

Information Guide

The Ecodesign Directive for Energy Related Products (ErP)

ISSUE 44





Guide to the Ecodesign Directive for Energy Related Products (ErP)

This is an independent guide produced by Mitsubishi Electric to enhance the knowledge of its customers and provide a view of the key issues facing our industry today. The Guide accompanies a series of seminars, all of which are CPD accredited.



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The Ecodesign Directive for Energy Related Products (ErP) is European legislation adopted in 2009 to improve the environmental performance of any products that use energy or that are related to energy consumption. Energy Using Products (EuPs) cover a broad range of equipment: any product that uses, generates, transfers or measures energy, whether electricity, gas or fossil fuel.

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The Ecodesign Directive for Energy Related Products (ErP)

The ErP Directive encompasses products from televisions and computers to air conditioning, boilers and transformers. But the ErP also includes products that have an impact on energy consumption and energy savings such as windows, insulation material, shower heads and taps.



This is a wide-reaching piece of legislation that affects any manufacturer selling products in Europe – and anyone specifying and installing that equipment. The aim of the Directive is twofold: to raise awareness among consumers about the energy efficiency of products through accurate energy labelling; and to direct manufacturers to make their products more energy efficient from the design phase. This stage is very important because the EU estimates that 80% of all product-related environmental impacts are determined during product design. Since the ErP covers such a broad range of products, they have been divided into 'lots'. The legislation has come into force for each lot over a number of years. From 1st January 2013 air conditioning units less than 12kW, which fall into ENER Lot 10, will be affected.

Enforcement of the ErP will be based on a number of criteria, including achievement of minimum efficiency levels for each type of product. In the UK the enforcement body will be the National Measurement Office, which has several recourses to action for

non-compliance including stop notices and fines.

Most significantly, the ErP will link energy labelling to CE certification. This means that if a product does not meet the minimum requirements of ErP regulations, then it may fail to achieve CE certification and the EU will impose an import ban.

However, if the equipment is very energy efficient it will not only be passed under the ErP rules, but also awarded the European Ecolabel, with its distinctive flower logo. This certification is awarded to products that are energy efficient from production through operation to disposal.

Introduction of the ErP for Lot 10 will not be staged across Europe, or have a transition period: the rules come into force on 1st January 2013 across the whole of the EU. Stocks imported from outside the EU until the end of 2012 will not be affected.

Existing installed air conditioning systems are not required to meet the new rules. And in the case of refurbishment of such systems, only newly installed products have to meet the standards of the ErP Directive.

The Directive is a powerful piece of legislation that will have an impact on how consumers and businesses purchase energy-using products.

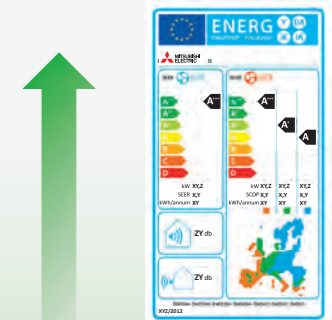
Its effects are already being felt by consumers in the ban on conventional light bulbs and their replacement by energy-efficient LED lamps. And although we are all by now familiar with the energy labelling of items such as freezers and washing machines, the ErP will make these labels more detailed and informative. It should be noted other areas in the air conditioning, heating and ventilation markets are also being consulted in separate lots - such as air to water heat pumps, motors and fans, compressors and air conditioning units greater than 12 kW. The next part of this Guide explains how ErP labelling will work.

✓ The energy label will be part of the CE conformity
Units featuring a particularly high efficiency can be labelled with the Ecolabel flower.

✗ Inefficient units are no longer CE compliant



Inefficient products below the minimum requirement



Not CE compliant

ErP: Performance requirements and new labelling scheme

The labelling of products to indicate their energy efficiency is by now well-known to consumers. However, with the introduction of the ErP Directive, labels are set to become much more detailed.

From 1st January 2013, air conditioning units under 12kW will have to meet the requirements of the ErP. And the energy labels they carry will also change. The example below shows how the new labels will show detailed information on product performance.

