

NEW ECODESIGN DIRECTIVE

Shaping the future

For room air conditioners of up to 12 kW (Lot 10)



Information brochure for specialists, decision-makers and operators

Targets of the European Union	04
The directive in the context of the CE-certification	05
Efficiency and comfort	06
Energy efficiency label and measurement criteria	07
Climate zones for the heating mode	10
SCOP calculation	11
Important questions and answers on the directive	12
Inverter technology – the new trend technology	14
Product overview	15
Our promise to the environment	17

Shaping the future

Are you familiar with the ErP directive? No? It will change our day-to-day life, and it will alter the way energy usage by products is regulated in the entire EU. One example of this which has already received a lot of attention is the move to replace the use of conventional light bulbs with more energy efficient LED lamps and fluorescent tube lighting.

The environmentally friendly design of products in relation to their energy consumption is the aim of the European ecodesign – or, in short: ErP directive (Energy related Products). Across a variety of product categories new energy efficiency ratings will be introduced which will change our perspective on what we see as ‘environmentally friendly products’. Everything from PCs, vacuum cleaners, boilers and even windows will be affected by the new regulations.

From the 1st January 2013 a set of regulations for air-conditioning systems up to 12 kW will be introduced. Mitsubishi Electric’s energy saving air conditioning systems use future orientated technology and are already compliant with the new implementing measures under the ErP directive.

Actively participate in the design of the future by selecting and using energy-saving and future-oriented air conditioning systems!



The European Union has set high targets regarding the climate protection which are to be achieved by 2020. They are defined by the term '20-20-20 targets' which include a 20% cut in greenhouse gas emissions by 2020, a 20% increase in use of renewable energy by 2020 and a 20% cut in energy consumption through improved energy efficiency by 2020.

20 %

decrease in the consumption of primary energy

20 %

increase in renewable energy sources

20 %

decrease in CO₂ emissions

The European Union has set high targets

On 01 January 2013, the implementing measures regulation 2012/206/EU will come into force, which implements the requirements of the ErP directive 2009/125/EC for room air conditioners up to a cooling capacity of 12 kW or heating if the product has no cooling function. The intention is to promote an environmentally-friendly design of products by means of minimum energy consumption in order to reduce CO₂ emissions by 20 % by 2020.



A+++
The premium wall mounted unit (2.2 – 5.8 kW) combines the highest levels of energy efficiency with a perfect design.

It is obvious why the ErP directive now also includes air conditioning systems: Air conditioning technology has become part of our day-to-day lives. In summer, hardly anyone is willing to do without the comfort of an air conditioning system in the car, and more and more family house and property owners enjoy the benefits of an air conditioning system in their own four walls. The technical development of products over the past few years has already brought significant progress when it comes to energy efficiency; in particular, this is the case with well-known brand manufacturers such as Mitsubishi Electric.

Products with a particularly high level of efficiency and outstanding environmental characteristics may be labelled with the European Ecolabel. Products which fail to meet the minimum requirements are not CE marking compliant.



The ErP directive aims at supporting a sustainable, energy-efficient product design with suitable political instruments. Here, the framework directive stipulates which product groups may be affected and which framework conditions apply. Products relevant to energy consumption are affected if they meet the following criteria: an annual sales volume within the EU of at least 200,000 units; a significant environmental impact of the product, as well as a significant potential for improving the environmental impact at acceptable cost.

The classification into product groups is implemented in what is known as Lots (Lot 10 for room air conditioners up to 12 kW).

If the new minimum efficiency requirements are not reached, an import ban for the European Union takes effect. The import ban is based on one simple fact: in the future, the minimum efficiency requirements will be part of the CE conformity. Inefficient air conditioning systems which fail to meet the minimum requirements will no longer be granted the CE marking. Particularly efficient air conditioning systems, on the other hand, may be awarded the European Ecolabel.



Special awards
The European Ecolabel is awarded based on a comprehensive criteria which not only includes the individual characteristics of a product but its entire lifecycle, from environmentally compatible production up to the disposal stage.



