

IT COOLING

CHILLERS

NR-FC-Z

**AIR COOLED CHILLER
WITH FREE-COOLING FOR HIGH
LEAVING WATER TEMPERATURE,
FROM 364 TO 978 kW**



 **FREE COOLING**

 **HIGH TEMPERATURE**

NR-FC-Z

THE FREE-COOLING CHILLER DEDICATED TO HIGH TEMPERATURE IT ENVIRONMENTS



Air cooled chiller with scroll compressors and free-cooling technology from 364 to 978 kW

NR-FC-Z is the ultimate RC brand chiller solution with scroll compressors and a free-cooling system, dedicated to IT infrastructures.

Specifically designed to operate with high water temperatures (set point up to 24°C) and high ΔT (up to 11°C), NR-FC-Z delivers concrete energy savings in modern data centers. The free-cooling hydraulic equipment allows the unit to

freely employ the outside air to satisfy the cooling capacity. When the air temperature is too high to grant complete free-cooling, highly efficient scroll compressors ensure full load coverage.

Smart LAN functions are natively present to easily connect NR-FC-Z to other chillers and enhance the system's efficiency and stability.

FULL CONFIGURABILITY FOR EVERY INSTALLATION OPPORTUNITY

IT COOLING APPLICATIONS

A

High efficiency

EER
4,05SEPR HT
6,65TFC [°C]
10,8

K

Key efficiency
with EC fansEER
3,79SEPR HT
6,36TFC [°C]
9,2

K

Key efficiency

EER
3,69SEPR HT
6,03TFC [°C]
9,2

AVERAGE VALUES

 Data centers

 Server rooms

 Technological hubs

 Telecommunication installations

EER: Water (in/out) 28/20°C, Air (in) 35°C, Et. glycol 30%. GROSS VALUE.

SEPR HT: Water (in/out) 7°C - Regulation (EU) N.2281/2016. NET VALUES: EN14511, EN14825.

TFC: Total free-cooling temperature. Water (in/out) 28/20°C, Et. glycol 30%.

ACOUSTIC VERSIONS

FREE-COOLING CONFIGURATIONS

-

Standard

Unit with standard soundproofing equipment.
Unit with acoustical compressor enclosure (Opt. 2312).

Baseline
-2 dB(A)

-

Base

Standard free-cooling unit.

SL

Super low noise

Special acoustic insulation of the compressor enclosure and the pumps (if present), devoted fan speed reduction and increased heat exchange surface.

-9 dB(A)

NG

No Glycol

Free-cooling is possible without the use of glycol on the plant side.

No compromises on efficiency!

The highest standards of reliability and reduced running costs, without any compromises.

SMART LAN LOGICS



EMBEDDED FUNCTIONS FOR MULTI-UNIT SYSTEMS

Group controls

Up to 16 chillers can be connected and run as a group to enhance the system's efficiency and dependability.

- ▶ Dynamic master
- ▶ Stand-by unit management
- ▶ Load sharing or sequencing
- ▶ Resource priority management
- ▶ Group fast restart
- ▶ Centralized pump control

Adaptive set-point

The indoor chilled water units communicate their load conditions to the external group of chillers, that adjust their operating set-point accordingly, for the greatest energy savings.

MASSIVE FREE-COOLING



TOTAL FREE-COOLING FROM 11°C

Thanks to large free-cooling coils, NR-FC-Z uses the outdoor air as main source to produce cooling.

With a set-point of 20°C, the total free-cooling operation is possible from outdoor air temperature of 11°C.

This means that most of the time the chiller can provide the required cooling capacity without using the compressor, with unmatched efficiency.

IDEAL FOR HIGH TEMPERATURE IT ENVIRONMENTS



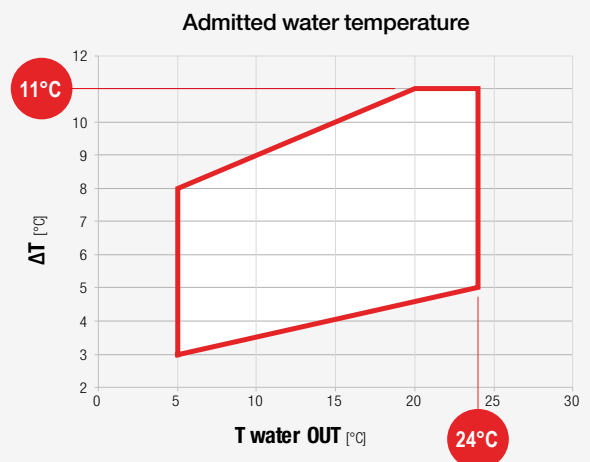
HIGH TEMPERATURE

HIGHER TEMPERATURES FOR LOWER PUE

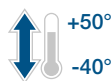
Modern IT infrastructures are designed to work with higher indoor temperatures than traditional levels (ASHRAE Thermal Guidelines for Data Processing Environments) to enhance the cooling equipment's efficiency and lower the data center's PUE (Power Usage Effectiveness).

NR-FC-Z is optimized to efficiently work with high temperature IT environments:

- ▶ **Leaving water temperature up to 24°C**
To enhance the chiller's EER and fully capitalize on free-cooling.
- ▶ **ΔT up to 11°C**
For a lower water flow rate and a consequent reduction of the pump consumption.



UNYIELDING IN EXTREME CONDITIONS



NR-FC-Z can operate in all climates from -30°C (-40°C with special equipment) to +50°C and, equipped with highly resistant coil coatings, it can withstand even the harshest industrial or marine environments.

PACKAGED SOLUTION



NR-FC-Z is a complete all-in-one solution ready to be installed. The integrated hydronic modules includes the pumps, the buffer tanks and the main hydraulic components, allowing simplified installation and time-saving commissioning.

READY FOR MISSION CRITICAL APPLICATIONS



Designed for continuous operation, NR-FC-Z meets the needs of the uninterruptible industry. Devoted devices and functions maximize the unit's uptime even in case of emergency circumstances.

FREE-COOLING TECHNOLOGY

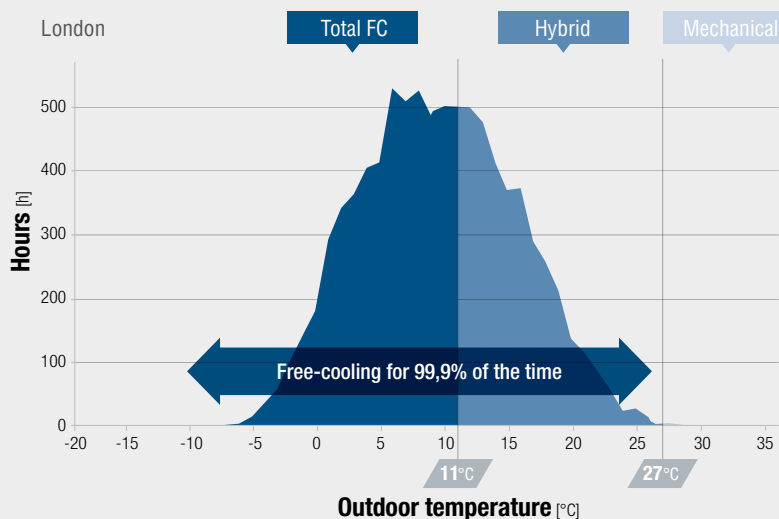
The ultimate solution to harness the full potential of outdoor air.

In many climates, data center managers can reduce the OPEX (Operating Expenditure) of their cooling plant by taking advantage of favorable environmental conditions, that is any time the outdoor air is colder than the operating water.

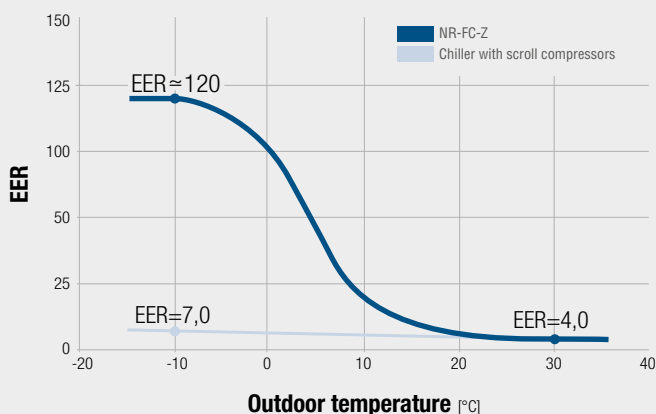
The higher the water operating temperature, the greater the annual free-cooling potential.

