRCS-FC-Z /CA			0211	0251	0351	0452	0552	0712	0803	0903	1003
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE											
COOLING ONLY (GROSS VALUE)											
Cooling capacity		kW	310	354	496	616	714	990	1068	1209	1446
Total power input		kW	85,4	89,8	134	173	177	268	267	308	412
EER		kW/kW	3,63	3,94	3,69	3,56	4,03	3,69	4,00	3,92	3,51
COOLING ONLY (EN14511 VALUE)											
Cooling capacity	(2)(3)	kW	307	351	492	611	708	983	1062	1201	1436
EER	(2)(3)	kW/kW	3,50	3,79	3,56	3,44	3,87	3,56	3,90	3,80	3,40
SEPR HT	(4)(5)		6,97	6,90	7,13	6,80	6,88	6,94	6,88	6,88	6,65
TOTAL FREE-COOLING (GROSS VALUE)											
Cooling capacity	(6)	kW	310	354	496	616	714	990	1068	1209	1446
EER	(6)	kW/kW	60,71	52,04	58,36	60,37	52,51	58,25	52,35	54,71	65,43
Total free-cooling temperature	(6)	°C	-0,1	-0,2		-0,5	0,4	-0,9	0,2	0,0	-1,6
COOLING ONLY (16°C/10°C)											
Cooling capacity	(7)	kW	310	354	496	616	714	990	1068	1209	1446
Total power input	(7)	kW	85,4	89,8	134	173	177	268	267	308	412
EER	(7)	kW/kW	3,63	3,94	3,69	3,56	4,03	3,69	4,00	3,92	3,51
COOLING ONLY (23°C/15°C)											
Cooling capacity	(8)	kW	355	393	559	707	790	1115	1183	1349	1623
Total power input	(8)	kW	89,2	90,1	137	181	177	274	266	311	422
EER	(8)	kW/kW	3,98	4,36	4,07	3,90	4,47	4,06	4,44	4,33	3,84
EXCHANGERS - HEAT EXCHANGER USER SIDE IN REFRIGERATION											
Water flow	(3)	l/s	16,40	18,75	26,28	32,63	37,83	52,47	56,60	64,05	76,60
Pressure drop	(2)(3)	kPa	90,3	96,3	104	95,9	111	109	74,6	95,6	107
REFRIGERANT CIRCUIT											
Compressors nr.		N°	1	1	1	2	2	2	3	3	3
No. Circuits		N°	1	1	1	1	1	1	2	2	2
Refrigerant charge		kg	120	120	140	260	280	320	430	430	520
NOISE LEVEL											
Sound Pressure	(9)	dB(A)	56	57	58	58	59	60	61	61	61
Sound power level in cooling	(10)(11)	dB(A)	88	89	90	91	92	93	94	94	94
SIZE AND WEIGHT											
Length	(12)	mm	4000	4000	4900	6400	7900	10000	12100	13000	13000
Width	(12)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	(12)	mm	2500	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(12)	kg	3660	3790	4380	5720	6770	8870	10530	11370	11730

Notes:

1 ▸ Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30%.
2 ▸ Values in compliance with EN14511-3:2013.
3 ▸ User side heat exchanger water temperature (in/out) 15°C/10°C; source side heat exchanger air temperature (in) 35°C, Glycol 30%
4 ▸ Seasonal space heating energy index
5 ▸ Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 2016/2281]
6 ▸ Plant (side) cooling exchanger water (in/out) 15°C/10°C; Ethylene glycol 30%.
7 ▸ User side heat exchanger water temperature (in/out) 12°C/7°C; source side heat exchanger air temperature (in) 35°C, Glycol 30%
8 ▸ User side heat exchanger water temperature (in/out) 23°C/15°C; source side heat exchanger air temperature (in) 35°C, Glycol 30%
9 ▸ Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
10 ▸ Sound power on the basis of measurements made in compliance with ISO 9614.
11 ▸ Sound power level in cooling, outdoors.
12 ▸ Unit in standard configuration/execution, without optional accessories.

