

New “KXZ series” Multi-split Inverter System Building Air Conditioners for Tropical usage with Top-Level Energy Efficiency



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Mitsubishi Heavy Industries Thermal Systems, Ltd. has developed new models of multi-split inverter system air conditioners for buildings in very hot regions, and started selling them in December 2015. The upper limit of the operable outside temperature has been elevated to 52°C from the previous KXZ standard level of 46°C. Enhanced efficiency and diversified options for operational control have realized better energy-saving capability. The features and specifications of the new models are introduced below.

1. Product features

(1) Expanded operable range

The upper limit of the operable outside temperature for cooling has been elevated to the dry-bulb temperature (DBT) of 52°C from the previous KXZ standard level of 46°C DBT. This was enabled by redesigned installation dimensions based on an analysis of airflow around the outdoor unit and the improved controllability of refrigerator oil recovery. Thus, our new models can operate under high load conditions.

(2) Extensive product line-up

Owing to the technological advancements and improvements for the combined use of more than one outdoor unit, the number of combinable outdoor units has been increased to three from the previous two. Accordingly, our product line-up now includes 14 models (previously 4 models) with the possible maximum horsepower (HP) being increased to 36 (**Table 1**).

Table 1 Product line-up

Nominal horsepower	8	10	12	16	18	20	22	24	26	28	30	32	34	36
KXZ series for tropical usage	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Conventional models (KXE6 series)		○		○		○								○

(3) Improved efficiency

The flow-path configuration of the outdoor unit heat exchanger was redesigned in the new models (in terms of the number of passes and tube layout). For the liquid-refrigerant distribution system, distributors were used instead of conventional headers to enhance the refrigerant distribution performance. The maximized capability of the heat exchanger has significantly improved the efficiency.

Concentrated winding motors were installed in the compressor to reduce power loss in the motor coils. A multi-port system was adopted for the compressor scroll mechanism to prevent the power loss caused by excessive compression. Thus, superior energy-saving performance has been made possible, especially in terms of the seasonal efficiency rating.

The cooling efficiency (when expressed by EER^{*1}) has also been improved by nearly 30% relative to the conventional value (in the case of 16 HP).

*1: EER stands for energy efficiency ratio, which is obtained by dividing the rated cooling capacity (kW) by consumed electricity (kW). (A higher EER indicates better energy efficiency.)

(4) Original energy-saving control system

The new models employ our original energy-saving control system, in which the number of compressor rotations is optimized based on the difference between the temperature in the room and the preset level of the air conditioners. With this system, the expected effect of power consumption reduction is roughly estimated to be a maximum of 34%. Other various attempts for energy conservation were also made, including power demand controllers with a three-stage control system (improved from the two-stage control system).

2. Product specifications

Table 2 shows the specifications of the new models.

Table 2 Specifications of KXZ series

Nominal horsepower			8	10	12
Model code			FDCB224KXZE1	FDCB280KXZE1	FDCB335KXZE1
Power source		—	3 phases 380-415V 50Hz/380V 60Hz		
Capacity	Rated cooling capacity	kW	22.4	28.0	33.5
	Rated heating capacity	kW	25.0	31.5	37.5
Electrical features	Rated cooling power consumption	kW	4.98	7.24	8.96
	Rated heating power consumption	kW	5.56	7.28	9.04
Dimensions (H×W×D)		mm	1 690×1350×720		
Operating sound pressure level (cooling/heating)		dB(A)	56/57	55/57	61/58
Refrigerant	Type	—	R410A		
Indoor unit	Connectable units	# of units	1-19	1-24	1-29
	Connectable capacity range	—	180-291	224-364	268-435