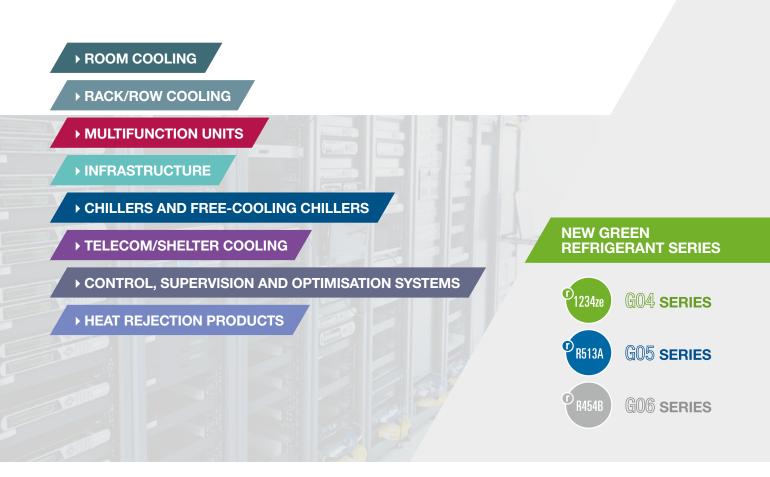
MITSUBISHI ELECTRIC HYDRONICS & IT COOLING SYSTEMS S.p.A.

IT COOLING PRODUCT OVERVIEW

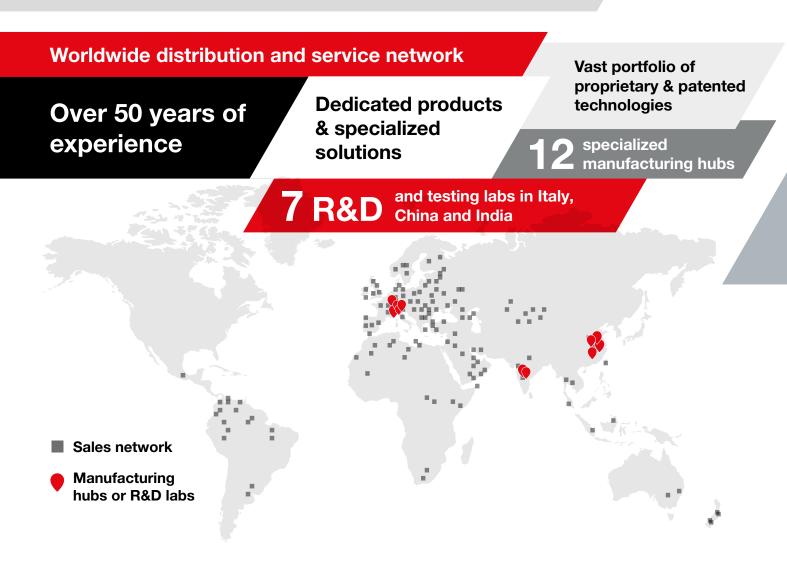




melcohit.com

RC IT COOLING'S MISSION

With over 50 years experience in the HVAC industry, RC has been a major player widely recognized for its leadership in IT Cooling solutions. Building on this strong legacy, Mitsubishi Electric Hydronics & IT Cooling Systems SpA has decided to turn RC into the Group's specialized brand for data center cooling







The result is a brand new business organisation providing the most complete product range, which combines the best technologies, solutions and innovations from RC and Climaveneta.

RC IT COOLING leading-edge cooling technologies and solutions for IT applications are designed to provide even the most challenging Data Center and **Telecom projects with:**





Smart integration of the most advanced technologies



Reduced operating costs



Complete reliability and extended lifetime



Widest use of the available power capacity



Optimised footprint



Increased sustainability



Advanced technologies for efficient data centers.

RC IT Cooling leadership in data center cooling systems is backed by 50 years of experience in the smart integration of premium technologies for complex IT cooling projects.



Magnetic levitation

An extended range of chillers with magnetic levitation centrifugal compressors from 200kW to 4MW, both air source and water source. available also in free cooling and evaporative free cooling versions, to deliver highest efficiency in every application.



