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

IT COOLING

CHILLERS

i-FR-G01-Z

AIR COOLED CHILLERS WITH INVERTER SCREW COMPRESSORS, FROM 477 TO 1697 kW

R134a

TOTAL INVERTER TECHNOLOGY

rcitcooling.com

i-FR-G01-Z

THE FULL INVERTER CHILLER TO MAKE YOUR DATA CENTER RUN AT PEAK EFFICIENCY.

ErP 2021 COMPLIANT

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

Air cooled chiller with inverter screw compressors for outdoor installation from 477 to 1697 kW

i-FR-G01-Z is the new air cooled chiller with inverter screw compressors dedicated to data center environments.

Thanks to the variable speed technology applied on both the compressors and fans, i-FR-G01-Z ensures top-level energy efficiency values and complete dependability. Optimized to work with high temperature IT environments, the chiller's outstanding performance brings to significant PUE reduction and helps to keep the OPEX under control.

- INV. DRIVEN COMP.
- R HFC R-134a
- COOLING
- SCREW
- T SHELL & TUBES
- EC AXIAL

COUNTLESS VERSIONS FOR THE MOST CHALLENGING NEEDS

EFFICIENCY VALUES

K	Key efficiency	Cost effective units, giving an incredible combination between cooling capacity and footprint with the unmatched benefits of the variable speed technology.	EER: 3,37 — SEPR HT*: 5,63 up to: 6,00
K +EC fans	Key efficiency	Very high seasonal efficiency version with reduced footprint, obtained by adding EC fans to the already high performing K version.	EER: 3,39 — SEPR HT*: 5,77 up to: 6,20
A	High efficiency	High efficiency version both at full and partial loads, thanks to oversized heat exchangers and EC fans, to cut energy expenses and running costs in any load condition, even at high ambient temperatures.	EER: 3,73 — SEPR HT*: 6,11 up to: 6,54

*EER conditions: water (in/out) 26/18°C, air 35°C.
SEPR HT conditions: water (in/out) 12/7°C, EN14825.

ACOUSTIC VERSIONS

-	Standard	Unit with standard compressor's enclosures.	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	A desuperheater on the compressor discharge line recovers approximately 20% of the unit's capacity. **Suitable for DHW production or other secondary uses, such as the integration of an existing boiler.**	60°C
R	Total heat recovery	A devoted refrigerant water heat exchanger recovers all the condensation heat. **Suitable for DHW production or air treatment in applications with AHU.**	up to 60°C

i-FR-G01-Z synthesizes the profound experience of the RC brand in screw compressors chillers into a high performing range featuring unbeatable efficiency levels.

LEADING INVERTER TECHNOLOGY FOR TOP-LEVEL EFFICIENCY

2021 ECODESIGN DIRECTIVE COMPLIANT

TOTAL INVERTER TECHNOLOGY

The new i-FR-G01-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 every condition
- offer stepless and accurate capacity control
- ensure premium efficiency values, thus cutting operating costs

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-G01-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.

REDUCED FOOTPRINT

up to 12% better SEPR HT

18% MORE COMPACT

The new i-FR-G01-Z achieves unbeatable values in terms of footprint and seasonal efficiency, making it the best solution for both new installations and renewal of older HVAC plants.

Compared to the previous inverter screw compressor chiller range, the new i-FR-G01-Z is up to 18% more compact while providing up to 12% better SEPR HT.

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).

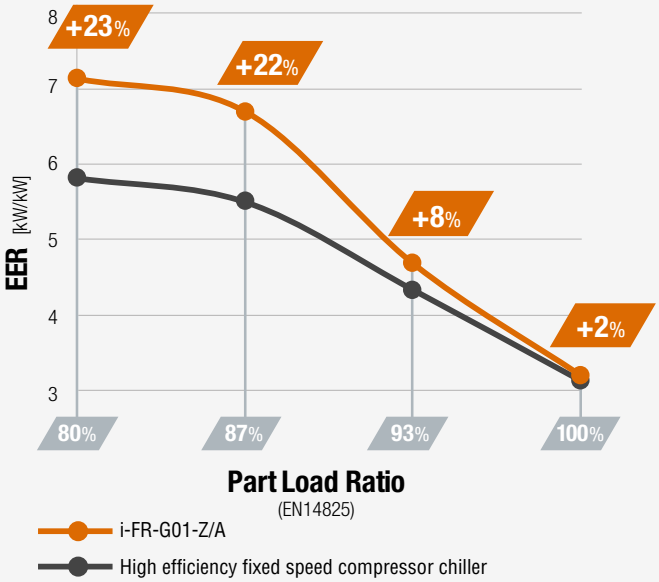
EXTENDED OPERATING RANGE

-8°

Unit working with outdoor air temperatures from -20°C up to to +55°C and leaving water temperatures down to -8°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.

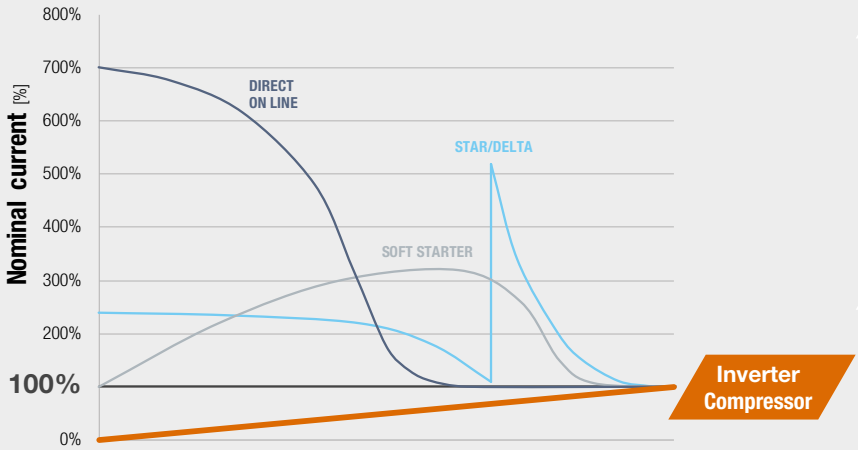
ErP 2021 COMPLIANT

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

Even in high load profile applications, i-FR-G01-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

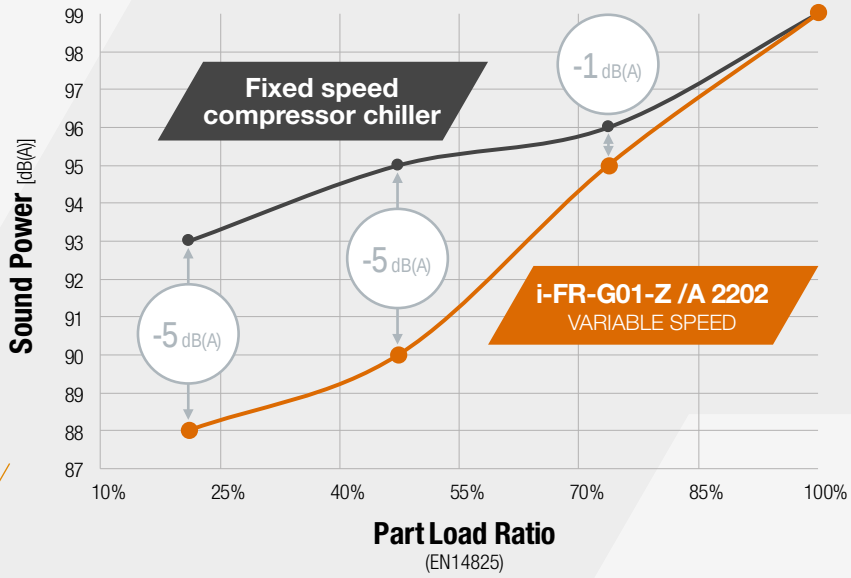
The unit never exceeds the nominal current, not even when starting up.

