

FOCS3-W-Y

**WATER SOURCE CHILLERS FOR
INDOOR INSTALLATION**

- ▶ High efficiency
- ▶ Flexible installation
- ▶ Easy adaptability
- ▶ Advanced control



FOCS3-W-Y

LIQUID CHILLER, WATER SOURCE 188-1693 KW

Chilled water unit for indoor installation. Semi-hermetic screw compressors optimized to operate with low compression ratio and R134a; shell and tube condenser, flooded evaporator and electronic expansion valve.

Thanks to its precise and accurate thermoregulation, this extremely flexible and reliable unit easily adapts to different thermal load conditions. The high performance level and the premium efficiency is achieved thanks to the accurate sizing of all the components, such as the heat exchangers and the innovative optimized compressors.

CA Version
Class A efficiency



Unparalleled efficiency

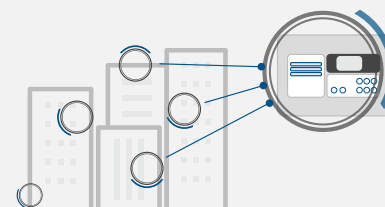
Thanks to the choice of high performing components, the FOCS3-W-Y units are characterized by really competitive efficiency levels both at full and part loads (EER 5.8, ESEER 7.4, IPLV 7.7), which ensure minimum running costs and a quick return on investment.

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, to a higher ease of handling and on site positioning in plants with reduced space.

Easy adaptability

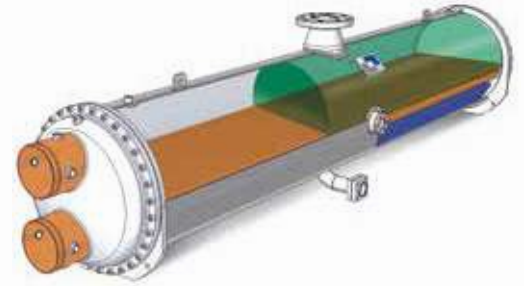
Maximum adaptability to the needs of the plant thanks to the continuous modulation of the cooling capacity and the precision in the control logics.



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 to maximize the cooling power and optimize the operation of the compressors.

In the evaporator the complete flooding of the tubes is guaranteed also 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

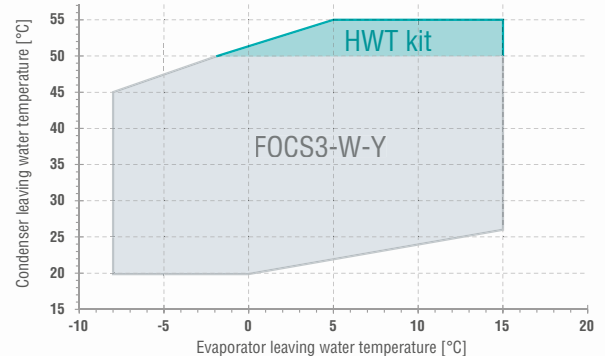
Elimination of a surface dedicated to super-heating

Facilitation of cleaning operation

LARGE OPERATING RANGE

FOCS3-W-Y is characterized by a huge operating range, even in the standard configuration.

The operating limits can be further enlarged with dedicated accessories, such as the High Water Temperature (HWT) kit, available for every size.



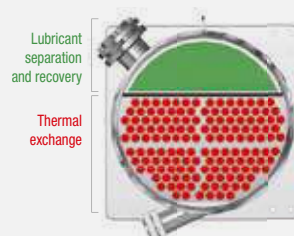
Optimized compressors

Screw compressors intentionally designed to work with low compression ratios, allowing them to reach efficiency values, both at part and full loads, considerably higher than those possible for units with traditional screw compressors.



Perfect lubricant recovery

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



High quality components

FOCS3-W-Y is provided with an electronic expansion valve managed by proprietary control logics which guarantees the proper refrigerant charge and the complete flooding of the tubes, also when the compressors work in part load conditions.