An advanced free cooling system available both as direct and indirect free cooling (no glycol), to exploit the outdoor air to cool the data center.

Smart Thermal **Energy Management**



An innovative heat recovery system that allows the smart use of rejection heat from the data center for comfort heating and other neighbouring applications.



Active



Real active redundancy delivered through the combined adoption of innovative EC PUL fans, inverter DC brushless compressors and a smart algorithm that balances heating load also among stand-by units.

New G04, G05, G06 and G00 series using green refrigerants



Following on vast experience in using green refrigerants, RC has already employed extensively green HFO refrigerants such as R513A and R454B in many ranges, in order to continue to be at the forefront with green best practices.

Adaptive set point

An advanced algorithm instantaneously detects the real thermal loads of indoor units and conveys this information to chiller, for selection of the most efficient operating mode (e.g. dynamic variation of chillers et points and operating mode, free cooling mode, active redundancy mode).





The possibility to modulate cooling capacity results in increased efficiency as well as in the possibility to effectively implement smart management solutions such as active redundancy.

Hydronic Plant Connect



ADAPTIVE Set point

Fully developed in-house, HPC perfectly matches the need for cooling, reliability, and energy savings, guaranteeing excellent performances while fully respecting the required IT cooling demands. **V-AIR**



High efficiency EC technology fans are extensively adopted for their advantages both in internal units as well as in remote condensers with energy reduction up to 15% compared to traditional EC fans.

ROOM COOLING

| Direct expansion close control ur | nits | | |
|---|--------|--------------|--|
| t-NEXT DX with remote air cooled condenser | 6,37 • | 4 149 | AIR COOLED AXIAL C EC FAN |
| t-NEXT DW with built-in water cooled condenser | 7,89 > | ∢ 156 | WATER COOLED AXIAL C FAN |
| t-NEXT DF DX dual fluid / air cooled | 12,2 ► | 4 136 | AIR COOLED 🚲 DUAL FLUID |
| t-NEXT DF DW dual fluid / water cooled | 11,2 > | 145 | 👌 💥 WATER COOLED 🎄 🗱 DUAL FLUID |
| t-NEXT FC DW free cooling / water cooled | 7,88 > | 157 | WATER COOLED Stree Cooling C FAN |
| i-NEXT DX inverter compr./ with remote air cooled condenser | 10,4 > | 135 | INVERTER AIR COOLED |
| i-NEXT DW inverter compr./ with built-in water cooled condenser | 11 > | ↓ 140 | INVERTER A 💥 WATER COOLED |
| i-NEXT DF DX inverter compr./dual fluid/air cooled | 12,3) | 142 | INVERTER AIR COOLED AND DUAL FLUID |
| i-NEXT DF DW inverter compr./dual fluid/water cooled | 12,3 ► | 4 147 | NVERTER 🖋 WATER COOLED 🛷 dual fluid 🕼 EC FAN |
| i-NEXT FC DW inverter compr./free cooling/water cooled | 11 > | 4 140 | INVERTER A WATER COOLED A FREE COOLING C FAN |

≈. = ⊮.}

| Chilled water close control | ol units | | | |
|---|----------|------------|-------|----------------------------------|
| w-NEXT3 chilled water | 6 > 4 26 | | | 💥 CHILLED 🥳 EC FAN |
| w-NEXT3 DF dual fluid | 9 > 16 | | | CHILLED 🖉 DUAL COIL 🕼 EC FAN |
| W-NEXT-S dual coil | 6,7 • | | 1 213 | Chilled / CF EC FAN |
| w-NEXT DF dual coil | 13,6) | 140 | | CHILLED 🚔 DUAL COIL / 🕼 EC FAN |
| w-NEXT HD S/K high density | 14,3 > | 183 | | CHILLED HIGH DENSITY CHILLED FAN |
| w-NEXT2 S/K chilled water, 2-section | 57,8 > | | ▲ 227 | Chilled 🥳 EC FAN |
| w-NEXT2 DF chilled water, 2-section, dual coil | 58,2 ► | | ₹ 227 | CHILLED 🚔 DUAL COIL 🕼 EC FAN |

| i-MTR2-G02-M0 full inverter / direct expansion | 12 > | 18 | INVERTER C FAN |
|---|-----------------|----------|------------------------------|
| | 10 | 15 20 kW | |
| Close control units for high temperatur | e, high Delta T | | |
| NEXT-X-TYPE chilled water, X coil technology | 49,3 • | 4 173 | 🖌 COILS / 🛠 CHILLED 🌀 EC FAN |

