

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

COMFORT

HEAT PUMPS

FOCS-N-G05

**REVERSIBLE UNIT, AIR SOURCE
FOR OUTDOOR INSTALLATION
FROM 441 TO 1162 KW**



FOCS-N-G05

THE GREEN, LARGE CAPACITY HEAT PUMP SOLUTION



Air source reversible heat pump with screw compressors, 441 – 1162 kW

FOCS-N-G05 is the ultimate solution for every plant which requires a reversible, large capacity air source heat pump. Featuring the green low-GWP R513A refrigerant, FOCS-N-G05 boosts the eco-friendliness of the heat pump technology offering a greener approach.

Designed for two-pipes systems, these units are able to produce hot or cold water according to the selected operation mode; ensuring optimal responses to every load's changes, in every operating conditions.

COMFORT APPLICATIONS

- ✓ Commercial premises
- ✓ Office buildings
- ✓ Hotels and resorts
- ✓ Healthcare facilities
- ✓ Retail and department stores
- ✓ Sports and leisure installations

TAILORED EFFICIENCY



B version

Designed for installation even in plants with space constraints, still maintaining the unparalleled advantages of the heat pump technology.

EER= 2,8
COP= 3,2

SEER= 4,1
SCOP= 3,2

CA version

High efficiency versions, thanks to oversized heat exchangers, giving an optimal compromise between footprint and efficiency and ensuring a fast payback.

EER= 2,9
COP= 3,3

SEER= 4,2
SCOP= 3,4

“Average values, Eurovent conditions”

ACOUSTIC VERSIONS

Standard	Unit with standard soundproofing equipment.	Baseline
LN	Unit with compressor's acoustical enclosure and reduced fan speed.	-6 dB (A)
SL	The highest level of noise reduction which cuts noise emissions by to 10 thanks to a special acoustical lining and reduced fan speed.	-10 dB (A)

HEAT RECOVERY CONFIGURATIONS

Standard units	Unit for the production of chilled water.	Baseline
D	A desuperheater on the compressor discharge line recovers approximately 20% of the unit's capacity.	60° C

ALL-ROUND SUSTAINABILITY



FOCS-N-G05 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).

Fully committed to support the creation of a greener tomorrow, Mitsubishi Electric Hydronics & IT Cooling Systems designed FOCS-N-G05, a complete large capacity heat pump range with reduced environmental impact, optimized for R513A refrigerant.

Combining brilliant annual efficiency with the use of a low GWP refrigerant, FOCS-N-G05 tackles both the indirect (due to primary energy consumption) and the direct global warming, thus resulting in the perfect choice for any new, forward-looking cooling system.



LOW GWP

-56% GWP Vs R134a



Non-flammable

Safety Class A1

REFRIGERANT BENCHMARK

SCROLL			SCREW		
Refrigerant	GWP*	Flammability	Refrigerant	GWP*	Flammability
R410A	2088	NON flammable	R134a	1430	NON flammable
R32	675	MILDLY flammable	R513A	631	NON flammable
R454B	466	MILDLY flammable	1234ze	7	MILDLY flammable
R452B	698	MILDLY flammable	1234yf	4	MILDLY flammable

*IPCC AR4 **ASHRAE 34 - ISO 817

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 FOCS-N-G05, is a brilliant exception: it offers a -56% GWP reduction compared to the R134a's while ensuring complete non-toxicity and non-flammability (Class A1 of ASHRAE 34, ISO 817).



PERFECT INDOOR COMFORT

The advanced control system is engineered to maintain optimal comfort conditions all year-round according to occupancy needs and variations. 3 different acoustic versions have been specifically developed for those projects, where quality of acoustical comfort is key.



COMPACT DESIGN FOR THE HIGHEST FLEXIBILITY

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



EXTENSIVE OPERATING RANGE

The advanced control logics and fan speed regulation allow the units to be operative all year round. In heat pump mode the units are able to produce hot water up to 60°C, and to work with air temperatures down to -10°C during winter and up to +50°C during summer.

