

RC Technical Documentation
FR-W-G04-Z_0551_2002_201812_EN

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

Ecodesign requirements for process chillers

WATER COOLED CHILLERS

FR-W-G04-Z 0551 - 2002

Cooling Capacity Range 92,9 - 372 [kW] - (EN14511 VALUE)
Nominal Cooling Capacity at TdesignC Range 92,9 - 372 [kW]

EN



1. REGULATION (EU) N. 2016/2281 FOR HIGH TEMPERATURE PROCESS CHILLERS	
1.1 Scope of the document	3
1.2 REGULATION (UE) N. 2016/2281 description	3
1.3 Description of the data declared by Mitsubishi Electric Hydronics & IT Cooling Systems	3
2. RC CONTENTS UNIT	
2.1 Table index	4
3. TECHNICAL PARAMETERS	
3.1 FR-W-G04-Z /	5



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 (UE) 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

FR-W-G04-Z 0551 - 2002

Cooling Capacity Range 92,9 - 372 [kW]

Nominal Cooling Capacity at TdesignC Range 92,9 - 372 [kW]

Units	Version	Size					Pag.
FR-W-G04-Z		0551	0651	0751	0851	0951	5
		1102	1302	1402	1502	1702	
		1902	2002				

FR-W-G04-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		7,05
Annual electricity consumption	Q	[kWh]	97754
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	92,87
Rated power input	D _A	[kW]	19,20
Rated energy efficiency ratio	EER _{DC,A}		4,85
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	86,71
Rated power input	D _B	[kW]	14,30
Declared energy efficiency ratio	EER _{DC,B}		6,04
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	80,51
Rated power input	D _C	[kW]	11,20
Declared energy efficiency ratio	EER _{DC,C}		7,17
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	74,32
Rated power input	D _D	[kW]	10,00
Declared energy efficiency ratio	EER _{DC,D}		7,40
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	7,00

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

FR-W-G04-Z /0651			
-			
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		7,04
Annual electricity consumption	Q	[kWh]	108007
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	102,60
Rated power input	D _A	[kW]	21,60
Rated energy efficiency ratio	EER _{DC,A}		4,74
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	95,76
Rated power input	D _B	[kW]	16,00
Declared energy efficiency ratio	EER _{DC,B}		5,98
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	88,92
Rated power input	D _C	[kW]	12,30
Declared energy efficiency ratio	EER _{DC,C}		7,22
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	82,08
Rated power input	D _D	[kW]	11,10
Declared energy efficiency ratio	EER _{DC,D}		7,38
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	7,00

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

FR-W-G04-Z /0751			
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		7,03
Annual electricity consumption	Q	[kWh]	132279
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	125,50
Rated power input	D _A	[kW]	27,00
Rated energy efficiency ratio	EER _{DC,A}		4,65
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	117,13
Rated power input	D _B	[kW]	20,10
Declared energy efficiency ratio	EER _{DC,B}		5,83
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	108,77
Rated power input	D _C	[kW]	14,90
Declared energy efficiency ratio	EER _{DC,C}		7,30
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	100,40
Rated power input	D _D	[kW]	13,60
Declared energy efficiency ratio	EER _{DC,D}		7,36
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	7,00

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

FR-W-G04-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		7,02
Annual electricity consumption	Q	[kWh]	150978
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	143,10
Rated power input	D _A	[kW]	30,60
Rated energy efficiency ratio	EER _{DC,A}		4,67
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	133,56
Rated power input	D _B	[kW]	22,90
Declared energy efficiency ratio	EER _{DC,B}		5,83
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	124,02
Rated power input	D _C	[kW]	16,60
Declared energy efficiency ratio	EER _{DC,C}		7,45
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	114,48
Rated power input	D _D	[kW]	15,90
Declared energy efficiency ratio	EER _{DC,D}		7,21
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	7,00

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

FR-W-G04-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		7,08
Annual electricity consumption	Q	[kWh]	173130
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	165,45
Rated power input	D _A	[kW]	35,10
Rated energy efficiency ratio	EER _{DC,A}		4,71
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	154,47
Rated power input	D _B	[kW]	26,10
Declared energy efficiency ratio	EER _{DC,B}		5,91
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	143,43
Rated power input	D _C	[kW]	19,60
Declared energy efficiency ratio	EER _{DC,C}		7,33
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	132,40
Rated power input	D _D	[kW]	17,80
Declared energy efficiency ratio	EER _{DC,D}		7,42
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	7,00

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

FR-W-G04-Z /1102			
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		7,05
Annual electricity consumption	Q	[kWh]	197357
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	187,66
Rated power input	D _A	[kW]	38,20
Rated energy efficiency ratio	EER _{DC,A}		4,91
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	175,19
Rated power input	D _B	[kW]	28,70
Declared energy efficiency ratio	EER _{DC,B}		6,11
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	162,67
Rated power input	D _C	[kW]	22,60
Declared energy efficiency ratio	EER _{DC,C}		7,19
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	150,16
Rated power input	D _D	[kW]	20,40
Declared energy efficiency ratio	EER _{DC,D}		7,36
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	7,00