100

150 kW

50

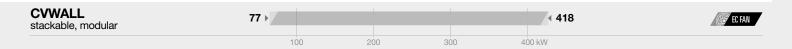
- Highest energy efficiency
- Total dependability
- Ideal for high temp. IT environments





| Close control units with displa | acement air c | lelivery | | |
|--|---------------|----------|-------|------------------------|
| w-NEXT3 DL displacement | 6 ▶ | < 26 | | CHILLED CE FAN |
| t-NEXT DL DX with remote air cooled condenser | 7,63 🕨 | | 42,6 | AIR COOLED |
| w-NEXT DL chilled water | 11,6 ► | | 41,3 | Chilled Cran |
| i-NEXT DL DX inverter compr. / with remote air cooled c | cond. 2 | 1,7 ▶ | ₹ 53 | INVERTER AT AIR COOLED |
| | 10 | 0 20 | 30 40 | 50 kW |

FANWALL UNIT FOR DATA CENTER COOLING



REMOTE CONDENSERS AND DRY COOLERS

| T-MATE2 DX-A air cooled remote condenser with AC axial fans | 12,2 ▶ | 146 | OUTDOOR AXIAL |
|--|--------|-------------------------|----------------------------|
| T-MATE2 DX-E air cooled remote condenser with EC axial fans | 9,79 > | 146 | OUTDOOR SEC AXIAL |
| T-MATE DX-PF-E air cooled remote condenser with EC plug fans | 9,90 > | 156 | OUTDOOR OF CENTRIE |
| T-MATE DC-A dry cooler with AC axial fans | 9,41 > | ▲ 156 | OUTDOOR AXIAL |
| GR-Z A dry cooler with EC plug fans | 6,40 > | • 172 | OUTDOOR AXIAL |
| GR-Z E air cooled remote condenser with AC axial fans | 8,30 > | ▲ 156 | OUTDOOR CAXIAL |
| DR-Z adiabatic with EC axial fans | | 223 > | 1047 Adiabatic Se ec axial |
| | 50 | 100 150 200 250 300 | kW |

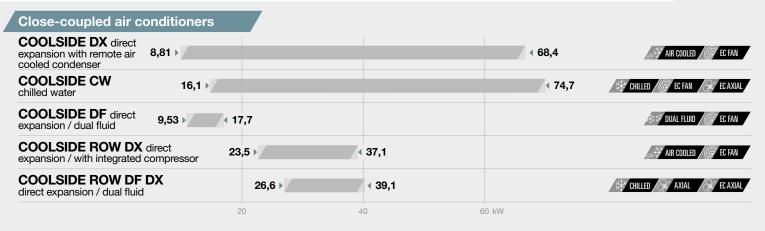


RACK/ROW COOLING

- Maximization of the internal capacity of the infrastructure
- Elimination of hot spots
- Minimum floorspace occupancy







INFRASTRUCTURE





RC RACK

High quality cabinets for the protection and housing of servers

Floor-standing cabinets suitable for the housing of the server. The supporting structure is made of sheet steel with a thickness of 20/10 and can reach a capacity of 2000 kg.

RC AISLE

Aisle Containment solutions for high density applications

Aisle Containment solutions for the physical separation of the hot and cold air streams.

RC PDUs

Premium Rack Power Technology

Power distribution units (PDUs) that manage power usage for servers, storage and network equipment.



RAISED FLOORS

Raised floor solutions for high efficiency data centers

The raised floor is designed to easily adapt to future evolutions of IT spaces, avoiding expensive building work.This solution fulfills the need for versatile design of data centers.