TECHNOLOGICAL CHOICES

Variable speed fans

- ▶ **Sizes 2022 to 2622:** high performing axial fans equipped with autotransformer for speed adjustment
- ▶ **Sizes 2722 to 4822:** high performing EC fans, for higher efficiency and continuous speed modulation

Shell-and-tube plant-side heat exchanger

Dry expansion shell-and-tube heat exchanger 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

Electronic expansion valve

managed by proprietary dedicated logics, to guarantee an excellent flow control and a highly precise temperature control.

Source side heat exchanger

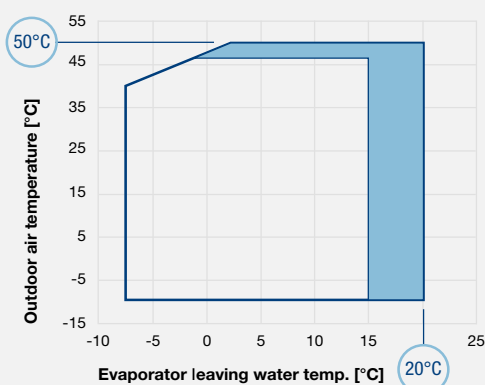
- ▶ Cu/Al traditional coils
- ▶ Excellent heat conduction
- ▶ Available several surface treatments against corrosion (options)



EXTENDED OPERATING LIMITS

FOCS-N-G05 can operate with outdoor air temperatures up to 50° C in cooling mode and down to -10° C in heating mode. In heat pump mode, the units can supply hot water up to 60° C, thanks to the HWT kit (opt.1953)

COOLING MODE OPERATING LIMITS

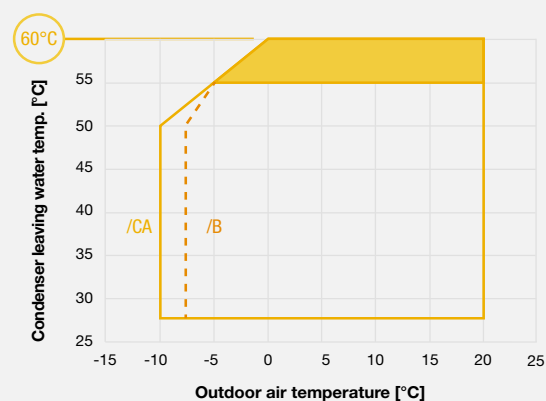


Standard unit



Required: HWT kit (Opt.1953)

HEATING MODE OPERATING LIMITS



EC fans: Maximum outside air temperature: 46°

In case of higher outdoor air temperature, dedicated EC fans must be selected

Advanced technologies smartly combined with the green R513A refrigerant: the perfect match for offering the highest efficiency levels.



Factory-mounted pump group (opt.)

- ▶ 2 pumps (duty/standby) fixed or variable speed
- ▶ Low- or high-head models available
- ▶ 2 or 4 poles motors
- ▶ VPF and VPF.D variable primary water flow controls available

VPF control logic



The VPF control series (Variable Primary Flow system) adjusts the pump speed on the basis of the plant's thermal load and ensures both the highest pump energy savings and chiller stable operation.

VPF: constant ΔP on the plant side

For systems with the primary circuit only.

VPF.D: constant ΔT on the plant side

For systems with primary and secondary circuits separated by a hydraulic decoupler.

Compact screw compressors, optimized for high pressure ratio applications

- ▶ 25% minimum capacity step
- ▶ Economizer circuits to increase efficiency and capacity
- ▶ Long-life bearings (more than 150.000h at full load)
- ▶ Star/Delta starting

Smart Defrost

Thanks to the large know-how in heat pump technology, a series of smart proprietary auto adaptive algorithms have been developed to manage in the smartest way the defrosting cycles.

- ▶ Reduction in defrosting time
- ▶ Minimum impact on leaving water temperature
- ▶ Reduction of energy required for defrosting
- ▶ Increase of COP

+10%
NET HEATING
CAPACITY
compared to units with
traditional defrost cycles.