No additional equipment needed

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

The new i-FR-G01-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.

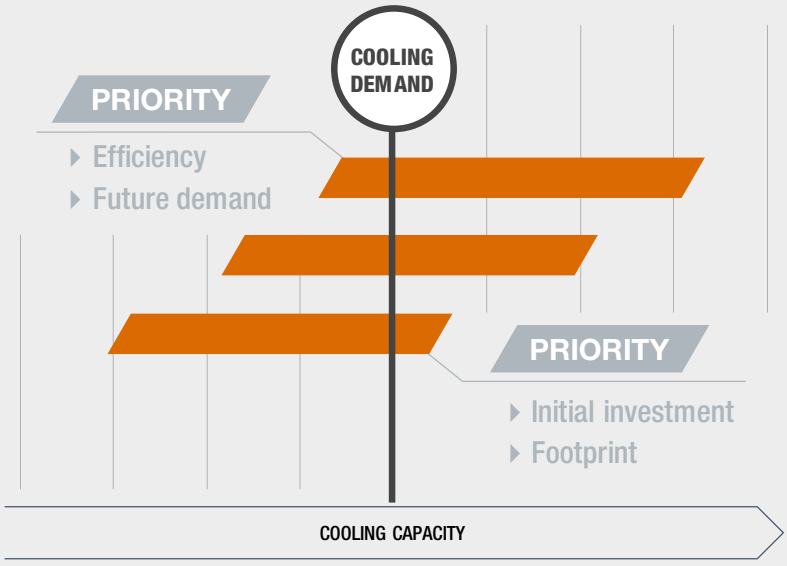
In applications with units working at part load for most of the year, i-FR-G01-Z ensures extremely low noise operations down to -5dB(A).

Ideal for sound sensitive environments located nearby

- Offices
- Meeting Rooms

FLEXIBLE SELECTION

The smart design of the units combined with the 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.

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

Casing

Base and frame made of hot-galvanized steel, all parts polyester-painted.

- Easy access to all inner components
- Simple transport, lifting, and handling
- Total weather resistance

Refrigerant circuits

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

Variable speed fans

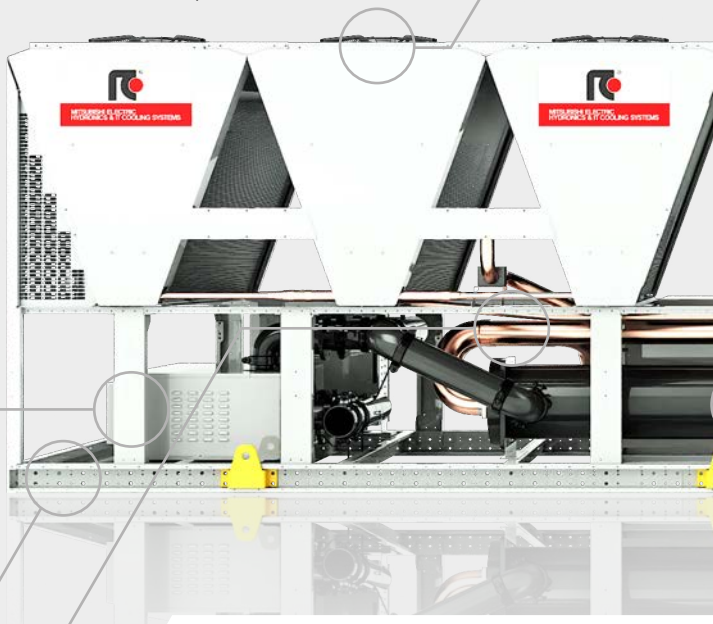
New generation AC and EC fans for precise airflow management and reduced power consumption.

i-FR-G01-Z / K versions

High performing axial fans equipped with autotransformer for speed adjustment

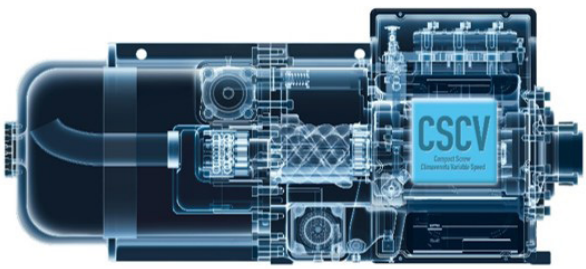
i-FR-G01-Z / A versions

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



CSCV Compressors

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

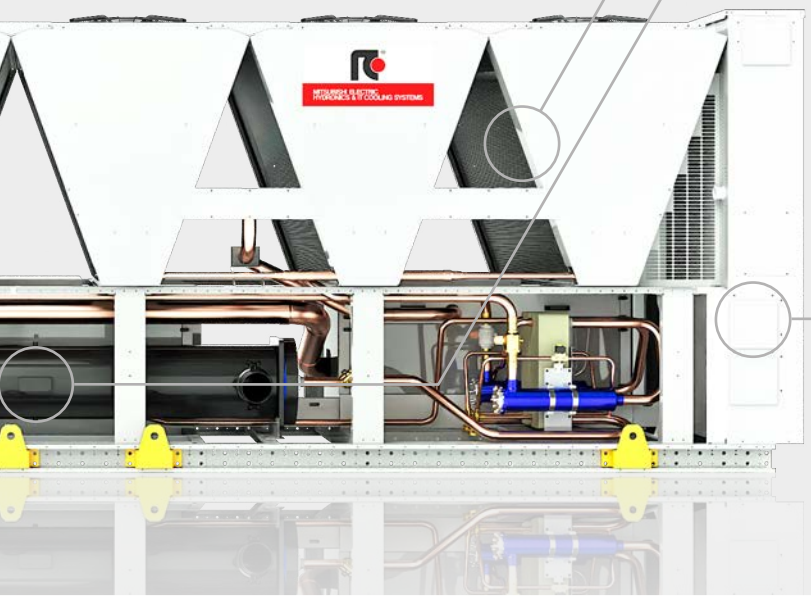


Trusted reliability, simplified installation, maximized performance: i-FR-G01-Z improves the already high performance of the fixed speed chiller range adding new exceptional features.

Micro-channel coils

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

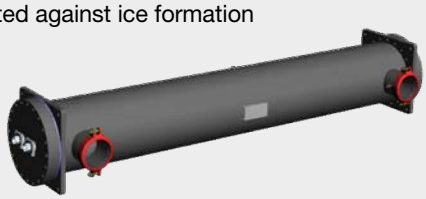
- Up to 30% of refrigerant charge reduction vs. traditional tube and fin coils.
- Long Life Alloy (LLA) for higher corrosion resistance and longer life cycle
- Protective coating available for harsh industrial and marine evironments (Opt.)