In a data center located in London, with operating water temperature 28/20°C, NR-FC-Z can satisfy the whole cooling demand for 50% of the time by only utilising free-cooling, while for 49% of the time by running the compressors at part loads.

This means that 99% of the time NR-FC-Z works with the free-cooling activated, and for very little time as an ordinary chiller.



Efficiency comparison:



Note: Operating water temperature (in/out) 28°C/20°C.

MECHANICAL COOLING vs FREE-COOLING

Comparing the efficiency of a NR-FC-Z and a traditional scroll compressor chiller, the enormous efficiency gap in the free-cooling temperature range is evident. In any modern IT infrastructure, free-cooling technology is a huge opportunity that must be seized.

In total free-cooling, the compressors are off and minimum energy is needed to satisfy the nominal cooling capacity.

Thanks to maximized free-cooling coils, NR-FC-Z makes the most of free-cooling, always granting a secure and efficient cooling capacity back-up with highly performing compressors.

How RC masters free-cooling

RC's free-cooling chillers work in three different modes:

- ▶ Total free-cooling
- ▶ Hybrid cooling
- ▶ Mechanical cooling

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.
- ▶ Compressors are off.

MAXIMUM ENERGY SAVING

Hybrid cooling

- ▶ The outdoor air temperature is lower than the returning water temperature but not cold enough to achieve total free-cooling.
- ▶ Compressors are partialized.

OPTIMISED RESOURCE MANAGEMENT

Mechanical cooling

- ▶ Outdoor air temperature is equal to or higher than the returning water temperature.
- ▶ Total cooling capacity provided by the compressors.

CONVENTIONAL CHILLER OPERATION

ENERGY ANALYSIS

Project: Large size data center

The data center, located in London, has a nominal cooling load of 3000 kW.

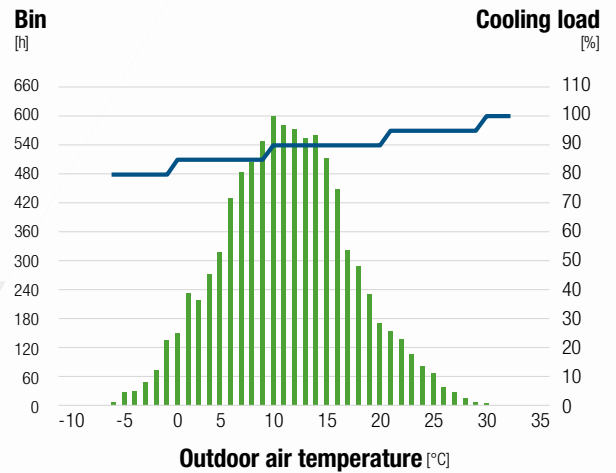
The infrastructure is characterized by a high temperature IT environment and the cooling equipment is based on a chilled water system operating with water temperature 26/18°C.

The data center is active 24/7, with a cooling load ranging from 80% to 100%, according to the outdoor conditions.

Energy analysis parameters:

Operating schedule: 24/7, all-year-round	Electricity cost: 0,12 €/kWh
Fluid temperature: 26/18°C	Inflation rate: 3%
Fluid type: Water + et. glycol 30%	Interest rate: 6%

Temperature profile



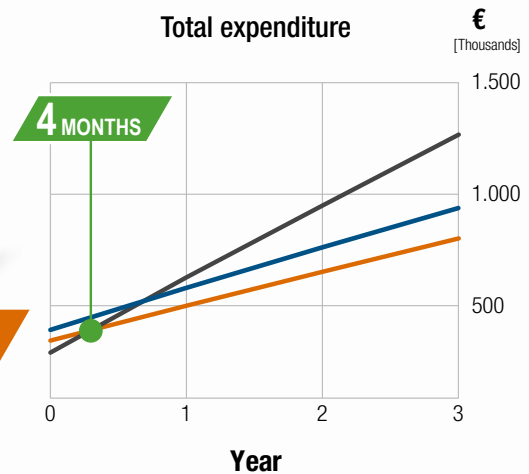
Comparison between technologies

According to the N+1 redundancy, 6 chillers of approximately 650 kW have been selected, for a total cooling capacity of 3900 kW.

The load is shared equally among all the 6 chillers, following the active redundancy principle.

The analysis compares three models of high efficiency chillers, with different technology.

Payback Time



Free-cooling chillers with screw compressors

CC: (26/18°C) 627 kW
EER: (26/18°C) 3,76
SEPR HT: 5,91

Chillers with full inverter screw compressors

CC: (26/18°C) 673 kW
EER: (26/18°C) 3,81
SEPR HT: 6,16

NR-FC-Z / A 0926

CC: (26/18°C) 681 kW
EER: (26/18°C) 3,96
SEPR HT: 6,42

Results

The results obtained are astounding: the chillers with free-cooling achieve -53% of annual energy consumption compared to the best-in-class full inverter screw chillers.

From the two free-cooling chillers, NR-FC-Z is evidently the winning solution. In fact multi-scroll units achieve a good part load performance, with limited investment costs compared to screw or MagLev compressors.

Significant annual energy savings of NR-FC-Z reflects the higher free-cooling potential of the new unit compared to regular free-cooling units.

AT A GLANCE

NR-FC-Z vs full inverter screw compressor chillers

Power input savings

1.527 MWh per year

CO₂ saved per year

840 tons, equivalent to CO₂ emissions produced by a petrol car driving 5.000.000 km

Payback period

4 months

Annual energy savings

-53 %

TECHNOLOGICAL CHOICES

W3000+ CONTROL

Fully in-house developed management software.

- ▶ Efficient and reliable operation in all conditions
- ▶ Connectivity with the most commonly used BMS protocols (Opt.)

KIPlink USER INTERFACE

Innovative Wi-Fi interface for an easy and enhanced unit management.



Air side heat exchangers

MICROCHANNEL

- Full aluminum coils for the condenser
- ▶ -30% refrigerant charge reduction Vs. traditional solutions.

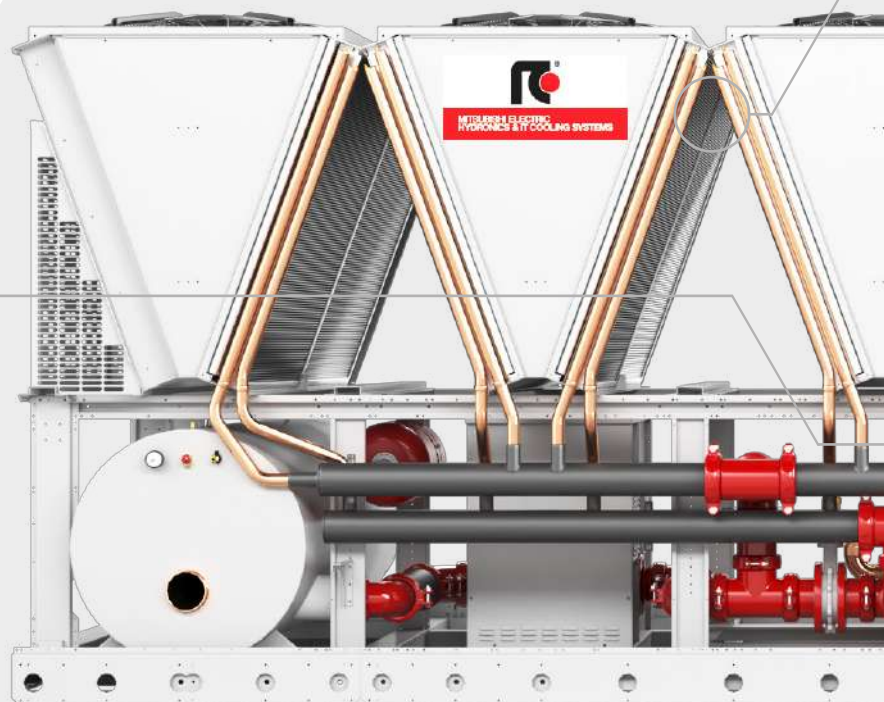
TUBE & FINS

- Cu/Al coils for the free-cooling heat exchanger
- ▶ Ideally designed to optimize airflow and heat transfer.