W3000TE CONTROL AND USER-FRIENDLY INTERFACE

The logic behind FOCS-N-G05 is the W3000TE control software. Characterized by advanced functions and algorithms, **W3000TE features proprietary settings** ensure faster adaptive responses to different dynamics, in all operating conditions:

- ✓ Efficient and reliable operation in all conditions
- ✓ Connectivity with the most commonly used BMS protocols (Opt.)
- ✓ Demand limit option (available for double circuit units).





FOCS-N-G05

Reversible unit, air source for outdoor installation 441-1162 kW

FOCS-N-G05/B			2022	2222	2422	2722	3222	3622	4222	4822
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	(1)	kW	449,7	494,0	530,9	662,8	790,9	916,2	1029	1146
Total power input	(1)	kW	169,5	184,1	193,9	233,6	278,2	304,4	350,4	396,9
EER	(1)	kW/kW	2,653	2,683	2,738	2,837	2,843	3,010	2,937	2,887
ESEER	(1)	kW/kW	3,640	3,680	3,740	4,130	4,020	4,000	4,120	4,040
COOLING ONLY (EN14511 VALUE)										
Cooling capacity	(1)(2)	kW	448,5	492,6	529,3	661,1	788,7	913,9	1026	1143
EER	(1)(2)	kW/kW	2,630	2,660	2,710	2,810	2,810	2,980	2,900	2,860
ESEER	(1)(2)	kW/kW	3,540	3,580	3,620	4,020	3,910	3,900	3,980	3,930
Cooling energy class			-	-	-	-	-	-	-	-
HEATING ONLY (GROSS VALUE)										
Total heating capacity	(3)	kW	483,4	528,9	568,2	705,5	832,1	955,4	1083	1207
Total power input	(3)	kW	158,4	172,5	185,0	218,9	257,0	288,0	328,4	369,9
COP	(3)	kW/kW	3,052	3,066	3,071	3,223	3,238	3,317	3,298	3,263
HEATING ONLY (EN14511 VALUE)										
Total heating capacity	(3)(2)	kW	484,8	530,6	570,2	707,6	834,7	958,0	1087	1211
COP	(3)(2)	kW/kW	3,030	3,050	3,050	3,200	3,220	3,300	3,270	3,240
Cooling energy class			-	-	-	-	-	-	-	-
ENERGY EFFICIENCY										
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)										
Ambient refrigeration										
Prated,c	(10)	kW	-	-	-	661	789	914	1026	1143
SEER	(10)(11)		-	-	-	4,14	4,10	4,10	4,15	4,11
Performance ηs	(10)(12)	%	-	-	-	163	161	161	163	161
SEASONAL EFFICIENCY IN HEATING (Reg. EU 813/2013)										
PDesign	(4)	kW	339	366	400	-	-	-	-	-
SCOP	(4)(13)		3,19	3,20	3,19	-	-	-	-	-
Performance ηs	(4)(14)	%	125	125	125	-	-	-	-	-
Seasonal efficiency class	(15)		-	-	-	-	-	-	-	-
EXCHANGERS										
HEAT EXCHANGER USER SIDE IN REFRIGERATION										
Water flow	(1)	l/s	21,50	23,62	25,39	31,69	37,82	43,81	49,20	54,80
Pressure drop	(1)	kPa	30,0	33,3	38,4	32,5	36,7	33,3	42,3	37,0
HEAT EXCHANGER USER SIDE IN HEATING										
Water flow	(3)	l/s	23,33	25,53	27,43	34,06	40,17	46,12	52,30	58,27
Pressure drop	(3)	kPa	35,3	38,9	44,8	37,6	41,4	36,9	47,9	41,8
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	184	213	230	258	311	385	437	483
NOISE LEVEL										
Sound Pressure	(5)	dB(A)	79	80	80	80	81	80	82	81
Sound power level in cooling	(6)(7)	dB(A)	99	101	101	101	102	102	104	104
Sound power level in heating	(6)(8)	dB(A)	99	101	101	101	102	102	104	104
SIZE AND WEIGHT										
Operating weight	(9)	kg	5900	6330	6420	7290	9390	10400	10700	11310
A	(9)	mm	4900	5800	5800	7000	7900	10000	10000	11800
B	(9)	mm	2260	2260	2260	2260	2260	2260	2260	2260
H	(9)	mm	2430	2430	2430	2430	2430	2430	2430	2430

