

RC Technical Documentation
FRCS3-W-G05-Z_0551_4752_201810_ML

REGULATION (EU) N. 2016/2281 FOR HIGH TEMPERATURE PROCESS CHILLERS

Ecodesign requirements for process chillers

WATER COOLED CHILLERS

FRCS3-W-G05-Z 0551 - 4752

Cooling Capacity Range 187 - 1688 [kW] - (EN14511 VALUE)
Nominal Cooling Capacity at TdesignC Range 187 - 1688 [kW]



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1. REGULATION (EU) N. 2016/2281 FOR HIGH TEMPERATURE PROCESS CHILLERS

1.1 Scope of the document

This document is compliant with the Commission Regulation (EU) N. 2016/2281 regarding "REQUIREMENTS FOR PRODUCT INFORMATION" (Annex II, Point 5). In particular, it deals with high temperature process chillers and contains information required by Table 15 of the above-mentioned regulation, which is entitled "Information requirements for high temperature process chillers".

1.2 REGULATION (EU) N. 2016/2281 description

The COMMISSION REGULATION (EU) N. 2016/2281 of 30 November 2016, implementing Directive 2009/125/EC of the European Parliament and of the Council, establishes eco-design requirements for the placing on the market and/or putting into service of: air heating products with a rated heating capacity which does not exceed 1MW, cooling products and high temperature process chillers with a rated cooling capacity which do not exceed 2 MW, and all fan coil units. All these energy-related products are defined in Article 2 of the Regulation in question.

1.3 Description of the data declared by Mitsubishi Electric Hydronics & IT Cooling Systems

- High temperature process chiller: a product designed to cool down and continuously maintain the temperature of a liquid to provide cooling to a refrigerated appliance or system, whose aim is not to provide cooling for the thermal comfort of human beings. It is capable of delivering its rated refrigeration capacity at an indoor side heat exchanger outlet temperature of 7°C, at standard rating conditions.
- Rated refrigeration capacity (P): the refrigeration capacity that the high temperature process chiller is able to reach when operating at full load at a specific rating point, expressed in kW.
- Seasonal Energy Performance Ratio (SEPR): the efficiency ratio of a high temperature process chiller at standard rating conditions, representative of the variations in load and ambient temperature throughout the year, and calculated as the ratio between the annual refrigeration demand and the annual electricity consumption.
- Annual electricity consumption: result of the sum of the ratios between each bin-specific cooling demand and the corresponding bin-specific energy efficiency ratio, multiplied by the corresponding number of bin hours.
- Degradation coefficient for chillers: measure of efficiency loss due to cycling of the chiller.
- Capacity control: the ability of a chiller to change its cooling capacity by changing the volumetric flow rate of at least one of the fluids needed to operate the refrigeration cycle.
- Global warming potential (GWP) of the refrigerant: the 100-year climatic warming potential of one kilogram of a greenhouse gas relative to one kilogram of dioxide (CO₂).

2. RC CONTENTS UNIT

2.1 Table index

WATER COOLED CHILLERS

FRCS3-W-G05-Z 0551 - 4752

Cooling Capacity Range 187 - 1688 [kW]

Nominal Cooling Capacity at TdesignC Range 187 - 1688 [kW]

