

PROCESS

CHILLERS

# WATER COOLED CHILLER RANGE

**SCREW COMPRESSORS  
WITH R513A REFRIGERANT**

**r R513A**



# TOP-RELIABLE CHILLER RANGE FOR YOUR INDUSTRIAL FACILITY



In industrial facilities working most hours per day, chiller activity is key in removing excess heat produced by manufacturing processes.

Fully committed to supporting the creation of a greener tomorrow, Mitsubishi Electric presents a complete range of water cooled screw compressor chillers optimized for the use of R513A, the innovative low GWP refrigerant that ensures top-level chiller performance and completely reliable usage.

## PROCESS APPLICATIONS

- ✓ Food industry
- ✓ Chemical and Pharmaceutical
- ✓ Printing industry
- ✓ Plastics
- ✓ Winery

## 2 EVAPORATING TECHNOLOGIES

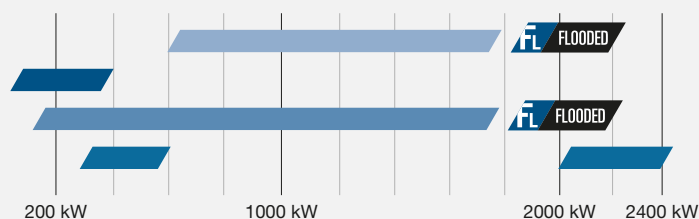
**T** SHELL&T.

**FL** FLOODED

Two types of heat exchangers to achieve premium levels of efficiency at both full and partial loads.

## A COMPLETE RANGE FROM 124 kW TO 2 MW

i-FX-W(1+i)-G05-Y  
FX-W-G05-Y  
FOCS3-W-G05-Y  
FOCS2-W-G05-Y



## HEAT RECOVERY SYSTEM AVAILABLE



For recovering heat when both hot and cold water are required.

## THE BEST COMPRESSOR COMBINATION

**(1+i)**

Two compressor technologies that can offer the best efficiency according to the real thermal loads.

## INNOVATIVE 1+i INVERTER TECHNOLOGY



## MANY INSTALLATION OPPORTUNITIES

i-FX-W(1+i)-G05-Y	531-1778 kW	<ul style="list-style-type: none"> <li>✓ Inverter driven compressor</li> <li>✓ Unbeatable efficiency both at full and partial loads</li> <li>✓ Compact design</li> </ul>	<b>Ideal for medium-large applications</b>
FX-W-G05-Y	124-399 kW	<ul style="list-style-type: none"> <li>✓ High efficiency</li> <li>✓ Heat recovery system available</li> </ul>	<b>Ideal for small-medium size applications</b>
FOCS3-W-G05-Y	188-1688 kW	<ul style="list-style-type: none"> <li>✓ Extremely small footprint</li> <li>✓ Very high efficiency</li> </ul>	<b>Ideal for medium applications</b>
FOCS2-W-G05-Y	305-2410 kW	<ul style="list-style-type: none"> <li>✓ High configurability</li> <li>✓ Wide choice of accessories</li> <li>✓ Wide range &gt; from 2 to 4 compressor units</li> <li>✓ Low sound levels &gt; several enclosures available</li> </ul>	<b>Ideal for medium-large applications</b>

# ALL-ROUND SUSTAINABILITY



The new screw compressor chiller range with R513A refrigerant is the result of Mitsubishi Electric Hydronics & IT Cooling Systems' extensive approach to sustainability.

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).

Combining brilliant annual efficiency with the use of a low GWP refrigerant, the range of chillers with R513A tackles both the indirect (due to primary energy consumption) and direct global warming, thus resulting in the perfect choice for any new, forward-looking cooling system.



**-56% GWP**  
vs R134a



**Non-flammable**  
Safety Class A1

New generation refrigerant with reduced greenhouse effect. Non-flammable.

#### Reduced GWP

R513A GWP<sub>100 year</sub> = 572  
(R134a GWP<sub>100 year</sub> = 1300)  
GWP values according to IPCC AR5

#### Non-toxic, non-flammable

ASHRAE 34, ISO 817: A1 class

#### Favorable physical properties

Same cooling capacity delivered as R134a  
Same operating pressures as R134a

#### In line with standard building codes

No special equipment  
No need for flammable risk assessment  
No extra costs

#### Compliant with eco regulation objectives

No future retrofit required  
Reduced price volatility

## REFRIGERANT BENCHMARK

SCROLL		
Refrigerant	GWP*	Flammability**
R410A	2088	NON flammable
R32	675	MILDLY flammable
R454B	466	MILDLY flammable
R452B	698	MILDLY flammable

SCREW		
Refrigerant	GWP*	Flammability**
R134a	1430	NON flammable
R513A	631	NON flammable
R1234ze	7	MILDLY flammable
R1234yf	4	MILDLY flammable

New regulations like the EU F-gas and the Kigali Amendment to the Montreal Protocol, are driving the industry towards new eco-friendly refrigerants, with reduced greenhouse effect.

Unfortunately, the majority of low GWP refrigerants raises another critical issue: flammability.

The new refrigerant R513A, chosen for the water cooled chiller range, is a brilliant exception: it offers a -56% GWP reduction compared to R134a's while ensuring complete non-toxicity and non-flammability (Class A1 of ASHRAE 34, ISO 817).

\*IPCC AR4 \*\*ASHRAE 34 - ISO 817

# i-FX-W(1+i)-G05-Y

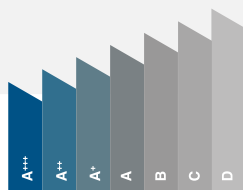
## HIGH EFFICIENCY WATER COOLED CHILLER AND HEAT PUMP REVERSIBLE ON THE HYDRAULIC SIDE, WITH INVERTER TECHNOLOGY AND FLOODED EVAPORATOR 531-1778 kW

i-FX-W(1+i)-G05-Y is the Climaveneta brand water cooled chiller with 1+i innovative logics that combines fixed speed and variable speed screw compressors, thus ensuring continuous modulation of loads and a perfect leaving water stability. All the units come with an exclusive flooded evaporator and a shell and tube condenser, specifically conceived and developed in-house.

Their exclusive design ensures a perfect heat exchange coefficient and provides EER results not only above class A but also among the highest values available on the water chiller with screw compressor market.



### PREMIUM ENERGY EFFICIENCY



i-FX-W(1+i)-G05-Y has been designed to operate at very high levels of efficiency at both full and partial loads.

With EER in Class A and unbeatable ESEER values, the water cooled chiller always meets the requested cooling capacity, thus ensuring reduced energy consumption and 20% less CO<sub>2</sub> emissions compared to other Class A chillers.

### REDUCED ENERGY CONSUMPTION



Brilliantly engineered technological choices combined with great efforts during the design phase of the product have demonstrated that high efficiency can go hand in hand with significant cost savings up to 21% compared to traditional chillers featuring the same technology.

EER\* = 5,10

**SEPR HT\* = 7,74**

\*Average values

### QUICK RETURN ON THE INVESTMENT



Accessibility is key in social development. This means that technology and innovation must be available and affordable.