Notes:

- 1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger ir (in) 35°C.
- 2 Values in compliance with EN14511
- 3 Plant (side) heat exchanger water (in/out) 40°C/45°C; Source (side) heat exchanger air (in) 7°C -87% R.H.
- 4 Parameter calculated for LOW-TEMPERATURE application in AVERAGE climate conditions according to [REGULATION (EU) N. 813/2013]
- 5 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.
- 6 Sound power on the basis of measurements made in compliance with ISO 9614.
- 7 Sound power level in cooling, outdoors.
- 8 Sound power level in heating, outdoors.
- 9 Unit in standard configuration/execution, without optional accessories.

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

- 11 Seasonal energy efficiency ratio
- 12 Seasonal space cooling energy efficiency
- 13 Seasonal coefficient of performance
- 14 Seasonal space heating energy efficiency
- 15 Energy efficiency class referred to LOW-TEMPERATURE application in AVERAGE climate conditions according to [REGULATION (EU) N. 811/2013]

The units highlighted in this publication contain HFC R513A (XP10) [GWP₁₀₀ 631] fluorinated greenhouse gases.

Certified data in EUROVENT



FOCS-N-G05/CA			2022	2222	2422	2622	2722	3222	3622	4222	4822
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
PERFORMANCE											
COOLING ONLY (GROSS VALUE)											
Cooling capacity	(1)	kW	459,6	502,8	537,8	586,0	671,6	802,9	928,9	1041	1162
Total power input	(1)	kW	164,0	176,2	188,1	209,6	226,5	269,8	296,3	348,8	385,2
EER	(1)	kW/kW	2,802	2,854	2,859	2,796	2,965	2,976	3,135	2,985	3,017
ESEER	(1)	kW/kW	3,820	3,850	3,850	3,880	4,290	4,130	4,150	4,160	4,190
COOLING ONLY (EN14511 VALUE)											
Cooling capacity	(1)(2)	kW	458,4	501,4	536,1	584,7	669,8	800,6	926,5	1038	1159
EER	(1)(2)	kW/kW	2,770	2,820	2,820	2,770	2,930	2,940	3,100	2,950	2,980
ESEER	(1)(2)	kW/kW	3,720	3,750	3,730	3,800	4,150	4,000	4,040	4,020	4,070
Cooling energy class			-	-	-	-	-	-	-	-	-
HEATING ONLY (GROSS VALUE)											
Total heating capacity	(3)	kW	474,9	525,3	558,7	595,6	689,4	812,5	932,0	1062	1178
Total power input	(3)	kW	149,3	162,5	174,2	184,5	205,6	241,7	269,1	312,8	346,9
COP	(3)	kW/kW	3,181	3,233	3,207	3,228	3,353	3,362	3,463	3,395	3,396
HEATING ONLY (EN14511 VALUE)											
Total heating capacity	(3)(2)	kW	476,3	526,9	560,6	597,0	691,4	814,9	934,5	1065	1181
COP	(3)(2)	kW/kW	3,160	3,210	3,180	3,210	3,330	3,340	3,440	3,370	3,370
Cooling energy class			-	-	-	-	-	-	-	-	-
ENERGY EFFICIENCY											
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)											
Ambient refrigeration											
Prated,c	(10)	kW	-	-	-	-	670	801	926	1038	1159
SEER	(10)(11)		-	-	-	-	4,23	4,14	4,20	4,19	4,24
Performance η_s	(10)(12)	%	-	-	-	-	166	163	165	165	167
SEASONAL EFFICIENCY IN HEATING (Reg. EU 813/2013)											
PDesign	(4)	kW	342	372	361	393	-	-	-	-	-
SCOP	(4)(13)		3,38	3,41	3,38	3,56	-	-	-	-	-
Performance η_s	(4)(14)	%	132	133	132	139	-	-	-	-	-
Seasonal efficiency class	(15)		-	-	-	-	-	-	-	-	-
EXCHANGERS											
HEAT EXCHANGER USER SIDE IN REFRIGERATION											
Water flow	(1)	l/s	21,98	24,05	25,72	28,02	32,11	38,39	44,42	49,77	55,59
Pressure drop	(1)	kPa	31,3	34,5	39,4	26,5	33,4	37,8	34,3	43,3	38,0
HEAT EXCHANGER USER SIDE IN HEATING											
Water flow	(3)	l/s	22,92	25,36	26,97	28,75	33,28	39,22	44,99	51,24	56,85
Pressure drop	(3)	kPa	34,1	38,3	43,4	27,9	35,9	39,5	35,2	45,9	39,8
REFRIGERANT CIRCUIT											
Compressors nr.		N°	2	2	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2	2	2
Refrigerant charge		kg	233	256	253	276	288	391	495	518	618
NOISE LEVEL											
Sound Pressure	(5)	dB(A)	79	80	80	80	80	81	80	81	81
Sound power level in cooling	(6)(7)	dB(A)	99	101	101	101	101	102	102	104	104
Sound power level in heating	(6)(8)	dB(A)	99	101	101	101	101	102	102	104	104
SIZE AND WEIGHT											
Operating weight	(9)	kg	6050	6630	6710	6950	7480	9620	10650	11260	11690
A	(9)	mm	4900	5800	5800	5800	7000	7900	10000	11800	11800
B	(9)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
H	(9)	mm	2430	2430	2430	2430	2430	2430	2430	2430	2430

