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Capacity evaluation for refrigerating unit coolers

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Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by The Japan Cooling Machines and Tools Association (JCA)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act. This edition replaces the previous edition (**JIS B 8610**:2002), which has been technically revised.

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Capacity evaluation for refrigerating unit coolers

1 Scope

This Japanese Industrial Standard specifies the details of capacity evaluation for direct expansion refrigerating unit coolers (hereafter referred to as unit coolers).

It is applicable to unit coolers using R410A and R404A refrigerants.

NOTE 1 This Standard provides specific figures and calculation methods for unit coolers using copper pipes of 9.52 mm, 12.70 mm and 15.88 mm in diameter that are fitted with smooth aluminium plate fins. Provided the manufacturer prepares the necessary data by testing, this Standard is also applicable to unit coolers that use other pipe sizes and are fitted with smooth aluminium plate fins or formed aluminium fins.

NOTE 2 The scope of this Standard is limited to "refrigerating" unit coolers so as to exclude air conditioning unit coolers with an evaporating temperature 0 °C or higher which, if included, would cause variation of performance according to the temperature and humidity conditions at the unit cooler inlet, and complicate the calculation formula and diagrams.

The heat exchanging part of a unit cooler is considered to be a dry heating surface without frosting.

2 Terms and definitions

For the purpose of this Standard, the following terms and definitions apply.

2.1

refrigerating capacity

result of multiplying the logarithmic mean temperature difference between the refrigerant evaporating temperature in pipe and the air temperatures at the inlet and outlet of the heat exchanging part of a unit cooler by the overall heat transfer coefficient and the effective external heating surface area [see Formula (1) given in Clause 5]

2.2

external heating surface area

total heating surface area on the ventilating side of a unit cooler [see Formula (4) given in Clause 5]

2.3

effective external heating surface area

effective heating surface area on the ventilating side of a unit cooler that results from the external heating surface area corrected by the fin efficiency and the fin contact efficiency

2.4