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

IT COOLING

AIR COOLED CHILLERS WITH INVERTER SCREW COMPRESSORS

i-FR-G04-Z

AIR COOLED CHILLERS WITH INVERTER SCREW COMPRESSORS AND HFO REFRIGERANT FROM 377 TO 1463 kW

r HFO 1234ze

TOTAL INVERTER TECHNOLOGY

rcitcooling.com

i-FR-G04-Z

THE FUTURE-PROOF CHILLER FOR GREEN EFFICIENCY

EER* up to 4,10

SEPR HT up to 6,43

*EER conditions: evap. 26/18°C, air 35°C

Air cooled chiller with inverter screw compressors and HFO 1234ze refrigerant. From 377 to 1463 kW

ErP 2021 COMPLIANT

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

i-FR-G04-Z is the eco-friendly and high performing chiller that matches the advantages of full inverter technology with environmental benefits of HFO green refrigerant.

Dedicated to rapidly changing data centers, i-FR-G04-Z air cooled chiller strives to reduce running costs while ensuring complete infrastructure dependability.

LEADING INVERTER TECHNOLOGY

TOTAL INVERTER TECHNOLOGY

The new i-FR-G04-Z showcases the latest variable speed technology applied on:

- dual screw compressors with integrated refrigerant cooled inverter motor and variable Vi technology
- high efficiency variable speed fans
- integrated variable speed hydronic modules (opt.)

THIS INCREDIBLE PERFORMING CHILLER ADJUSTS THE ROTATIONAL SPEED AND THE INTERNAL GEOMETRY TO:

- perfectly match the cooling load of the plant in any condition
- offer stepless and accurate capacity control
- ensure premium efficiency values, thus cutting operating costs

UNCOMPROMISED EFFICIENCY

A

2021 ECODESIGN DIRECTIVE COMPLIANT

Thanks to the latest variable speed technology applied both on the compressors and on the fans, i-FR-G04-Z achieves uncompromised part load efficiency values.

The new family exceeds the strictest 2021 Ecodesign Directive tier, placing it on the top level of the market.

COOLING DEPENDABILITY

Designed for continuous operation, i-FR-G04-Z meets the needs of an industry that cannot afford cooling interruptions. Bespoke devices and and functions maximize the unit uptime even in case of emergency circumstances.

ACOUSTIC VERSIONS

-	**Standard**	Unit with standard compressor's enclosure.	**Baseline**
		Unit with noise reducer kit (Opt. 2315).	**-3 dB(A)**
SL	**Super low noise**	The highest level of noise reduction which cuts noise emissions down to -9dB(A),without compromising the unit's efficiency.	**-9 dB(A)**

HEAT RECOVERY CONFIGURATIONS

-	**Standard unit**	Unit for the production of chilled water.
D	**Partial heat recovery**	Unit for the production of chilled water, equipped with an auxiliary heat exchanger on the compressor discharge for superheat recovery.

ALL-ROUND SUSTAINABILITY

r HFO 1234ze

i-FR-G04-Z is the result of Mitsubishi Electric Hydronics & IT Cooling Systems' extensive approach to sustainability.

Achieving outstanding performance and ensuring long-term sustainability are challenges that modern HVAC systems need to tackle.
Increasing concerns about the global warming impact of chillers and heat pumps is driving new regulatory policies to push towards even more efficient units with the lowest carbon footprint.
Today, an all-round approach is the only way to effectively reduce the Total Equivalent Warming Impact (TEWI).

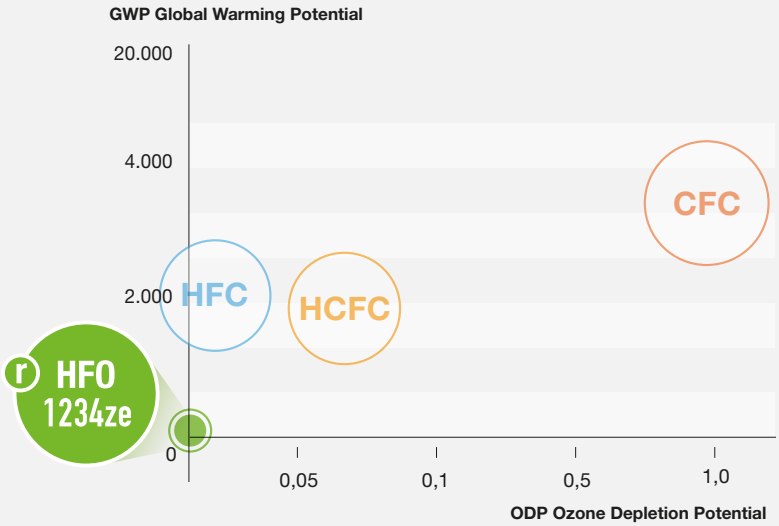
Fully committed to support the creation of a greener tomorrow, Mitsubishi Electric Hydronics & IT Cooling Systems designed i-FR-G04-Z, a complete chiller range optimized for HFO refrigerant R1234ze, with nearly zero environmental impact.

Combining brilliant annual efficiency with the use of a low GWP refrigerant, i-FR-G04-Z tackles both the indirect (due to the primary energy consumption) and the direct global warming impact, thus resulting the perfect choice for any new, forward-looking cooling system.

The environmental impact of the refrigerants is measured by two parameters:

- **ODP:** Ozone Depletion Potential
- **GWP:** Global Warming Potential

While in the past the focus was on reducing ODP values to 0, new regulations encourage Member States to work harder on GWP.



The path to a greener world

Starting from the 70s, several international agreements have been made to drive the industry towards eco-friendly refrigerants. The last crucial step was taken in 2016, when the Kigali Amendment to the Montreal Protocol was passed, paving the way for the global phasedown of HFCs.