Notes:

- Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger air (in) 35°C.
- Values in compliance with EN14511
- Plant (side) heat exchanger water (in/out) 40°C/45°C; Source (side) heat exchanger air (in) 7°C - 87% R.H.
- Parameter calculated for LOW-TEMPERATURE application in AVERAGE climate conditions according to [REGULATION (EU) N. 813/2013]
- 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, outdoors.
- Sound power level in heating, outdoors.
- Unit in standard configuration/execution, without optional accessories.

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

11 Seasonal energy efficiency ratio

12 Seasonal space cooling energy efficiency

13 Seasonal coefficient of performance

14 Seasonal space heating energy efficiency

15 Energy efficiency class referred to LOW-TEMPERATURE application in AVERAGE climate conditions according to [REGULATION (EU) N. 811/2013]

The units highlighted in this publication contain HFC R513A (XP10) [GWP₁₀₀ 631] fluorinated greenhouse gases.**Certified data in EUROVENT**



FOCS-N-G05

Reversible unit, air source
for outdoor installation 441-1162 kW

FOCS-N-G05/LN-CA			2022	2222	2422	2622	2722	3222	3622	4222	4822
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
PERFORMANCE											
COOLING ONLY (GROSS VALUE)											
Cooling capacity	(1)	kW	444,3	492,0	524,2	564,0	654,5	779,5	903,5	1013	1130
Total power input	(1)	kW	166,8	176,3	189,9	214,0	228,4	272,7	295,2	347,9	387,6
EER	(1)	kW/kW	2,664	2,791	2,760	2,636	2,866	2,858	3,061	2,912	2,915
ESEER	(1)	kW/kW	3,780	3,850	3,840	3,860	4,250	4,110	4,140	4,150	4,190
COOLING ONLY (EN14511 VALUE)											
Cooling capacity	(1)(2)	kW	443,2	490,6	522,6	562,8	652,8	777,4	901,3	1010	1127
EER	(1)(2)	kW/kW	2,640	2,760	2,730	2,620	2,840	2,830	3,030	2,880	2,890
ESEER	(1)(2)	kW/kW	3,680	3,740	3,730	3,780	4,130	4,000	4,030	4,020	4,070
Cooling energy class			-	-	-	-	-	-	-	-	-
HEATING ONLY (GROSS VALUE)											
Total heating capacity	(3)	kW	471,6	525,3	558,7	591,5	689,4	812,5	932,0	1062	1178
Total power input	(3)	kW	149,3	162,5	174,2	184,5	205,6	241,7	269,1	312,8	346,9
COP	(3)	kW/kW	3,159	3,233	3,207	3,206	3,353	3,362	3,463	3,395	3,396
HEATING ONLY (EN14511 VALUE)											
Total heating capacity	(3)(2)	kW	472,9	526,9	560,6	592,9	691,4	814,9	934,5	1065	1181
COP	(3)(2)	kW/kW	3,140	3,210	3,180	3,190	3,330	3,340	3,440	3,370	3,370
Cooling energy class			-	-	-	-	-	-	-	-	-
ENERGY EFFICIENCY											