Protective coatings available (Opt.)

Scroll compressors

- ▶ Tandem or trio configuration for multiple step regulation
- ▶ Acoustical enclosure as standard for SL (Super-low noise) versions



ALL-IN-ONE SOLUTION

The integrated hydronic module (opt.) includes the pumps, the buffer tank, and all the main hydraulic components, for the best optimization of the installation space, time and costs.

VSPEED

INTEGRATED HYDRONIC MODULES



PUMPS

- ▶ Single or twin pumps
- ▶ Low or high head (approx. 100 or 200 kPa).
- ▶ Fixed or variable speed

PUMPS + BUFFER TANK

- ▶ 1000 litre buffer tank
- ▶ 20 mm insulation lining
- ▶ Including: expansion vessel, safety valve, manometer.

ONLY TERMINALS

- ▶ Control 1 or 2 external pumps
- ▶ On/off or modulating signal

Trusted reliability, simplified installation, maximized performance: NR-FC-Z is the ideal solution for forward-looking data centers.

EC axial fans

SEASONAL EFFICIENCY: up to **+5%**



New generation axial fans, for precise airflow management and reduced power consumption.

NR-FC-Z / A versions

High performing EC fans for the highest efficiency

NR-FC-Z / K versions

Variable speed AC fans equipped with phase-cut device

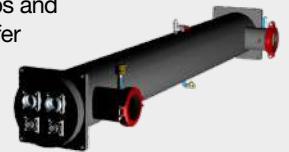
Shell and tube evaporator

ΔT : up to 11K

Direct expansion shell & tube evaporator, with internal grooved copper tubes.

Water-side: single pass
Refrigerant side (multi-circuit): double pass

- ▶ Robust, reliable, inspectionable
- ▶ Fully protected against ice formation
- ▶ Low pressure drops and optimal heat transfer efficiency



**DESIGNED AND MANUFACTURED
IN-HOUSE**

The NR-FC-Z is a Plug & Play package, ready to be installed.

Advanced water flow controls allow the user to make the most of the variable speed pumps, bringing time-saving commissioning, and significant energy reduction.

FLOW CONTROLS

CONSTANT FLOW

In addition to the traditional on/off pump control, NR-FC-Z offers the unique 2PS function.

VARIABLE FLOW

The VPF control series (Variable Flow Control) adjusts the pumps speed on the basis of the plant thermal load, ensuring the highest energy savings while keeping the chiller's operation stable.



Each time the free-cooling is activated, water pressure drops increase since the water must pass through additional coils. This may cause unwanted water flow variations.

The 2PS (2 Pump Speeds) automatically adjusts the pump speed according to the free-cooling chiller operating mode, keeping the water flow steady.

SMART LAN FUNCTIONS

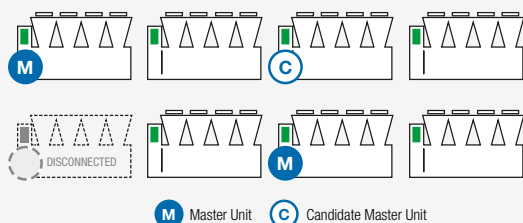
The control of NR-FC-Z features embedded functions that leverages the LAN connection between the chillers and the indoor units, in order to enhance the system's efficiency and dependability.

DYNAMIC MASTER WITH SUCCESSION PRIORITY

In case the master unit becomes disconnected, the Dynamic Master logic automatically elects a new master among the other units, allowing the chillers and their functions to continue working.

The Dynamic Master ensures the group's stability, granting a backup solution to the LAN functions, and overcoming the single point of failure typical of the static master architecture.

Master succession priority



Thanks to the innovative succession priority function, it is possible to set one or more succession master candidates. In case the master unit becomes disconnected, the new master is elected among the units set as priority.

RESOURCE PRIORITY MANAGEMENT

In case of a varying group of chillers, with different technologies, it is possible to set the usage priority of each unit, making the most of the available cooling resources. The load management function will be adjusted accordingly.

When available, free-cooling is always given priority and is fully exploited before activating any compressor. Then the activation of the compressors follows the priority level assigned to the units.

LOAD MANAGEMENT

There are two possible load management logics:

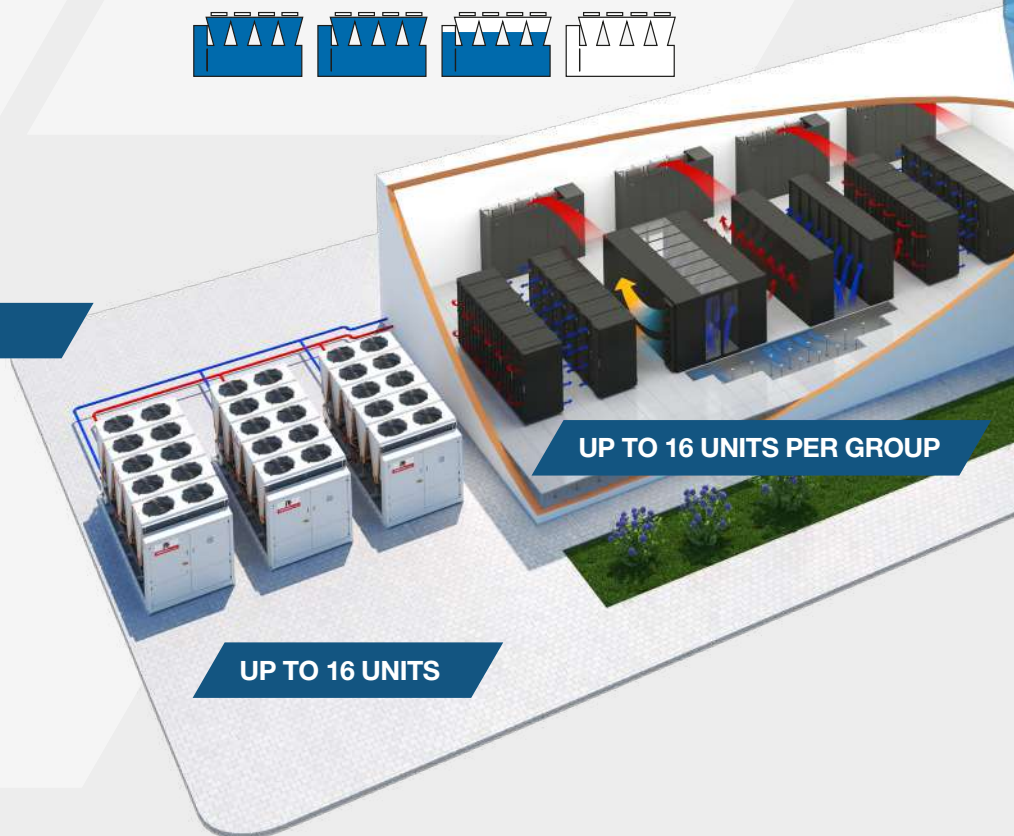
1. Load sharing

The load is distributed equally among the active units of the group.



2. Sequencing

The units are activated one after another. When the first unit is saturated (all the available resources are used), the second unit is activated, and so forth until the load is fully covered.



STAND-BY UNIT MANAGEMENT

- ▶ Set the number of stand-by units
- ▶ Automatic rotation with running hours equalization.
- ▶ Immediate activation in case of a unit's failure or disconnection, or emergency load levels.

FURTHER FUNCTIONS

- ▶ Pump controls are available both for individual and centralized pump group configurations (on/off, VPF, 2PS, etc.)
- ▶ Auxiliary inputs are applied at a group level (set-point adjustment, demand limit, etc.)