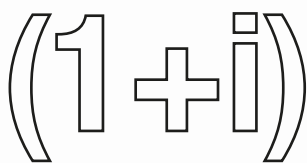
The unparalleled efficiency of i-FX-W(1+i)-G05-Y allows for a quick return on the investment. The inverter driven technology of screw compressor chillers has never been so accessible.

### ALWAYS MATCHING THE REQUIRED LOAD



Thanks to the inverter technology, i-FX-W(1+i)-G05-Y always produces the perfect cooling load, reducing energy consumption and improving the facility's profitability.





## A new concept of efficiency:

Fixed speed compressor ( 1 )  
+ Variable speed compressor ( i )

### UNBEATABLE EFFICIENCY, IN EVERY LOAD CONDITION

#### The advantages of 1+i logic

Always the best combination of compressors

Continuous modulation from 15% to 100%

Perfect leaving water temperature stability

EER in Class A efficiency

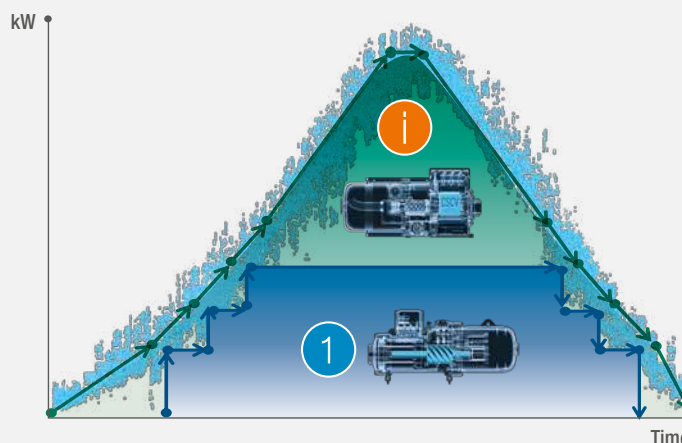
SEPR HT up to 7,9

Mitsubishi Electric has developed a new concept of efficiency: the combination of a fixed speed screw compressor (1) with a variable speed inverter driven screw compressor (+ i). This solution, combined with unique and advanced control logic, improves the best features and benefits of each compressor.

The result is a unit that focuses on efficiency in all load conditions, overcoming the limitations traditionally imposed by the full inverter system on full loads and the fixed speed screw compressors on partial loads.

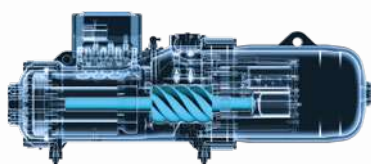
#### PREMIUM EFFICIENCY THANKS TO THE COMBINATION (1+i) COMPRESSORS

- Cooling load of the variable speed compressor
- Cooling load of the fixed speed compressor
- Total requested cooling load



1

#### Fixed Speed Compressor



The new generation of fixed speed compressors is the result of our commitment to avoid the efficiency loss in part-load operation: the new compressor features a better lubrication system and an innovative internal geometry that allows a jump in performance at partial loads.

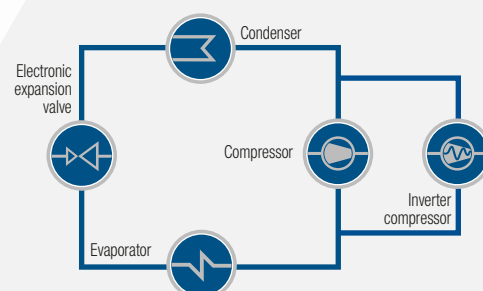


#### Variable Speed Compressor



The new inverter driven compressor is compact, with an oil separator, frequency inverter and cooling system integrated all within a single casing. The Vi control allows automatic adaptation to the different operating conditions thus ensuring that different refrigeration load levels are always at the highest values of energy efficiency.

#### Two compressors in one single refrigerant circuit



The two compressors are combined on the same refrigerant circuit, ensuring higher efficiency values at partial loads in comparison with units with independent circuits.



## i-FX-W(1+i)-G05-Y

High efficiency water cooled chiller,  
for indoor installation  
531-1778 kW

i-FX-W (1+i)-G05-Y			1402	1752	1902	2152	2602
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
<b>PERFORMANCE</b>							
<b>COOLING ONLY (GROSS VALUE)</b>							
Cooling capacity	(1)	kW	532,3	665,0	721,0	819,3	998,7
Total power input	(1)	kW	102,0	124,6	135,4	154,6	189,4
EER	(1)	kW/kW	5,219	5,337	5,325	5,299	5,273
ESEER	(1)	kW/kW	8,370	8,430	8,270	8,400	8,400
<b>COOLING ONLY (EN14511 VALUE)</b>							
Cooling capacity	(1)(2)	kW	530,7	662,9	718,8	816,9	995,5
EER	(1)(2)	kW/kW	5,020	5,130	5,110	5,090	5,070
ESEER	(1)(2)	kW/kW	7,200	7,270	7,110	7,230	7,240
Cooling energy class			B	A	A	A	A
<b>ENERGY EFFICIENCY</b>							
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)</b>							
<b>Process refrigeration at high temperature</b>							
Prated,c	(7)	kW	486,7	608,1	659,4	750,0	914,3
SEPR	(7)(9)		7,70	7,83	7,64	7,69	7,59
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095)</b>							
<b>Process refrigeration at medium temperature</b>							
Prated,c	(8)	kW	227,0	289,1	314,4	357,8	431,0
SEPR	(8)(9)		4,29	4,47	4,47	4,51	4,46
<b>EXCHANGERS</b>							
<b>HEAT EXCHANGER USER SIDE IN REFRIGERATION</b>							
Water flow	(1)	l/s	25,45	31,80	34,48	39,18	47,76
Pressure drop	(1)	kPa	36,3	41,3	40,2	39,4	44,0
<b>HEAT EXCHANGER SOURCE SIDE IN REFRIGERATION</b>							
Water flow	(1)	l/s	30,22	37,63	40,81	46,41	56,61
Pressure drop	(1)	kPa	45,3	42,9	50,5	50,2	46,9
<b>REFRIGERANT CIRCUIT</b>							
Compressors nr.		N°	2	2	2	2	2
No. Circuits		N°	1	1	1	1	1
<b>NOISE LEVEL</b>							
Sound Pressure	(3)	dB(A)	82	82	81	83	83
Sound power level in cooling	(4)(5)	dB(A)	100	100	100	102	102
<b>SIZE AND WEIGHT</b>							
Length	(6)	mm	2950	3310	3310	3310	4475
Width	(6)	mm	1320	1425	1445	1480	1410
Height	(6)	mm	1805	1935	2000	2150	2250
Operating weight	(6)	kg	3350	4280	4410	4830	6630

### Notes:

- 1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger water (in/out) 30°C/35°C.
- 2 Values in compliance with EN14511-3.
- 3 Average sound pressure level at 1m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
- 4 Sound power on the basis of measurements made in compliance with ISO 9614.
- 5 Sound power level in cooling, indoors.
- 6 Unit in standard configuration/execution, without optional accessories.