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)											
Ambient refrigeration											
Prated,c	(10)	kW	-	-	-	-	653	777	901	1010	1127
SEER	(10)(11)		-	-	-	-	4,22	4,11	4,17	4,18	4,22
Performance ηs	(10)(12)	%	-	-	-	-	166	162	164	164	166
SEASONAL EFFICIENCY IN HEATING (Reg. EU 813/2013)											
PDesign	(4)	kW	340	372	361	391	-	-	-	-	-
SCOP	(4)(13)		3,36	3,41	3,38	3,53	-	-	-	-	-
Performance ηs	(4)(14)	%	131	133	132	138	-	-	-	-	-
Seasonal efficiency class	(15)		-	-	-	-	-	-	-	-	-
EXCHANGERS											
HEAT EXCHANGER USER SIDE IN REFRIGERATION											
Water flow	(1)	l/s	21,25	23,53	25,07	26,97	31,30	37,28	43,21	48,44	54,04
Pressure drop	(1)	kPa	29,3	33,0	37,5	24,5	31,7	35,7	32,4	41,1	36,0
HEAT EXCHANGER USER SIDE IN HEATING											
Water flow	(3)	l/s	22,77	25,36	26,97	28,55	33,28	39,22	44,99	51,24	56,85
Pressure drop	(3)	kPa	33,6	38,3	43,4	27,5	35,9	35,9	35,2	45,9	39,8
REFRIGERANT CIRCUIT											
Compressors nr.		N°	2	2	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2	2	2
Refrigerant charge		kg	242	267	284	306	316	391	541	535	596
NOISE LEVEL											
Sound Pressure	(5)	dB(A)	73	74	74	74	74	75	74	75	75
Sound power level in cooling	(6)(7)	dB(A)	93	95	95	95	95	96	96	98	98
Sound power level in heating	(6)(8)	dB(A)	94	96	96	96	96	97	97	99	99
SIZE AND WEIGHT											
Operating weight	(9)	kg	6120	6610	6700	6930	7580	9730	10800	11400	11860
A	(9)	mm	4900	5800	5800	5800	7000	7900	10000	11800	11800
B	(9)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
H	(9)	mm	2430	2430	2430	2430	2430	2430	2430	2430	2430

Notes:

- Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger air (in) 35°C.
- Values in compliance with EN14511
- Plant (side) heat exchanger water (in/out) 40°C/45°C; Source (side) heat exchanger air (in) 7°C - 87% R.H.
- Parameter calculated for LOW-TEMPERATURE application in AVERAGE climate conditions according to [REGULATION (EU) N. 813/2013]
- 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, outdoors.
- Sound power level in heating, outdoors.
- Unit in standard configuration/execution, without optional accessories.

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

- Seasonal energy efficiency ratio
- Seasonal space cooling energy efficiency
- Seasonal coefficient of performance
- Seasonal space heating energy efficiency
- Energy efficiency class referred to LOW-TEMPERATURE application in AVERAGE climate conditions according to [REGULATION (EU) N. 811/2013]