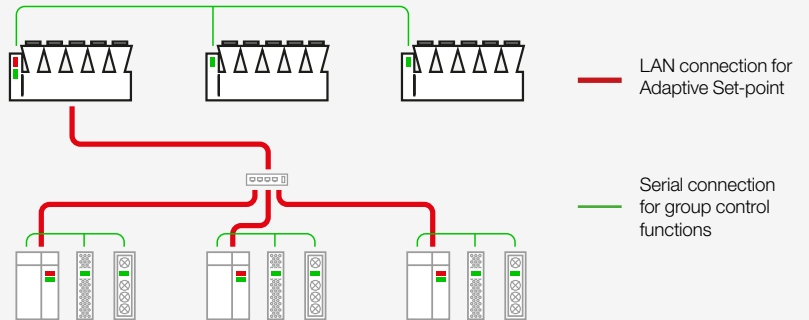
FAST RESTART

- ▶ No simultaneous start-ups of different unit's compressors, to prevent dangerous current peaks
- ▶ Selectable units start-up sequence

ADAPTIVE SET-POINT

Thanks to the Adaptive Set-point function, entire cooling equipment of the data center works as one. Outdoor chillers and indoor chilled water units coordinate to optimize their operation and enhance the system efficiency at part loads.

HOW IT WORKS



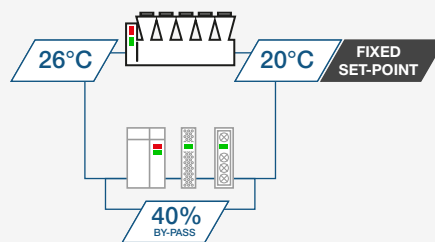
1 group of external chillers (up to 16 units) can be connected with up to 20 groups of indoor chilled water units (up to 16 units per group), with a simple LAN cable.

Each group of chilled water units communicates its real-time load condition. A smart algorithm combines the signals of all the indoor groups and converts them into a chiller set-point adjustment.

OPERATING PRINCIPLE

When the cooling load is low, the chiller group benefits from a higher set-point, with significant energy savings for the entire cooling system.

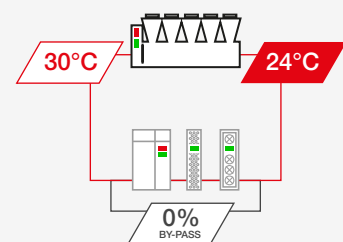
PARTIAL LOAD Standard Operation



+4°C
WATER TEMPERATURE

MORE
FREE-COOLING!

PARTIAL LOAD Adaptive Set-point



HIGHER
COMPRESSOR EFFICIENCY!

AT FULL LOAD:

The system operates with 28/20°C operating temperature and the air conditioners use the whole water flow rate.

AT PARTIAL LOADS:

- ▶ In traditional applications, the air conditioners modulate their by-pass valves and the chillers work partialized, but with the same operating set-point.
- ▶ With the Adaptive Set-point, the air conditioners gradually close their by-pass valve and, at the same time, the chillers increase their operating set-point. Few degrees really make the difference, especially in case of a free-cooling chillers.

CORE FEATURES FOR ALL YOUR EQUIPMENT NEEDS

W3000+ control and KIPlink innovative interface



The logic behind NR-FC-Z is the W3000+ control software. Characterized by advanced functions and algorithms, **W3000+ features proprietary settings** that ensure faster adaptive responses to different dynamics, in all operating modes. Direct control over the unit comes through the innovative KIPlink interface.

Based on Wi-Fi technology, **KIPlink** gets rid of the standard keyboard and **allows one to operate on the unit directly from a mobile device** (smartphone, tablet, notebook).

MAIN FEATURES



Easier on-site operation

Monitor each component while moving around the unit for maintenance operations.
View and change all parameters with easy-to-understand screenshots and dedicated tooltips.
Get devoted "help" messages / for alarm reset and trouble shooting.



Real-time graphs and trends

Monitor the immediate labor status of the compressors, heat exchangers, cooling circuits, and pumps.
View the real-time graphs of the key operating variable trends.



Data logger function

View history of events and use the filter for a simple search.
Enhance diagnostics with data and graphs of 10 minutes before and after each alarm.
Download all the data for detailed analysis.

How to access the unit with KIPlink



Direct access to the W3000TE control is achieved by scanning the QR-code positioned on the front side of the NR-FC-Z unit.



The three-colour LED button positioned on the electrical board allows the user to switch the unit on/off and visualize the general status of the equipment without using any mobile device.

In addition (Opt. 1442, 1444) or in substitution (Opt. 6194, 6195) to the KIPlink, NR-FC-Z can be provided with: a 7" color touch screen interface or with a keyboard with large display and LED icons. In these cases, the LED switch is not provided.

Remote keyboard is possible (Opt. C9261063, C9261064, C926108911, C926108913).

EQUIPMENT FOR MISSION CRITICAL APPLICATIONS

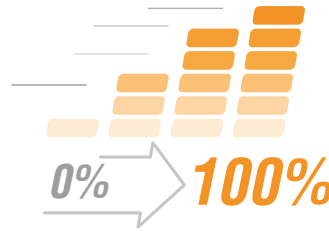
Committed to ensure the highest standards of reliability, NR-FC-Z includes a full range of devices and functions that maximize unit's uptime in case of emergency circumstances.

FAST RESTART

Ensures a **faster return to the necessary cooling** levels in the shortest time possible, while maintaining the **reliability** of the chiller.



Ensure fast cooling start-up



Have the unit running at full load in a shorter time

A 6-cpr unit in standard working conditions delivers 100% of cooling capacity (850 kW) within 72" after power is restored.

Fast restart - UPS excluded (Opt.4501)

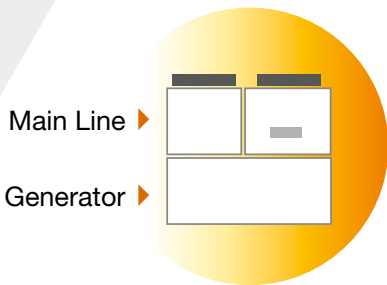
This option requires an external 230V AC UPS, not supplied with the unit, to keep the on-board controller functional and ensure fast restart after a power outage.

Fast restart - UPS included (Opt. 4502)

This option includes an electric device capable of keeping the controller power supply uninterrupted during a power failure. The capacity of this device is selected on the basis of the needs of a specific project.

DOUBLE POWER SUPPLY

Redundancy increases uptime. NR-FC-Z extends this concept also to the electrical supply: the unit, equipped with an ATS*, can be connected to two separate power lines to enhance the system's dependability.



In case of a main line power outage, the ATS* automatically switches over to the backup line, granting uninterrupted power supply to the unit.

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

* ATS: Automatic Transfer Switch

** The Tier Classification System provides the data center industry with a consistent method to compare typically unique facilities based on expected site infrastructure performance, or uptime.

Double power supply (ATS) (Opt. 1561)

The ATS, installed within the electrical board, automatically senses if one of the sources has lost or gained power. The switching is completely automatic (line priority and frequency of checking are selectable).

Double power supply (Motorized changeover) (Opt. 1562)

The motorized changeover, installed within the electrical board, is with remote control (i.e. signal of generator start-up).

ENERGY METER

You can't manage what you don't measure.

PUE (Power usage effectiveness) is the ratio that determines how energy efficient data centers are comparing the power currently used for the IT equipment with the power used by the infrastructure which keeps that IT equipment working, including the cooling system. Energy meter option allows to acquire the electrical data and the power absorbed by the unit and send them to the supervisor for energy metering.