7 Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 2016/2281]

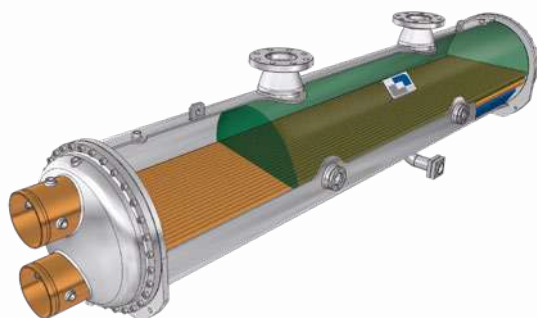
8 Seasonal Energy Efficiency of Process Cooling at Medium Temperature [REGULATION (EU) N. 2015/1095]

9 Seasonal energy efficiency ratio

**The units highlighted in this publication contain R513A [GWP<sub>100</sub> 631] fluorinated greenhouse gases.**

**Certified data in EUROVENT**

## Innovative design of Heat Exchangers



The flooded evaporator and the shell and tube condenser, both fully designed and built internally, present an exclusive design aimed at maximising the cooling power and optimising the operation of the compressors.

The shell and tube condenser is designed in order to guarantee reduced pressure drops on the water side and to decrease the pumping costs as much as possible.

In the evaporator the complete flooding of the tubes is also guaranteed during partial load conditions by an electronic expansion valve, managed by proprietary control logics.



i-FX-W (1+i)-G05-Y			3002	3402	3852	4252	4652
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
<b>PERFORMANCE</b>							
<b>COOLING ONLY (GROSS VALUE)</b>							
Cooling capacity	(1)	kW	1143	1296	1472	1607	1784
Total power input	(1)	kW	216,0	243,1	275,6	303,9	343,4
EER	(1)	kW/kW	5,292	5,331	5,341	5,288	5,195
ESEER	(1)	kW/kW	8,330	8,380	8,410	8,210	8,170
<b>COOLING ONLY (EN14511 VALUE)</b>							
Cooling capacity	(1)(2)	kW	1139	1293	1468	1602	1778
EER	(1)(2)	kW/kW	5,110	5,150	5,180	5,100	5,010
ESEER	(1)(2)	kW/kW	7,280	7,370	7,470	7,180	7,140
Cooling energy class			A	A	A	A	B
<b>ENERGY EFFICIENCY</b>							
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)</b>							
<b>Process refrigeration at high temperature</b>							
Prated,c	(7)	kW	1046	1186	1348	1482	-
SEPR	(7)(9)		7,73	7,82	7,89	7,77	-
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095)</b>							
<b>Process refrigeration at medium temperature</b>							
Prated,c	(8)	kW	495,8	563,9	642,8	704,4	783,9
SEPR	(8)(9)		4,53	4,67	4,68	4,58	4,54
<b>EXCHANGERS</b>							
<b>HEAT EXCHANGER USER SIDE IN REFRIGERATION</b>							
Water flow	(1)	l/s	54,66	61,97	70,41	76,87	85,33
Pressure drop	(1)	kPa	44,5	37,8	36,6	43,7	53,8
<b>HEAT EXCHANGER SOURCE SIDE IN REFRIGERATION</b>							
Water flow	(1)	l/s	64,76	73,34	83,30	91,08	101,4
Pressure drop	(1)	kPa	36,4	40,4	36,0	43,0	36,0
<b>REFRIGERANT CIRCUIT</b>							
Compressors nr.		N°	2	2	2	2	2
No. Circuits		N°	1	1	1	1	1
<b>NOISE LEVEL</b>							
Sound Pressure	(3)	dB(A)	83	82	82	84	84
Sound power level in cooling	(4)(5)	dB(A)	102	102	102	104	104
<b>SIZE AND WEIGHT</b>							
Length	(6)	mm	4475	4570	4650	4650	4850
Width	(6)	mm	1405	1435	1495	1495	1495
Height	(6)	mm	2250	2380	2500	2500	2500
Operating weight	(6)	kg	7470	8220	8800	8930	9340

**Notes:**

- 1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger water (in/out) 30°C/35°C.
- 2 Values in compliance with EN14511-3.
- 3 Average sound pressure level at 1m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
- 4 Sound power on the basis of measurements made in compliance with ISO 9614.
- 5 Sound power level in cooling, indoors.
- 6 Unit in standard configuration/execution, without optional accessories.

- 7 Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 2016/2281]
  - 8 Seasonal Energy Efficiency of Process Cooling at Medium Temperature [REGULATION (EU) N. 2015/1095]
  - 9 Seasonal energy efficiency ratio
- The units highlighted in this publication contain R513A [GWP<sub>100</sub> 631] fluorinated greenhouse gases.**
- Certified data in EUROVENT**

## Perfect lubricant recovery

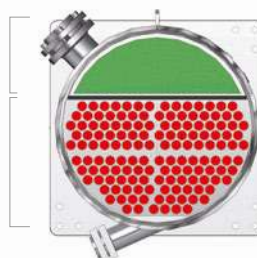
On the evaporator the presence of refrigerant fluid in the shell side and water in the tube side allows:

- ✓ Minimisation of pressure drops
- ✓ Perfect unified temperature as well as complete refrigerant evaporation
- ✓ No surface for the over-heating
- ✓ Easy cleaning operations

Unique design of the heat exchangers that provides the perfect separation and complete recovery of the lubricant in order to guarantee proper lubrication of the compressors and the relevant cleaning of the shell and tube exchanging surfaces.

Lubricant separation and recovery

Thermal exchange



# FX-W-G05-Y

## COMPACT WATER COOLED CHILLER WITH SCREW COMPRESSORS 124-399 kW

FX-W-G05-Y is the ideal solution for small to medium size applications.

This range is also available with the heat recovery version, delivering exceptional efficiency values not only in producing cooling, but also in heating mode.

Thanks to its precise and accurate thermoregulation, FX-W-G05-Y can easily adapt to different thermal load conditions and countless installation requirements.



### EXTREME EFFICIENCY

The FX-W-G05-Y range has been designed to provide utmost efficiency at both full loads in the summer, and partial loads in the spring and fall when the building cooling requirements decrease.

#### ErP 2021 COMPLIANT

Engineered with selected components and careful design, all FX-W-G05-Y units are compliant with the latest ErP 2021 efficiency targets for process applications.

#### Single circuit unit

EER\*=4,67

SEPR HT\*=7,00

#### Dual circuit unit

EER\*=4,69

SEPR HT\*=7,00

\*Average values

### HEAT RECOVERY SYSTEM



In all industrial segments, heat produced during production processes can be recovered when there is a simultaneous demand for chilled and hot water. This energy can be reused to:

- ✓ **Serve comfort workplaces** and other areas located close to the industrial facilities.
- ✓ **Produce domestic hot water or floor heating systems.**
- ✓ **Feed the Air Handling Unit post-heating coil** to compensate the amount of heat lost during dehumidification.
- ✓ **Pre-heat service fluids** or incoming raw materials before further processing.