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

FR-W-G04-Z /1302			
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		7,13
Annual electricity consumption	Q	[kWh]	219821
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	211,30
Rated power input	D _A	[kW]	43,00
Rated energy efficiency ratio	EER _{DC,A}		4,91
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	197,21
Rated power input	D _B	[kW]	32,10
Declared energy efficiency ratio	EER _{DC,B}		6,13
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	183,13
Rated power input	D _C	[kW]	25,10
Declared energy efficiency ratio	EER _{DC,C}		7,28
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	169,04
Rated power input	D _D	[kW]	22,70
Declared energy efficiency ratio	EER _{DC,D}		7,45
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	7,00

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

FR-W-G04-Z /1402			
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		7,06
Annual electricity consumption	Q	[kWh]	242717
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	231,17
Rated power input	D _A	[kW]	48,60
Rated energy efficiency ratio	EER _{DC,A}		4,76
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	215,79
Rated power input	D _B	[kW]	36,20
Declared energy efficiency ratio	EER _{DC,B}		5,95
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	200,37
Rated power input	D _C	[kW]	27,70
Declared energy efficiency ratio	EER _{DC,C}		7,23
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	184,96
Rated power input	D _D	[kW]	24,90
Declared energy efficiency ratio	EER _{DC,D}		7,43
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	7,00

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

FR-W-G04-Z /1502			
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		7,15
Annual electricity consumption	Q	[kWh]	268316
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P_A	[kW]	258,89
Rated power input	D_A	[kW]	53,90
Rated energy efficiency ratio	$EER_{DC,A}$		4,80
Parameters at rating point B			
Rated refrigeration capacity	P_B	[kW]	241,64
Rated power input	D_B	[kW]	40,50
Declared energy efficiency ratio	$EER_{DC,B}$		5,97
Parameters at rating point C			
Rated refrigeration capacity	P_C	[kW]	224,38
Rated power input	D_C	[kW]	30,50
Declared energy efficiency ratio	$EER_{DC,C}$		7,35
Parameters at rating point D			
Rated refrigeration capacity	P_D	[kW]	207,12
Rated power input	D_D	[kW]	27,50
Declared energy efficiency ratio	$EER_{DC,D}$		7,53
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C_{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	7,00

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

FR-W-G04-Z /1702			
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		7,10
Annual electricity consumption	Q	[kWh]	303292
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	290,77
Rated power input	D _A	[kW]	61,20
Rated energy efficiency ratio	EER _{DC,A}		4,75
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	271,41
Rated power input	D _B	[kW]	46,20
Declared energy efficiency ratio	EER _{DC,B}		5,87
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	252,03
Rated power input	D _C	[kW]	33,80
Declared energy efficiency ratio	EER _{DC,C}		7,45
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	232,64
Rated power input	D _D	[kW]	31,50
Declared energy efficiency ratio	EER _{DC,D}		7,38
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	7,00

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

FR-W-G04-Z /1902			
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		7,06
Annual electricity consumption	Q	[kWh]	347009
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	330,68
Rated power input	D _A	[kW]	69,90
Rated energy efficiency ratio	EER _{DC,A}		4,73
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	308,65
Rated power input	D _B	[kW]	52,40
Declared energy efficiency ratio	EER _{DC,B}		5,89
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	286,61
Rated power input	D _C	[kW]	39,50
Declared energy efficiency ratio	EER _{DC,C}		7,26
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	264,56
Rated power input	D _D	[kW]	35,60
Declared energy efficiency ratio	EER _{DC,D}		7,44
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	7,00

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FR-W-G04-Z /2002			
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		7,07
Annual electricity consumption	Q	[kWh]	390039
Parameters at full load and reference ambient temperature at rating point A			
Rated refrigeration capacity	P _A	[kW]	371,89
Rated power input	D _A	[kW]	78,00
Rated energy efficiency ratio	EER _{DC,A}		4,77
Parameters at rating point B			
Rated refrigeration capacity	P _B	[kW]	347,11
Rated power input	D _B	[kW]	58,30
Declared energy efficiency ratio	EER _{DC,B}		5,95
Parameters at rating point C			
Rated refrigeration capacity	P _C	[kW]	322,31
Rated power input	D _C	[kW]	43,70
Declared energy efficiency ratio	EER _{DC,C}		7,37
Parameters at rating point D			
Rated refrigeration capacity	P _D	[kW]	297,52
Rated power input	D _D	[kW]	40,60
Declared energy efficiency ratio	EER _{DC,D}		7,32
Other items			
Capacity control	fixed/staged/variable		Variable
Degradation coefficient for chillers	C _{DC}		0,9
GWP of the refrigerant		[Kg CO ₂ eq]	7,00

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



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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