- **1977** World Plan of Action on the Ozone Layer
- **1987** Montreal Protocol
- **1997** Kyoto Protocol
- **2006** EU F-gas regulation
- **2016** Kigali Amendment to The Montreal Protocol

QUICK&EASY INSTALLATION AND MAINTENANCE

A vast array of already mounted options together with a smart unit design for quick and easy installation and maintenance operations.

HIGH DEGREE OF CONFIGURABILITY

Always the right solution for every project thanks to many specifically developed versions and a bespoke list of options (e.g. the integrated hydronic modules, several water flows controls).

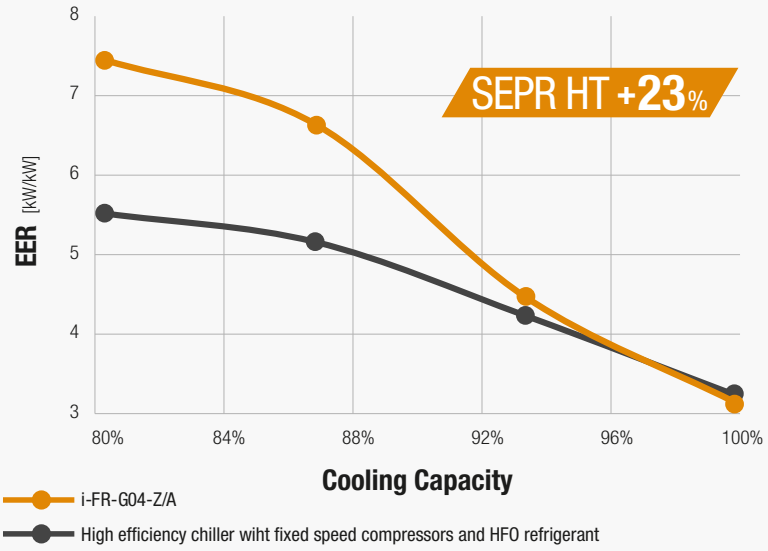
EXTENDED OPERATING RANGE

+55°
-20°

Wide operating range, working with outdoor air temperatures from -20°C up to +55°C thanks to specifically developed options and smart control logics.

FULL INVERTER TECHNOLOGY

HIGHER ENERGY EFFICIENCY



The increase in efficiency compared to high efficiency ErP 2018 compliant fixed speed units is expressed by drawing the EER trend to the conditions defined by the ErP directive 2009/125 /EC necessary for the calculation of SEPR HT seasonal parameters.

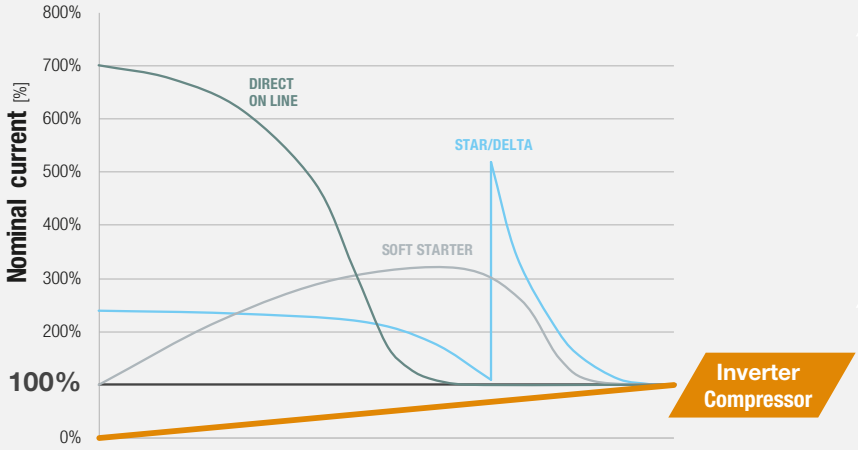
ErP 2021 COMPLIANT

IT environments are usually characterized by high thermal loads, all year round.

Even in high load profile applications, i-FR-G04-Z ensures significant efficiency improvement compared to traditional fixed speed compressor units.

ABSENCE OF IN-RUSH CURRENTS

The inverter technology involves a start-up phase with very low in-rush current. The frequency converters chosen by Mitsubishi Electric are characterized by values of Displacement Power Factor of between 0,97 and 0,99.



No electrical and mechanical stress

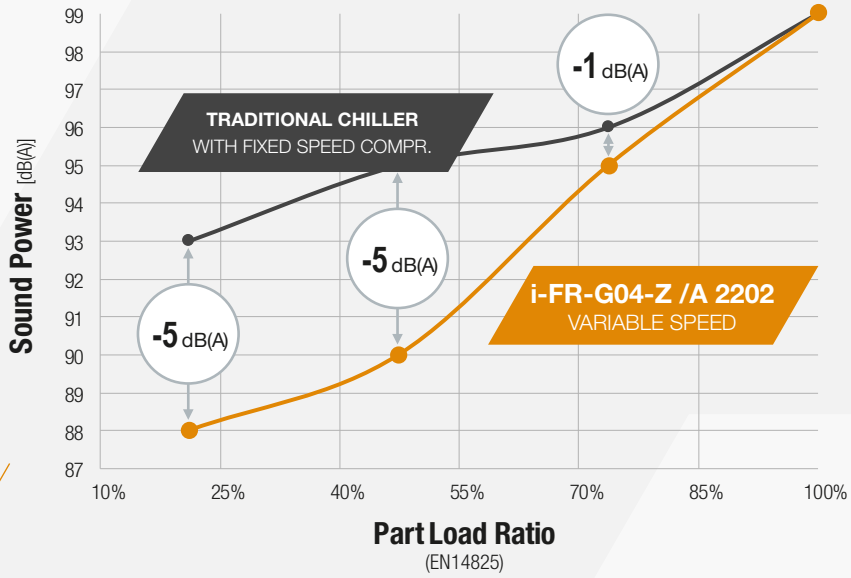
The unit never exceeds the nominal current, not even when starting up.