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FRCS3-W-G05-Z /0551			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,74
Annual electricity consumption	Q	[kWh]	177593
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	187,40
Rated power input	D _A	[kW]	38,30
Rated energy efficiency ratio	EER _{DC,A}		4,89
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	174,91
Rated power input	D _B	[kW]	27,70
Declared energy efficiency ratio	EER _{DC,B}		6,31
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	162,41
Rated power input	D _C	[kW]	19,60
Declared energy efficiency ratio	EER _{DC,C}		8,27
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	149,92
Rated power input	D _D	[kW]	18,40
Declared energy efficiency ratio	EER _{DC,D}		8,15
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /0701			
-			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,82
Annual electricity consumption	Q	[kWh]	233718
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	248,90
Rated power input	D _A	[kW]	50,30
Rated energy efficiency ratio	EER _{DC,A}		4,95
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	232,31
Rated power input	D _B	[kW]	36,40
Declared energy efficiency ratio	EER _{DC,B}		6,38
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	215,71
Rated power input	D _C	[kW]	26,00
Declared energy efficiency ratio	EER _{DC,C}		8,30
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	199,12
Rated power input	D _D	[kW]	24,10
Declared energy efficiency ratio	EER _{DC,D}		8,26
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /0851			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,46
Annual electricity consumption	Q	[kWh]	299209
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	304,70
Rated power input	D _A	[kW]	61,40
Rated energy efficiency ratio	EER _{DC,A}		4,96
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	284,39
Rated power input	D _B	[kW]	44,80
Declared energy efficiency ratio	EER _{DC,B}		6,35
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	264,07
Rated power input	D _C	[kW]	33,20
Declared energy efficiency ratio	EER _{DC,C}		7,96
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	243,76
Rated power input	D _D	[kW]	31,50
Declared energy efficiency ratio	EER _{DC,D}		7,75
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO2eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /0951			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,50
Annual electricity consumption	Q	[kWh]	328176
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	336,10
Rated power input	D _A	[kW]	67,10
Rated energy efficiency ratio	EER _{DC,A}		5,01
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	313,69
Rated power input	D _B	[kW]	48,60
Declared energy efficiency ratio	EER _{DC,B}		6,46
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	291,29
Rated power input	D _C	[kW]	36,60
Declared energy efficiency ratio	EER _{DC,C}		7,96
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	268,88
Rated power input	D _D	[kW]	34,50
Declared energy efficiency ratio	EER _{DC,D}		7,80
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /1101			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,48
Annual electricity consumption	Q	[kWh]	374148
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	381,87
Rated power input	D _A	[kW]	76,40
Rated energy efficiency ratio	EER _{DC,A}		5,00
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	356,44
Rated power input	D _B	[kW]	55,40
Declared energy efficiency ratio	EER _{DC,B}		6,43
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	330,98
Rated power input	D _C	[kW]	41,80
Declared energy efficiency ratio	EER _{DC,C}		7,93
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	305,52
Rated power input	D _D	[kW]	39,30
Declared energy efficiency ratio	EER _{DC,D}		7,78
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /1301			
-			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,50
Annual electricity consumption	Q	[kWh]	465062
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	458,16
Rated power input	D _A	[kW]	90,00
Rated energy efficiency ratio	EER _{DC,A}		5,09
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	427,65
Rated power input	D _B	[kW]	67,60
Declared energy efficiency ratio	EER _{DC,B}		6,33
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	397,11
Rated power input	D _C	[kW]	52,80
Declared energy efficiency ratio	EER _{DC,C}		7,52
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	366,56
Rated power input	D _D	[kW]	48,50
Declared energy efficiency ratio	EER _{DC,D}		7,56
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /1401			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,52
Annual electricity consumption	Q	[kWh]	509681
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P_A	[kW]	522,30
Rated power input	D_A	[kW]	100,60
Rated energy efficiency ratio	$EER_{DC,A}$		5,19
Parameters at rating point B			
Rated refrigeration capacity	P_B	[kW]	487,48
Rated power input	D_B	[kW]	75,50
Declared energy efficiency ratio	$EER_{DC,B}$		6,46
Parameters at rating point C			
Rated refrigeration capacity	P_C	[kW]	452,66
Rated power input	D_C	[kW]	58,30
Declared energy efficiency ratio	$EER_{DC,C}$		7,77
Parameters at rating point D			