Sound pressure level dB(A)
The sound pressure level is a sound field parameter which indicates the perceived operating noise of an internal unit within a certain distance.

Sound power level dB(A)
The sound power is an acoustic parameter which describes the source strength of a sound generator and is thus independent of the distance to the receiver location.

Focus on efficiency and comfort

In the future, new energy efficiency classes will apply. In addition to the most efficient energy efficiency class 'A' which has been the highest grade up until now, the scale will be expanded to include the classes A+, A++ and A+++.

Furthermore, consumers will receive more information which is relevant to their purchasing decision, for example on the noise level emitted from a split air conditioning system. For this purpose, the sound power level of the indoor and outdoor unit are indicated in decibels as an objective acoustic parameter. If the sound power parameter of an indoor unit is known, the sound emission may be calculated, taking into consideration the distance and the radiation characteristics. One benefit is the fact that independently of the location of usage and the measurement procedure of the sound pressure, it is possible to compare different air conditioning systems. Often, the sound pressure level is measured at a distance of approx. 1 m; here, modern split air conditioning systems are very quiet at an average of 21 decibels.

Cooling capacity ≤ 6 kW		Cooling capacity > 6 kW ≤ 12 kW	
Indoor unit	Outdoor unit	Indoor unit	Outdoor unit
60 dB(A)	65 dB(A)	65 dB(A)	70 dB(A)

Energy efficiency classes from A+++ to D
SEER in cooling mode

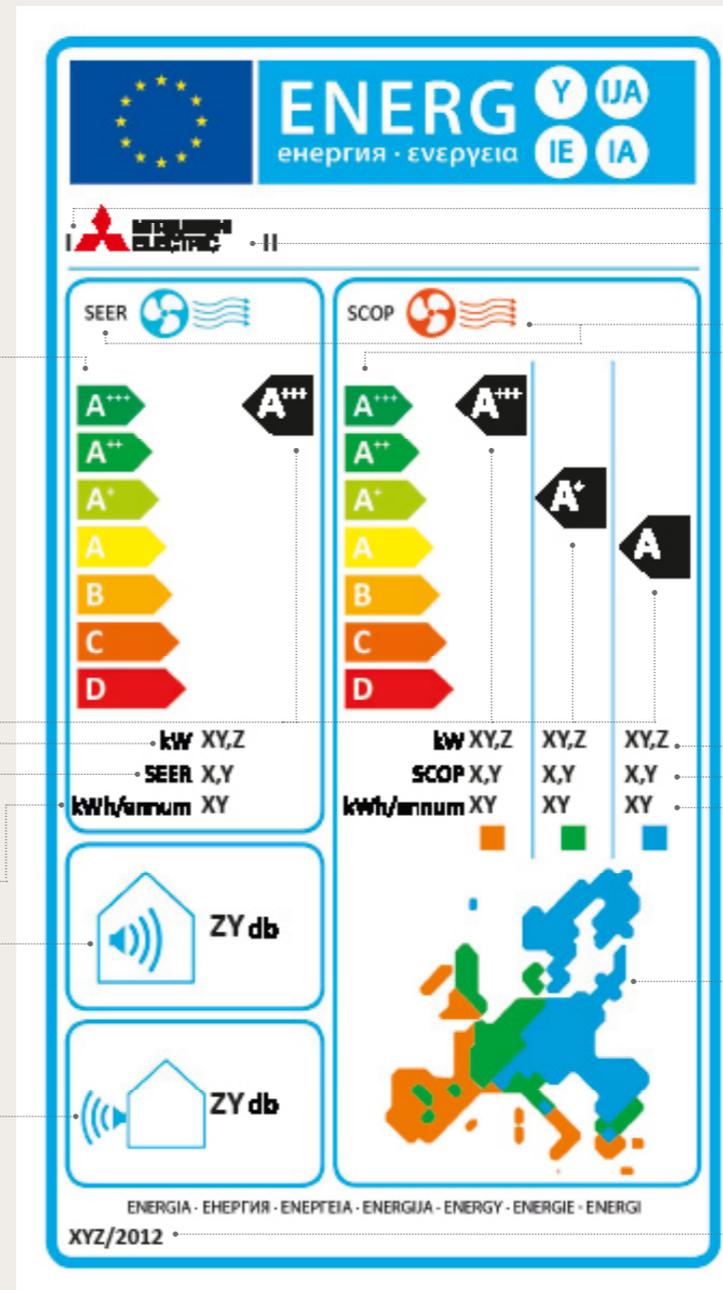
A+++	> 8,5
A++	> 6,1
A+	> 5,6
A	> 5,1
B	> 4,6
C	> 4,1
D	< 3,6