No additional equipment needed

Such as star/delta commuters or soft starters in order to reduce the in-rush currents.

The new i-FR-G04-Z chillers apply variable speed technology in all of its main components, achieving top-level performances in any load condition.

REDUCED SOUND POWER LEVELS



LOWER SPEED, LOWER NOISE

The unit working in partial loads is far more silent than a fixed speed compressor unit.

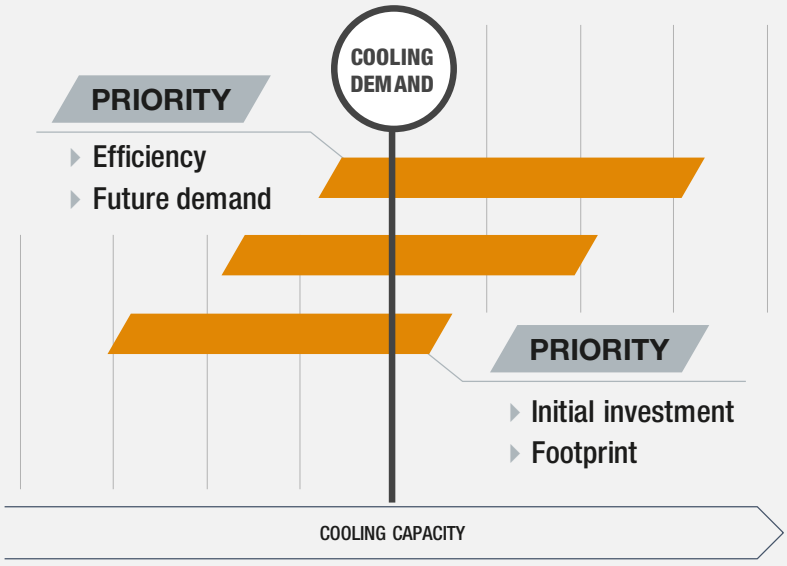
In applications with units working at part load for most of the year, i-FR-G04-Z ensures extremely low noise operations down to -5dB(A).

Ideal for sound sensitive environments located nearby

- Offices
- Meeting rooms

FLEXIBLE SELECTION

The smart design of the units combined with ELCAWorld selection software allows you to always choose the right unit for every project, prioritizing efficiency, additional future plant demands or reducing the initial investment and the footprint.



Choose YOUR target

- EFFICIENCY
- INITIAL INVESTMENT
- FOOTPRINT
- FUTURE PLANT DEMANDS

TECHNOLOGICAL CHOICES

W3000TE CONTROL

Fully in-house developed management software.

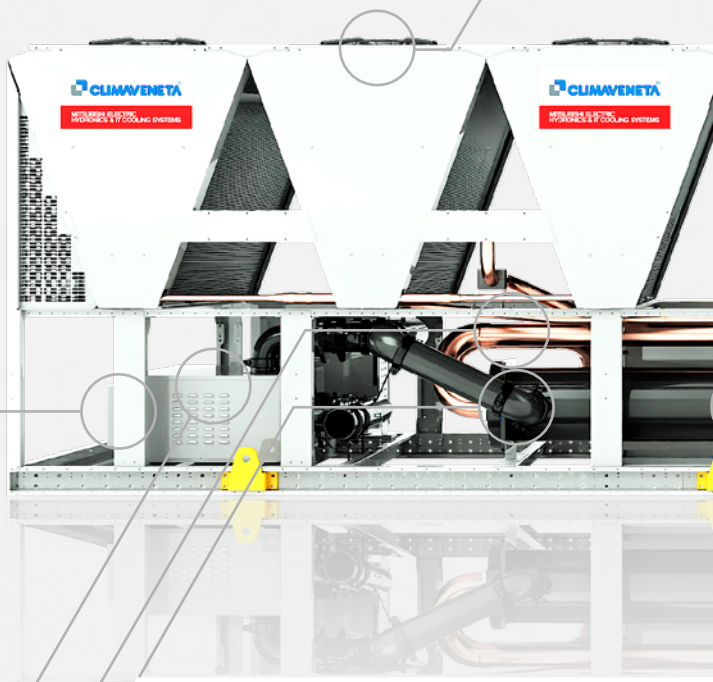
- Efficient and reliable operation in all conditions
- Connectivity with the most commonly used BMS protocols (Opt.)

KIPlink USER INTERFACE

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

Variable speed fans

High performing EC fans, for higher efficiency and continuous speed modulation



Built-in pump group (Opt.)

Factory-mounted pumps and pre-plumbed hydraulic components, for minimum on-site installation time, work, and cost.

- Fix speed and variable speed pumps available, with low or high head
- Electronic primary flow controls for constant pressure or constant temperature

Gas detector device

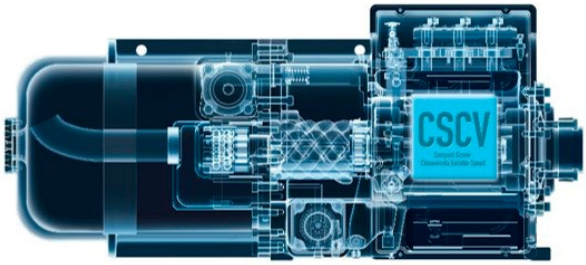
Included as standard for each refrigerant circuit. In case of refrigerant leak detection, this device raises an alarm.

Refrigerant circuits

One **independent refrigerant circuit** per compressor, to grant **reliability** and easy maintenance. **Compressor enclosures are supplied as standard** in all versions.