The ErP considers three characteristics of this type of air conditioning unit:

1. Standby/off mode power consumption
2. Seasonal performance
3. Sound power levels

In 2005 it was estimated that 3.7 billion products had standby/off modes consuming €6.4 billion in electricity. By 2020 it is estimated that there will be 4.6 billion of these products, so reducing consumption during standby time is an opportunity to reduce EU energy consumption significantly.

At the present time, product energy labels show full-load efficiency at a single temperature condition. Although this label has been widely accepted at industry level, it is not necessarily a realistic picture of how products perform in operation.

The new labels will therefore show Seasonal Energy Efficiency Ratings (SEERs) relating to cooling; and Seasonal Coefficient of Performance (SCOP), which relates to heating.

Furthermore, the label will indicate how the product performs in heating mode across three different temperature zones: warm, moderate and cold. Sound power levels will also be shown on labels where appropriate. For a split system the sound power levels of the indoor and outdoor units will be indicated.

The new label also shows that in addition to the A to G ratings there are now additional A+, A++ and A+++ ratings, related to the system's seasonal performance.

This is a very important point. The extension of the ratings scale, and the new SEER and SCOP measurements mean that the efficiency class of some air conditioning units may change. Specifiers and installers should bear this in mind from January 2013, even when purchasing equipment they have used previously. A product which is currently in the 'A' category, may not reach that standard or may exceed it from January 2013.