I

CHILLERS AND FREE-COOLING CHILLERS

| Air cooled chillers | ; | | | | |
|--|----------------------|-------------------------|------------------------|--------------|--------------------------------------|
| NR2-G02-Z scroll compressors | 58,7 ▶ | 4 1267 | | Т | SHELL&T. SCROLL AXIAL PLATES |
| FR2-G01-Z screw compressors | 437 🕨 | | | < 2425 | SCROLL AXIAL T SHELL&T. |
| i-NR-Z inverter driven scroll compressors | 43,9 • 129 | | | \bigwedge | INVERTER SCROLL AXIAL PLATES |
| NRCS-Z scroll compressors | 50,7 • | 885 | | | SCROLL AXIAL T SHELL&T. |
| FR-Z screw compressors | 140) | | 1710 | G | scroll 🔗 axial /P plates /T shell&t. |
| i-FR-G01-Z inverter coll-free centrif. compr. | driven 477 • | | ↓ 1697 | INVERTER AND | SCREW 💦 AXIAL 🧖 EC FAN 🕂 SHELL&T. |
| TRCS2-Z inverter driv oil-free centrif. compr. | ^{ren} 220) | 1324 | | INVERTER & | OIL FREE AXIAL C FAN FL FLOODED |
| NR-C-Z inverter driver oil-free centrif. compr. | ^າ 17,4 | | | | SCROLL SPLUG FAN PLATES |
| | 500 | 1000 1500 | 2000 kW | V | |
| Water cooled chill | lers | | | | |
| NR-W-Z scroll compressors | 38,1 > < 398 | | | | SCROLL PLATES |
| FR-W-Z screw compressors | 124 • 401 | | | | SCREW T SHELL&T. |
| FRCS3-W-Z screw compressors | 188 ► | 1693 | | | SCREW FL FLOODED |
| TR-W-Z inverter driven oil-free centrif. compr. | 246 • | | | ∢ 454 | 9 INVERTER OIL FREE L FLOODED |
| | 100 | 0 2000 | 3000 | 4000 kW | |
| Condenserless ch | illers | | | | |
| | | | | | |

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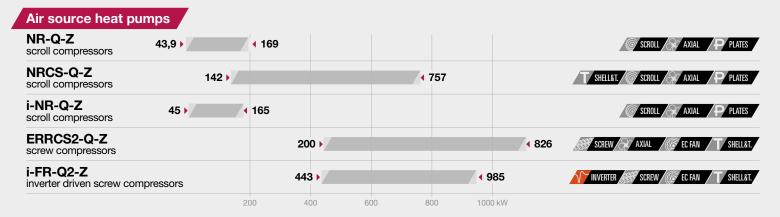
| HR-Z scroll compressors | 4,7 > 32,4 | |
|---------------------------------|------------|-----|
| NRCS-ME-Z scroll compressors | 39,5 🕨 | 432 |
| scioli compressors | | |
| FRCS-ME-Z | 79,2 🕨 | |
| screw compressors | | |
| | 5 | 500 |

| Air cooled chillers wi | ith free-cooling technolo | ogy 🔊 | | |
|---|---------------------------|-------|------------------------|------------------------------|
| NRCS-FC-Z scroll compressors | 41,5 > 477 | | | SCROLL AXIAL PLATES |
| NR2-FC-Z scroll compressors | 360 > | ∢ 895 | | SCROLL AXIAL C EC FAN PLATES |
| FR-FC-Z screw compressors | 332) | | 1450 | SCREW AXIAL T SHELL&T. |
| TRCS-FC-Z inverter driven oil-free centrif. compr. | 302 > | | 1693 | OIL FREE |
| | 500 | 1000 | 1500 kW | |