NR-FC-Z 0384 - 0926

Air cooled chiller with free-cooling for high leaving water temperature (from 364 to 978 kW)



NR-FC-Z /K

Model		0384	0414	0434	0464	0494	0524	0554	
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	
PERFORMANCE									
MECHANICAL COOLING (GROSS VALUE)									
Cooling capacity	(1)	kW	367,4	387,8	418,9	443,0	475,5	499,5	534,9
Total power input	(1)	kW	98,46	106,9	113,2	121,2	126,7	136,8	147,5
EER	(1)	kW/kW	3,730	3,628	3,701	3,655	3,753	3,651	3,626
MECHANICAL COOLING (EN14511 VALUE)									
Cooling capacity	(2)(3)	kW	366,5	386,8	417,7	441,9	474,2	498,5	533,7
EER	(2)(3)	kW/kW	3,690	3,590	3,650	3,610	3,700	3,620	3,590
SEPR	(4)(5)		5,79	5,68	5,90	5,93	5,88	5,69	5,77
TOTAL FREE-COOLING (GROSS VALUE)									
Total free-cooling temperature	(6)	°C	9,6	8,9	9,8	9,2	9,9	9,3	8,3
Cooling capacity	(6)	kW	367,4	387,8	418,9	443,0	475,5	499,5	534,9
EER	(6)	kW/kW	32,23	34,02	31,50	33,31	31,28	32,86	35,19
MECHANICAL COOLING (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(7)	kW	295,5	312,4	336,4	359,3	384,6	404,7	431,4
Total power input	(7)	kW	93,06	100,4	106,2	113,6	118,9	127,8	137,0
EER	(7)	kW/kW	3,174	3,112	3,168	3,163	3,235	3,167	3,149
23°C/15°C									
Cooling capacity	(8)	kW	335,8	354,7	382,5	407,2	436,5	458,5	489,5
Total power input	(8)	kW	96,06	104,0	110,1	117,8	123,2	132,8	142,8
EER	(8)	kW/kW	3,494	3,411	3,474	3,457	3,543	3,453	3,428
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow	(3)	l/s	12,10	12,77	13,80	14,59	15,66	16,45	17,62
Pressure drop	(2)(3)	kPa	35,7	40,3	46,7	42,0	46,9	34,6	36,4
REFRIGERANT CIRCUIT									
Compressors nr.		N°	4	4	4	4	4	4	4
No. Circuits		N°	2	2	2	2	2	2	2
Refrigerant charge		kg	40,0	45,0	52,0	52,0	56,0	58,0	64,0
NOISE LEVEL									
Sound Pressure	(9)	dB(A)	62	62	62	62	62	62	62
Sound power level in cooling	(10)(11)	dB(A)	94	94	94	95	95	95	95
SIZE AND WEIGHT									
A	(12)	mm	3905	3905	5080	5080	5080	5080	5080
B	(12)	mm	2260	2260	2260	2260	2260	2260	2260
H	(12)	mm	2450	2450	2450	2450	2450	2450	2450
Operating weight	(12)	kg	3580	3610	4110	4420	4610	5180	4720

Model		0594	0624	0685	0746	0836	0866	0926	
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	
PERFORMANCE									
MECHANICAL COOLING (GROSS VALUE)									
Cooling capacity	(1)	kW	567,5	603,6	649,7	713,6	796,4	837,8	895,9
Total power input	(1)	kW	155,5	163,2	179,2	190,1	220,7	226,3	247,1
EER	(1)	kW/kW	3,650	3,699	3,626	3,754	3,609	3,702	3,626
MECHANICAL COOLING (EN14511 VALUE)									
Cooling capacity	(2)(3)	kW	566,2	602,2	648,2	712,2	794,5	835,7	893,4
EER	(2)(3)	kW/kW	3,610	3,660	3,590	3,720	3,570	3,660	3,580
SEPR	(4)(5)		5,83	5,79	5,88	6,28	6,19	5,96	6,06
TOTAL FREE-COOLING (GROSS VALUE)									
Total free-cooling temperature	(6)	°C	9,2	9,7	9,0	9,9	8,8	9,8	9,0
Cooling capacity	(6)	kW	567,5	603,6	649,7	713,6	796,4	837,8	895,9
EER	(6)	kW/kW	33,19	31,77	34,19	31,30	34,93	31,50	33,68
MECHANICAL COOLING (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(7)	kW	462,2	490,9	528,3	579,9	649,3	678,0	728,9
Total power input	(7)	kW	144,9	152,2	167,1	178,7	205,7	212,0	229,8
EER	(7)	kW/kW	3,190	3,225	3,162	3,245	3,157	3,198	3,172
23°C/15°C									
Cooling capacity	(8)	kW	522,9	555,6	597,9	657,2	732,7	768,4	824,4
Total power input	(8)	kW	150,9	158,4	173,8	185,1	214,0	219,9	239,5
EER	(8)	kW/kW	3,465	3,508	3,440	3,551	3,424	3,494	3,442
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow	(3)	l/s	18,69	19,88	21,40	23,50	26,23	27,59	29,50
Pressure drop	(2)(3)	kPa	40,4	39,0	41,7	34,9	44,6	48,1	55,0
REFRIGERANT CIRCUIT									
Compressors nr.		N°	4	4	5	6	6	6	6
No. Circuits		N°	2	2	2	2	3	2	2
Refrigerant charge		kg	66,0	75,0	75,0	75,0	80,0	82,0	82,0
NOISE LEVEL									
Sound Pressure	(9)	dB(A)	62	63	63	63	63	64	64
Sound power level in cooling	(10)(11)	dB(A)	95	96	96	96	96	97	97
SIZE AND WEIGHT									
A	(12)	mm	6255	6255	6255	7430	7430	8605	8605
B	(12)	mm	2260	2260	2260	2260	2260	2260	2260
H	(12)	mm	2450	2450	2450	2450	2450	2450	2450
Operating weight	(12)	kg	4860	4970	5460	6050	6130	6700	6750

Notes:

- Plant (side) cooling exchanger water (in/out) 28°C/20°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- Values in compliance with EN14511
- Plant (side) cooling exchanger water (in/out) 28°C/20°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- Seasonal energy efficiency ratio
- Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 2016/2281]
- Plant (side) cooling exchanger water (in/out) 28°C/20°C; Ethylene glycol 30%
- Plant (side) cooling exchanger water (in/out) 16°C/10°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%

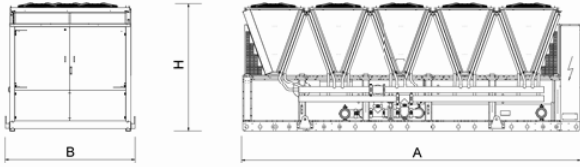
- Plant (side) cooling exchanger water (in/out) 23°C/15°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.

- Sound power on the basis of measurements made in compliance with ISO 9614.

- Sound power level in cooling, outdoors.

- Unit in standard configuration/execution, without optional accessories.

The units highlighted in this publication contain HFC R410A [GWP100 2088] fluorinated greenhouse gases.



NR-FC-Z /SL-K

Model		0384	0414	0434	0464	0494	0524	0554
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
PERFORMANCE								
MECHANICAL COOLING (GROSS VALUE)								
Cooling capacity	(1) kW	364,5	385,9	417,0	439,4	466,5	503,5	534,1
Total power input	(1) kW	97,59	105,7	111,3	120,1	128,7	133,6	144,1
EER	(1) kW/kW	3,735	3,651	3,747	3,659	3,625	3,769	3,706
MECHANICAL COOLING (EN14511 VALUE)								
Cooling capacity	(2)(3) kW	363,6	384,9	415,8	438,3	465,2	502,4	532,9
EER	(2)(3) kW/kW	3,690	3,610	3,700	3,620	3,580	3,730	3,670
SEPR	(4)(5)	6,13	6,01	6,21	6,01	6,08	5,99	6,03
TOTAL FREE-COOLING (GROSS VALUE)								
Total free-cooling temperature	(6) °C	9,3	8,6	9,3	8,7	8,1	9,7	9,0
Cooling capacity	(6) kW	364,5	385,9	417,0	439,4	466,5	503,5	534,1
EER	(6) kW/kW	44,51	47,12	44,55	46,94	49,84	43,03	45,65
MECHANICAL COOLING (GROSS VALUE)								
16°C/10°C								
Cooling capacity	(7) kW	293,6	311,1	335,3	357,1	379,4	407,6	430,3
Total power input	(7) kW	91,99	98,99	104,3	112,2	119,7	124,8	133,8
EER	(7) kW/kW	3,191	3,142	3,215	3,183	3,170	3,266	3,216
23°C/15°C								
Cooling capacity	(8) kW	333,4	353,0	381,0	404,3	429,3	461,9	488,6
Total power input	(8) kW	95,09	102,7	108,1	116,6	124,6	129,6	139,5
EER	(8) kW/kW	3,506	3,437	3,525	3,467	3,445	3,564	3,503
EXCHANGERS								
HEAT EXCHANGER USER SIDE IN REFRIGERATION								
Water flow	(3) l/s	12,00	12,71	13,73	14,47	15,36	16,58	17,59
Pressure drop	(2)(3) kPa	35,1	40,1	46,5	41,3	45,9	35,2	36,3
REFRIGERANT CIRCUIT								
Compressors nr.	N°	4	4	4	4	4	4	4
No. Circuits	N°	2	2	2	2	2	2	2
Refrigerant charge	kg	42,0	47,0	50,0	52,0	52,0	57,0	60,0
NOISE LEVEL								
Sound Pressure	(9) dB(A)	54	54	54	53	53	54	54
Sound power level in cooling	(10)(11) dB(A)	86	86	86	86	86	87	87
SIZE AND WEIGHT								
A	(12) mm	5080	5080	5080	5080	5080	6255	6255
B	(12) mm	2260	2260	2260	2260	2260	2260	2260
H	(12) mm	2450	2450	2450	2450	2450	2450	2450
Operating weight	(12) kg	3960	4080	4600	4580	4610	5850	5360