FOCS3-W-Y 0551 - 4752

WATER COOLED CHILLER 188-1693 kW

FOCS3-W-Y

| Model | | | 0551 | 0701 | 0851 | 0951 | 1101 | 1301 | 1401 | 1651 | 1901 | 2101 | 2501 |
|---|--------|-------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Power supply | V/phHz | | 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 |
| PERFORMANCE | | | | | | | | | | | | | |
| COOLING ONLY (GROSS VALUE) | | | | | | | | | | | | | |
| Cooling capacity | (1) | kW | 188 | 250 | 306 | 338 | 384 | 460 | 524 | 592 | 682 | 741 | 837 |
| Total power input | (1) | kW | 34,9 | 45,9 | 56,1 | 61,2 | 69,8 | 82,5 | 93,0 | 104 | 122 | 133 | 149 |
| EER | (1) | kW/kW | 5,39 | 5,45 | 5,45 | 5,52 | 5,49 | 5,57 | 5,63 | 5,70 | 5,59 | 5,57 | 5,61 |
| ESEER | (1) | kW/kW | 6,84 | 7,09 | 6,55 | 6,85 | 6,80 | 6,73 | 6,90 | 7,00 | 6,90 | 6,89 | 6,94 |
| COOLING ONLY (EN14511 VALUE) | | | | | | | | | | | | | |
| Cooling capacity | (1)(2) | kW | 187 | 249 | 305 | 336 | 382 | 458 | 522 | 590 | 679 | 739 | 834 |
| EER | (1)(2) | kW/kW | 5,09 | 5,15 | 5,16 | 5,21 | 5,20 | 5,30 | 5,40 | 5,41 | 5,33 | 5,34 | 5,37 |
| ESEER | (1)(2) | kW/kW | 6,14 | 6,31 | 5,94 | 6,16 | 6,14 | 6,15 | 6,09 | 6,35 | 6,10 | 6,19 | 6,23 |
| Cooling energy class | | | A | 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 | 187 | 249 | 305 | 336 | 382 | 458 | 522 | 590 | 679 | 739 | 834 |
| SEPR HT | (7)(9) | | 7,97 | 8,07 | 7,69 | 7,74 | 7,71 | 7,51 | 7,68 | 7,53 | 7,53 | 7,85 | 7,86 |
| SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095) | | | | | | | | | | | | | |
| Process refrigeration at medium temperature | | | | | | | | | | | | | |
| Prated,c | (8) | kW | 88,4 | 117 | 145 | 161 | 183 | 215 | 245 | 278 | 321 | 347 | 392 |
| SEPR MT | (8)(9) | | 4,11 | 4,15 | 4,27 | 4,47 | 4,46 | 4,35 | 4,44 | 4,46 | 4,48 | 4,46 | 4,49 |
| EXCHANGERS | | | | | | | | | | | | | |
| HEAT EXCHANGER USER SIDE IN REFRIGERATION | | | | | | | | | | | | | |
| Water flow | (1) | l/s | 9,00 | 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 |
| HEAT EXCHANGER SOURCE SIDE IN REFRIGERATION | | | | | | | | | | | | | |
| Water flow | (1) | l/s | 10,64 | 14,10 | 17,26 | 19,01 | 21,61 | 25,86 | 29,42 | 33,17 | 38,31 | 41,69 | 47,02 |
| Pressure drop | (1) | kPa | 56,7 | 57,2 | 56,0 | 58,6 | 57,4 | 54,5 | 44,3 | 55,2 | 59,7 | 45,3 | 47,6 |
| REFRIGERANT CIRCUIT | | | | | | | | | | | | | |
| 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 |
| Refrigerant charge | | Kg | 75,0 | 86,0 | 95,0 | 94,0 | 86,0 | 100 | 110 | 112 | 121 | 147 | 182 |
| NOISE LEVEL | | | | | | | | | | | | | |
| 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 |
| SIZE AND WEIGHT | | | | | | | | | | | | | |
| A | (6) | mm | 2920 | 2920 | 2920 | 2920 | 2920 | 2900 | 2900 | 2900 | 2930 | 2980 | 2990 |
| B | (6) | mm | 1180 | 1180 | 1180 | 1180 | 1180 | 1180 | 1180 | 1180 | 1180 | 1190 | 1280 |
| H | (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 |

Notes:

- Plant (side) cooling exchanger water (in/out) 12°C/7°C;
Source (side) heat exchanger water (in/out) 30°C/35°C.
- Values in compliance with EN14511-3:2013.
- 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.
- Sound power on the basis of measurements made in compliance with ISO 9614.
- Sound power level in cooling, indoors.
- 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 space heating energy index
The units highlighted in this publication contain HFC R134a [GWP₁₀₀ 1430]
fluorinated greenhouse gases.
Certified data in EUROVENT

ADVANCED CONTROL

The new controller featuring proprietary settings to ensure faster adaptive responses to different dynamics.

The new user interface features:



LED icons that allow a full and immediate status display of the various circuits, including circulation pumps and condensing circuits. (for air cooled units only)

Controls and display that allow easy and safe access to the unit's settings.