| Highest energy efficiency Ideal for IT environments Lowest noise emissions | l | | |
|--|------------------------------|--------------|--|
| Air cooled chillers with evaporative free-co | oling technology / 🔊 | • | |
| TRCS-EFC-Z 330 > | | ∢ 1441 | SCREW AXIAL T SHELL&T. |
| TRCS-EFC-Z nverter oil-free centrif. compr. 300 ▶ | | ▲ 1682 | OIL FREE CAXIAL FL FLOODED |
| 500 | 1000 | 1500 kW | |
| hir and water cooled chillers with HFO 1234 | 4ze GO4 SERIES ^{Q2} | 34ze | |
| FR2-G04-Z 437 ▶ ir cooled, screw compressors 437 ▶ | | ₹ 2445 | SCREW AXIAL T SHELL&T. |
| -FR-G04-Z 383 > | • 1463 | | INVERTER SCREW CF EC FAN |
| TRCS2 HFO-Z air cooled, 339 August 2019 | ▲ 1017 | | OIL FREE C FAN F FLOODED |
| FR-W-G04-Z water 93,1 > 373 | | | SCREW CF EC FAN T SHELL&T. |
| RCS2-W HFO-Z water cooled, 340 V | ▲ 1364 | | |
| -FR2-W-G04-Z 398 ► vater cooled, screw compr. | • 1241 | | SHELL&T. |
| TR2-W-G04-Z nverter oil-free centrif. compr. 246 | | ∢ 454 | 19 INVERTER OIL FREE |
| 500 | 1000 | 1500 kW | |
| ir and water cooled chillers with R513A | G05 SERIES PRISA | | |
| R2-G05-Z 437 ► | ◆ 2425 | | SCREW AXIAL T SHELL&T. |
| R-G05-Z ir cooled, screw compressors 140 > 4 396 | | | SCREW AXIAL T SHELL&T. |
| -FR-G05-Z air cooled, 477 > | ▲ 1697 | INVERTER AND | SCREW 😽 AXIAL 🖉 EC FAN 丁 SHELL&T. |
| RCS2-G05-Z air cooled, 325 Noverter oil-free centrif. compr. | ↓ 1789 | INVERTER S. | OIL FREE AXIAL C EC FAN |
| R-W-G05-Z water ooled, screw compressors 124 > 401 | | | SCREWI T SHELL&T |
| RCS3-W-G05-Z water ooled, screw compressors | ↓ 1693 | | SCREW FLOODED |
| R-W-G05-Z water cooled, 248 | | 444 | 66 INVERTER S OIL FREE L FLOODED |
| RCS-FC-G05-Z air ooled, oilfree centrif. compr., 299 ▶ ee-cooling | ∢ 1671 | | INVERTER OIL FREE CF EC FAN FL FLOODED |
| | ▲ 1450 | | SCREW AXIAL / T SHELL&T. |

| Air Cooed chillers and f | ree-cooling | chillers with F | R454B | GO6 SERIE | S P _{R454B} | |
|---|-------------|-----------------|-------|---------------|-----------------------------|--------------------------------|
| NR2-G06-Z air cooled, scroll compressors | 55,9 🕨 | | | ∢ 1216 | | SCROLL AXIAL PLATES T SHELL&T. |
| | | 100 50 | 0 | 1000 1500 |) kW | |

- Smart heat recovery system
- A single unit for multiple uses
- System simplification



INVERTER

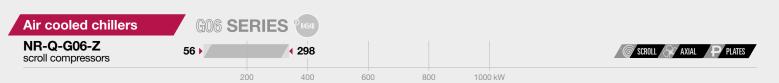
VAIF

Smart

Water source heat pumps

| NRCS-WQ-Z scroll compressors | 48,4 • | | | | | 4 284 | SCROLL P PLATES |
|-----------------------------------|--------|-----|-------|-----|-----|--------------------|-----------------|
| ERRCS2-WQ-Z scroll compressors | | | 189 🕨 | | | <mark>∢</mark> 318 | SCREW SHELL&T. |
| | 50 | 100 | 150 | 200 | 250 | 300 kW | |

| Air and water source 4-pipe | heat pum | ps with R513 | GO5 S | ERIES PISTA | |
|--|----------|--------------|---------|-------------|---------------------------------------|
| ERRCS2-Q-G05-Z air source, screw compressors | 199 🕨 | | | 826 | SCREW SC AXIAL / C EC FAN / T SHELL&T |
| i-FR-Q2-G05-Z air source, inverter, screw compressors | | 443 🕨 | | 985 | INVERTER SCREW C EC FAN / T SHELL&T. |
| ERRCS2-WQ-G05-Z water source, screw compressors | 189 🕨 | 4 318 | | | SCREW/T SHELL&T. |
| | 200 | 400 | 600 800 | 1000 kW | |