Rated refrigeration capacity	P_D	[kW]	417,84
Rated power input	D_D	[kW]	52,40
Declared energy efficiency ratio	$EER_{DC,D}$		7,97
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C_{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /1651			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,51
Annual electricity consumption	Q	[kWh]	584356
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	589,50
Rated power input	D _A	[kW]	113,40
Rated energy efficiency ratio	EER _{DC,A}		5,20
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	550,20
Rated power input	D _B	[kW]	85,40
Declared energy efficiency ratio	EER _{DC,B}		6,44
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	510,90
Rated power input	D _C	[kW]	66,30
Declared energy efficiency ratio	EER _{DC,C}		7,71
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	471,60
Rated power input	D _D	[kW]	60,90
Declared energy efficiency ratio	EER _{DC,D}		7,75
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /1901			
-			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,51
Annual electricity consumption	Q	[kWh]	674384
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	679,40
Rated power input	D _A	[kW]	132,70
Rated energy efficiency ratio	EER _{DC,A}		5,12
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	634,11
Rated power input	D _B	[kW]	99,20
Declared energy efficiency ratio	EER _{DC,B}		6,39
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	588,81
Rated power input	D _C	[kW]	76,50
Declared energy efficiency ratio	EER _{DC,C}		7,69
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	543,52
Rated power input	D _D	[kW]	69,90
Declared energy efficiency ratio	EER _{DC,D}		7,77
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /2101			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,70
Annual electricity consumption	Q	[kWh]	711637
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	738,90
Rated power input	D _A	[kW]	144,00
Rated energy efficiency ratio	EER _{DC,A}		5,13
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	689,64
Rated power input	D _B	[kW]	107,10
Declared energy efficiency ratio	EER _{DC,B}		6,44
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	640,38
Rated power input	D _C	[kW]	80,60
Declared energy efficiency ratio	EER _{DC,C}		7,95
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	591,12
Rated power input	D _D	[kW]	73,30
Declared energy efficiency ratio	EER _{DC,D}		8,06
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /2501			
-			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,65
Annual electricity consumption	Q	[kWh]	804232
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	834,30
Rated power input	D _A	[kW]	161,70
Rated energy efficiency ratio	EER _{DC,A}		5,16
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	778,68
Rated power input	D _B	[kW]	120,10
Declared energy efficiency ratio	EER _{DC,B}		6,48
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	723,06
Rated power input	D _C	[kW]	90,30
Declared energy efficiency ratio	EER _{DC,C}		8,01
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	667,44
Rated power input	D _D	[kW]	83,70
Declared energy efficiency ratio	EER _{DC,D}		7,97
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /2602			
-			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,62
Annual electricity consumption	Q	[kWh]	899781
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	913,19
Rated power input	D _A	[kW]	177,00
Rated energy efficiency ratio	EER _{DC,A}		5,16
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	852,32
Rated power input	D _B	[kW]	131,80
Declared energy efficiency ratio	EER _{DC,B}		6,47
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	791,44
Rated power input	D _C	[kW]	102,20
Declared energy efficiency ratio	EER _{DC,C}		7,74
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	730,56
Rated power input	D _D	[kW]	93,40
Declared energy efficiency ratio	EER _{DC,D}		7,82
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO2eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /3002			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,50
Annual electricity consumption	Q	[kWh]	1048507
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	1058,00
Rated power input	D _A	[kW]	203,10
Rated energy efficiency ratio	EER _{DC,A}		5,21
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	987,47
Rated power input	D _B	[kW]	153,40
Declared energy efficiency ratio	EER _{DC,B}		6,44
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	916,93
Rated power input	D _C	[kW]	119,50
Declared energy efficiency ratio	EER _{DC,C}		7,67
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	846,40
Rated power input	D _D	[kW]	108,70
Declared energy efficiency ratio	EER _{DC,D}		7,79
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO2eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /3152			
-			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,71
Annual electricity consumption	Q	[kWh]	1081072
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	1136,91
Rated power input	D _A	[kW]	210,60
Rated energy efficiency ratio	EER _{DC,A}		5,40
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	1061,20
Rated power input	D _B	[kW]	158,80
Declared energy efficiency ratio	EER _{DC,B}		6,68