Energy efficiency class
Energy efficiency class in cooling and heating mode of the unit model

In the heating mode, the indication for the unit model is shown for all three climate zones.

Nominal capacity in cooling mode
SEER value
Annual power consumption for cooling

Operating noise, indoors/outdoors
When it comes to emission measurement, the sound power level is an important sound energy parameter for assessing a sound source since – contrary to the sound pressure – the sound power is independent of the location of the source and/or the receiver.
Maximally admissible are:



name or trademark of the manufacturer

name or type of the unit

SEER and SCOP

The SEER (Seasonal Energy Efficiency Ratio) value indicates the seasonal efficiency in cooling mode.
The SCOP (Seasonal Coefficient of Performance) value refers to the seasonal efficiency in heating mode.

Energy efficiency classes from A+++ to D
SCOP in heating mode

A+++	> 5,1
A++	> 4,6
A+	> 4,0
A	> 3,4
B	> 3,1
C	> 2,8
D	< 2,5

Nominal capacity in the heating mode

SCOP value

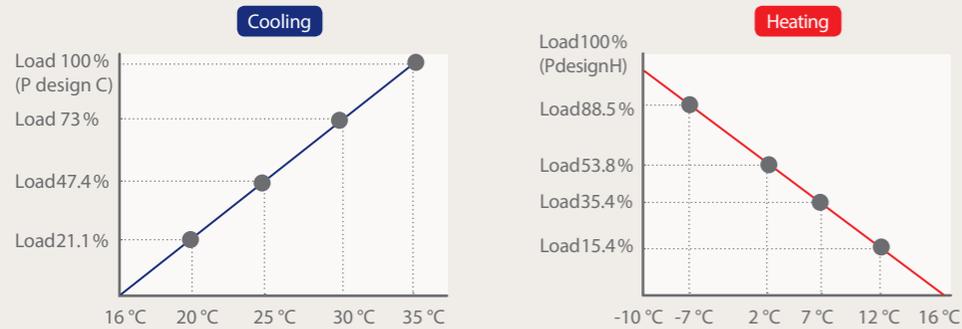
Annual power consumption for heating

climate zones

In the heating mode, the EU is divided into three climate zones for calculation and classification purposes. This aims at calculating the energy efficiency taking into consideration the actual regional ambient temperatures.

Time reference

Indication on label data



The new seasonal measurement procedure for the cooling and heating mode take the following aspects into consideration: four seasons, three EU climate zones in heating mode, partial load operation, thermostat-off consumption, stand-by consumption and crankcase heater. This assesses the energy efficiency using a realistic average usage rate for a split air conditioning system.