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

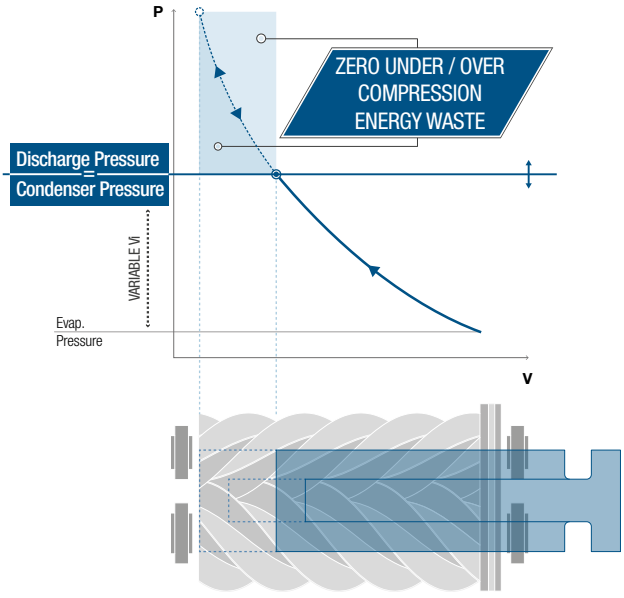
Obtained thanks to an integrated Vi slider which adapts the internal geometry to the current operating condition, thus ensuring the best efficiency.

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-G01-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” 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

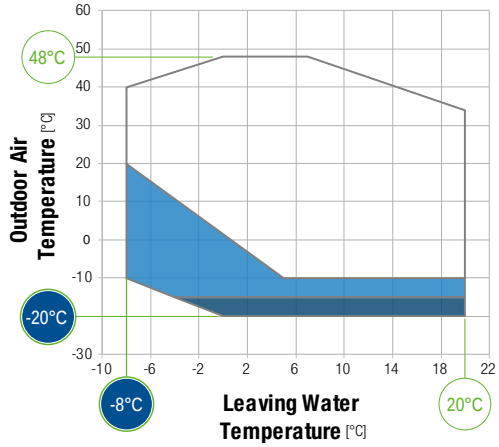
Direct access to the W3000TE control is achieved by scanning the QR-code positioned on the front side of the i-FR-G01-Z unit.

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-G01-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



K VERSION (Standard)

FULL LOAD OPERATION

Standard unit
Required: EC fans (Opt. 808)
Required: EC fans (Opt. 808)
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)

EC fans (Opt. 808)
Maximum outside air temperature: **46°C**

PARTIAL LOAD OPERATION

In case of higher outdoor air temperature, i-FR-G01-Z automatically partializes its resources to ensure uninterrupted operation (HPTC function).

Operating limits when working partialized (water */7°C):
up to 53°C

RC products have always been synonymous for best in class performance and high versatility. This is particularly true for i-FR-G01-Z, the innovative chiller where all the features have been designed for complete customer peace of mind.

Hydronic modules and flow controls

i-FR-G01-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.

Close-coupled pumps by Grundfos

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 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

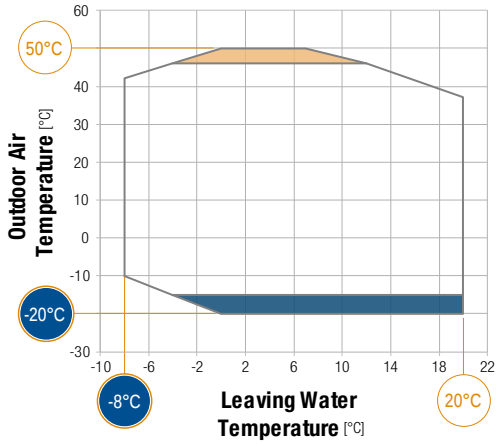
The VPF control series (Variable Primary Flow) doesn't only **adjust the pump speed on the basis of the plant's thermal load**, but also **dynamically optimizes the unit's thermoregulation** for variable flow operation, thus ensuring both the highest pump energy savings and chiller stable operation.

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

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-G01-Z automatically partializes its resources to ensure uninterrupted operation (HPTC function).

Operating limits when working partialized (water */7°C):
up to 55°C

i-FR-G01-Z Energy Analysis

Rome, Data center

IT COOLING

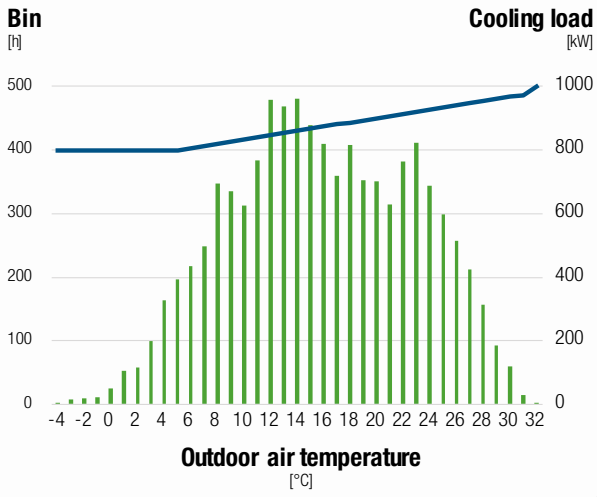
Project

A medium-sized data center in Rome was considered for this energy analysis.

This project evaluated the significant increase in seasonal efficiency of the new i-FR-G01-Z inverter screw chillers compared to an already excellent high efficiency fixed speed compressor chiller.

This IT Cooling application emphasizes the benefits of the Inverter technology, ensuring exceptional results.

Temperature profile



Cooling load

For cooling the data center, it has been considered a plant requiring a continuous cooling load 7 days a week, 14 hours per day.

As visible from the graph, for most of the hours the unit is working at high loads.

Energy analysis parameters:

Total of 3 units:	2 operating + 1 redundant		
Operating schedule:	7 days/week, continous operation		
Cold water set point:	26/18°C	**Electric energy cost:**	0,13 €/kWh
Interest rate:	6%	**Inflation rate:**	3%

i-FR-G01-Z/A vs High efficiency chiller with fixed speed compr.

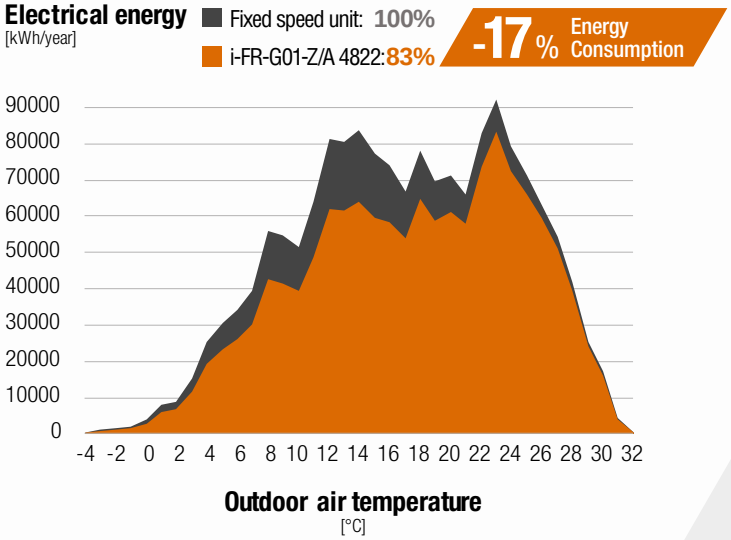
This analysis compares the performance values of three full inverter air cooled chillers i-FR-G01-Z with the efficiency of three high efficiency chillers featuring fixed speed compressors.