CSCV Compressors
Engineered for R1234ze refrigerant

Inverter, Variable Vi dual rotor screw compressors, designed according to Mitsubishi Electric Hydronics & IT Cooling Systems specifications and for its' exclusive use.



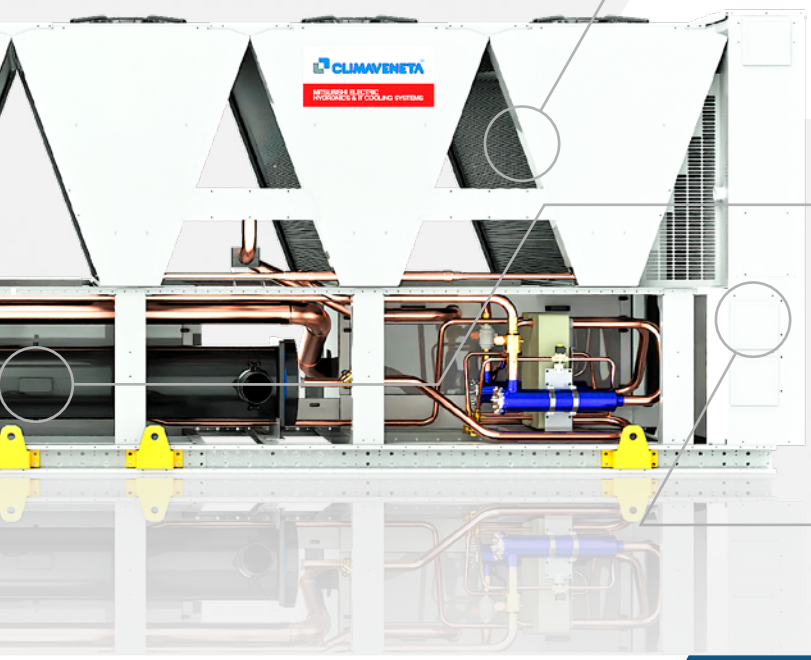
Trusted reliability, simplified installation, maximized performance: i-FR-G04-Z improves the already high performance of the fixed speed chiller range adding new exceptional features.

r HFO 1234ze

Micro-channel coils

New generation full aluminum micro-channel coils, ideally positioned on a “V” block structure to optimize airflow and heat transfer.

- Up to 30% of refrigerant charge reduction vs. traditional tube and fin coils.
- Long Life Alloy (LLA) for higher corrosion resistance and longer life cycle
- Protective coating available for harsh industrial and marine evironments (Opt.)



HFO refrigerant

4th generation refrigerant HFO 1234ze, with negligible greenhouse effect and zero impact on the ozone layer.

Negligible GWP

HFO 1234ze $GWP_{100\ year} < 1$

(R134a $GWP_{100\ year} = 1300$)

GWP values according to IPCC rev. 5th

Rapid molecule disintegration in the atmosphere

HFO 1234ze = 2 weeks

(R134a = 14 years)

Approved by international standards

ASHRAE 34, ISO 817:

A2L classification (non toxic, mildly flammable)

Compatible with common construction materials

No special components

No extra cost

In-line with environmental regulation objectives

No future retrofit required

Shell and tube evaporator

Dry expansion, single pass shell and tube evaporator, fully developed by Mitsubishi Electric Hydronics & IT Cooling Systems.

- Internally grooved copper tubes for enhanced heat exchange
- Low pressure drops
- Fully protected against ice formation

Electrical panel

Large electrical panel with power circuit components and control main board.

- Forced-air cooling system

SMART VARIABLE Vi LOGIC

Variable Speed Drive

Integrated and compact frequency converter, refrigerant cooled, for outstanding seasonal efficiency and wide capacity regulation.

Automatic internal volume ratio adaption

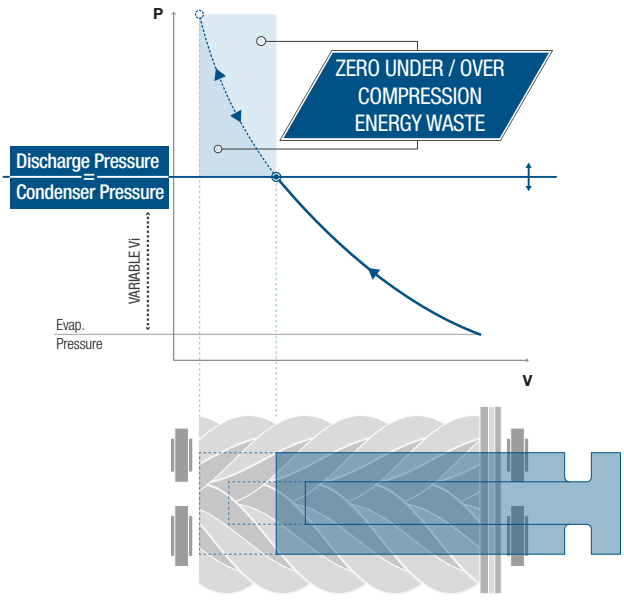
Obtained thanks to an integrated Vi slider which adapts the internal geometry to the current operating condition, thus ensuring the best efficiency.

Extra durability achieved thanks to dedicated components:

- Envelope control function, 3-stage warning and alarm system, safe-torque-off function.
- Carbon steel bearings granted for a lifetime of over 150.000 hours.

High efficiency high speed motor

For unprecedented full and part load efficiencies and extremely wide and accurate capacity regulation.

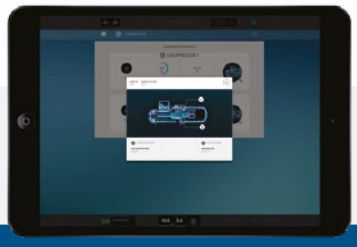


CORE FEATURES FOR ALL YOUR EQUIPMENT NEEDS

W3000TE control and KIPlink innovative interface

The logic behind i-FR-G04-Z is the W3000TE control software. Characterized by advanced functions and algorithms, **W3000TE 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).