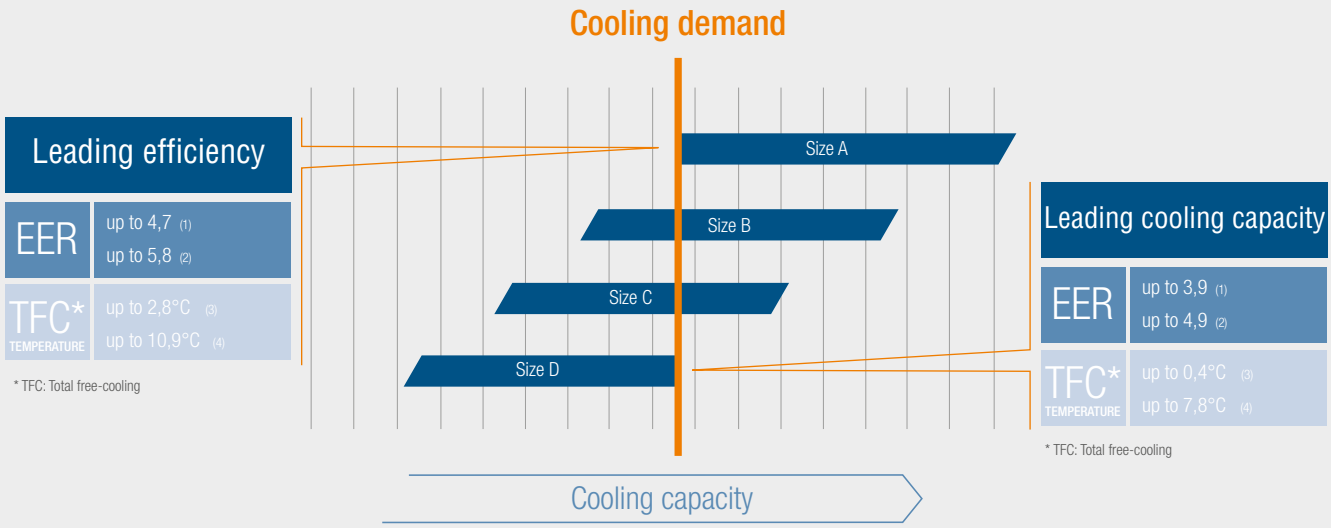
The units highlighted in this publication contain HFC R134a [GWP_{100} 1430] fluorinated greenhouse gases.

POWERFUL FLEXIBILITY

A MIGHTY CORE TAILORED TO A PROJECT'S NEEDS

Every job has its own specific needs. Because of the skillful use of component technical features, TRCS-FC-Z range perfectly tailors the actual specifications and priorities of any project.

A definite cooling demand can in fact be provided giving priority to reducing the initial investment cost (leading cooling capacity), or putting a premium on annual energy savings and payback time (leading efficiency).



(1) Water (in/out) 15°C/10°C; Air (in) 30°C; Et. glycol 30%. (2) Water (in/out) 27°C/20°C; Air (in) 30°C; Et. glycol 30%. (3) Water (in/out) 15°C/10°C; Et. glycol 30%. (4) Water (in/out) 27°C/20°C; Et. glycol 30%.

THDI AND POWER FACTOR

THDi

The accurate design of electrical and electronic components and the use of specific solutions, such as compressor line reactors (std) and power factor correction capacitors (opt), reduce the THDi (Total Harmonic Distortion of current) and increase unit's Power Factor. To fit even the most demanding requirements, modular active harmonic filters can be added to cut the THDi down to values below 5%.

HFO REFRIGERANT

HFO 1234ze

GREEN EFFICIENCY

In line with the most severe environmental regulations, TRCS-FC-Z is also available with the new green HFO 1234ze refrigerant. A solution that complies with the highest efficiency targets required by modern projects, whilst offering an eco-friendly alternative to HFCs.