Chiller with fixed speed compressors

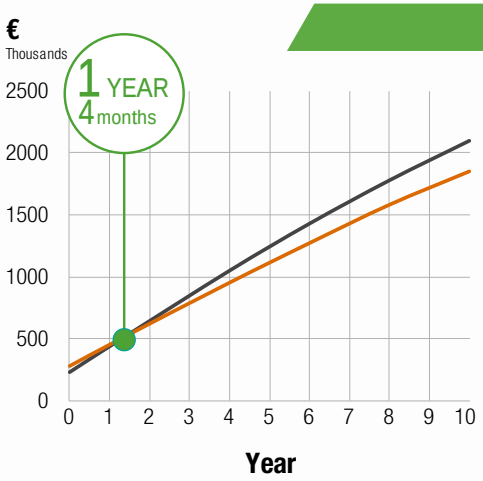
Cooling capacity: 751 kW (26/18°C, 35°C)
EER: 3,74 (26/18°C, 35°C)
SEPR HT: 5,38 **Length:** 5250 mm

i-FR-G01-Z/A

Cooling capacity: 750 kW (26/18°C, 35°C)
EER: 3,91 (26/18°C, 35°C)
SEPR HT: 6,42 **Length:** 5400 mm



Payback Time



Results

The results obtained comparing the HVAC plant with fixed speed compressor chillers and the plant based on the new inverter screw compressor chillers are brilliant:

Even if the two units feature similar footprint, the new unit achieves an annual energy efficiency 20% higher than the latest generation fixed speed unit, resulting in an annual energy consumption reduced by 17%.

This leads to a payback time of only 1 year and 4 months.

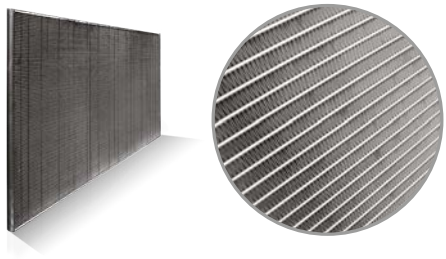
AT A GLANCE

Power input saving	CO_2 saved per year	Payback period	Annual energy efficiency
283.405 kWh per year	127.193 kg, equivalent to CO_2 emissions produced by a petrol car driving 748.143 km	1 year and 4 months	+20 %

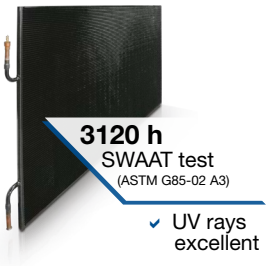
ACCESSORIES AND SERVICES

MICROCHANNEL COILS

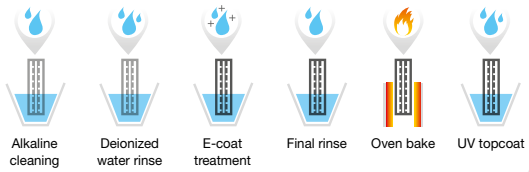
Al - Regular (std)



Al - E-coating (Opt. 876)



E-coating process

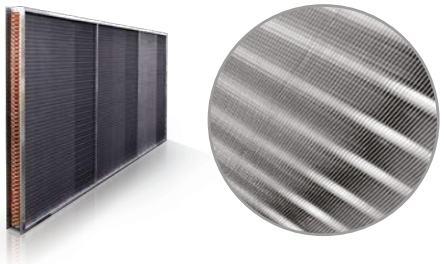


TUBE & FIN COILS

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

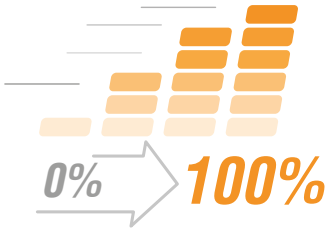
EQUIPMENT FOR MISSION CRITICAL APPLICATIONS

Committed to ensure the highest standards of reliability, i-FR-G01-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

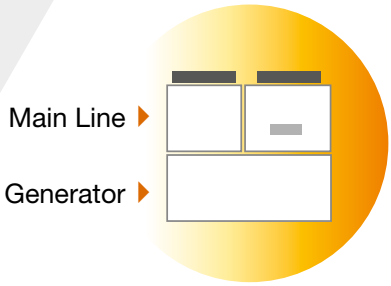
A 2-cpr unit in standard working conditions delivers 100% of cooling capacity within 180" after power is restored.

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-G01-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-G01-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.

AIR COOLED CHILLERS WITH INVERTER SCREW COMPRESSORS

i-FR-G01-Z

2202 - 7223

Air cooled chillers with inverter screw compressors (from 477 to 1697 kW)

i-FR-G01-Z/K

Model			2202	2602	2652	2702	2722	3152	3602
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		kW	478,6	531,1	561,2	598,1	656,7	720,7	801,4
Total power input		kW	165,1	181,6	190,6	200,8	227,7	252,4	278,6
EER		kW/kW	2,899	2,925	2,944	2,979	2,884	2,855	2,877
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	477,3	529,4	559,6	596,2	654,7	718,2	798,9
EER	(1)(2)	kW/kW	2,870	2,890	2,910	2,940	2,850	2,820	2,840
Cooling energy class			C	C	B	B	C	C	C
SEPR	(3)(4)		5,63	5,59	5,59	5,61	5,52	5,54	5,55
COOLING ONLY (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(5)	kW	523,5	580,9	614,5	655,2	718,8	788,5	877,1
Total power input	(5)	kW	171,6	188,9	198,4	208,9	237,7	264,9	293,8
EER	(5)	kW/kW	3,051	3,075	3,097	3,136	3,024	2,977	2,985
23°C/15°C									
Cooling capacity	(6)	kW	599,1	665,1	704,8	752,0	824,0	903,3	1005
Total power input	(6)	kW	181,2	199,9	210,1	221,5	253,5	285,7	319,8
EER	(6)	kW/kW	3,306	3,327	3,355	3,395	3,250	3,162	3,143
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow		l/s	22,89	25,40	26,84	28,60	31,40	34,47	38,33
Pressure drop	(1)(2)	kPa	32,0	39,5	35,2	40,0	38,3	46,2	40,7
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	69,0	76,0	80,0	88,0	94,0	104	117
NOISE LEVEL									
Sound Pressure	(7)	dB(A)	67	68	68	68	69	68	68
Sound power level in cooling	(8)(9)	dB(A)	99	100	100	100	101	101	101
SIZE AND WEIGHT									
A	(10)	mm	4150	5400	5400	5400	5400	6650	6650
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	4790	5270	5280	5330	5720	6210	6270

Model			3902	4202	4502	4802	4812	4822	5412
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		kW	874,1	932,0	990,3	1029	1054	1128	1169
Total power input		kW	299,6	317,8	343,7	368,3	352,1	389,0	413,1
EER		kW/kW	2,918	2,933	2,881	2,794	2,993	2,900	2,830
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	871,3	928,7	987,3	1026	1050	1124	1166
EER	(1)(2)	kW/kW	2,880	2,890	2,850	2,760	2,950	2,860	2,800
Cooling energy class			C	C	C	C	B	C	C
SEPR	(3)(4)		5,53	5,53	5,54	5,55	5,59	5,50	5,55
COOLING ONLY (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(5)	kW	954,6	1015	1080	1123	1153	1233	1276
Total power input	(5)	kW	315,2	333,7	360,2	385,9	367,3	406,6	431,8
EER	(5)	kW/kW	3,029	3,042	2,998	2,910	3,139	3,032	2,955
23°C/15°C									
Cooling capacity	(6)	kW	1062	1098	1203	1279	1318	1409	1455
Total power input	(6)	kW	326,1	329,4	371,1	414,7	391,7	435,2	462,1
EER	(6)	kW/kW	3,257	3,333	3,242	3,084	3,365	3,238	3,149
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow		l/s	41,80	44,57	47,36	49,20	50,41	53,94	55,90
Pressure drop	(1)(2)	kPa	42,8	48,7	42,4	45,8	48,1	51,7	41,7
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	127	135	140	146	151	164	168
NOISE LEVEL									
Sound Pressure	(7)	dB(A)	69	70	70	71	71	72	72
Sound power level in cooling	(8)(9)	dB(A)	102	103	103	104	104	105	105
SIZE AND WEIGHT									
A	(10)	mm	7900	7900	7900	7900	9150	9150	9150
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	6700	6740	7350	7750	8220	8340	8500

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 HFC R134a [GWP_{100} 1430] fluorinated greenhouse gases.