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**FOCS-N-G05/SL-CA**

			2022	2222	2422	2622	2722	3222	3622	4222	4822
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
PERFORMANCE											
COOLING ONLY (GROSS VALUE)											
Cooling capacity	(1)	kW	440,7	487,9	519,6	558,6	648,7	771,5	895,0	1004	1119
Total power input	(1)	kW	169,4	178,7	192,6	217,5	231,0	275,9	297,4	350,6	391,5
EER	(1)	kW/kW	2,602	2,730	2,698	2,568	2,808	2,796	3,009	2,864	2,858
ESEER	(1)	kW/kW	3,760	3,840	3,830	3,850	4,270	4,110	4,150	4,180	4,200
COOLING ONLY (EN14511 VALUE)											
Cooling capacity	(1)(2)	kW	439,6	486,6	518,0	557,4	647,1	769,4	892,8	1001	1116
EER	(1)(2)	kW/kW	2,580	2,700	2,670	2,550	2,780	2,770	2,980	2,830	2,830
ESEER	(1)(2)	kW/kW	3,670	3,740	3,710	3,770	4,160	3,990	4,040	4,040	4,080
Cooling energy class			-	-	-	-	-	-	-	-	-
HEATING ONLY (GROSS VALUE)											
Total heating capacity	(3)	kW	465,6	519,6	551,8	583,9	681,1	802,2	919,9	1050	1162
Total power input	(3)	kW	147,7	160,8	172,4	182,6	202,8	238,4	265,1	308,1	341,9
COP	(3)	kW/kW	3,152	3,231	3,201	3,198	3,358	3,365	3,470	3,408	3,399
HEATING ONLY (EN14511 VALUE)											
Total heating capacity	(3)(2)	kW	466,9	521,2	553,7	585,2	683,0	804,6	922,3	1053	1165
COP	(3)(2)	kW/kW	3,130	3,210	3,180	3,180	3,340	3,340	3,450	3,380	3,380
Cooling energy class			-	-	-	-	-	-	-	-	-
ENERGY EFFICIENCY											
SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)											
Ambient refrigeration											
Prated,c	(10)	kW	-	-	-	-	647	769	893	1001	1116
SEER	(10)(11)		-	-	-	-	4,23	4,10	4,18	4,19	4,22
Performance η_s	(10)(12)	%	-	-	-	-	166	161	164	165	166
SEASONAL EFFICIENCY IN HEATING (Reg. EU 813/2013)											
PDesign	(4)	kW	340	371	365	393	-	-	-	-	-
SCOP	(4)(13)		3,39	3,44	3,41	3,56	-	-	-	-	-
Performance η_s	(4)(14)	%	132	135	134	139	-	-	-	-	-
Seasonal efficiency class	(15)		-	-	-	-	-	-	-	-	-
EXCHANGERS											
HEAT EXCHANGER USER SIDE IN REFRIGERATION											
Water flow	(1)	l/s	21,08	23,33	24,85	26,71	31,02	36,90	42,80	48,01	53,53
Pressure drop	(1)	kPa	28,8	32,5	36,8	24,0	31,2	34,9	31,8	40,3	35,3
HEAT EXCHANGER USER SIDE IN HEATING											
Water flow	(3)	l/s	22,47	25,08	26,64	28,18	32,88	38,72	44,40	50,67	56,11
Pressure drop	(3)	kPa	32,7	37,5	42,3	26,8	35,0	38,5	34,2	44,9	38,8
REFRIGERANT CIRCUIT											
Compressors nr.		N°	2	2	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2	2	2
Refrigerant charge		kg	243	268	285	307	317	391	541	536	598
NOISE LEVEL											
Sound Pressure	(5)	dB(A)	69	70	70	70	70	71	70	71	71
Sound power level in cooling	(6)(7)	dB(A)	89	91	91	91	91	92	92	94	94
Sound power level in heating	(6)(8)	dB(A)	90	92	92	92	92	93	93	95	95
SIZE AND WEIGHT											
Operating weight	(9)	kg	6190	6680	6770	7010	7650	9820	10890	11510	11950
A	(9)	mm	4900	5800	5800	5800	7000	7900	10000	11800	11800
B	(9)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
H	(9)	mm	2430	2430	2430	2430	2430	2430	2430	2430	2430

Notes:

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12 Seasonal space cooling energy efficiency

13 Seasonal coefficient of performance

14 Seasonal space heating energy efficiency

15 Energy efficiency class referred to LOW-TEMPERATURE application in AVERAGE climate conditions according to [REGULATION (EU) N. 811/2013]

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FURTHER OPTIONS

Auxiliary input

Auxiliary signal 4-20mA: Analog input signal that enables the main setpoint variation according to the value of current applied.

