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

Climaveneta **Technical Documentation**
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REGULATION (EU) N. 2016/2281 FOR COMFORT CHILLERS

Ecodesign requirements for cooling products

MULTIFUNCTION UNITS WATER SOURCE

ERACS2-WQ-G05 0802 - 1502

Cooling Capacity Range 349 - 349 [kW] - (EN14511 VALUE)
Nominal Cooling Capacity at TdesignC Range 349 - 349 [kW]

EN

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1. REGULATION (EU) N. 2016/2281 FOR COMFORT 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 comfort chillers and contains information required by Table 10 of the above-mentioned regulation, which is entitled “Information requirements for comfort 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

- Comfort chiller: a cooling product designed with the aim of attaining and maintaining the desired indoor temperature for the thermal comfort of human beings, whose evaporator extracts heat from a water-based cooling system designed to operate at leaving chilled water temperatures greater than or equal to +2°C.
- Rated cooling capacity (Prated,c): the cooling capacity of a comfort chiller when providing space cooling at standard rating conditions, expressed in kW.
- Low temperature application: application where the comfort chiller delivers its declared capacity for cooling at an indoor heat exchanger outlet temperature of 7°C.
- Medium temperature application: application where the comfort chiller delivers its declared capacity for cooling at an indoor heat exchanger outlet temperature of 18°C.
- Seasonal energy efficiency of the space cooling (ηs,c): ratio between the space cooling demand pertaining to the designated cooling season, and the annual energy consumption required to meet this demand, expressed in %.
- Seasonal Energy Efficiency Ratio (SEER): the overall energy efficiency ratio of the comfort chiller, representative for the cooling season, calculated as the reference annual cooling demand divided by the annual energy consumption for cooling.
- Degradation coefficient for chillers: measure of efficiency loss due to cycling of the chiller.
- Off mode: a condition in which the chiller is connected to the main power source and is not providing any function.
- Thermostat off-mode: condition corresponding to the hours with no cooling load and activated cooling function, whereby the cooling function is switched on but the chiller is not operational.
- Crankcase heater mode: condition in which a heating device is activated to avoid the refrigerant migrating to the compressor so as to limit the refrigerant concentration in oil when the compressor is started.
- Standby mode: condition where the chiller is connected to the mains power source and depends on energy input from the mains power source to work as intended. The unit provides only the following functions, which may persist for an indefinite time: reactivation function, or reactivation function and only an indication of enabled reactivation function, and/or information or status display.
- 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.
- Sound power level (LWA): the A-weighted sound power level, indoors and/or outdoors, expressed in dB.
- 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. CLIMAVENETA CONTENTS UNIT

2.1 Table index

MULTIFUNCTION UNITS WATER SOURCE

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Cooling Capacity Range 349 - 349 [kW]

Nominal Cooling Capacity at TdesignC Range 349 - 349 [kW]

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Outdoor side heat exchanger of chiller	air or water/brine		Water/brine
Indoor side heat exchanger chiller	water		Water
Type	compressor driven vapour compression or sorption process		Compressor driven vapour compression
Driver of compressor	electric motor or fuel driven, gaseous or liquid fuel, internal or external combustion engine		Electric motor
Rated cooling capacity	Prated,c	[kW]	348,9
Seasonal energy efficiency of the space cooling	ηs,c	[%]	196,0
Declared cooling capacity for part load at given outdoor temperatures Tj			
Declared cooling capacity at given outdoor temperatures Tj = 35°C	Pdc	[kW]	349
Declared cooling capacity at given outdoor temperatures Tj = 30°C	Pdc	[kW]	257
Declared cooling capacity at given outdoor temperatures Tj = 25°C	Pdc	[kW]	165
Declared cooling capacity at given outdoor temperatures Tj = 20°C	Pdc	[kW]	126
Degradation coefficient for chillers	Cdc		0,9
Declared energy efficiency ratio or gas utilisation efficiency/auxiliary energy factor for part load at given outdoor temperatures Tj			
Declared energy efficiency ratio at given outdoor temperatures Tj = 35°C	EERd	[%]	4,43
Declared energy efficiency ratio at given outdoor temperatures Tj = 30°C	EERd	[%]	5,41
Declared energy efficiency ratio at given outdoor temperatures Tj = 25°C	EERd	[%]	5,84
Declared energy efficiency ratio at given outdoor temperatures Tj = 20°C	EERd	[%]	5,80
Power consumption in modes other than "active mode"			
Off mode	POFF	[kW]	0,000
Thermostat-off mode	PTO	[kW]	2,736
Crankcase heater mode	PCK	[kW]	0,437
Standby mode	PSB	[kW]	0,437
Other items			
Capacity control	fixed/staged/variable		Variable
Sound power level, outdoor	LWA	[dB(A)]	97,0
GWP of the refrigerant		[Kg CO2eq]	631
For air-to-water comfort chillers: air flow rate, outdoor measured		[m³/h]	-
For water/brine-to-water chillers: Rated brine or water flow rate, outdoor side heat exchanger		[m³/h]	73
Standard rating conditions used:	low temperature application/medium temperature application		Low temperature application

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

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eco Changes 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