### HEAT RECOVERY CONFIGURATIONS

-	<b>Standard unit</b>	Unit for the production of chilled water.	<b>Baseline</b>
D	<b>Partial heat recovery</b>	A desuperheater on the compressor discharge line recovers approximately 20% of the unit's capacity.	<b>60°C</b>
R	<b>Total heat recovery</b>	A devoted refrigerant water heat exchanger recovers all the condensation heat.	<b>48°C</b>





R R513A

COOLING

T SHELL &amp; TUBES

SCREW

FX-W-G05-Y			551	651	751	851	951	1102	1302	1402	1502	1602	1752
Power supply	V/ph/Hz		400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
<b>PERFORMANCE</b>													
<b>COOLING ONLY (GROSS VALUE)</b>													
Cooling capacity	(1)	kW	124,3	140,5	166,3	198,2	221,7	252,4	285,1	311,9	345,2	366,2	400,6
Total power input	(1)	kW	25,5	28,41	35,57	40,52	46,1	51,04	56,86	64,04	71,26	76,05	86,66
EER	(1)	kW/kW	4,875	4,947	4,671	4,894	4,809	4,949	5,011	4,873	4,842	4,812	4,621
ESEER	(1)	kW/kW	5,97	5,95	5,96	5,94	5,93	6,32	6,24	6,22	6,12	6,11	6,09
<b>COOLING ONLY (EN14511 VALUE)</b>													
Cooling capacity	(1)(2)	kW	123,9	140,1	165,8	197,5	220,8	251,4	284,1	310,7	344,2	365,1	399,2
EER	(1)(2)	kW/kW	4,71	4,78	4,5	4,72	4,63	4,77	4,84	4,69	4,69	4,66	4,48
ESEER	(1)(2)	kW/kW	5,53	5,51	5,48	5,46	5,44	5,73	5,67	5,63	5,6	5,63	5,58
Cooling energy class			B	B	C	B	C	B	B	B	B	B	C
<b>ENERGY EFFICIENCY</b>													
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)</b>													
Process refrigeration at high temperature													
Prated,c	(7)	kW	123,9	140,1	165,8	197,5	220,8	251,4	284,1	310,7	344,2	365,1	399,2
SEPR	(7)(9)		7	7,04	7	7,02	7	7,01	7,03	7,02	7,02	7	7
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095)</b>													
Process refrigeration at medium temperature													
Prated,c	(8)	kW	60,2	67	81,5	94,9	107,1	121,4	135	150	166,4	177,4	195,8
SEPR	(8)(9)		3,65	3,7	3,63	3,55	3,58	3,7	3,69	3,65	3,58	3,59	3,63
<b>EXCHANGERS</b>													
<b>HEAT EXCHANGER USER SIDE IN REFRIGERATION</b>													
Water flow	(1)	l/s	5,944	6,719	7,954	9,479	10,6	12,07	13,63	14,91	16,51	17,51	19,16
Pressure drop	(1)	kPa	19,8	19,7	27,6	33	41,2	41	38,5	46,1	32	36	43
<b>HEAT EXCHANGER SOURCE SIDE IN REFRIGERATION</b>													
Water flow	(1)	l/s	7,133	8,045	9,611	11,37	12,75	14,45	16,29	17,9	19,83	21,06	23,19
Pressure drop	(1)	kPa	22,1	25,9	31	27	26,5	22,7	26,6	29,3	33	28,9	24,8
<b>REFRIGERANT CIRCUIT</b>													
Compressors nr.		N°	1	1	1	1	1	2	2	2	2	2	2
No. Circuits		N°	1	1	1	1	1	2	2	2	2	2	2
<b>NOISE LEVEL</b>													
Sound Pressure	(3)	dB(A)	75	75	76	76	76	78	77	78	78	78	78
Sound power level in cooling	(4)(5)	dB(A)	92	92	93	93	93	95	95	96	96	96	96
<b>SIZE AND WEIGHT</b>													
Length	(6)	mm	2400	2600	2700	3000	3000	3000	3100	3100	3200	3200	3200
Width	(6)	mm	920	920	950	960	960	1100	1100	1100	1100	1200	1200
Height	(6)	mm	1500	1500	1500	1500	1500	1500	1500	1500	1600	1600	1600
Operating weight	(6)	kg	1050	1110	1280	1450	1460	1710	1820	1990	2280	2430	2590

**Notes:**

- 1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger water (in/out) 30°C/35°C.
- 2 Values in compliance with EN14511-3.
- 3 Average sound pressure level at 1m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
- 4 Sound power on the basis of measurements made in compliance with ISO 9614.
- 5 Sound power level in cooling, indoors.

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

7 Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 2016/2281]

8 Seasonal Energy Efficiency of Process Cooling at Medium Temperature [REGULATION (EU) N. 2015/1095]

9 Seasonal energy efficiency ratio

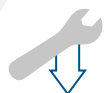
**The units highlighted in this publication contain HFC R513A [GWP<sub>100</sub> 631] fluorinated greenhouse gases.****Certified data in EUROVENT****TOTAL RELIABILITY**

The FX-W-G05-Y range meets the needs of an industry that cannot afford any cooling interruption.

The units are available with one or two independent circuits to guarantee ultimate redundancy and proven dependability. Dedicated features such as Fast Restart and Double Power Supply ensure uninterrupted operation under any unexpected circumstance.

**COMPACT DESIGN FOR THE HIGHEST FLEXIBILITY**

The compact structure resulting from the rationalised design and assembly of the chiller components leads to more flexibility during the installation phase, both in the case of new plants and existing ones.

**REDUCED MAINTENANCE COSTS**

The latest technology for the compressors and top quality heat exchangers provide outstanding long-term reliability aimed at lower maintenance costs.

**EXTENDED OPERATING FIELD**

Dedicated heat exchangers and wide operation limits for a vast range of applications:

- Operation down to -8°C
- Suitable for applications with dry cooler and cooling tower.

# FOCS3-W-G05-Y

## WATER COOLED CHILLER WITH SCREW COMPRESSORS AND FLOODED EVAPORATOR 188-1688 kW

FOCS3-W-G05-Y is the high efficiency screw compressor chiller featuring shell and tube condenser, flooded evaporator and electronic expansion valve.

Thanks to its vertical and compact design, the chiller can be easily installed in narrow spaces and can fit into most building layouts. High performances and premium efficiency are achieved thanks to the accurate sizing of all components and the precision in the control logics.



### HIGH EFFICIENCY AT FULL LOADS



In uninterrupted process cooling activities, the combination of the flooded evaporator and the fixed speed compressor ensure maximum efficiency at full loads, thus ensuring very low operating costs.

### COMPACT DESIGN



The compact and essential design leads to more flexibility during the design phase, both in the case of new plants and preexisting ones, to a higher ease of handling and on site positioning in plants with reduced space.

### EASY ADAPTABILITY

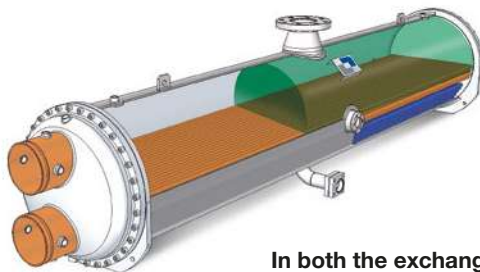


Maximum adaptability to the needs of the plant thanks to the continuous modulation of the cooling capacity and the precision in the control logics.