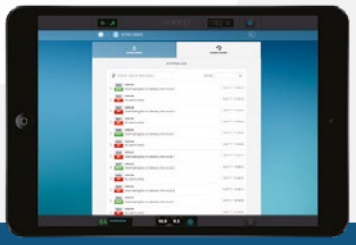


Easier on-site operation

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” message 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

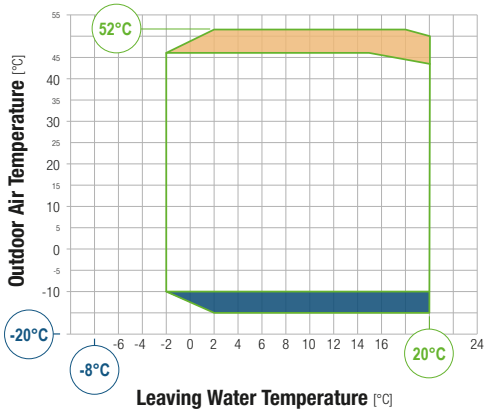
Direct access to the W3000TE control is achieved by scanning the QR-code positioned on the front side of the i-FR-G04-Z unit.

LED switch

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

In addition (Opt. 1442, 1444) or in substitution (Opt. 6194, 6195) to the KIPlink, i-FR-G04-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).

EXTENSIVE OPERATING LIMITS



A VERSION (High Efficiency)

FULL LOAD OPERATION

- Standard unit
- **Required:** HT kit (Opt. 1955)
- **Required:** Low temp. device DBA (Opt. 813)

Air temp. < -10°C
Double insulation on heat exchangers (Opt. 2631)

LWT < 0°C
Compressor liquid injection (Opt. 871)

PARTIAL LOAD OPERATION

In case of higher outdoor air temperature, i-FR-G04-Z automatically partializes its resources to ensure uninterrupted operation. Operating limits when working partialized (water */7°C):

/A **/SL-A** **55°C**

RC brand products have always been synonymous for best in class performance and high versatility. This is particularly true for i-FR-G04-Z, the innovative chiller where all the features have been designed for complete customer peace of mind.

Hydronic modules and flow controls

i-FR-G04-Z units come equipped as standard with terminal and modulating signal (0-10V) to control the activation and speed of one external variable speed pump, and with a parameter set constant water control to set the pump speed. This latest arrangement is particularly useful during the installation and commisioning to adjust water flow and the pressure head according to the current plant characteristics.

Factory-mounted pump group

2 pumps (duty/standby) provide low or high head
(available head approx. 100 or 200 kPa)

Fixed speed pumps
1 pump, 2-pole motor: Opt. 4706 (LH) / 4707 (HH)
2 pump, 2-pole motor: Opt. 4711 (LH) / 4712 (HH)
2 pump, 4-pole motor: Opt. 4708 (LH) / 4709 (HH)

Variable speed pumps
1 pump, 2-pole motor: Opt. 4717 (LH) / 4718 (HH)
2 pump, 2-pole motor: Opt. 4722 (LH) / 4723 (HH)
2 pump, 4-pole motor: Opt. 4719 (LH) / 4721 (HH)

Terminals for external pump control

The unit controls the activation or the activation and speed of 1 or 2 external pumps.

Terminals + Modulating signal
1 pump: Standard
2 pumps: Opt. 4714

These arrangements allow to control the activation / deactivation of fixed speed pumps too!

Other possible variable primary flow control logics:

VPF
VARIABLE PRIMARY FLOW

VPF control logic

The VPF control series (Variable Primary Flow) doesn't only **adjust the pump speed on the basis of the plant's thermal load**, but also **dynamically optimizes the unit's thermoregulation** for variable flow operation, thus ensuring both the highest pump energy savings and chiller stable operation.

VPF: constant ΔP on the plant side
For systems with only the primary circuit.
Opt. 4864 or 4865 for single unit system, Opt. 4866 for multi-unit system

VPF.D: constant ΔT on the plant side
For systems with primary and secondary circuits separated by a hydraulic decoupler.
Opt. 4867 for single unit system, Opt. 4868 for multi-unit system

VPF.E: constant ΔT
For systems with only the primary circuit and terminals with bypass. Opt. 4869

Close-coupled pumps by Grundfos

SiC/SiC (silicon carbide) primary seal pairing, extremely resistant against wear, abrasive particles and wear.

EPDM bellows seal prevent the risk of deposits, such as rust, on the shaft.

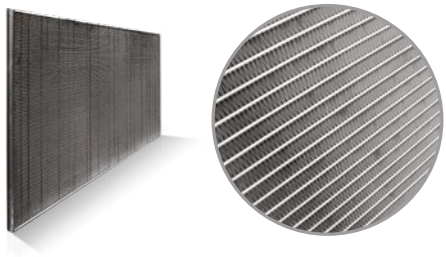
Pull-out design: during maintenance the power head can be pulled out without removing the pump housing from the pipework.