New energy efficiency label

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

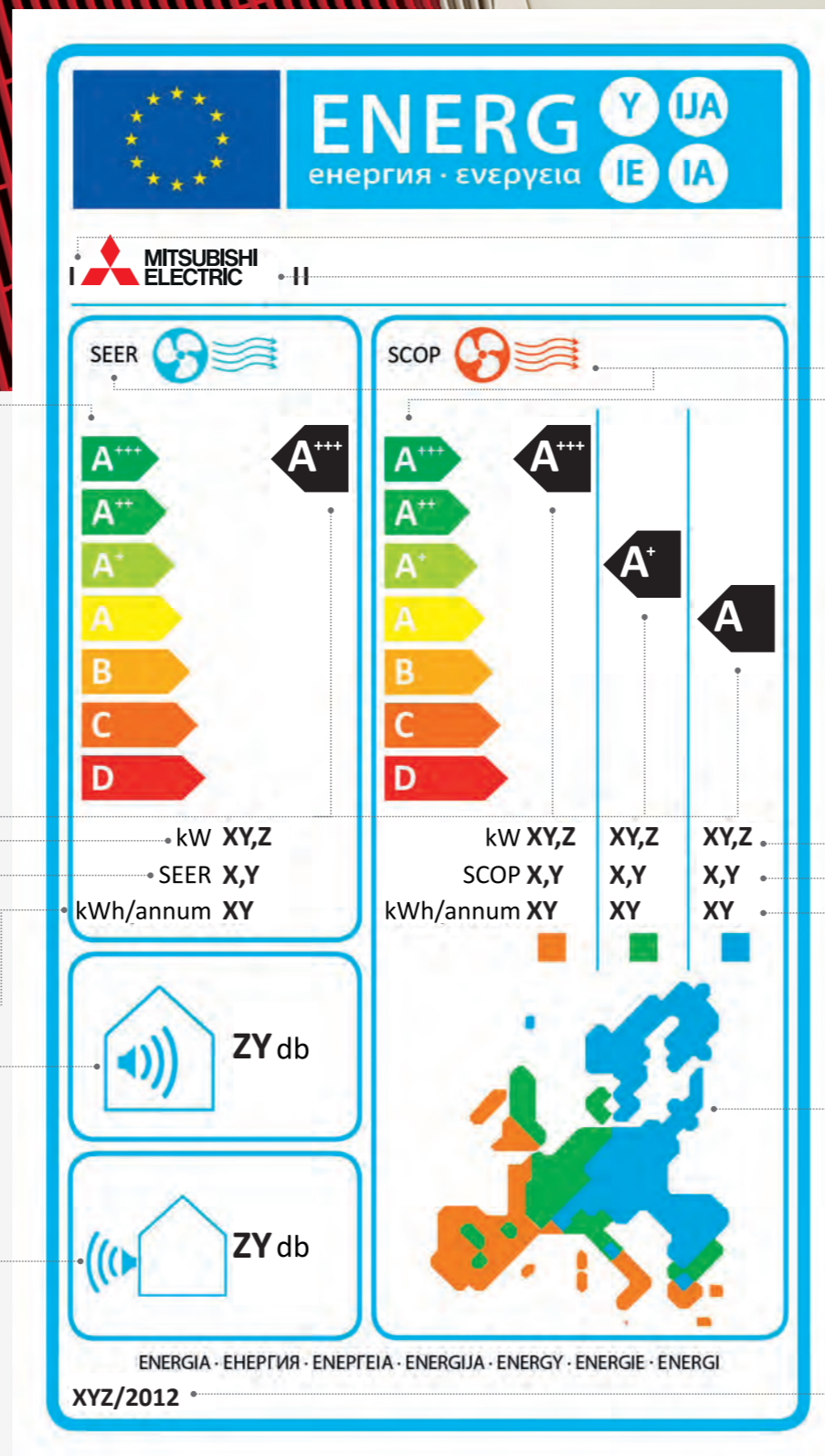
Annual power consumption for cooling

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:

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



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

ErP and air conditioning – New standards for performance

Air conditioning is regarded as a significant user of energy in buildings across the EU. The ErP is focusing on this area in a bid to reduce overall energy consumption, and to accelerate market transformation to more energy-efficient products.

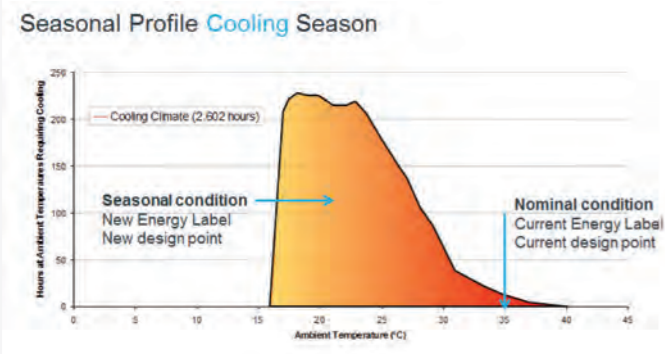


Fig 1. SEER shows a more realistic view of how air conditioning units perform at different loads in cooling mode

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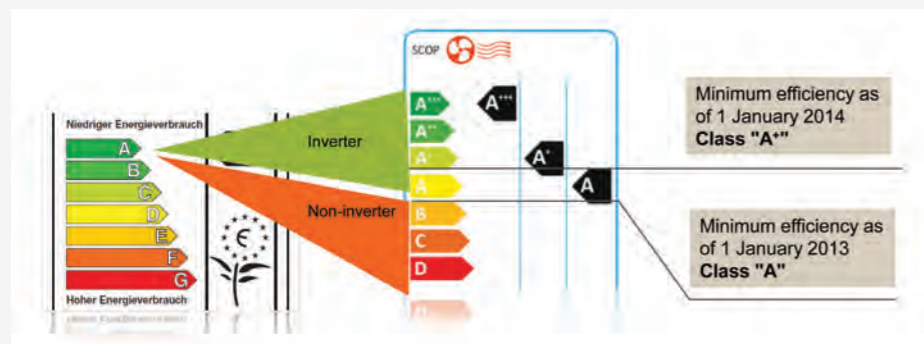


Fig 3. Seasonal efficiency labelling for heating operation.

In many ways, the ErP reflects the changing technology of air conditioning. Today's appliances have surpassed the existing 'A' rating on labels, so a new method of measuring performance accurately is necessary.

The new method is based on European Standard BSEN14825:2012.