## INNOVATIVE DESIGN OF THE HEAT EXCHANGERS

The flooded evaporator and the shell and tube condenser, both fully designed and built internally, present an exclusive design aimed at maximising the cooling power and optimising the operation of the compressors.

In the evaporator the complete flooding of the tubes is also guaranteed during partial load conditions by an electronic expansion valve, managed by proprietary control logics. The shell and tube condenser is designed in order to guarantee reduced pressure drops on the water side and to decrease the pumping costs as much as possible.



In both the exchangers the presence of refrigerant fluid in the shell side and water in the tube side allows:

Minimization of pressure drops

Perfect unified temperature as well as complete refrigerant evaporation

Elimination of a surface dedicated to super-heating

Facilitation of cleaning operation



FOCS3-W-G05-Y			0551	0701	0851	0951	1101	1301	1401	1651	1901	2101	2501
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
<b>PERFORMANCE</b>													
<b>COOLING ONLY (GROSS VALUE)</b>													
Cooling capacity	(1)	kW	188,2	250,0	306,0	337,6	383,5	459,9	524,0	591,8	681,6	741,3	837,0
Total power input	(1)	kW	36,40	47,78	58,45	63,77	72,73	85,99	96,90	108,2	127,0	138,7	155,6
EER	(1)	kW/kW	5,170	5,230	5,231	5,292	5,275	5,348	5,408	5,470	5,367	5,345	5,379
ESEER	(1)	kW/kW	6,910	7,150	6,560	6,830	6,800	6,730	7,250	6,960	7,020	6,920	6,800
<b>COOLING ONLY (EN14511 VALUE)</b>													
Cooling capacity	(1)(2)	kW	187,4	248,9	304,7	336,1	381,9	458,2	522,3	589,5	679,4	738,9	834,3
EER	(1)(2)	kW/kW	4,890	4,950	4,960	5,010	5,000	5,090	5,190	5,200	5,120	5,130	5,160
ESEER	(1)(2)	kW/kW	6,180	6,370	5,950	6,150	6,140	6,140	6,670	6,310	6,390	6,400	6,280
Cooling energy class			B	B	B	B	B	A	A	A	A	A	A
<b>ENERGY EFFICIENCY</b>													
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)</b>													
<b>Process refrigeration at high temperature</b>													
Prated,c	(7)	kW	187,4	248,9	304,7	336,1	381,9	458,2	522,3	589,5	679,4	738,9	834,3
SEPR	(7)(9)		7,74	7,82	7,46	7,50	7,48	7,50	7,52	7,51	7,51	7,70	7,65
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095)</b>													
<b>Process refrigeration at medium temperature</b>													
Prated,c	(8)	kW	88,40	117,3	145,1	161,1	182,9	215,3	245,4	278,0	320,7	347,3	392,2
SEPR	(8)(9)		3,97	4,00	4,14	4,33	4,33	4,34	4,36	4,45	4,47	4,37	4,37
<b>EXCHANGERS</b>													
<b>HEAT EXCHANGER USER SIDE IN REFRIGERATION</b>													
Water flow	(1)	l/s	9,001	11,95	14,63	16,15	18,34	21,99	25,06	28,30	32,59	35,45	40,03
Pressure drop	(1)	kPa	42,0	48,7	49,1	52,4	52,8	47,5	39,9	50,9	42,0	42,7	42,8
<b>HEAT EXCHANGER SOURCE SIDE IN REFRIGERATION</b>													
Water flow	(1)	l/s	10,70	14,19	17,36	19,13	21,74	26,02	29,60	33,37	38,54	41,94	47,31
Pressure drop	(1)	kPa	57,4	57,9	56,7	59,3	58,1	55,2	44,8	55,8	60,4	45,8	48,1
<b>REFRIGERANT CIRCUIT</b>													
Compressors nr.		N°	1	1	1	1	1	1	1	1	1	1	1
No. Circuits		N°	1	1	1	1	1	1	1	1	1	1	1
<b>NOISE LEVEL</b>													
Sound Pressure	(3)	dB(A)	77	77	80	80	80	80	80	80	80	82	82
Sound power level in cooling	(4)(5)	dB(A)	95	95	98	98	98	98	98	98	98	100	100
<b>SIZE AND WEIGHT</b>													
Length	(6)	mm	2920	2920	2920	2920	2920	2900	2900	2900	2930	2980	2990
Width	(6)	mm	1180	1180	1180	1180	1180	1180	1180	1180	1180	1190	1280
Height	(6)	mm	1870	1870	1870	1870	1870	1960	1970	1960	2050	2100	2200
Operating weight	(6)	kg	1740	1790	2170	2200	2260	2940	3020	3150	3270	3570	3960

FOCS3-W-G05-Y			2602	3002	3152	3502	3652	4002	4102	4502	4602	4752
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE												
COOLING ONLY (GROSS VALUE)												
Cooling capacity	(1)	kW	915,9	1062	1140	1218	1303	1382	1450	1522	1614	1693
Total power input	(1)	kW	171,0	194,8	204,3	222,9	234,1	251,9	263,1	279,3	295,9	304,3
EER	(1)	kW/kW	5,356	5,452	5,580	5,464	5,566	5,486	5,511	5,449	5,455	5,564
ESEER	(1)	kW/kW	7,060	7,330	7,530	7,150	7,400	7,130	7,200	7,190	7,230	7,500
COOLING ONLY (EN14511 VALUE)												
Cooling capacity	(1)(2)	kW	913,2	1058	1137	1214	1299	1377	1445	1517	1609	1688
EER	(1)(2)	kW/kW	5,160	5,210	5,400	5,220	5,380	5,250	5,290	5,210	5,240	5,320
ESEER	(1)(2)	kW/kW	6,400	6,480	6,870	6,330	6,740	6,350	6,450	6,410	6,500	6,660
Cooling energy class			A	A	A	A	A	A	A	A	A	A
ENERGY EFFICIENCY												
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)												
Process refrigeration at high temperature												
Prated,c	(7)	kW	913,2	1058	1137	1214	1299	1377	1445	1517	1609	1688
SEPR	(7)(9)		7,62	7,50	7,71	7,50	7,68	7,50	7,59	8,00	8,00	8,00
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095)												
Process refrigeration at medium temperature												
Prated,c	(8)	kW	429,0	497,3	533,5	572,3	610,9	649,8	679,1	712,6	754,8	791,9
SEPR	(8)(9)		4,37	4,37	4,43	4,44	4,46	4,43	4,38	4,59	4,56	4,57
EXCHANGERS												
HEAT EXCHANGER USER SIDE IN REFRIGERATION												
Water flow	(1)	l/s	43,80	50,79	54,53	58,23	62,33	66,11	69,33	72,76	77,20	80,94
Pressure drop	(1)	kPa	40,0	51,5	37,4	51,4	39,8	50,4	46,7	51,5	42,5	46,7
HEAT EXCHANGER SOURCE SIDE IN REFRIGERATION												
Water flow	(1)	l/s	51,80	59,91	64,10	68,67	73,30	77,91	81,66	85,84	91,05	95,19
Pressure drop	(1)	kPa	44,5	54,4	32,0	56,8	34,1	53,5	50,1	55,4	53,7	58,7
REFRIGERANT CIRCUIT												
Compressors nr.		N°	2	2	2	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2	2	2	2
NOISE LEVEL												
Sound Pressure	(3)	dB(A)	81	81	81	81	81	81	82	82	82	82
Sound power level in cooling	(4)(5)	dB(A)	100	100	100	100	100	100	101	102	102	102
SIZE AND WEIGHT												
Length	(6)	mm	4430	4430	4440	4470	4470	4470	4565	4650	5270	5270
Width	(6)	mm	1270	1270	1270	1270	1320	1270	1320	1320	1320	1320
Height	(6)	mm	2210	2210	2280	2250	2330	2280	2380	2380	2380	2380
Operating weight	(6)	kg	6200	6430	7080	7160	7560	7280	7850	7940	8420	8950

**Notes:**

1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger water (in/out) 30°C/35°C.