In-line or end-suction models were chosen based on dimensions and performances

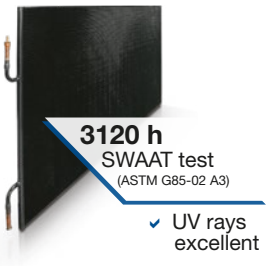
ACCESSORIES AND SERVICES

MICROCHANNEL COILS

Al - Regular (std)



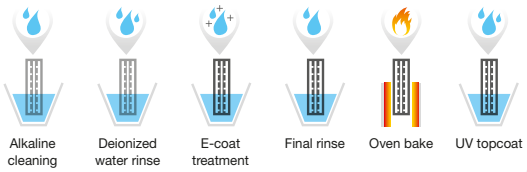
Al - E-coating (Opt. 876)



3120 h
SWAAT test
(ASTM G85-02 A3)

✔ UV rays excellent

E-coating process

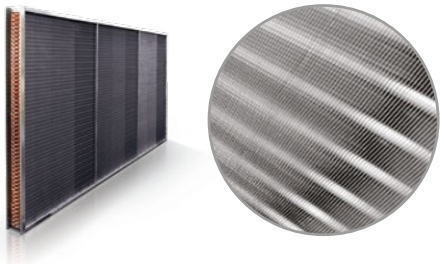


TUBE & FIN COILS

Cu/Al - Regular (Opt. 879)

Cu/Al - Pre-painted fins (Opt. 894)

Cu/Al - High pressure spray coating (Opt. 895 / RFQ)



Fin Guard Silver SB *
Opt. 895
Polyurethane resin with aluminum fillers
✔ **3000 h** ASTM B117
✔ **UV** rays - excellent
* Thermoguard

PoluAl XT *
RFQ
Polyurethane resin with aluminum fillers
✔ **4000 h** ASTM B117
✔ **UV** rays - excellent
* Blygold

Heresite P-413C *
RFQ
Phenolic resin
✔ **6000 h** ASTM B117
✔ **UV** rays - good
* Heresite Protective Coating, LLC

Cu/Cu - Tube & fin coil (Opt. 881)

WITNESS TESTING

Test your chiller before installation and make sure its' performance is totally reliable.

Performance WITNESS TEST

Performance Witness testing is available as additional service in order to allow the final user to see the unit being tested under specific conditions. Carried out within modern and sophisticated facilities, this service gives the customer the possibility to choose among different witness test options in order to:

- Verify unit operation under severe conditions
- Detect sound emissions
- Check performance, both at full and partial loads
- Test the unit with low outdoor air temperature operation
- Time the fast restart

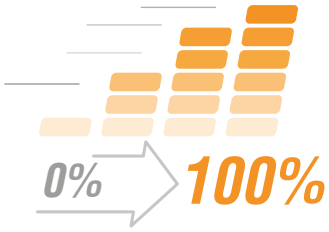
EQUIPMENT FOR MISSION CRITICAL APPLICATIONS

Committed to ensure the highest standards of reliability, i-FR-G04-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

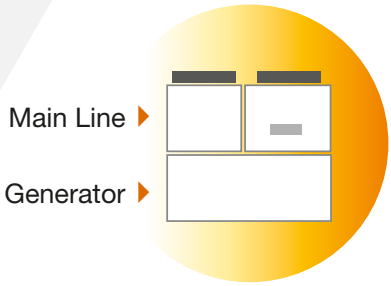
A 2-cpr unit in standard working conditions delivers 100% of cooling capacity within 180" after power is restored.

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. i-FR-G04-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 i-FR-G04-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 to acquire the electrical data and the power absorbed by the unit and send them to the supervisor for energy metering.

AIR COOLED CHILLERS WITH INVERTER SCREW COMPRESSORS

i-FR-G04-Z 2202 - 7823

Air cooled chillers with inverter screw compressors
and HFO refrigerant. From 377 to 1463 kW

i-FR-G04-Z /A			2202	2602	2702	2722	3602	4202	4802
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									
COOLING ONLY (GROSS VALUE)									
Cooling capacity	(1)	kW	382,7	417,9	486,9	534,8	642,0	725,9	843,1
Total power input	(1)	kW	117,7	130,2	147,7	168,4	211,1	237,1	281,3
EER	(1)	kW/kW	3,251	3,210	3,297	3,176	3,041	3,062	2,997
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	381,5	416,4	485,7	533,2	639,7	723,4	841,1
EER	(1)(2)	kW/kW	3,210	3,160	3,260	3,140	3,000	3,020	2,970
Cooling energy class			A	A	A	A	B	B	B
SEPR	(3)(4)		6,18	6,15	6,26	5,99	5,93	6,39	5,85
COOLING ONLY (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(5)	kW	420,4	458,8	536,3	587,8	707,3	797,1	929,5
Total power input	(5)	kW	122,5	135,3	153,6	175,3	218,7	243,9	287,2
EER	(5)	kW/kW	3,432	3,391	3,492	3,353	3,234	3,268	3,236
23°C/15°C									
Cooling capacity	(6)	kW	484,3	528,2	620,4	677,5	818,9	917,8	1077
Total power input	(6)	kW	130,0	143,1	162,8	186,3	231,1	254,4	294,4
EER	(6)	kW/kW	3,725	3,691	3,811	3,637	3,543	3,608	3,658
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow	(1)	l/s	18,30	19,98	23,29	25,58	30,70	34,71	40,32
Pressure drop	(1)(2)	kPa	35,3	42,1	30,1	36,4	46,1	46,8	30,8
REFRIGERANT CIRCUIT									
Compressors nr.		N°	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2
Refrigerant charge		kg	63,0	70,0	81,0	86,0	108	124	134
NOISE LEVEL									
Sound Pressure	(7)	dB(A)	67	68	68	69	68	70	72
Sound power level in cooling	(8)(9)	dB(A)	99	100	100	101	101	103	105
SIZE AND WEIGHT									
Length	(10)	mm	4150	5400	5400	5400	6650	7900	7900
Width	(10)	mm	2260	2260	2260	2260	2260	2260	2260
Height	(10)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	4780	5220	5360	5430	6060	6820	7810