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	985,40
Rated power input	D _C	[kW]	123,20
Declared energy efficiency ratio	EER _{DC,C}		8,00
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	909,60
Rated power input	D _D	[kW]	111,90
Declared energy efficiency ratio	EER _{DC,D}		8,13
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /3502			
-			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,50
Annual electricity consumption	Q	[kWh]	1202372
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	1213,70
Rated power input	D _A	[kW]	232,60
Rated energy efficiency ratio	EER _{DC,A}		5,22
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	1133,07
Rated power input	D _B	[kW]	175,50
Declared energy efficiency ratio	EER _{DC,B}		6,45
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	1052,13
Rated power input	D _C	[kW]	136,50
Declared energy efficiency ratio	EER _{DC,C}		7,71
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	971,20
Rated power input	D _D	[kW]	125,20
Declared energy efficiency ratio	EER _{DC,D}		7,76
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO2eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /3652			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,68
Annual electricity consumption	Q	[kWh]	1240305
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	1299,00
Rated power input	D _A	[kW]	241,40
Rated energy efficiency ratio	EER _{DC,A}		5,38
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	1212,40
Rated power input	D _B	[kW]	181,90
Declared energy efficiency ratio	EER _{DC,B}		6,66
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	1125,80
Rated power input	D _C	[kW]	141,00
Declared energy efficiency ratio	EER _{DC,C}		7,98
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	1039,20
Rated power input	D _D	[kW]	128,60
Declared energy efficiency ratio	EER _{DC,D}		8,08
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /4002			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,50
Annual electricity consumption	Q	[kWh]	1366268
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	1377,00
Rated power input	D _A	[kW]	262,30
Rated energy efficiency ratio	EER _{DC,A}		5,25
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	1285,20
Rated power input	D _B	[kW]	199,00
Declared energy efficiency ratio	EER _{DC,B}		6,46
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	1193,40
Rated power input	D _C	[kW]	155,20
Declared energy efficiency ratio	EER _{DC,C}		7,69
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	1101,60
Rated power input	D _D	[kW]	142,40
Declared energy efficiency ratio	EER _{DC,D}		7,74
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO2eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /4102			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		7,59
Annual electricity consumption	Q	[kWh]	1396398
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P_A	[kW]	1445,00
Rated power input	D_A	[kW]	273,20
Rated energy efficiency ratio	$EER_{DC,A}$		5,29
Parameters at rating point B			
Rated refrigeration capacity	P_B	[kW]	1348,67
Rated power input	D_B	[kW]	206,20
Declared energy efficiency ratio	$EER_{DC,B}$		6,54
Parameters at rating point C			
Rated refrigeration capacity	P_C	[kW]	1252,33
Rated power input	D_C	[kW]	158,20
Declared energy efficiency ratio	$EER_{DC,C}$		7,91
Parameters at rating point D			
Rated refrigeration capacity	P_D	[kW]	1156,00
Rated power input	D_D	[kW]	144,90
Declared energy efficiency ratio	$EER_{DC,D}$		7,98
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C_{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /4502			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		8,00
Annual electricity consumption	Q	[kWh]	1438990
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	1516,77
Rated power input	D _A	[kW]	291,20
Rated energy efficiency ratio	EER _{DC,A}		5,21
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	1415,87
Rated power input	D _B	[kW]	215,20
Declared energy efficiency ratio	EER _{DC,B}		6,58
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	1314,73
Rated power input	D _C	[kW]	162,20
Declared energy efficiency ratio	EER _{DC,C}		8,11
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	1213,60
Rated power input	D _D	[kW]	149,30
Declared energy efficiency ratio	EER _{DC,D}		8,13
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO2eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /4602			
-			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		8,00
Annual electricity consumption	Q	[kWh]	1495399
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	1609,00
Rated power input	D _A	[kW]	307,10
Rated energy efficiency ratio	EER _{DC,A}		5,24
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	1501,73
Rated power input	D _B	[kW]	225,90
Declared energy efficiency ratio	EER _{DC,B}		6,65
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	1394,47
Rated power input	D _C	[kW]	168,40
Declared energy efficiency ratio	EER _{DC,C}		8,28
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	1287,20
Rated power input	D _D	[kW]	154,40
Declared energy efficiency ratio	EER _{DC,D}		8,33
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO2eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