TELECOM/SHELTER COOLING

Reliability and extended operation

- High capacity sensitive cooling
- Black out management



| Air conditioners for telecom applications | with free-cooling | g and full DC inverter technolog | ал |
|--|-------------------|--|---------------------------------|
| MINIPAC EVO packaged for outdoor installation 1,95 > | | ₹ 20,6 | OUTDOOR CENTRIE CE FAN |
| MINIPAC EVO INV packaged for outdoor installation / inverter techn. | 8,56 > | ∢ 17,6 | OUTDOOR CENTRIE. CE FAN |
| ENERTEL EVO packaged for outdoor installation packaged for indoor installation | | 14,8 | INVERTER INDOOR CENTRIE CE FAN |
| ENERTEL EVO INV packaged for indoor installation /inverer techn. | 8,51 ▶ | 4 18,1 | INVERTER INDOOR CENTRIF. CE FAN |
| SPLIT EVO split system / ceiling or 4,94 V wall installation | | ₹ 16,8 | WALL INSTALLATION CENTRIE C FAN |
| SPLIT EVO INV split system / ceiling or wall installation /inverter tech. | 8,64 > | 17,3 Inverter | Wall INSTALLATION CENTRIF. |
| 5 | 10 | 15 20 kW | |

CONTROL, SUPERVISION AND OPTIMISATION SYSTEMS

| - | _ | |
|---|------|---|
| - | _ | |
| 7 | 1.11 | 1 |
| | | |

Group devices

ClimaPRO

Plant Room Optimisation System Plant Room Optimiser for real time,smart management of energy indecesfor the single units and the entire plant room.

MANAGER 3000

Specialized group control forthe data center air conditioners.



HPC - Hydronic Plant Connect HPC is a new control logic, completely integrated in the units' controller, that allows one to manage the entire hydronic IT cooling plant.



Supervision and monitoring systems

FWS3 / FWS3000
 Remote monitoring systems.

 RC Cloud Cloud based remote monitoring system.

Human Machine Interfaces

• **KIPlink** Control interface for smart phones and tablets.





MORE THAN 1000 PROJECTS ALL OVER THE WORLD

BANEDANMARK TIER III

Ringsted - Denmark

Period: 2020 - 2021 Application type: Data Center System type: Hydronic System, HPAC System Cooling capacity: 771 Installed Units: 3x i-NR-Z/SL 0302P, 1x i-FR-G04-Z/SL-A 2602, 8x COOLSIDE,



DNV-GØDSTRUP HOSPITAL

Herning - Denmark

2x Aisle Containment

Period: 2020

Application type: Healthcare / Hospitals, Data Center System type: Hydronic System, HPAC System

Cooling capacity: 766

Installed Units: 2x TRCS2-W HFO-Z/HC/S, 24x Coolside CW-I 0060, 2x w-NEXT DL/S 042, 2x w-NEXT DL 022, 2x w-NEXT DL 042, 84x RACK Every project is characterized by different usage conditions and system specifications for many different latitudes. All these projects share high energy efficiency, maximum integration, and total reliability due to the unique experience of RC branded solutions.

WIIT DATACENTER MILAN

Milan - Italy

Period: 2017-2018

Investor: WIIT

Application: Data Center

Plant type: Hydronic System

Cooling capacity: 700 kW

Installed machines: 10x NEXT EVO INV DX U; 18x TEAM MATE STD



FORTUM DISTRICT HEATING

Kirkkonummi - Finland

Period: 2017-2018 Application: Data Center Plant type: Hydronic System Cooling capacity: 27150 kW Heating capacity: 26486 kW Installed machines:

2x FRCS2-W HFO/H/CA/S 5422, 8x ACU EXPANDED





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

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