i-FR-G04-Z /A			4822	6002	6022	6603	7203	7223	7823
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									
COOLING ONLY (GROSS VALUE)									
Cooling capacity	(1)	kW	915,7	994,1	1038	1146	1280	1399	1463
Total power input	(1)	kW	305,7	322,1	340,6	379,0	423,0	471,2	499,3
EER	(1)	kW/kW	2,995	3,086	3,048	3,024	3,026	2,969	2,930
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	912,6	991,0	1035	1143	1276	1394	1458
EER	(1)(2)	kW/kW	2,960	3,050	3,010	2,990	2,990	2,930	2,890
Cooling energy class			B	A	A	B	B	B	B
SEPR	(3)(4)		5,71	5,80	5,78	5,88	5,87	5,76	5,65
COOLING ONLY (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(5)	kW	1007	1095	1143	1263	1412	1539	1609
Total power input	(5)	kW	311,4	327,5	346,7	386,4	431,8	480,7	509,5
EER	(5)	kW/kW	3,234	3,344	3,297	3,269	3,270	3,202	3,158
23°C/15°C									
Cooling capacity	(6)	kW	1162	1267	1322	1464	1638	1774	1855
Total power input	(6)	kW	317,6	333,3	353,4	395,4	442,5	491,6	521,2
EER	(6)	kW/kW	3,659	3,801	3,741	3,703	3,702	3,609	3,559
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow	(1)	l/s	43,79	47,54	49,65	54,79	61,21	66,89	69,95
Pressure drop	(1)(2)	kPa	47,0	42,8	43,8	40,1	40,8	48,7	53,3
REFRIGERANT CIRCUIT									
Compressors nr.		N°	2	2	2	3	3	3	3
No. Circuits		N°	2	2	2	3	3	3	3
Refrigerant charge		kg	139	167	171	189	195	203	218
NOISE LEVEL									
Sound Pressure	(7)	dB(A)	72	72	72	72	72	73	73
Sound power level in cooling	(8)(9)	dB(A)	105	105	105	105	105	106	106
SIZE AND WEIGHT									
Length	(10)	mm	9150	10400	10400	11650	11650	12900	12900
Width	(10)	mm	2260	2260	2260	2260	2260	2260	2260
Height	(10)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	8240	8780	8880	11170	11800	12430	12390

Notes:
1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger air (in) 35°C.
2 Values in compliance with EN14511-3:2013.
3 Seasonal energy efficiency ratio
4 Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 2016/2281]
5 Plant (side) cooling exchanger water (in/out) 16°C/ 10°C; Source (side) heat exchanger air (in) 35°C.
6 Plant (side) cooling exchanger water (in/out) 23°C/ 15°C; Source (side) heat exchanger air (in) 35°C.
7 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.
8 Sound power on the basis of measurements made in compliance with ISO 9614.
9 Sound power level in cooling, outdoors.
10 Unit in standard configuration/execution, without optional accessories.
The units highlighted in this publication contain HFO-1234ze [GW_{P100} 7] fluorinated greenhouse gases.
Certified data in EUROVENT

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

GREEN CERTIFICATION RELEVANT

INV.DRIVEN COMP. | R HFO1234ze | COOLING | A ENERGY CLASS

VPF VAR.PRIM.FLOW | T SHELL & TUBES | AXIAL | SCREW

i-FR-G04-Z /SL-A			2202	2602	2702	2722	3602	4202	4802
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									
COOLING ONLY (GROSS VALUE)									
Cooling capacity	(1)	kW	377,2	421,3	480,7	527,2	633,2	718,2	832,9
Total power input	(1)	kW	116,8	125,4	145,9	167,1	207,2	234,4	269,9
EER	(1)	kW/kW	3,229	3,360	3,295	3,155	3,056	3,064	3,086
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	376,1	419,8	479,5	525,7	631,0	715,7	830,5
EER	(1)(2)	kW/kW	3,190	3,310	3,260	3,120	3,010	3,020	3,050
Cooling energy class			A	A	A	A	B	B	A
SEPR	(3)(4)		6,22	6,34	6,31	6,05	5,99	6,44	6,02
COOLING ONLY (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(5)	kW	414,0	462,9	528,9	578,7	696,8	787,9	918,3
Total power input	(5)	kW	121,9	130,2	152,2	174,4	215,3	241,7	275,3
EER	(5)	kW/kW	3,396	3,555	3,475	3,318	3,236	3,260	3,336
23°C/15°C									
Cooling capacity	(6)	kW	476,2	533,3	610,8	665,7	805,3	905,5	1065
Total power input	(6)	kW	130,1	137,6	162,2	186,1	228,4	252,9	281,7
EER	(6)	kW/kW	3,660	3,876	3,766	3,577	3,526	3,580	3,781
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow	(1)	l/s	18,04	20,15	22,99	25,21	30,28	34,34	39,83
Pressure drop	(1)(2)	kPa	34,3	42,8	29,4	35,3	44,8	45,9	38,9
REFRIGERANT CIRCUIT									
Compressors nr.		N°	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2
Refrigerant charge		kg	63,0	73,0	81,0	86,0	108	124	134
NOISE LEVEL									
Sound Pressure	(7)	dB(A)	60	61	61	62	61	63	63
Sound power level in cooling	(8)(9)	dB(A)	92	93	93	94	94	96	96
SIZE AND WEIGHT									
Length	(10)	mm	4150	5400	5400	5400	6650	7900	9150
Width	(10)	mm	2260	2260	2260	2260	2260	2260	2260
Height	(10)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	5020	5600	5680	5760	6390	7160	8400