2 Values in compliance with EN14511-3.

3 Average sound pressure level at 1m distance, unit in a free field on a reflective surface;

non-binding value calculated from the sound power level.

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

5 Sound power level in cooling, indoors.

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

7 Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 2016/2281]

8 Seasonal Energy Efficiency of Process Cooling at Medium Temperature [REGULATION (EU) N. 2015/1095]

9 Seasonal energy efficiency ratio

**The units highlighted in this publication contain R513A [GWP<sub>100</sub> 631] fluorinated greenhouse gases.****Certified data in EUROVENT**

# FOCS2-W-G05-Y

## WATER COOLED CHILLER AND HEAT PUMP WITH SCREW COMPRESSORS AND SHELL AND TUBE CONDENSER 305-2410 kW

Ideal solution for medium and large size applications, the FOCS2-W-G05-Y series features a wide cooling capacity from 305 to 2410 kW and units from one to four compressors.

All the units offers precise and accurate thermoregulation, easily adapting to different thermal load conditions. High performances are guaranteed thanks to the accurate sizing of all the components.



### COUNTLESS INSTALLATION OPPORTUNITIES

FOCS2-W-G05-Y is available with a wide range of accessories and configurations. This high configurability is key to always delivering the most appropriate solution to customers, according to the plant requirements.

### 2 Efficiency Versions

- **CA** high efficiency
- **CA-E** Class A version

### 3 Heat Recovery Configurations

In all industrial segments, heat produced during production processes can be recovered when there is a simultaneous demand for chilled and hot water. This energy can be reused to:

- ✓ **Serve comfort workplaces** and other areas located close to the industrial facilities.
- ✓ **Produce domestic hot water or floor heating systems.**
- ✓ **Feed the Air Handling Unit post-heating coil** to compensate the mount of heat lost during dehumidification.
- ✓ **Pre-heat service fluids** or incoming raw materials before further processing.

### 3 Acoustic Configurations

	Standard unit	Baseline
	<b>Standard unit +Enclosure (Base)</b> realized with peraluman panels lined with an acoustic insulation made by polyester fiber with a thickness of 30mm.	-14 dB(A)
	<b>Standard unit +Enclosure (Plus)</b> realized with peraluman panels lined with a special acoustic insulation composed by 5 alternating layers of polyurethane and gaiter for total thickness 50 mm.	-18 dB(A)

### HEAT RECOVERY CONFIGURATIONS



	Standard unit	Unit for the production of chilled water.	Baseline
<b>D</b>	<b>Partial heat recovery</b>	A desuperheater on the compressor discharge line recovers approximately 20% of the unit's capacity.	60°C
<b>R</b>	<b>Total heat recovery</b>	A devoted refrigerant water heat exchanger recovers all the condensation heat.	50°C
<b>H</b>	<b>Heat pump reversible on the hydraulic side</b>		





FOCS2-W-G05-Y /CA			1301	1401	1601	1801	2101
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE							
COOLING ONLY (GROSS VALUE)							
Cooling capacity	(1)	kW	306,0	348,3	421,8	477,4	537,7
Total power input	(1)	kW	63,01	71,59	86,86	98,34	110,5
EER	(1)	kW/kW	4,857	4,865	4,854	4,857	4,866
ESEER	(1)	kW/kW	5,820	5,830	5,620	5,720	5,820
COOLING ONLY (EN14511 VALUE)							
Cooling capacity	(1)(2)	kW	304,9	347,0	420,0	475,8	535,8
EER	(1)(2)	kW/kW	4,670	4,680	4,660	4,690	4,690
ESEER	(1)(2)	kW/kW	5,340	5,350	5,160	5,300	5,380
Cooling energy class			B	B	B	B	B
ENERGY EFFICIENCY							
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)							
Process refrigeration at high temperature							
Prated,c	(7)	kW	304,9	347,0	-	-	-
SEPR	(7)(9)		6,63	6,64	-	-	-
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095)							
Process refrigeration at medium temperature							
Prated,c	(8)	kW	151,3	172,2	206,7	234,2	262,7
SEPR	(8)(9)		3,84	3,84	3,81	3,88	4,00
EXCHANGERS							
HEAT EXCHANGER USER SIDE IN REFRIGERATION							
Water flow	(1)	l/s	14,64	16,66	20,17	22,83	25,71
Pressure drop	(1)	kPa	41,9	45,0	52,7	41,7	44,2
HEAT EXCHANGER SOURCE SIDE IN REFRIGERATION							
Water flow	(1)	l/s	17,57	20,00	24,22	27,41	30,87
Pressure drop	(1)	kPa	36,4	35,4	35,2	35,1	34,9
REFRIGERANT CIRCUIT							
Compressors nr.	N°		1	1	1	1	1
No. Circuits	N°		1	1	1	1	1
NOISE LEVEL							
Sound Pressure	(3)	dB(A)	79	79	79	79	79
Sound power level in cooling	(4)(5)	dB(A)	97	97	97	97	97
SIZE AND WEIGHT							
Length	(6)	mm	3830	3830	3860	3860	3860
Width	(6)	mm	900	900	900	900	900
Height	(6)	mm	1700	1700	1840	1840	1840
Operating weight	(6)	kg	2050	2110	2590	2810	2910

**Notes:**

- 1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger water (in/out) 30°C/35°C.
- 2 Values in compliance with EN14511-3.
- 3 Average sound pressure level at 1m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
- 4 Sound power on the basis of measurements made in compliance with ISO 9614.
- 5 Sound power level in cooling, indoors.

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

7 Parameter calculated according to [REGULATION (EU) N. 2016/2281]

8 Seasonal energy efficiency ratio

9 Seasonal space cooling energy efficiency

The units highlighted in this publication contain R513A [GWP<sub>100</sub> 631] fluorinated greenhouse gases.

Certified data in EUROVENT

**EASY ADAPTABILITY**

Maximum adaptability to the needs of the plant thanks to the continuous modulation of the cooling capacity and the precision in the control logics.

**FLEXIBLE INSTALLATION**

The compact and essential design leads to more flexibility during the design phase, both in the case of new plants and preexisting ones, in addition to greater ease of handling and on site positioning in plants with reduced space.

**TOTAL RELIABILITY**

Profound experience on field combined with many years of continuous improvement in both designing and manufacturing screw compressor chillers, have led to top-level dependability for all FOCS2-W-G05-Y units.