Certified data in EUROVENT

ASHRAE 90.1 compliant

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

VPF | HFC R134a | AXIAL | ENERG.CL. | INV.COMP. | COOLING | SCREW | SHELL&T.

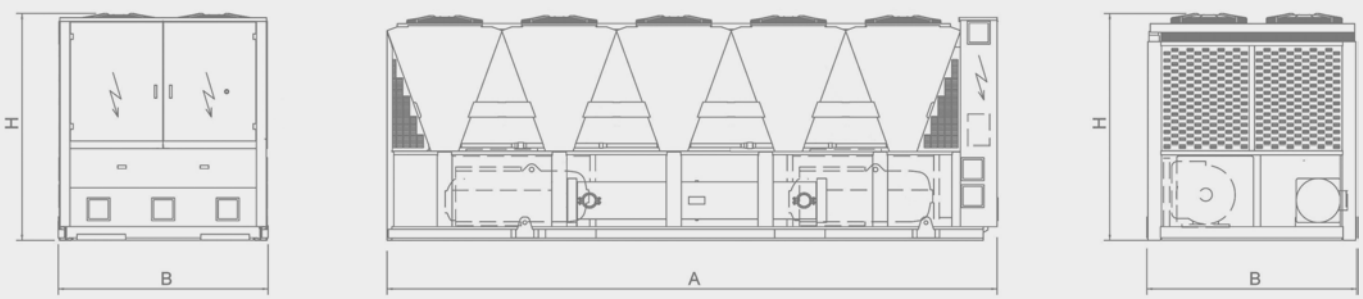
Model			6002	6022	6303	6903	7203	7213	7223
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE									
COOLING ONLY (GROSS VALUE)									
Cooling capacity		kW	1242	1302	1409	1493	1559	1649	1697
Total power input		kW	421,2	457,9	478,8	522,8	555,4	572,1	593,5
EER		kW/kW	2,949	2,843	2,943	2,856	2,807	2,882	2,859
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	1238	1297	1405	1488	1555	1644	1691
EER	(1)(2)	kW/kW	2,910	2,810	2,910	2,820	2,780	2,850	2,820
Cooling energy class			B	C	B	C	C	C	C
SEPR	(3)(4)		5,56	5,56	5,51	5,55	5,61	5,53	5,54
COOLING ONLY (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(5)	kW	1357	1420	1536	1628	1702	1801	1854
Total power input	(5)	kW	438,8	477,1	502,9	547,5	582,2	598,4	621,4
EER	(5)	kW/kW	3,093	2,976	3,054	2,974	2,923	3,010	2,984
23°C/15°C									
Cooling capacity	(6)	kW	1550	1618	1661	1827	1941	2056	2117
Total power input	(6)	kW	466,9	507,9	497,0	571,6	626,2	641,1	666,9
EER	(6)	kW/kW	3,320	3,186	3,342	3,196	3,100	3,207	3,174
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow		l/s	59,42	62,28	67,38	71,40	74,58	78,86	81,17
Pressure drop	(1)(2)	kPa	47,1	51,8	45,9	51,5	39,6	44,3	50,4
REFRIGERANT CIRCUIT									
Compressors nr.		N°	2	2	3	2	3	2	3
No. Circuits		N°	2	2	3	3	3	3	3
Refrigerant charge		kg	181	186	205	212	221	237	250
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									
A	(10)	mm	10400	10400	11650	11650	11650	12900	12900
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	8890	9000	10650	11460	11840	12350	12430

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 HFC R134a [GWP_{100} 1430] fluorinated greenhouse gases.

Certified data in EUROVENT



AIR COOLED CHILLERS WITH INVERTER SCREW COMPRESSORS

i-FR-G01-Z

2202 - 7223

Air cooled chillers with inverter screw compressors (from 477 to 1697 kW)

i-FR-G01-Z/SL-K

Model			2202	2602	2652	2702	2722	3152	3602
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		kW	477,0	516,7	554,6	578,0	662,9	711,3	774,2
Total power input		kW	161,3	169,9	187,5	203,5	219,1	249,6	283,5
EER		kW/kW	2,957	3,041	2,958	2,840	3,026	2,850	2,731
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	475,7	515,1	553,0	576,3	660,9	708,9	772,0
EER	(1)(2)	kW/kW	2,930	3,000	2,930	2,810	2,990	2,810	2,700
Cooling energy class			B	B	B	C	B	C	C
SEPR	(3)(4)		5,85	6,00	5,80	5,59	5,92	5,72	5,55
COOLING ONLY (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(5)	kW	522,0	565,5	607,6	632,9	726,3	778,4	846,7
Total power input	(5)	kW	167,6	176,5	195,1	212,1	228,5	262,0	299,6
EER	(5)	kW/kW	3,115	3,204	3,114	2,984	3,179	2,971	2,826
23°C/15°C									
Cooling capacity	(6)	kW	598,1	647,9	697,4	725,8	833,9	892,0	987,2
Total power input	(6)	kW	177,1	186,3	206,7	225,1	243,5	282,7	322,8
EER	(6)	kW/kW	3,377	3,478	3,374	3,224	3,425	3,155	3,058
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow		l/s	22,81	24,71	26,52	27,64	31,70	34,02	37,02
Pressure drop	(1)(2)	kPa	31,8	37,4	34,4	37,3	39,1	45,0	38,0
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	72,0	79,0	84,0	88,0	101	109	117
NOISE LEVEL									
Sound Pressure	(7)	dB(A)	60	61	61	61	61	61	61
Sound power level in cooling	(8)(9)	dB(A)	92	93	93	93	94	94	94
SIZE AND WEIGHT									
A	(10)	mm	5400	5400	5400	5400	6650	6650	6650
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	5450	5600	5620	5650	6560	6580	6590