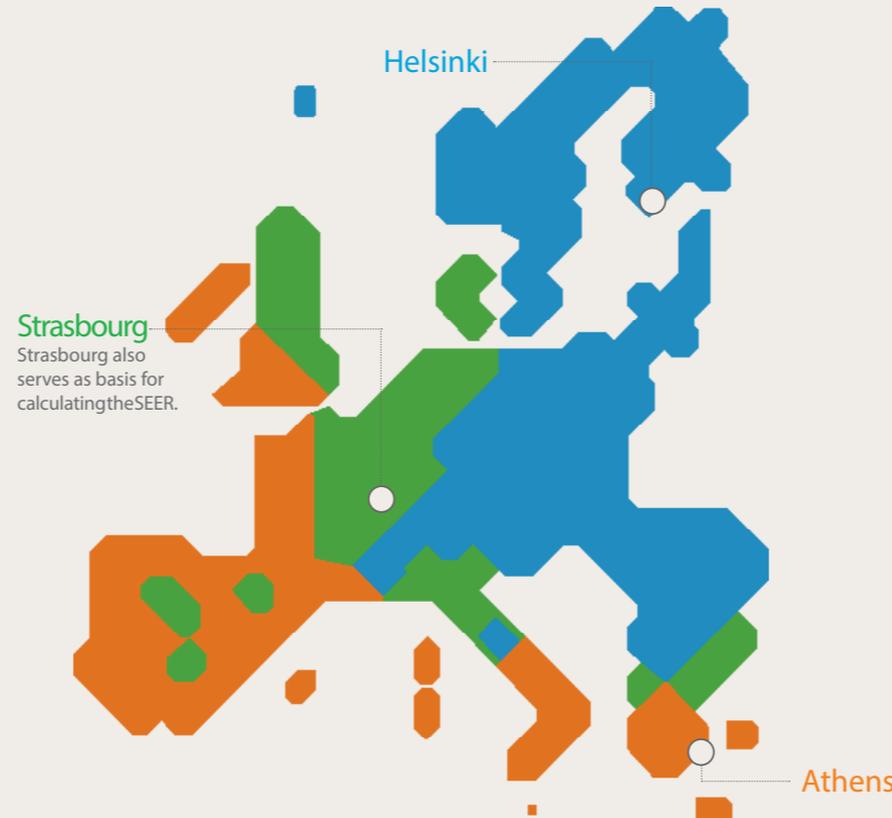
New things to come

The classification into individual energy efficiency classes will be re-regulated by the regulation 2011/626/EU supplementing directive 2010/30/EU with regard to energy labelling of air conditioners. Furthermore, the scale will be expanded to include three new classes: A+, A++ and A+++. Based on restructuring the measurement points and calculating the SEER and SCOP, this will result in changes with respect to the classification of the efficiency class for air conditioning systems which will be sold without technical modifications. This is what specialist planners and specialist craftsmen should explicitly pay attention to – even if they have used certain air conditioning systems over and over again – because the efficiency class may have changed by 01 January 2013.

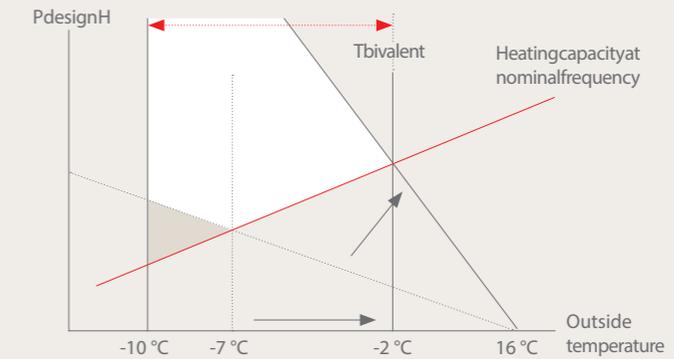
Furthermore, air conditioning systems will need to gradually meet a higher efficiency class every second year starting on 1 January 2013 with A to G and moving to A+++ to D by 1 January 2019.

More detail on the new stipulations can be found on the inside page.

Reference climate dates for three zones for calculating the SCOP
 Since the climate conditions have a great influence on the operating behaviour in the heat pump mode, three climate zones have been stipulated for the EU: warm, moderate, cold. The measurement points are homogenous at 12 °C, 7 °C, 2 °C and -7 °C.