FOCS3-W-Y

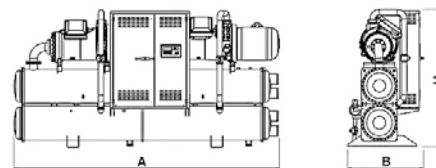
| Model | | | 2602 | 3002 | 3152 | 3502 | 3652 | 4002 | 4102 | 4502 | 4602 | 4752 |
|---|---------|-------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Power supply | V/phase | | 400/3/50 | 400/3/50 | 400/3/50 | 400/3/50 | 400/3/50 | 400/3/50 | 400/3/50 | 400/3/50 | 400/3/50 | 400/3/50 |
| PERFORMANCE | | | | | | | | | | | | |
| COOLING ONLY (GROSS VALUE) | | | | | | | | | | | | |
| Cooling capacity | (1) | kW | 916 | 1062 | 1140 | 1218 | 1303 | 1382 | 1450 | 1522 | 1614 | 1693 |
| Total power input | (1) | kW | 164 | 187 | 196 | 214 | 225 | 242 | 253 | 268 | 284 | 292 |
| EER | (1) | kW/kW | 5,58 | 5,68 | 5,82 | 5,69 | 5,80 | 5,72 | 5,74 | 5,68 | 5,68 | 5,80 |
| ESEER | (1) | kW/kW | 7,35 | 7,43 | 7,46 | 7,24 | 7,32 | 7,28 | 7,27 | 7,12 | 7,39 | 7,39 |
| COOLING ONLY (EN14511 VALUE) | | | | | | | | | | | | |
| Cooling capacity | (1)(2) | kW | 913 | 1058 | 1137 | 1214 | 1299 | 1377 | 1445 | 1517 | 1609 | 1688 |
| EER | (1)(2) | kW/kW | 5,37 | 5,42 | 5,62 | 5,43 | 5,60 | 5,46 | 5,50 | 5,42 | 5,45 | 5,54 |
| ESEER | (1)(2) | kW/kW | 6,44 | 6,56 | 6,80 | 6,41 | 6,67 | 6,47 | 6,49 | 6,36 | 6,58 | 6,58 |
| Cooling energy class | | | 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 | 1058 | 1137 | 1214 | 1299 | 1377 | 1445 | 1517 | 1609 | 1688 |
| SEPR HT | (7)(9) | | 7,61 | 7,57 | 7,96 | 7,57 | 7,92 | 7,62 | 7,69 | 8,00 | 8,04 | 8,14 |
| SEASONAL EFFICIENCY IN COOLING (Reg. EU 2015/1095) | | | | | | | | | | | | |
| Process refrigeration at medium temperature | | | | | | | | | | | | |
| Prated,c | (8) | kW | 429 | 497 | 534 | 572 | 611 | 650 | 679 | 713 | 755 | 792 |
| SEPR MT | (8)(9) | | 4,37 | 4,41 | 4,57 | 4,49 | 4,60 | 4,51 | 4,44 | 4,59 | 4,58 | 4,65 |
| 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 | 51,49 | 59,55 | 63,73 | 68,26 | 72,87 | 77,45 | 81,18 | 85,33 | 90,51 | 94,64 |
| Pressure drop | (1) | kPa | 44,0 | 53,8 | 31,6 | 56,2 | 33,7 | 52,9 | 49,5 | 54,7 | 53,1 | 58,0 |
| 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 |
| Refrigerant charge | | Kg | 210 | 249 | 270 | 270 | 280 | 280 | 288 | 297 | 341 | 341 |
| 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 | | | | | | | | | | | | |
| A | (6) | mm | 4430 | 4430 | 4440 | 4470 | 4470 | 4470 | 4565 | 4650 | 5270 | 5270 |
| A | (6) | mm | 1270 | 1270 | 1270 | 1270 | 1320 | 1270 | 1320 | 1320 | 1320 | 1320 |
| A | (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 EN14511-3:2013.
- 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 space heating energy index

The units highlighted in this publication contain HFC R134a [GWP₁₀₀ 1430] fluorinated greenhouse gases.

Certified data in EUROVENT



As an option a new touch screen interface is available



7" color display that allows intuitive navigation between the different screens.

the presence of a USB port allows quick and easy application updates, as well as downloading the registered variables in graphical form.

MORE THAN 1000 PROJECTS ALL OVER THE WORLD

Every project is characterised by different usage conditions and system specifications for many different latitudes. All these projects share high energy efficiency, maximum integration and total reliability of the Climaveneta brand.

ORKLA FOODS SVERIGE

2016 Fågelmara - Sweden

Application:

Industrial Process - Food & Drink

Plant type:

Hydronic System

Cooling capacity:

1020 kW

Installed machines:

1x WATER SOURCE CHILLER with screw compressor



PROJECT

Born out of a merger in 2014, Orkla Foods Sverige is Sweden's leading food company, it boasts many popular brands including Felix ketchup which is produced in Fågelmara. The factory employs around 75 people whose job it is to prepare and taste the ketchup along with other sauces and dressings.

CHALLENGE

Orkla Foods Sverige prides itself on its innovative and quality, in addition it has focused on developing processes which allows it to be sustainable in the food industry.

Parallely to its internal production, Orkla Foods Sverige was interested in reducing the carbon footprint of its buildings, factory included.

SOLUTION

Thus, the company invested in a new efficient cooling system for its process cooling. The system was based on 1 water source chiller with screw compressor for a total cooling capacity of 1020 kW.

Thanks to the high performing components, the unit is characterized by highly competitive efficiency levels both at full and part loads, which ensure minimum running costs and a quick return on investment.



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.

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