## FOCS2-W-G05-Y

Water cooled chiller and heat pumps with screw compressors  
and shell and tube condenser  
305-2410 kW

FOCS2-W-G05-Y /CA			2401	8103	9003	9004	9604
Power supply	V/ph/Hz		400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
<b>PERFORMANCE</b>							
<b>COOLING ONLY (GROSS VALUE)</b>							
Cooling capacity	(1)	kW	606,8	2024	2236	2278	2416
Total power input	(1)	kW	124,7	417,3	460,6	469,7	498,3
EER	(1)	kW/kW	4,866	4,850	4,855	4,850	4,848
ESEER	(1)	kW/kW	5,810	5,970	6,010	6,110	6,050
<b>COOLING ONLY (EN14511 VALUE)</b>							
Cooling capacity	(1)(2)	kW	604,2	2018	2228	2273	2410
EER	(1)(2)	kW/kW	4,670	4,710	4,700	4,730	4,720
ESEER	(1)(2)	kW/kW	5,320	5,500	5,500	5,680	5,600
Cooling energy class			B	B	B	B	B
<b>ENERGY EFFICIENCY</b>							
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)</b>							
<b>Process refrigeration at high temperature</b>							
Prated,c	(7)	kW	-	-	-	-	-
SEPR	(7)(9)		-	-	-	-	-
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095)</b>							
<b>Process refrigeration at medium temperature</b>							
Prated,c	(8)	kW	299,2	-	-	-	-
SEPR	(8)(9)		4,01	-	-	-	-
<b>EXCHANGERS</b>							
<b>HEAT EXCHANGER USER SIDE IN REFRIGERATION</b>							
Water flow	(1)	l/s	29,02	96,81	106,9	108,9	115,5
Pressure drop	(1)	kPa	56,3	43,7	53,3	32,3	36,3
<b>HEAT EXCHANGER SOURCE SIDE IN REFRIGERATION</b>							
Water flow	(1)	l/s	34,83	116,3	128,4	130,8	138,8
Pressure drop	(1)	kPa	36,6	35,0	36,3	35,5	37,4
<b>REFRIGERANT CIRCUIT</b>							
Compressors nr.		N°	1	3	3	4	4
No. Circuits		N°	1	3	3	4	4
<b>NOISE LEVEL</b>							
Sound Pressure	(3)	dB(A)	79	82	82	82	82
Sound power level in cooling	(4)(5)	dB(A)	97	102	102	102	102
<b>SIZE AND WEIGHT</b>							
A	(6)	mm	3860	4950	4950	4650	4650
B	(6)	mm	900	1700	1700	2250	2250
H	(6)	mm	1840	2150	2150	2230	2230
Operating weight	(6)	kg	2970	10170	10350	14330	14390

### Notes:

- 1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger water (in/out) 30°C/35°C.
- 2 Values in compliance with EN14511-3.
- 3 Average sound pressure level at 1m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
- 4 Sound power on the basis of measurements made in compliance with ISO 9614.
- 5 Sound power level in cooling, indoors.

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

7 Parameter calculated according to [REGULATION (EU) N. 2016/2281]

8 Seasonal energy efficiency ratio

9 Seasonal space cooling energy efficiency

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**Certified data in EUROVENT**



FOCS2-W-G05-Y /CA-E			1301	1401	1601	1801	2101	7204	7804	8404
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
<b>PERFORMANCE</b>										
<b>COOLING ONLY (GROSS VALUE)</b>										
Cooling capacity	(1)	kW	320,7	364,7	441,9	506,3	573,7	2025	2157	2294
Total power input	(1)	kW	59,70	67,84	82,38	94,07	106,9	375,9	401,7	427,5
EER	(1)	kW/kW	5,372	5,379	5,363	5,380	5,367	5,387	5,370	5,366
ESEER	(1)	kW/kW	6,370	6,370	6,300	6,390	6,380	6,620	6,510	6,520
<b>COOLING ONLY (EN14511 VALUE)</b>										
Cooling capacity	(1)(2)	kW	319,5	363,3	440,0	504,2	571,4	2019	2149	2286
EER	(1)(2)	kW/kW	5,110	5,120	5,090	5,110	5,100	5,190	5,140	5,140
ESEER	(1)(2)	kW/kW	5,710	5,720	5,630	5,720	5,710	6,020	5,830	5,860
Cooling energy class			A	A	A	A	A	A	A	A
<b>ENERGY EFFICIENCY</b>										
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)</b>										
<b>Process refrigeration at high temperature</b>										
Prated,c	(7)	kW	319,5	363,3	-	-	-	-	-	-
SEPR	(7)(9)		7,21	7,23	-	-	-	-	-	-
<b>SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095)</b>										
<b>Process refrigeration at medium temperature</b>										
Prated,c	(8)	kW	152,0	172,9	208,2	238,5	271,1	-	-	-
SEPR	(8)(9)		4,03	4,04	4,02	4,05	4,14	-	-	-
<b>EXCHANGERS</b>										
<b>HEAT EXCHANGER USER SIDE IN REFRIGERATION</b>										
Water flow	(1)	l/s	15,33	17,44	21,13	24,21	27,44	96,82	103,2	109,7
Pressure drop	(1)	kPa	45,7	47,7	53,5	53,4	52,8	41,3	59,3	54,6
<b>HEAT EXCHANGER SOURCE SIDE IN REFRIGERATION</b>										
Water flow	(1)	l/s	18,13	20,62	24,99	28,62	32,44	114,4	121,9	129,7
Pressure drop	(1)	kPa	49,0	47,2	52,2	53,3	55,0	52,6	54,0	54,5
<b>REFRIGERANT CIRCUIT</b>										
Compressors nr.	N°		1	1	1	1	1	4	4	4
No. Circuits	N°		1	1	1	1	1	4	4	4
<b>NOISE LEVEL</b>										
Sound Pressure	(3)	dB(A)	79	78	78	78	78	82	82	82
Sound power level in cooling	(4)(5)	dB(A)	97	97	97	97	97	102	102	102
<b>SIZE AND WEIGHT</b>										
A	(6)	mm	4250	4250	4150	4150	4130	5220	4900	4900
B	(6)	mm	900	900	900	900	900	2250	2250	2250
H	(6)	mm	1815	1910	1990	1990	1990	2305	2455	2455
Operating weight	(6)	kg	2470	2770	3570	3750	3790	13720	15850	16100

**Notes:**

- 1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger water (in/out) 30°C/35°C.
- 2 Values in compliance with EN14511-3.
- 3 Average sound pressure level at 1m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
- 4 Sound power on the basis of measurements made in compliance with ISO 9614.
- 5 Sound power level in cooling, indoors.