Warm (Athens)			Moderate (Strasbourg)			Cold (Helsinki)				
Part load	Temperature conditions		Part load	Temperature conditions		Part load	Temperature conditions			
	Outdoors DB	Indoors WB		Outdoors DB	Indoors WB		Outdoors DB	Indoors WB		
–	–	20 °C	88%	-7 °C	-8 °C	20 °C	61%	-7 °C	-8 °C	20 °C
100%	2 °C	1 °C	54%	2 °C	1 °C	20 °C	37%	2 °C	1 °C	20 °C
64%	7 °C	6 °C	35%	7 °C	6 °C	20 °C	24%	7 °C	6 °C	20 °C
29%	12 °C	11 °C	15%	12 °C	11 °C	20 °C	11%	12 °C	11 °C	20 °C



SCOP calculation in the heat pump mode
 If T bivalent high
 ► P design H = high
 ► SCOP = low

The new parameters: SEER and SCOP

So far, air conditioning systems were assessed with EER and COP. EER evaluated the efficiency in the cooling mode. COP defined the efficiency – i.e. the ratio of consumed and output power – in the heating mode. So far, these values were exclusively oriented towards one single operating point. This led to manufacturers optimising their units to a single operational point and therefore being able to reach a higher efficiency class for the overall performance of the air conditioning unit which may not have been justified.

SEER and SCOP seek to address this problem by including seasonal variation in the performance rating. This means that several realistic measurement points are defined which all contribute to the classification into the respective energy efficiency class. In cooling mode, the measurement points are at an outside temperature of 20 °C, 25 °C, 30 °C and 35 °C. For the cooling mode, the climate data for Strasbourg was taken as a single reference point for the whole of Europe. In accordance with the temperature changes in Strasbourg, the individual measurement points were weighted differently. For instance, the part load operation of an air conditioning system which represents more than 90% of operation receives a correspondingly high weighting regarding the classification into the respective efficiency class.

For the heating mode, a comprehensive temperature profile for the whole of Europe could not be created. For this reason, three EU climate zones were defined – North, Central and South Europe – for which different load profiles were created. The measuring points are all homogenous at an outside temperature of 12 °C, 7 °C, 2 °C and -7 °C.

Technical terms with respect to the SCOP

P design H: corresponds to a heating load of 100%. The value depends on the selected bivalence point.

T design: outside temperature which determines the P design H point. The latter is determined from the area conditions.

T bivalent: Corresponds to the lowest temperature at which full heating performance can be achieved with the heat pump (without additional heating). This point can be freely selected within the prescribed temperature ranges (T design - T bivalent).

Questions and answers on the ecodesign directive



Today A, and tomorrow A +++?

► Due to the new measuring procedure, the classification of the energy efficiency is implemented with new classes. An air conditioning system which would achieve class A according to the current scale may fall into a significantly more unfavourable class according to the new energy labelling regulation for air conditioners. The minimum requirements do not have any influence on the classification of the units.

What are the benefits of the new ErP directive for specialists and users?

► Due to the three new efficiency classes, air conditioning systems can be better differentiated with respect to their efficiency.

Does the new ErP directive apply in all EU member states, or is there any grading?

► The implementation of the implementing measure regulation for air conditioners (Lot 10) will take place from 1 January 2013 and shall be binding in its entirety and directly applicable in all EU member states without any national transition periods.

Does the ErP also apply to stock articles?

► All air conditioning systems placed on the market (customs cleared) until the end of 2012 which remain in the stock of the manufacturer or the dealer may continue to be sold after 1 January 2013 as these products will not be affected.

What happens if air conditioning units of existing systems are partially exchanged?

► Existing air conditioning systems enjoy comprehensive inventory protection. If, for example, individual units are replaced due to technical defects, only the newly inserted products must comply with the stipulations of the ErP directive. Air conditioning systems which are not replaced are not subject to the stipulations of the ErP directive.

Who benefits from the new ErP directive, and who has a disadvantage?

► In particular, products with the new innovative inverter technology are among the winners in the area of air conditioning systems. The ErP directive will now ensure that the providers of inefficient units will lose their market access.

Will the new ErP directive trigger an efficiency boost with new air conditioning systems?