Model			3902	4202	4502	4802	4812	4822	5412
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		kW	845,6	903,1	972,7	1028	1046	1120	1162
Total power input		kW	304,7	323,1	342,2	358,3	344,9	381,1	404,9
EER		kW/kW	2,775	2,795	2,842	2,869	3,033	2,939	2,870
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	843,1	900,1	969,8	1025	1042	1116	1159
EER	(1)(2)	kW/kW	2,740	2,760	2,810	2,830	2,990	2,900	2,840
Cooling energy class			C	C	C	C	B	B	C
SEPR	(3)(4)		5,54	5,50	5,66	5,74	5,70	5,63	5,74
COOLING ONLY (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(5)	kW	922,6	982,7	1061	1123	1144	1225	1270
Total power input	(5)	kW	321,0	339,5	358,9	374,8	359,4	397,9	422,9
EER	(5)	kW/kW	2,874	2,895	2,956	2,996	3,183	3,079	3,003
23°C/15°C									
Cooling capacity	(6)	kW	1024	1060	1182	1306	1310	1402	1478
Total power input	(6)	kW	332,8	335,2	369,8	395,4	382,7	425,2	446,1
EER	(6)	kW/kW	3,077	3,162	3,196	3,303	3,423	3,297	3,313
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow		l/s	40,44	43,19	46,52	49,15	50,01	53,58	55,57
Pressure drop	(1)(2)	kPa	40,1	45,7	40,9	45,7	47,3	51,0	41,2
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	127	135	146	155	159	172	177
NOISE LEVEL									
Sound Pressure	(7)	dB(A)	62	63	63	63	63	63	63
Sound power level in cooling	(8)(9)	dB(A)	95	96	96	96	96	96	96
SIZE AND WEIGHT									
A	(10)	mm	7900	7900	9150	9150	10400	10400	10400
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	7050	7100	8110	8550	9010	9130	9310

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 HFC R134a [GWP_{100} 1430] fluorinated greenhouse gases.

Certified data in EUROVENT

ASHRAE 90.1 compliant

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

VPF | HFC R134a | AXIAL | ENERG.CL. | INV.COMP. | COOLING | SCREW | SHELL&T.

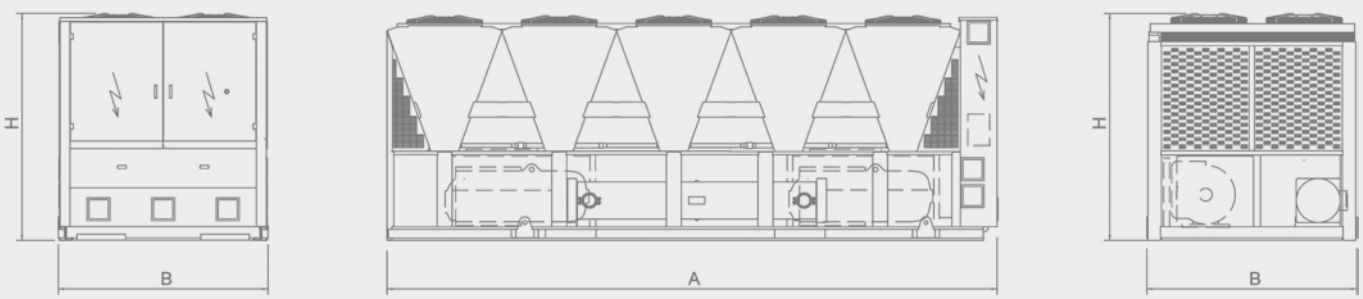
Model			6002	6022	6303	6903	7203	7213	7223
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE									
COOLING ONLY (GROSS VALUE)									
Cooling capacity		kW	1199	1290	1365	1474	1541	1590	1635
Total power input		kW	428,2	451,3	486,9	519,0	548,8	584,9	607,6
EER		kW/kW	2,800	2,858	2,803	2,840	2,808	2,718	2,691
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	1195	1286	1361	1469	1537	1586	1630
EER	(1)(2)	kW/kW	2,770	2,820	2,770	2,800	2,780	2,690	2,660
Cooling energy class			C	C	C	C	C	D	D
SEPR	(3)(4)		5,55	5,70	5,59	5,96	5,69	5,61	5,56
COOLING ONLY (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(5)	kW	1308	1408	1486	1608	1683	1734	1821
Total power input	(5)	kW	447,2	470,2	511,6	543,7	575,2	613,5	627,3
EER	(5)	kW/kW	2,925	2,994	2,905	2,958	2,926	2,826	2,903
23°C/15°C									
Cooling capacity	(6)	kW	1522	1605	1604	1806	1961	2019	2079
Total power input	(6)	kW	471,3	500,2	505,8	567,3	607,1	647,2	673,3
EER	(6)	kW/kW	3,229	3,209	3,171	3,184	3,230	3,120	3,088
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow		l/s	57,32	61,67	65,28	70,50	73,70	76,02	78,18
Pressure drop	(1)(2)	kPa	43,9	50,8	43,1	50,2	38,7	41,2	46,7
REFRIGERANT CIRCUIT									
Compressors nr.		N°	2	2	3	2	3	2	3
No. Circuits		N°	2	2	3	3	3	3	3
Refrigerant charge		kg	181	195	205	222	232	242	250
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									
A	(10)	mm	10400	11650	11650	12900	12900	12900	12900
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	9270	9790	11140	12390	12770	12850	12930

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 HFC R134a [GWP_{100} 1430] fluorinated greenhouse gases.

Certified data in EUROVENT



AIR COOLED CHILLERS WITH INVERTER SCREW COMPRESSORS

i-FR-G01-Z

2202 - 7223

Air cooled chillers with inverter screw compressors (from 477 to 1697 kW)

i-FR-G01-Z/A

Model			2202	2602	2652	2702	2722	3152	3602	3902
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE										
COOLING ONLY (GROSS VALUE)										
Cooling capacity		kW	510,2	551,9	590,0	626,9	684,3	767,2	839,9	899,4
Total power input		kW	157,1	170,7	181,9	195,0	213,4	246,9	274,6	291,3
EER		kW/kW	3,248	3,233	3,244	3,215	3,207	3,107	3,059	3,088
COOLING ONLY (EN14511 VALUE)										
Cooling capacity	(1)(2)	kW	508,7	550,4	588,2	624,8	682,1	765,0	837,1	896,4
EER	(1)(2)	kW/kW	3,210	3,200	3,200	3,170	3,160	3,070	3,020	3,050
Cooling energy class			A	A	A	A	A	B	B	B
SEPR	(3)(4)		6,39	6,42	6,36	6,32	6,29	6,15	6,06	5,84
COOLING ONLY (GROSS VALUE)										
16°C/10°C										
Cooling capacity	(5)	kW	559,2	605,1	647,1	687,6	750,2	841,2	920,2	983,7
Total power input	(5)	kW	162,8	177,2	188,9	202,5	222,3	258,7	288,8	306,2
EER	(5)	kW/kW	3,435	3,415	3,426	3,396	3,375	3,252	3,186	3,213
23°C/15°C										
Cooling capacity	(6)	kW	642,0	695,3	743,9	790,9	862,1	966,8	1057	1098
Total power input	(6)	kW	171,2	186,9	199,6	214,4	236,5	278,4	313,2	316,4
EER	(6)	kW/kW	3,750	3,720	3,727	3,689	3,645	3,473	3,375	3,470
EXCHANGERS										
HEAT EXCHANGER USER SIDE IN REFRIGERATION										
Water flow		l/s	24,40	26,39	28,22	29,98	32,73	36,69	40,16	43,01
Pressure drop	(1)(2)	kPa	36,4	34,0	38,9	43,9	41,6	37,3	44,7	45,3
REFRIGERANT CIRCUIT										
Compressors nr.		N°	2	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2	2
Refrigerant charge		kg	79,0	81,0	87,0	92,0	100	113	123	133
NOISE LEVEL										
Sound Pressure	(7)	dB(A)	67	68	67	67	68	68	68	69
Sound power level in cooling	(8)(9)	dB(A)	99	100	100	100	101	101	101	102
SIZE AND WEIGHT										
A	(10)	mm	5400	5400	6650	6650	6650	7900	7900	9150
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	5180	5240	5720	5800	6210	6620	6670	7080