Model		0594	0624	0685	0746	0836	0866	0926
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
PERFORMANCE								
MECHANICAL COOLING (GROSS VALUE)								
Cooling capacity	(1) kW	568,2	604,0	643,7	710,6	801,0	826,3	888,2
Total power input	(1) kW	154,7	160,2	176,2	187,4	213,1	223,3	244,8
EER	(1) kW/kW	3,673	3,770	3,653	3,792	3,759	3,700	3,628
MECHANICAL COOLING (EN14511 VALUE)								
Cooling capacity	(2)(3) kW	566,9	602,6	642,2	709,2	799,1	824,2	885,7
EER	(2)(3) kW/kW	3,630	3,730	3,610	3,760	3,720	3,660	3,580
SEPR	(4)(5)	6,04	6,07	6,11	6,62	6,48	6,25	6,33
TOTAL FREE-COOLING (GROSS VALUE)								
Total free-cooling temperature	(6) °C	8,4	9,7	9,0	9,6	9,7	9,0	8,5
Cooling capacity	(6) kW	568,2	604,0	643,7	710,6	801,0	826,3	888,2
EER	(6) kW/kW	48,56	43,14	45,98	43,33	42,83	44,19	47,50
MECHANICAL COOLING (GROSS VALUE)								
16°C/10°C								
Cooling capacity	(7) kW	463,9	491,4	523,5	578,1	649,7	669,6	723,9
Total power input	(7) kW	143,6	149,1	164,0	175,6	198,9	207,5	227,0
EER	(7) kW/kW	3,231	3,296	3,192	3,292	3,266	3,227	3,189
23°C/15°C								
Cooling capacity	(8) kW	524,1	556,1	592,4	654,8	733,7	757,7	818,0
Total power input	(8) kW	149,9	155,3	170,8	182,2	206,6	216,2	237,0
EER	(8) kW/kW	3,496	3,581	3,468	3,594	3,551	3,505	3,451
EXCHANGERS								
HEAT EXCHANGER USER SIDE IN REFRIGERATION								
Water flow	(3) l/s	18,71	19,89	21,20	23,40	26,38	27,21	29,25
Pressure drop	(2)(3) kPa	40,5	39,1	40,9	34,6	45,1	46,8	54,1
REFRIGERANT CIRCUIT								
Compressors nr.	N°	4	4	5	6	6	6	6
No. Circuits	N°	2	2	2	2	2	3	2
Refrigerant charge	kg	66,0	77,0	79,0	82,0	86,0	86,0	86,0
NOISE LEVEL								
Sound Pressure	(9) dB(A)	54	55	57	55	56	57	57
Sound power level in cooling	(10)(11) dB(A)	87	88	90	88	89	90	90
SIZE AND WEIGHT								
A	(12) mm	6255	7430	7430	8605	9780	9780	9780
B	(12) mm	2260	2260	2260	2260	2260	2260	2260
H	(12) mm	2450	2450	2450	2450	2450	2450	2450
Operating weight	(12) kg	4930	5500	6140	6610	7200	7230	7280

Notes:

- 1 ▶ Plant (side) cooling exchanger water (in/out) 28°C/20°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- 2 ▶ Values in compliance with EN14511
- 3 ▶ Plant (side) cooling exchanger water (in/out) 28°C/20°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- 4 ▶ Seasonal energy efficiency ratio
- 5 ▶ Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 2016/2281]
- 6 ▶ Plant (side) cooling exchanger water (in/out) 28°C/20°C; Ethylene glycol 30%.
- 7 ▶ Plant (side) cooling exchanger water (in/out) 16°C/10°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- 8 ▶ Plant (side) cooling exchanger water (in/out) 23°C/15°C; Source (side) heat exchanger air (in) 35°C; Ethylene 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 R410A [GWP100 2088] fluorinated greenhouse gases.



NR-FC-Z 0384 - 0926

Air cooled chiller with free-cooling for high leaving water temperature (from 364 to 978 kW)



NR-FC-Z /A

Model		0384	0414	0434	0464	0494	0524	0554
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
PERFORMANCE								
MECHANICAL COOLING (GROSS VALUE)								
Cooling capacity	(1) kW	389,4	422,0	454,6	479,6	510,6	542,8	577,2
Total power input	(1) kW	96,52	103,6	109,9	116,6	123,2	132,5	142,3
EER	(1) kW/kW	4,035	4,073	4,136	4,113	4,144	4,097	4,056
MECHANICAL COOLING (EN14511 VALUE)								
Cooling capacity	(2)(3) kW	388,5	420,8	453,2	478,3	509,1	541,5	575,8
EER	(2)(3) kW/kW	3,990	4,020	4,070	4,060	4,080	4,050	4,010
SEPR	(4)(5)	6,39	6,43	6,54	6,40	6,33	6,26	6,41
TOTAL FREE-COOLING (GROSS VALUE)								
Total free-cooling temperature	(6) °C	10,1	10,8	11,3	11,7	12,0	11,6	11,1
Cooling capacity	(6) kW	389,4	422,0	454,6	479,6	510,6	542,8	577,2
EER	(6) kW/kW	40,06	37,35	34,97	32,85	31,52	33,51	35,63
MECHANICAL COOLING (GROSS VALUE)								
16°C/10°C								
Cooling capacity	(7) kW	312,7	337,9	363,1	386,0	410,1	436,6	462,0
Total power input	(7) kW	91,42	98,14	104,0	110,6	116,8	125,0	133,4
EER	(7) kW/kW	3,421	3,444	3,491	3,490	3,511	3,493	3,463
23°C/15°C								
Cooling capacity	(8) kW	355,7	384,8	414,0	439,3	467,2	496,1	526,3
Total power input	(8) kW	94,22	101,1	107,2	113,9	120,3	129,1	138,3
EER	(8) kW/kW	3,776	3,806	3,862	3,857	3,884	3,843	3,805
EXCHANGERS								
HEAT EXCHANGER USER SIDE IN REFRIGERATION								
Water flow	(3) l/s	12,82	13,90	14,97	15,79	16,82	17,87	19,01
Pressure drop	(2)(3) kPa	39,3	46,8	53,9	48,1	53,2	39,4	41,2
REFRIGERANT CIRCUIT								
Compressors nr.	N°	4	4	4	4	4	4	4
No. Circuits	N°	2	2	2	2	2	2	2
Refrigerant charge	kg	40,0	45,0	52,0	65,0	67,0	67,0	70,0
NOISE LEVEL								
Sound Pressure	(9) dB(A)	63	63	64	63	64	64	64
Sound power level in cooling	(10)(11) dB(A)	95	95	96	96	97	97	97
SIZE AND WEIGHT								
A	(12) mm	3905	5080	5080	6255	6255	6255	6255
B	(12) mm	2260	2260	2260	2260	2260	2260	2260
H	(12) mm	2450	2450	2450	2450	2450	2450	2450
Operating weight	(12) kg	3580	4070	4260	5110	5300	5340	5360