► Many of Mitsubishi Electric's air conditioning systems have strongly exceeded the current standards due to our future-oriented technology in the area of inverter technology. The difference in the energy consumption between a product which is currently rated as a top product and the future top classification A +++ can be huge. Energy consumption and energy costs for the user can be reduced by up to 70 %.



Energy-saving inverter technology



The most modern inverter technology ensures the highest levels of energy efficiency and comfort.

What is inverter technology? It is as simple as this: Conventional air conditioning systems only have two power stages: "on", with 100 % performance, and "off", with 0 % performance. This is not the case with full inverter air conditioning systems: power output corresponds to the demand. Naturally, this smooth adjustment consumes significantly less energy. Compared to conventional air conditioning systems, this technically sophisticated solution is initially connected with higher investment costs. However, when taking into consideration its reliability, comfort aspects, such as an extremely quiet and draught-free air conditioning, and – in particular – its operating costs, the full inverter technology is clearly more favourable.

With 25 years of experience in research, development and application in inverter technology, Mitsubishi Electric is the global technology leader in this area.

Quality has various forms

Single-split and multi-split air conditioning systems as well as our air/water heating pump systems have been developed with a focus on the new ErP directive – for today's future-oriented solutions which are fit for tomorrow.



Recognizable quality

German professional association "Fachverband Gebäude-Klima e.V. (FGK)" has awarded all split units with heat pump functions by Mitsubishi Electric the new seal of quality for room air conditioning units.

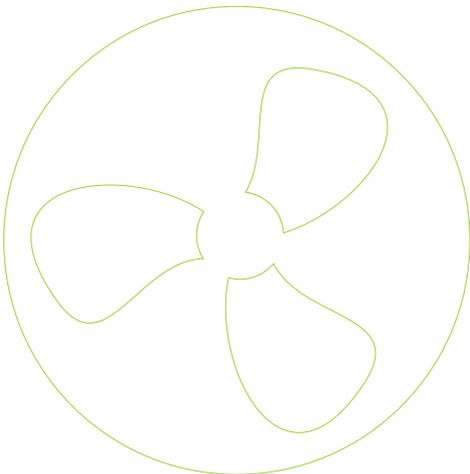
- Highest energy efficiency – only inverter units may be labelled with the seal of quality
- Guaranteed availability of replacement parts within two working days, replacement parts must be available for at least ten years
- Comprehensive range of training, planning support and complete documentation
- Guaranteed compliance with technical data in catalogues, performance data according to EN 14511

Shaping the future



For more than 90 years, Mitsubishi Electric has continuously set new standards in the area of air conditioning and heat pump technology, and is one of the leading global providers. In the framework of our Eco Changes Statement, we actively contribute to an ecologically responsible society and to environmental protection.

We are compliant with the new EU ecodesign directive, and have adapted our product range corresponding to the new seasonal measuring values. Order our product brochures for room air conditioners, split systems and air-to-water heat pumps now – our products will convince you with their excellent energy efficiency parameters!



Active environmental protection: our 2021 environmental vision

Climate protection is an important global issue, which will play an active role in shaping our future. Mitsubishi Electric has a long history of reducing CO₂ emissions using advanced technology and highly energy-efficient products. This tradition is set to continue into the future as a result of the company's Environmental Initiative 2021. As part of this initiative, we undertake to protect the climate on a long-term basis, with the aim of achieving a 30 % reduction in CO₂ emissions worldwide by 2021 by preserving our natural resources in production processes and product use, and through recycling. But that, of course, is not all because we shall also continue to devote ourselves to the development of further innovative products – for the sake of the environment.



The environmental statement of Mitsubishi Electric Group

"Eco Changes" is the driving force behind the environmentally oriented management of Mitsubishi Electric. It is our aim to always strive at a greener future by means of innovative environmental technology and production know-how. With a range of technologies and activities for households, offices, production plants, infrastructure and even outer space, we contribute to creating a sustainable society.

Referring to the company slogan "Changes for the Better", which reflects our desire to continuously optimise our company, "Eco Changes" expresses Mitsubishi Electric's desire to create a better environment together with our customers.