Model			4202	4502	4802	4822	5412	5703	6303	6603
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE										
COOLING ONLY (GROSS VALUE)										
Cooling capacity		kW	959,4	1028	1099	1162	1230	1334	1467	1520
Total power input		kW	307,8	326,5	343,9	373,0	385,1	434,5	473,6	498,0
EER		kW/kW	3,117	3,149	3,196	3,115	3,194	3,070	3,098	3,052
COOLING ONLY (EN14511 VALUE)										
Cooling capacity	(1)(2)	kW	955,9	1025	1095	1159	1226	1330	1463	1516
EER	(1)(2)	kW/kW	3,070	3,110	3,150	3,080	3,150	3,030	3,070	3,020
Cooling energy class			B	A	A	B	A	B	B	B
SEPR	(3)(4)		5,77	5,90	5,98	5,92	5,88	5,88	5,81	5,79
COOLING ONLY (GROSS VALUE)										
16°C/10°C										
Cooling capacity	(5)	kW	1047	1124	1203	1273	1347	1461	1602	1661
Total power input	(5)	kW	323,2	341,2	357,7	388,6	400,1	457,2	498,2	522,6
EER	(5)	kW/kW	3,239	3,294	3,363	3,276	3,367	3,196	3,216	3,178
23°C/15°C										
Cooling capacity	(6)	kW	1137	1259	1381	1459	1545	1648	1742	1843
Total power input	(6)	kW	319,3	349,7	379,7	413,6	423,9	480,6	493,5	531,3
EER	(6)	kW/kW	3,561	3,600	3,637	3,528	3,645	3,429	3,530	3,469
EXCHANGERS										
HEAT EXCHANGER USER SIDE IN REFRIGERATION										
Water flow		l/s	45,88	49,16	52,54	55,59	58,81	63,78	70,16	72,70
Pressure drop	(1)(2)	kPa	51,6	45,7	50,1	41,2	46,2	41,1	35,1	37,7
REFRIGERANT CIRCUIT										
Compressors nr.		N°	2	2	2	2	2	3	3	3
No. Circuits		N°	2	2	2	2	2	3	3	3
Refrigerant charge		kg	141	151	161	173	182	197	226	224
NOISE LEVEL										
Sound Pressure	(7)	dB(A)	70	70	71	72	72	72	72	72
Sound power level in cooling	(8)(9)	dB(A)	103	103	104	105	105	105	105	105
SIZE AND WEIGHT										
A	(10)	mm	9150	10400	10400	10400	11650	12900	12900	12900
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	7120	8110	8550	8810	9280	10880	10920	11610

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 HFC R134a [GWP_{100} 1430] fluorinated greenhouse gases.

Certified data in EUROVENT

ASHRAE 90.1 compliant

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

VPF | HFC R134a | AXIAL | ENERG.CL. | INV.COMP. | COOLING | SCREW | SHELL&T.

i-FR-G01-Z/SL-A

Model			2202	2602	2652	2702	2722	3152	3602	3902
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE										
COOLING ONLY (GROSS VALUE)										
Cooling capacity		kW	498,8	559,5	581,8	615,1	682,8	751,6	811,9	891,5
Total power input		kW	155,7	175,2	178,0	194,0	208,0	240,9	264,1	283,2
EER		kW/kW	3,204	3,193	3,269	3,171	3,283	3,120	3,074	3,148
COOLING ONLY (EN14511 VALUE)										
Cooling capacity	(1)(2)	kW	497,4	557,9	580,0	613,4	680,6	749,5	809,4	888,6
EER	(1)(2)	kW/kW	3,170	3,160	3,230	3,140	3,240	3,080	3,040	3,110
Cooling energy class			A	A	A	A	A	B	B	A
SEPR	(3)(4)		6,44	6,49	6,54	6,42	6,49	6,27	6,23	6,01
COOLING ONLY (GROSS VALUE)										
16°C/10°C										
Cooling capacity	(5)	kW	546,3	613,6	638,1	674,9	749,0	824,1	890,1	975,7
Total power input	(5)	kW	161,6	182,2	184,9	201,9	216,6	252,6	277,6	297,8
EER	(5)	kW/kW	3,381	3,368	3,451	3,343	3,458	3,262	3,206	3,276
23°C/15°C										
Cooling capacity	(6)	kW	626,7	705,4	733,8	776,4	861,6	947,2	1023	1091
Total power input	(6)	kW	170,5	192,9	195,6	214,3	230,4	272,2	301,0	307,8
EER	(6)	kW/kW	3,676	3,657	3,752	3,623	3,740	3,480	3,399	3,545
EXCHANGERS										
HEAT EXCHANGER USER SIDE IN REFRIGERATION										
Water flow		l/s	23,85	26,76	27,82	29,42	32,65	35,94	38,83	42,63
Pressure drop	(1)(2)	kPa	34,8	35,0	37,8	33,6	41,5	35,8	41,8	44,5
REFRIGERANT CIRCUIT										
Compressors nr.		N°	2	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2	2
Refrigerant charge		kg	79,0	88,0	92,0	97,0	107	118	129	141
NOISE LEVEL										
Sound Pressure	(7)	dB(A)	60	60	60	60	61	61	61	62
Sound power level in cooling	(8)(9)	dB(A)	92	93	93	93	94	94	94	95
SIZE AND WEIGHT										
A	(10)	mm	5400	6650	6650	6650	7900	7900	9150	10400
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	5490	6030	6080	6400	6990	6990	7460	7860

i-FR-G01-Z/SL-A			4202	4502	4802	4822	5412	5703	6303
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		kW	942,8	1016	1086	1149	1213	1332	1462
Total power input		kW	299,7	318,3	335,7	364,6	377,2	438,1	473,2
EER		kW/kW	3,146	3,192	3,235	3,151	3,216	3,040	3,090
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	939,4	1013	1082	1146	1209	1328	1458
EER	(1)(2)	kW/kW	3,100	3,150	3,190	3,110	3,170	3,010	3,060
Cooling energy class			A	A	A	A	A	B	B
SEPR	(3)(4)		5,85	5,96	6,11	6,06	6,02	5,96	5,84
COOLING ONLY (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(5)	kW	1029	1112	1190	1259	1329	1458	1594
Total power input	(5)	kW	314,9	332,7	349,2	379,8	392,0	462,1	498,5
EER	(5)	kW/kW	3,268	3,342	3,408	3,315	3,390	3,155	3,198
23°C/15°C									
Cooling capacity	(6)	kW	1120	1247	1366	1444	1524	1644	1730
Total power input	(6)	kW	311,1	340,9	370,5	404,1	415,4	487,4	493,7
EER	(6)	kW/kW	3,600	3,658	3,687	3,573	3,669	3,373	3,504
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Water flow		l/s	45,09	48,60	51,92	54,96	58,00	63,72	69,92
Pressure drop	(1)(2)	kPa	49,8	44,7	48,9	40,3	44,9	41,0	34,8
REFRIGERANT CIRCUIT									
Compressors nr.		N°	2	2	2	2	2	4	3
No. Circuits		N°	2	2	2	2	2	3	3
Refrigerant charge		kg	149	160	171	183	191	206	226
NOISE LEVEL									
Sound Pressure	(7)	dB(A)	63	63	63	63	63	63	63
Sound power level in cooling	(8)(9)	dB(A)	96	96	96	96	96	96	96
SIZE AND WEIGHT									
A	(10)	mm	10400	11650	11650	11650	12900	12900	12900
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(10)	kg	8080	8860	9310	9640	10080	11410	11420

Notes:

1 ▸ Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger air (in) 35°C.
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3 ▸ Seasonal energy efficiency ratio
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5 ▸ Plant (side) cooling exchanger water (in/out) 16°C/ 10°C; Source (side) heat exchanger air (in) 35°C.
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8 ▸ Sound power on the basis of measurements made in compliance with ISO 9614.
9 ▸ Sound power level in cooling, outdoors.
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The units highlighted in this publication contain HFC R134a [GWP_{100} 1430] fluorinated greenhouse gases.