Remote signal double set-point: Analog input signal that allows to change the operating set-point switching only among 2 fixed set-points.

Remote Demand Limit: Voltage free digital input to temporarily limit the units' power consumption.

Electrical

Numbered wiring: Electrical board wires are identified by numbered labels also indicated in the unit's wiring scheme to facilitate maintenance of the electrical board connections.

Compressor rephasing: Capacitors installed on the compressors' power inlet line to increase the unit's average $\cos(\phi)$.

Automatic circuit breakers: Over-current switches provided in place of standard fuses to protect the compressor from possible current peaks.

Soft-starter: Electronic device to manage the inrush current of the compressor.

Connectivity

Serial card interface module to allow integration with BMS protocols: Modbus LonWorks / BACnet MS/TP/ BACnet over IP.

M-Net interface kit: Interface module to allow the integration of the unit with Mitsubishi Electric proprietary communication protocol M-Net.

Heat exchanger

Water flow switch: Designed to protect the unit where the water flow across the evaporator is not sufficient and falls outside of the operating parameters.

Flanged hydraulic connections: Grooved coupling with flanged counter-pipe.

HWT kit

HWT kit: High water temperature kit, to enlarge the operating range of the unit. With this option, the maximum condenser leaving water temperature is 60°C.

Structure

Coils protecting grilles: protect the coils against the intrusion of external solid bodies.

Rubber type antivibration mountings: Reduce vibrations, keeping noise to a minimum.

“BY FAR THE BEST PROOF IS EXPERIENCE”

Sir Francis Bacon
British philosopher
(1561 - 1626)

Every project is characterised by different needs and system specifications for various climates. All these projects share high energy efficiency, maximum integration, and total reliability resulting from the Climaveneta brand experience.



HOTEL ABI D'ORU

Marinella Gulf - Italy

Period: 2016 - 2017
Application: Hotel and resorts
Cooling capacity: 680 kW
Heating capacity: 300 kW
Installed machines: 1x TECS XL CA 0452; 1x FOCS-NR XL CA 12022; i-life2; i-life2HP; ClimaPRO



CAMPUS NEW VELIZY

Vèlizy - Villacoublay - France

Period: 2016
Application: School / University
Cooling capacity: 935 kW
Heating capacity: 235 kW
Installed machines: FOCS-N/D/ LN-CA 3622



NAVE DE VERO

Marghera - Venice - Italy

Period: 2014
Application: Shopping Centre
Cooling capacity: 3842 kW
Installed machines: 1x FOCS2-W/CA-E 4802, 1x NECS/Q/SL 0152, 2x FOCS2-W/D/CA-E 4802, 1x FOCS-N/SL-CA 4822, 2x FOCS-N/D/SL-CA 4822



GUSTAVO FRICKE HOSPITAL

Viña del mar - Chile

Period: 2016 - 2018
Application: Healthcare / Hospitals
Cooling capacity: 6381 kW
Heating capacity: 5711 kW
Installed machines: 1x ERACS2-Q/SL-CA 2722, 2x FOCS-N/B 2622, 4x FOCS-N/B 3222, 2x FOCS-N/B 2222, 1x MANAGER 3000



BNP PARIBAS CARDIF

Nanterre - Paris - France

Period: 2012
Application: Bank Offices
Cooling capacity: 662 kW
Installed machines: 3x i-WZ-D/S 10000, 2x i-WZD/S 15000, 2x FOCS-NR/XL-CA-E/S (1062, 1762), 1x NECS-N/LN 0302



ESSELUNGA VERONA

Verona - Italy

Period: 2017
Application: Supermarket
Cooling capacity: 377 kW
Heating capacity: 300 kW
Installed machines: x FOCS-N/XL-CA-E /S 1722



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

www.melcohit.com