Model		0594	0624	0685	0746	0836	0866	0926
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
PERFORMANCE								
MECHANICAL COOLING (GROSS VALUE)								
Cooling capacity	(1) kW	612,0	650,6	704,5	759,3	854,5	895,8	952,0
Total power input	(1) kW	151,0	159,6	171,8	185,5	211,8	222,0	241,2
EER	(1) kW/kW	4,053	4,076	4,101	4,093	4,034	4,035	3,947
MECHANICAL COOLING (EN14511 VALUE)								
Cooling capacity	(2)(3) kW	610,4	649,0	702,7	757,7	852,3	893,3	949,1
EER	(2)(3) kW/kW	4,000	4,030	4,050	4,050	3,980	3,980	3,890
SEPR	(4)(5)	6,31	6,29	6,42	6,79	6,62	6,52	6,52
TOTAL FREE-COOLING (GROSS VALUE)								
Total free-cooling temperature	(6) °C	11,4	11,6	12,1	11,5	11,7	11,4	10,7
Cooling capacity	(6) kW	612,0	650,6	704,5	759,3	854,5	895,8	952,0
EER	(6) kW/kW	34,38	33,54	31,04	33,45	32,99	34,59	36,76
MECHANICAL COOLING (GROSS VALUE)								
16°C/10°C								
Cooling capacity	(7) kW	495,4	526,2	567,1	613,8	689,0	719,8	770,9
Total power input	(7) kW	141,8	149,7	162,3	175,6	199,4	208,2	225,5
EER	(7) kW/kW	3,494	3,515	3,494	3,495	3,455	3,457	3,419
23°C/15°C								
Cooling capacity	(8) kW	562,3	597,3	644,2	697,6	780,5	816,9	874,1
Total power input	(8) kW	147,0	155,3	167,6	181,1	206,1	215,6	234,3
EER	(8) kW/kW	3,825	3,846	3,844	3,852	3,787	3,789	3,731
EXCHANGERS								
HEAT EXCHANGER USER SIDE IN REFRIGERATION								
Water flow	(3) l/s	20,16	21,42	23,20	25,01	28,14	29,50	31,35
Pressure drop	(2)(3) kPa	45,7	44,6	47,3	38,6	50,1	53,7	60,6
REFRIGERANT CIRCUIT								
Compressors nr.	N°	4	4	5	6	6	6	6
No. Circuits	N°	2	2	2	2	2	3	2
Refrigerant charge	kg	77,0	81,0	84,0	86,0	89,0	89,0	89,0
NOISE LEVEL								
Sound Pressure	(9) dB(A)	64	65	65	65	65	66	66
Sound power level in cooling	(10)(11) dB(A)	97	98	98	98	98	99	99
SIZE AND WEIGHT								
A	(12) mm	7430	7430	8605	8605	9780	9780	9780
B	(12) mm	2260	2260	2260	2260	2260	2260	2260
H	(12) mm	2450	2450	2450	2450	2450	2450	2450
Operating weight	(12) kg	5400	5500	5960	6610	7210	7230	7280

Notes:

- Plant (side) cooling exchanger water (in/out) 28°C/20°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- Values in compliance with EN14511
- Plant (side) cooling exchanger water (in/out) 28°C/20°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- Seasonal energy efficiency ratio
- Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 2016/2281]
- Plant (side) cooling exchanger water (in/out) 28°C/20°C; Ethylene glycol 30%.
- Plant (side) cooling exchanger water (in/out) 16°C/10°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%

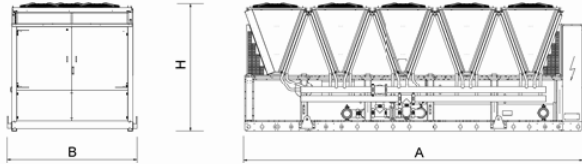
- Plant (side) cooling exchanger water (in/out) 23°C/15°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.

- Sound power on the basis of measurements made in compliance with ISO 9614.

- Sound power level in cooling, outdoors.

- Unit in standard configuration/execution, without optional accessories.

The units highlighted in this publication contain HFC R410A [GWP100 2088] fluorinated greenhouse gases.



NR-FC-Z /SL-A

Model			0384	0414	0434	0464	0494	0524
Power supply	V/ph/Hz		400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE								
MECHANICAL COOLING (GROSS VALUE)								
Cooling capacity	(1)	kW	377,0	402,3	424,2	459,2	487,2	517,2
Total power input	(1)	kW	92,02	100,0	107,9	112,1	119,6	129,5
EER	(1)	kW/kW	4,098	4,023	3,931	4,096	4,074	3,994
MECHANICAL COOLING (EN14511 VALUE)								
Cooling capacity	(2)(3)	kW	376,1	401,3	423,0	458,0	485,8	516,1
EER	(2)(3)	kW/kW	4,050	3,970	3,880	4,040	4,020	3,950
SEPR	(4)(5)		7,02	6,71	6,65	6,99	6,80	6,62
TOTAL FREE-COOLING (GROSS VALUE)								
Total free-cooling temperature	(6)	°C	10,3	10,2	9,7	10,5	10,5	10,0
Cooling capacity	(6)	kW	377,0	402,3	424,2	459,2	487,2	517,2
EER	(6)	kW/kW	67,32	71,84	75,75	65,60	69,60	73,89
MECHANICAL COOLING (GROSS VALUE)								
16°C/10°C								
Cooling capacity	(7)	kW	302,6	322,8	340,7	371,2	393,2	418,2
Total power input	(7)	kW	87,02	94,22	101,1	105,2	112,3	121,0
EER	(7)	kW/kW	3,478	3,427	3,370	3,529	3,501	3,456
23°C/15°C								
Cooling capacity	(8)	kW	344,3	367,2	387,4	421,5	446,8	474,1
Total power input	(8)	kW	89,82	97,42	104,8	109,0	116,3	125,6
EER	(8)	kW/kW	3,834	3,770	3,697	3,867	3,842	3,775
EXCHANGERS								
HEAT EXCHANGER USER SIDE IN REFRIGERATION								
Water flow	(3)	l/s	12,42	13,25	13,97	15,12	16,04	17,03
Pressure drop	(2)(3)	kPa	37,1	42,8	47,9	44,8	49,2	36,7
REFRIGERANT CIRCUIT								
Compressors nr.		N°	4	4	4	4	4	4
No. Circuits		N°	2	2	2	2	2	2
Refrigerant charge		kg	47,0	47,0	50,0	67,0	67,0	66,0
NOISE LEVEL								
Sound Pressure	(9)	dB(A)	55	55	55	54	55	55
Sound power level in cooling	(10)(11)	dB(A)	87	87	87	87	88	88
SIZE AND WEIGHT								
A	(12)	mm	5080	5080	5080	6255	6255	6255
B	(12)	mm	2260	2260	2260	2260	2260	2260
H	(12)	mm	2450	2450	2450	2450	2450	2450
Operating weight	(12)	kg	4190	4220	4300	5270	5300	5330
Model			0554	0594	0624	0685	0746	0836
Power supply	V/ph/Hz		400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE								
MECHANICAL COOLING (GROSS VALUE)								
Cooling capacity	(1)	kW	551,6	594,3	620,3	679,9	722,9	822,6
Total power input	(1)	kW	139,9	145,8	155,5	166,3	181,6	206,6
EER	(1)	kW/kW	3,943	4,076	3,989	4,088	3,981	3,982
MECHANICAL COOLING (EN14511 VALUE)								
Cooling capacity	(2)(3)	kW	550,4	592,8	618,8	678,2	721,4	820,6
EER	(2)(3)	kW/kW	3,900	4,030	3,940	4,040	3,940	3,930
SEPR	(4)(5)		6,76	6,91	6,69	7,14	7,22	7,11
TOTAL FREE-COOLING (GROSS VALUE)								
Total free-cooling temperature	(6)	°C	9,4	10,0	10,1	10,2	10,0	10,1
Cooling capacity	(6)	kW	551,6	594,3	620,3	679,9	722,9	822,6
EER	(6)	kW/kW	78,80	70,75	73,85	69,38	73,77	73,45
MECHANICAL COOLING (GROSS VALUE)								
16°C/10°C								
Cooling capacity	(7)	kW	443,8	483,1	504,1	550,7	587,3	666,5
Total power input	(7)	kW	129,9	135,7	144,6	155,3	170,2	192,8
EER	(7)	kW/kW	3,416	3,560	3,486	3,546	3,451	3,457
23°C/15°C								
Cooling capacity	(8)	kW	504,2	547,2	570,8	623,9	665,7	753,0
Total power input	(8)	kW	135,3	141,4	150,7	161,4	176,6	200,3
EER	(8)	kW/kW	3,727	3,870	3,788	3,866	3,770	3,759
EXCHANGERS								
HEAT EXCHANGER USER SIDE IN REFRIGERATION								
Water flow	(3)	l/s	18,16	19,57	20,43	22,39	23,80	27,09
Pressure drop	(2)(3)	kPa	38,2	43,7	41,2	44,8	35,8	46,4
REFRIGERANT CIRCUIT								
Compressors nr.		N°	4	4	4	5	6	6
No. Circuits		N°	2	2	2	2	2	2
Refrigerant charge		kg	70,0	77,0	79,0	82,0	84,0	86,0
NOISE LEVEL								
Sound Pressure	(9)	dB(A)	55	55	56	56	56	56
Sound power level in cooling	(10)(11)	dB(A)	88	88	89	89	89	89
SIZE AND WEIGHT								
A	(12)	mm	6255	7430	7430	8605	8605	9780
B	(12)	mm	2260	2260	2260	2260	2260	2260
H	(12)	mm	2450	2450	2450	2450	2450	2450
Operating weight	(12)	kg	5360	5460	5500	5960	6610	7210