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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 sectionable 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 (Opt. 3431): Factory installed device. In case of a gas leak detection it raises an alarm.
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): FX 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): FX 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

BNP PARIBAS

2015 BAILLY ROMAINVILLIERS (FRANCE)

Application:
Data Center

Plant type:
Hydronic System

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

PROJECT

Val d'Europe was built in conjunction with The Walt Disney Company, who wished to create a town near the Resort. In this modern and fast-moving context BNP Paribas decided to establish their new data center.

CHALLENGE

The new project consists of two buildings of 1630 and 9990 m^2, located on a 74,965 m2 piece of land aimed at combining the landscaping requirements with the company's environmental responsibility policy, that is, to reduce their own ecological footprint as much as possible. The new buildings contain offices and 4 data centers that will host and enable IR + Networks + telecom operations of most of the bank's IT production.

SOLUTION

At BNPP Val d'Europe it was supplied a complete system able to combine the reliability and continuous cooling in the data center with sustainability and the perfect level of comfort in the offices. The system is composed of 12 high efficiency chillers and 28 close control units for a total of 12,200 kW and is worth more than one million euros.

Going in depth 2 FR FC-Z NG 3902 SL-T chillers in a super low noise version with a 100% positive free-cooling temperature are able to grant an energy cost very close to zero and reach an EER equal to 36. Furthermore, 10 FRCS2-Z 3602 SL-K-S air source chillers in a compact and super low-noise version have been installed Inside the data centers 28 close control units have been installed for the precise temperature and humidity control.

MORE THAN 1000 PROJECTS ALL OVER THE WORLD

2017 Bangalore - India

Qualcomm India Data Center

Application: Data Center
Plant type: HPAC System
Cooling Capacity: 4495 kW
Installed machines:
4x i-FR(1+i)/CA/S-Z high efficiency chillers with fixed speed and inverter speed compressors

2016 Rome - Italy

Telecom Data Center - Acilia Tier IV

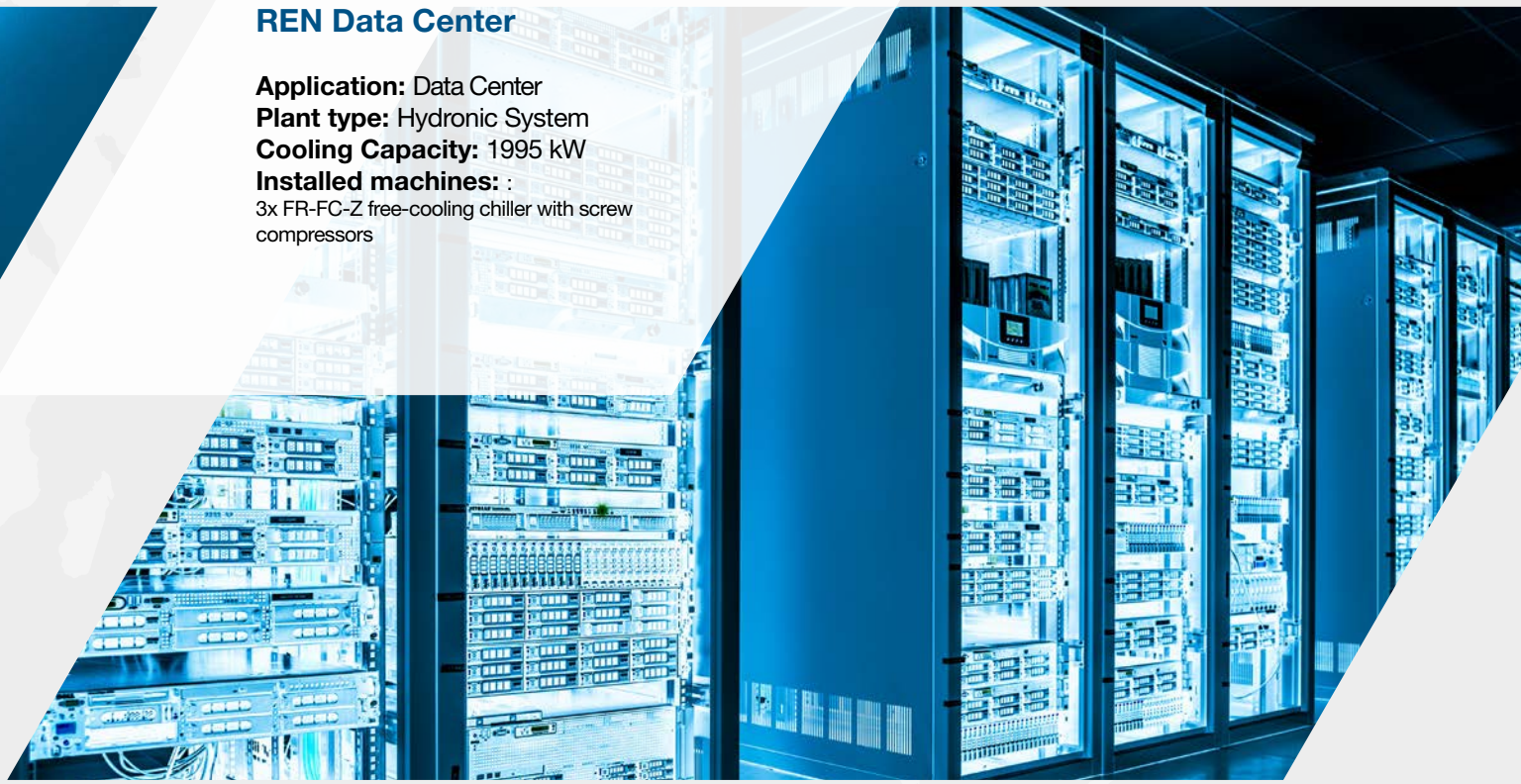
Application: Data Center
Plant type: Hydronic System
Cooling Capacity: 7804 kW
Installed machines:
3x TRCS2/SL-CA-S-Z oil-free compressor chillers, 5x i-FR(1+i)/CA-S-Z fixed speed and inverte speed compressor chillers

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 Braga - Portugal

REN Data Center

Application: Data Center
Plant type: Hydronic System
Cooling Capacity: 1995 kW
Installed machines: :
3x FR-FC-Z free-cooling chiller with screw compressors



2018 Karlskrona - Sweden

Telenor Data Centre

Application: Data Center
Plant type: HPAC System
Cooling Capacity: 1866 kW
Installed machines:
3x FR-FC/SL-Z free-cooling chiller with screw comrpessors, 6x indoor close control air conditioners

i-FR-G01-Z_ENG_10-2018

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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