ClimaPRO DCO

clima PRO DCO

According to the units' actual efficiency curves, ClimaPRO DCO continuously optimises plant working conditions by promptly adjusting equipment staging and sequencing, managing operating set-points and controlling water flows throughout the entire system. ClimaPRO DCO can be natively interfaced with any BMS or it can successfully perform all functions on its own.

“EXPERIENCE IS BY FAR THE BEST PROOF”

Sir Francis Bacon
British philosopher
(1561-1626)

INFOCAMERE PADOVA

2015 - PADUA (ITALY)

Application:
Data Center

Plant type:
Hydronic System

Cooling capacity:
1000 kW

Installer:
Retice

HVAC Designer: **per. Ind. Roberto Michelotto (TIFS - Padova)**

Machines installed:
2x Chillers with free-cooling, 1x MANAGER 3000

PROJECT

InfoCamere, the IT company for the Italian Chambers of Commerce, is the ideal technological structure for supporting the Chamber system in managing its IT information store and providing high-speed and high-security communication network among an extended network of offices. Located in Padua, Infocamere is a real 'Virtual data center', managing the complex administrative procedures associated with business life.

CHALLENGE

Built to connect more than 105 Chambers of Commerce and 300 branch offices throughout Italy on a daily basis, Infocamere operates as real cloud, offering customers a number of services and providing easy to access information all the year round, 24/7. Reliable and safe operation, together with high energy efficiency standards, were therefore the main drivers when it came to evaluating cooling solutions for the data center.

SOLUTION

The units selected for the cooling plant are two free-cooling chillers featuring magnetic levitation compressors and an advanced free-cooling system aimed at achieving the best efficiency in any load condition.

When outdoor temperatures are low enough, free-cooling switches the compressors off and utilises outdoor air to directly chill the water (free-cooling). When temperatures, on the other hand, rise above the minimum threshold, the unit switches on the magnetic levitation compressors, ensuring premium efficiency levels in all other conditions. Additionally, VPF (Variable Primary Flow) function smartly adjusts plant's water flow, capitalising on load variations.

Total system's reliability is ensured by the FAST RESTART function for a quick reboot in case of power outage or voltage dips.

MORE THAN 1000 PROJECTS ALL OVER THE WORLD

Each one featured by different usage, location and system requirements. All of them sharing the highest efficiency, lowest noise emissions and complete reliability of the RC IT Cooling brand.

2013 Langfang - China

Range International Information Group Data center

Application: Data center
Cooling capacity: 12700 kW
Installed machines:
42x Indoor chilled water close control units

2014 Milan - Italy

Cisco Systems Vimercate

Plant type: Hydronic system
Cooling capacity: 4505 kW
Heating capacity: 459 kW
Installed machines: 1x air cooled oil-free chiller, 2x water cooled oil-free chillers, 1x heat pump for the production of hot and cold water, 2x screw compressor chiller, 1x free-cooling chiller, 1x ClimaPRO DCO, several close control units

2015 Canberra - Australia

CDC Canberra Data Center

Application: Data center
Cooling capacity: 3975 kW
Heating capacity: 496 kW
Installed machines:
3x Free-cooling chillers, 2x Heat pumps for the production of hot and cold water

2015 - Jiangsu Province - China

Wuxi National Super Computing Data Center

Application: Data center
Cooling capacity: 28000 kW
Installed machines:
18x water cooled chillers with oil-free compressor

2013-2014 - Several applications in France

SFR

Application: Data center
Cooling capacity: 1454 kW
Installed machines:
5x free-cooling chillers with scroll compressor,
2x screw compressor chillers,
3x Super low noise chillers with free-cooling

2015 Beijing - China

CCB - China Construction Bank Data Center

Application: Data center
Cooling capacity: 70000 kW
Installed machines:
48x free cooling chillers,
4x heat pumps

2015 Buccinasco - Italy

Vodafone Buccinasco

Application: Data center
Cooling capacity: 4508 kW
Installed machines:
4x oil-free compressor chillers,
1x free-cooling chiller, 2x ClimaPRO DCO,
29x Close Control Units

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for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.

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