FRCS3-W-G05-Z /4752			
Type of condensing	Air cooled / Water cooled		
Refrigerant fluid(s)	Information to identify the refrigerant fluid(s) intended to be used with the condensing unit		-
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Operating temperature	t	[°C]	-
Seasonal energy performance ratio	SEPR		8,00
Annual electricity consumption	Q	[kWh]	1568728
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	1687,73
Rated power input	D _A	[kW]	317,30
Rated energy efficiency ratio	EER _{DC,A}		5,32
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	1575,47
Rated power input	D _B	[kW]	234,80
Declared energy efficiency ratio	EER _{DC,B}		6,71
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	1462,93
Rated power input	D _C	[kW]	176,50
Declared energy efficiency ratio	EER _{DC,C}		8,29
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	1350,40
Rated power input	D _D	[kW]	162,80
Declared energy efficiency ratio	EER _{DC,D}		8,29
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO2eq]	631

Contact details: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy

ENGLISH	ITALIANO	FRANCAISE	DEUTSCH	ESPAÑOL
Type of condensing	Tipo di condensazione	Type de condensation	Art der Verflüssigung	Tipo de condensación
Refrigerant fluid(s)	Fluido(i) refrigerante(i)	Fluide(s) frigorigène(s)	Kältemittel	Fluido o fluidos refrigerantes
Type	Tipo	Type	Bauart	Tipo
Operating temperature	Temperatura di esercizio	Température de service	Betriebstemperatur	Temperatura de funcionamiento
Seasonal energy performance ratio	Indice di prestazione energetica stagionale	Ratio de performance énergétique saisonnier	Jahresarbeitszahl	Factor de rendimiento energético estacional
Annual electricity consumption	Consumo annuo di energia elettrica	Consommation annuelle d'électricité	Jahresstromverbrauch	Consumo anual de electricidad
Parameters at full load and reference ambient temperature at rating point A	Parametri a pieno carico e alla temperatura ambiente al punto di valutazione A	Paramètres à pleine charge et à la température ambiante de référence au point d'évaluation A	Parameter bei Volllast und Bezugsumgebungstemperatur am Bewertungspunkt A	Parámetros a plena carga y a temperatura ambiente de referencia en el punto de clasificación A
Rated refrigeration capacity	Capacità dichiarata di refrigerazione	Puissance de réfrigération nominale	Nennkälteleistung	Potencia nominal de refrigeración
Rated power input	Potenza nominale assorbita	Puissance absorbée nominale	Nennleistungsaufnahme	Potencia utilizada nominal
Rated energy efficiency ratio	Indice di efficienza energetica nominale	Coefficient d'efficacité énergétique nominal	Nennleistungszahl	Factor de eficiencia energética nominal
Parameters at rating point B	Parametri al punto di valutazione B	Paramètres au point d'évaluation B	Parameter am Bewertungspunkt B	Parámetros en el punto de clasificación B
Rated refrigeration capacity	Capacità dichiarata di refrigerazione	Puissance de réfrigération nominale	Nennkälteleistung	Potencia nominal de refrigeración
Rated power input	Potenza nominale assorbita	Puissance absorbée nominale	Nennleistungsaufnahme	Potencia utilizada nominal
Declared energy efficiency ratio	Indice di efficienza energetica dichiarato	Coefficient d'efficacité énergétique déclaré	Nennleistungszahl	Factor de eficiencia energética nominal
Parameters at rating point C	Parametri al punto di valutazione C	Paramètres au point d'évaluation C	Parameter am Bewertungspunkt C	Parámetros en el punto de clasificación C
Rated refrigeration capacity	Capacità dichiarata di refrigerazione	Puissance de réfrigération nominale	Nennkälteleistung	Potencia nominal de refrigeración
Rated power input	Potenza nominale assorbita	Puissance absorbée nominale	Nennleistungsaufnahme	Potencia utilizada nominal