i-FR-G04-Z /SL-A			4822	6002	6022	6603	7203	7223	7823
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									
COOLING ONLY (GROSS VALUE)									
Cooling capacity	(1)	kW	902,8	972,2	1024	1141	1262	1391	1458
Total power input	(1)	kW	303,4	318,4	337,4	376,1	416,2	468,8	499,7
EER	(1)	kW/kW	2,976	3,053	3,035	3,034	3,032	2,967	2,918
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	899,8	969,3	1021	1138	1258	1386	1455
EER	(1)(2)	kW/kW	2,940	3,020	3,000	3,000	3,000	2,930	2,890
Cooling energy class			B	A	A	B	B	B	B
SEPR	(3)(4)		5,76	5,85	5,85	5,94	5,99	5,85	5,73
COOLING ONLY (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(5)	kW	992,0	1070	1126	1257	1392	1529	1602
Total power input	(5)	kW	309,6	324,4	344,1	384,4	425,3	478,8	510,8
EER	(5)	kW/kW	3,204	3,298	3,272	3,270	3,273	3,193	3,136
23°C/15°C									
Cooling capacity	(6)	kW	1143	1236	1300	1454	1614	1762	1845
Total power input	(6)	kW	316,8	331,1	351,8	394,7	436,4	490,4	523,8
EER	(6)	kW/kW	3,608	3,733	3,695	3,684	3,698	3,593	3,522
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow	(1)	l/s	43,17	46,49	48,96	54,56	60,35	66,50	69,70
Pressure drop	(1)(2)	kPa	45,7	40,9	42,6	39,7	39,7	48,1	30,9
REFRIGERANT CIRCUIT									
Compressors nr.		N°	2	2	2	3	3	3	3
No. Circuits		N°	2	2	2	3	3	3	3
Refrigerant charge		kg	139	167	171	189	204	213	223
NOISE LEVEL									
Sound Pressure	(7)	dB(A)	63	63	63	63	63	64	64
Sound power level in cooling	(8)(9)	dB(A)	96	96	96	96	96	97	97
SIZE AND WEIGHT									
Length	(10)	mm	9150	10400	10400	11650	12900	12900	12900
Width	(10)	mm	2260	2260	2260	2260	2260	2260	2260
Height	(10)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	8550	9090	9180	11620	12660	12950	12890

Notes:
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9 Sound power level in cooling, outdoors.
10 Unit in standard configuration/execution, without optional accessories.

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Certified data in EUROVENT

All the flexibility you need to fit the most diverse application requirements

FURTHER OPTIONS

Auxiliary input

4-20 mA (Opt. 6161): Enables remote set-point adjustments (analog input).
Double set-point (Opt. 6162): Enables the remote switch between 2 set-points (digital input).
Demand limit (Opt. 6171): Limits the unit's power absorption for safety reasons or in temporary situations (digital input).

Electrical

Automatic circuit breakers for all major electrical loads (compressors excluded) (Opt. 3414):
Protect all the major electrical loads (compressors excluded) from possible current peaks, over-current switches are provided in place of the standard fuses. The compressors are already protected by extra-fast fuses.

Connectivity

Serial card interface module to allow integration with BMS protocols:
Modbus (Opt. 4181) / LonWorks (Opt. 4182) / BACnet MS/TP (Opt. 4184) / BACnet over IP (Opt. 4185)
M-Net interface kit (Opt. 4187): Interface module to allow the integration of the unit with Mitsubishi Electric proprietary communication protocol M-Net.

Energy Meter

Energy meter for BMS (Opt. 5924): Acquires electrical data and the power absorbed by the unit and send them the BMS for energy metering (Modbus RS485).

Refrigerant circuit

Dual pressure relief valves with switch (Opt. 1961): 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 (Opt. 1901): Installed on each compressor suction line, it simplifies maintenance activity (discharge valves are present as per standard).

Refrigerant leak detector

Leak detector + compressor off (Opt. 3433): Factory installed device.
In case of a gas leak detection it raises an alarm and stops the units.

Hydraulic

Water flow switch (Opt. 1801): Designed to protect the unit where the water flow across the evaporator is not sufficient and falls outside of the operating parameters.
Delta T > 8°C (Opt. 2881): Evaporator designed to operate with low primary circuit water flow.
Flanged hydraulic connections (Opt. 2911): Grooved coupling with flanged counter-pipe.

Structure

Anti-intrusion grilles (Opt. 2021): Perimeter metal grilles to protect against the intrusion of solid bodies into the unit structure.
Rubber type (Opt. 2101) or spring type (Opt. 2102) anti-vibration mountings:
Reduce vibrations, keeping noise transmission to a minimum.

Packing

Reinforcing bars (Opt. 1971): Steel brackets used to strengthen the unit structure.
Suggested in case of long truck transport.
Nylon packing (Opt. 9966): i-FR-G04-Z is covered with a protective nylon layer and provided with the lifting eye-plates, to load the unit into a truck.
Container packing (Opt. 9979): i-FR-G04-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).

“BY FAR THE BEST PROOF IS EXPERIENCE”

Sir Francis Bacon
British philosopher (1561-1626)

Fortum District Heating

2018 Kirkkonummi - Finland

Data Center

Cooling capacity: 27150 kW
Heating capacity: 26486 kW
Installed machines: 2x FRCS2-W-Z water cooled chillers with screw compressors optimized for the HFO refrigerant, 8x NEXT LEGACY indoor close control air conditioners

BNP Paribas

2015 Bailly Romainvilliers - France

Data Center

Cooling capacity: 12208 kW
Installed machines:
2x FR FC-Z NG free-cooling chillers with screw compressors, 10x FRCS2-Z air cooled chillers with screw compressors, 28x indoor close control air conditioners

Telecom Data Center Acilia, Tier IV

2016 Rome - Italy

Data Center

Cooling capacity: 7804 kW
Installed machines:
3x TRCS2/SL-CA-S-Z oil-free compressor chillers, 5x i-FR(1+i)/CA-S-Z fixed speed and inverte speed compressor chillers

Qualcomm India Data Center

2017 Bangalore - India

Data Center

Cooling capacity: 4495 kW
Installed machines: 4x i-FR(1+i)/CA/S-Z high efficiency chillers with fixed speed and inverter speed compressors

RC_i-FR-G04-Z_10-18_ENG

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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