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

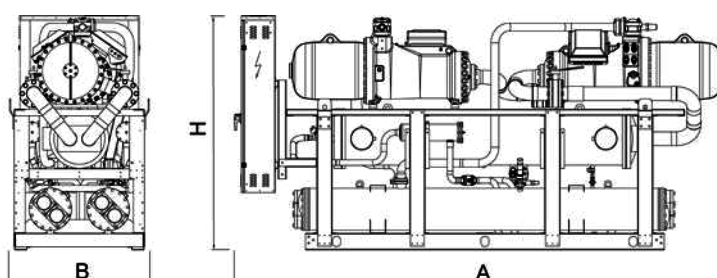
7 Parameter calculated according to [REGULATION (EU) N. 2016/2281]

8 Seasonal energy efficiency ratio

9 Seasonal space cooling energy efficiency

The units highlighted in this publication contain R513A [GWP<sub>100</sub> 631] fluorinated greenhouse gases.

**Certified data in EUROVENT**



# EQUIPMENT FOR MISSION CRITICAL APPLICATIONS

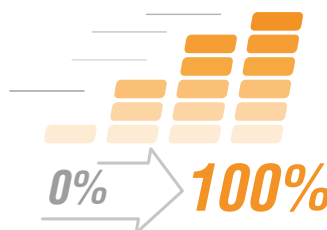
Committed to ensure the highest standards of reliability, the new range of water cooled chillers includes a full range of devices and functions that maximize the unit's uptime in case of emergency circumstances.

## FAST RESTART

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



Ensure immediate cooling start-up within 25"



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.

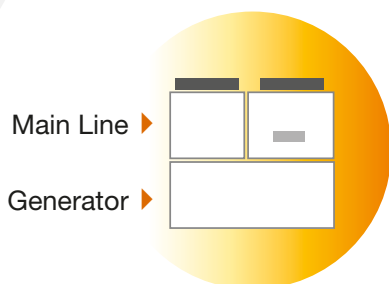
### Fast restart - UPS excluded (Opt.4501)

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. The new range 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.

\* ATS: Automatic Transfer Switch

### 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.**

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.



# 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

**Compressor rephasing (Opt. 3301):** The capacitors on the compressors' line increase the unit's power factor.  
**Automatic circuit breakers for compressors (Opt. 3411) or all major electrical loads (Opt. 3412):** Protects the compressors or the compressors and fans from possible current peaks, over-current switches are provided in place of the standard fuses.  
**Soft-starter (Opt. 1511) or 3-phase soft-starter (Opt. 1513):** Manages the inrush current enabling lower motor windings' mechanical wear, avoidance of mains voltage fluctuations during starting and favorable sizing for the electrical system.

## Connectivity

**BMS connection:** 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) anti-vibration mountings:** Reduce vibrations, keeping noise transmission to a minimum.

## Packing

**Nylon packing (Opt. 9966):** The unit 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):** The unit 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 CLIMAVENETA INSTALLATIONS

2012-2017 Lagundo, Bolzano - Italy

**Forst**

**Application:** Food & Drink

**Plant type:** Hydronic System

**Installed machines:** 2x BRAT2 0091T,  
4x i-LIFE2 402 DFMO, 4x i-CHD 706 U-2T,  
1x NX/CA 0562P, 1x i-FX-W (1+i) 1402,  
2x 2 NECS-WQ 0152, 21x i-Life2



2016-2017 Sommacampagna, Verona - Italy

**Bayernland**

**Application:** Industrial Process

**Plant type:** Hydronic System

**Cooling Capacity:** 762 kW

**Heating Capacity:** 239 kW

**Installed machines:** 2x FOCS2-W/R/CA 2101,  
1x NECS-WQ S 0412, 1x NECS-WQ S 0302,  
1x MANAGER 3000, 20x i-HWD2 702



2016 Ostra - Sweden

**Lyckeby Starch AB**

**Application:** Industrial Process - Paper & inks

**Plant type:** Hydronic System

**Cooling Capacity:** 252 kW

**Heating Capacity:** 354 kW

**Installed machines:** 1x FOCS2-W/H/CA-E  
1301 /HWT





## MORE THAN 1000 PROJECTS ALL OVER THE WORLD

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

**2016 Fågelmara - Sweden**

**Orkla Foods Sverige**

**Application:** Industrial Process - Food & Drink

**Plant type:** Hydronic System

**Cooling Capacity:** 1020 kW

**Installed machines:** 2x ABU 2.0 552, 3x ABU 30,  
2x NECS-W 0352, 1x FOCS2-W-CA-E 3001



**2018 Santena (To) - Italy**

**Petronas Research Centre**

**Application:** Automotive

**Plant type:** Hydronic System

**Cooling capacity:** 1660 kW

**Installed machines:** 1x FOCS3-W 3502,  
1x FOCS2-W/CA-E 1601



**2015 Durban - South Africa**

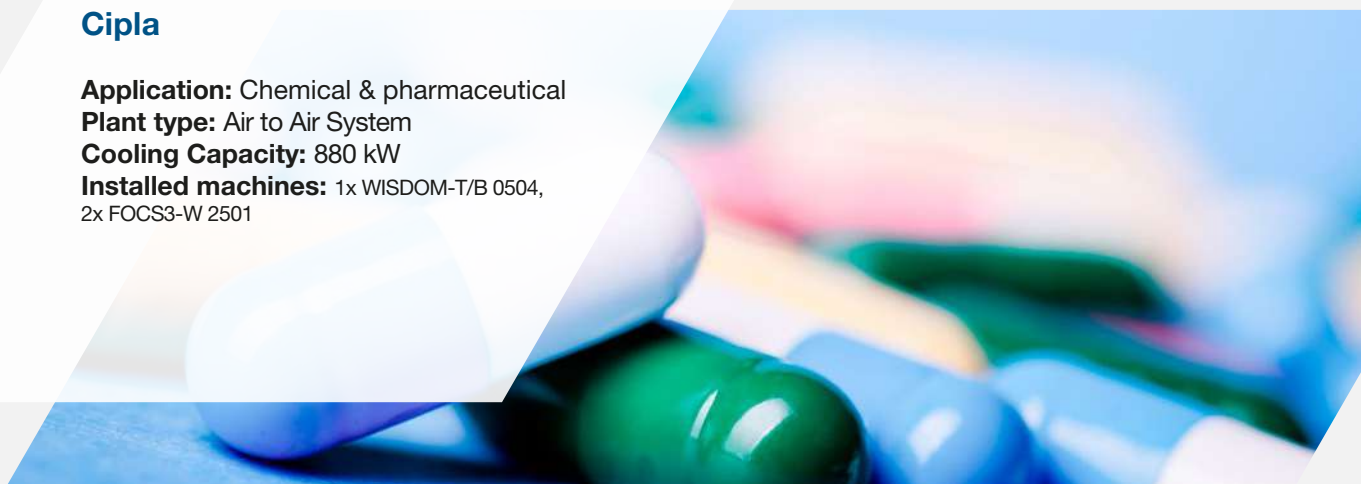
**Cipla**

**Application:** Chemical & pharmaceutical

**Plant type:** Air to Air System

**Cooling Capacity:** 880 kW

**Installed machines:** 1x WISDOM-T/B 0504,  
2x FOCS3-W 2501





for a greener tomorrow

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



## **mitsubishi electric hydronics & it cooling systems S.p.A.**

Head Office: Via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

Tel (+39) 0424 509 500 - Fax (+39) 0424 509 509

[www.climaveneta.com](http://www.climaveneta.com)

[www.melcohit.com](http://www.melcohit.com)