Notes:

- Plant (side) cooling exchanger water (in/out) 28°C/20°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- Values in compliance with EN14511
- Plant (side) cooling exchanger water (in/out) 28°C/20°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- Seasonal energy efficiency ratio
- Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 2016/2281]
- Plant (side) cooling exchanger water (in/out) 28°C/20°C; Ethylene glycol 30%
- Plant (side) cooling exchanger water (in/out) 16°C/10°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- Plant (side) cooling exchanger water (in/out) 23°C/15°C; Source (side) heat exchanger air (in) 35°C; Ethylene glycol 30%
- 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.
- Sound power on the basis of measurements made in compliance with ISO 9614.
- Sound power level in cooling, outdoors.
- Unit in standard configuration/execution, without optional accessories.

The units highlighted in this publication contain HFC R410A [GWP100 2088] fluorinated greenhouse gases.

FURTHER OPTIONS

Auxiliary input

4-20 mA: Enables remote set-point adjustments (analog input).

Double set-point: Enables the remote switch between 2 set-points (digital input).

Demand limit: Limits the unit's power absorption for safety reasons or in temporary situations (digital input).

Night mode: Limits the unit sound level reducing the speed of compressor and fans. Sound power reduction (with factory settings): -3 dB(A).

Electrical

Compressor rephasing: The capacitors on the compressors' line increase the unit's power factor.

Automatic circuit breakers for all major electrical loads: Protects the compressors and fans from possible current peaks, over-current switches are provided in place of the standard fuses.

Soft-starter: Manages the inrush current enabling lower motor windings' mechanical wear, avoidance of mains voltage fluctuations during starting and favorable sizing for the electrical system.

Connectivity

Serial card interface module to allow integration with BMS protocols:

Modbus / LonWorks / BACnet MS/TP / BACnet over IP / Konnex / Modbus TCP/IP/ SNMP

M-Net interface kit: Interface module to allow the integration of the unit with Mitsubishi Electric proprietary communication protocol M-Net.

Energy Meter

Energy meter for BMS: Acquires electrical data and the power absorbed by the unit and sends them the BMS for energy metering (Modbus RS485).

Energy meter for W3000: The electrical data acquired is available directly on the unit's control.

Refrigerant circuit

Dual pressure relief valves with switch: One valve is isolated from the refrigerant circuit while the other is in service. The user can work on the isolated valve for periodic maintenance or replacement, without removing the refrigerant from the circuit.

Compressor suction valve: Installed on each compressor suction line, it simplifies maintenance activity (discharge valves are present as per standard).

Refrigerant leak detector

Leak detector: Factory installed device. In case of a gas leak detection it raises an alarm.

Leak detector + compressor off: Factory installed device. In case of a gas leak detection it raises an alarm and stops the units.

Coils and Coatings

E-coated condensing coils: Highly resistant protection for microchannel coils.

Free-cooling coils with pre-painted fins: First grade of protection for traditional Cu/Al coils.

Free-cooling coils with Fing Guard Silver SB: Cu/Al coils fully covered with a highly resistant polyurethane coating.

Free-cooling coils Cu/Cu: Finned coils with copper tubes and copper fins.

Hydraulic

Water flow switch: Designed to protect the unit when the water flow across the evaporator is not sufficient and falls outside of the operating parameters.

FC modulating valve: Ensure the control of the leaving water temperature when the outdoor temperature is very low.

Flanged hydraulic connections: Grooved coupling with flanged counter-pipe.

Structure

Anti-intrusion grilles: Perimeter metal grilles to protect against the intrusion of solid bodies into the unit structure.

Spring type anti-vibration mountings: Reduce vibrations, keeping noise transmission to a minimum.

Packing

Reinforcing bars: Steel brackets used to strengthen the unit structure. Suggested in case of long truck transport.

Nylon packing: NR-FC-Z is covered with a protective nylon layer and provided with the lifting eye-plates, to load the unit into a truck.

Container packing: NR-FC-Z is covered with a protective nylon layer, provided with structural reinforcing bars and equipped with both lifting eye-plates and handling devices to load it on a container (metal slides, front handling bar).

A SELECTION OF RC INSTALLATIONS

TELECOM DATA CENTER

TIER IV

2016 ROME - ITALY

Application:
Data Center

Plant type:
Hydronic System

Cooling capacity: 7804 kW

Installed machines:
3x high efficiency chillers with
oil-free centrifugal compressors,
5x high efficiency chillers with
screw compressors



PROJECT

The structure has just been certified as TIER IV by Uptime Institute. That is to say, that these facilities have multiple, independent, and physically isolated systems that provide redundant capacity components and multiple, independent, diverse, and active distribution paths, which simultaneously serve the critical environment, achieving a fully Fault Tolerant infrastructure.

CHALLENGE

The cooling system is based on high efficiency RC units, linked to centralized free cooling and geo cooling systems.

SOLUTION

Specifically, the M&E designers have selected 3 chillers with oil-free compressors and 5 chillers with fixed speed and variable speed screw compressors, getting a total cooling capacity of 7,800 kW.

The large experience in air conditioning and the reliability of its solutions make Mitsubishi Electric Hydronics and IT Cooling Systems the ideal partner for cooling TIER IV data centers, like the newly certified Telecom IT structure in Acilia.

MORE THAN 1000 PROJECTS ALL OVER THE WORLD

2017 Amsterdam - The Netherlands

Schiphol Airport Data Center

Application: Data Center

Plant type: Hydronic System - HPAC System

Cooling capacity: 7869 kW

Installed machines:

40x close control chilled water units,

6x air cooled free-cooling chillers

2018 Treviso - Italy

Asco Tlc Data Centre Tier III

Application: Data Center

Plant type: HPAC System

Cooling capacity: 861 kW

Installed machines:

2x scroll compressor chiller with free-cooling technology,

6x 2-section chilled water air conditioners

2013 Lampertheim - France

SFR Datacenter

Application: Data Center

Plant type: Hydronic System

Cooling capacity: 386 kW

Installed machines:

2x scroll compressor chillers with free-cooling technology

RC's chiller units, with their unbeatable advantages in terms of efficiency, quality, and highly reliable standards are already the preferred choice of the major brands in the most prestigious projects all over the world.

2018 Wysogotowo - Poland Inea Data Centre

Application: Data Center
Plant type: Hydronic System
Cooling capacity: 1350 kW
Installed machines:

3x 2-section chilled water air conditioners;
3x full inverter air conditioners;
3x scroll compressor chillers with free-cooling technology;
3x remote condensers

2010 Reading - Great Britain DediPower Reading Data Centre

Application: Data Center
Plant type: Hydronic System
Cooling capacity: 1015 kW
Installed machines:

2x scroll compressor chillers,
1x scroll compressor chiller with free-cooling technology

2018 Brescia - Italy UBI Bank Data Centre

Application: Data Center
Plant type: Hydronic System - HPAC System
Cooling capacity: 1255 kW
Installed machines:

8x scroll compressor chillers with free-cooling technology,
2x ClimaPRO HVAC Optimisation and Control system,
20x indoor air conditioners



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.



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

Head Office: Via Roma 5 - 27010 Valle Salimbene (PV) - Italy

Tel +39 (0) 382 433 811 - Fax +39 (0) 382 587 148

www.rcitcooling.com

www.melcohit.com