Declared energy efficiency ratio	Indice di efficienza energetica dichiarato	Coefficient d'efficacité énergétique déclaré	Nennleistungszahl	Factor de eficiencia energética nominal
Parameters at rating point D	Parametri al punto di valutazione D	Paramètres au point d'évaluation D	Parameter am Bewertungspunkt D	Parámetros en el punto de clasificación D
Rated refrigeration capacity	Capacità dichiarata di refrigerazione	Puissance de réfrigération nominale	Nennkälteleistung	Potencia nominal de refrigeración
Rated power input	Potenza nominale assorbita	Puissance absorbée nominale	Nennleistungsaufnahme	Potencia utilizada nominal
Declared energy efficiency ratio	Indice di efficienza energetica dichiarato	Coefficient d'efficacité énergétique déclaré	Nennleistungszahl	Factor de eficiencia energética nominal
Other items	Altri elementi	Autres caractéristiques	Sonstige Produktdaten	Otros elementos
Capacity control	Dispositivo di controllo della capacità	Régulation de la puissance	Leistungsregelung	Control de la potencia
Degradation coefficient for chillers	Coefficiente di degradazione per i refrigeratori	Coefficient de dégradation pour les refroidisseurs	Minderungsfaktor von Kühlern	Coefficiente de degradación de las enfriadoras
Declared energy efficiency ratio or gas utilisation efficiency/auxiliary energy factor for part load at given outdoor temperatures Tj	Indice di efficienza energetica dichiarato o efficienza dell'uso del gas/fattore di energia ausiliaria a carico parziale alle temperature esterne date Tj	Coefficient d'efficacité énergétique déclaré ou rendement de la consommation de gaz/indice énergétique auxiliaire à charge partielle pour des températures extérieures données Tj	Angegebene Leistungszahl oder Gaswirkungsgrad/Hilfsenergiefaktor bei Teillast und bestimmten Außentemperaturen Tj	Factor de eficiencia energética declarado o eficiencia del uso de gas o factor de energía auxiliar para carga parcial a las temperaturas exteriores dadas Tj
GWP of the refrigerant	GWP del refrigerante	PRP du fluide frigorigène	Treibhausgaspotenzial des Kältemittels	PCA del refrigerante
Notes:	Note:	Remarques:	Hinweise:	Notas:
The parameters are declared for application at medium temperature, except in the case of low temperature heat pumps. For low temperature heat pumps, the parameters are declared for application at low temperature.	I parametri sono dichiarati per l'applicazione a temperatura media, tranne per le pompe di calore a bassa temperatura. Per le pompe di calore a bassa temperatura, i parametri sono dichiarati per l'applicazione a bassa temperatura.	Les paramètres sont déclarés pour l'application à moyenne température, excepté pour les pompes à chaleur basse température. Pour les pompes à chaleur basse température, les paramètres sont déclarés pour l'application à basse température.	Die Parameter sind für eine Mitteltemperaturanwendung anzugeben, außer für Niedertemperatur-Wärmepumpen. Für Niedertemperatur-Wärmepumpen sind die Parameter für eine Niedertemperaturanwendung anzugeben.	Los parámetros se declararán para aplicaciones de media temperatura, excepto si se trata de bombas de calor de baja temperatura. En el caso de las bombas de calor de baja temperatura, los parámetros se declararán para aplicaciones de baja temperatura.
Unit in standard configuration/execution, without optional accessories.	Unità in configurazione ed esecuzione standard, priva di accessori opzionali.	Unité en configuration et exécution standard, sans accessoires optionnels.	Gerät mit Standard-Konfiguration und -Ausführung, ohne wunschweises Zubehör.	Unidad en configuración y ejecución estándar, sin accesorios opcionales.



for a greener tomorrow

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



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