Seasonal energy efficiency is an important part of the ErP. Until now, energy efficiency labelling only recorded efficiency in heating or cooling mode at a single heating or cooling load. Nor did it reflect the differing climates across Europe when considering performance in heating mode. The new labelling system will introduce performance data at four different measuring points as well as allowing for the different climactic conditions across Europe.

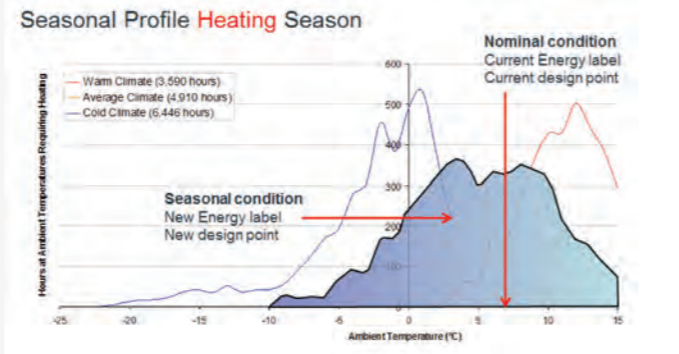


Fig 2. SCOP shows seasonal performance in heating mode.

Importantly, the new seasonal efficiency ratings take much better account of the developments in inverter technology. Non-inverter equipment that currently achieves an A rating will be moved down the scale, to a maximum of a B rating. The diagram in figure 3 on page 10 shows how the new label will emphasise the importance of inverters.

The seasonal coefficient of performance (SCOP) will also take into account performance at different heating loads. The SCOP calculation also includes a view of the different temperature zones across Europe, as shown in the map below. It should be noted that the UK falls into two zones.

Reference climate dates for three zones for calculating the SCOP

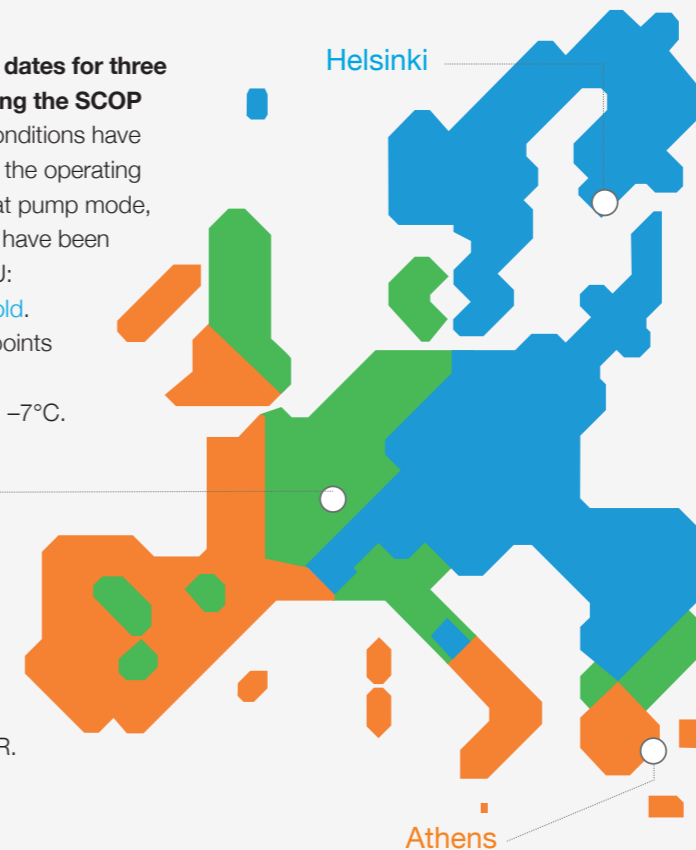
Since the climate conditions have a great influence on the operating behaviour in the heat pump mode, three climate zones have been stipulated for the EU:

warm, moderate, cold.

The measurement points are homogenous at 12°C, 7°C, 2°C and -7°C.

Strasbourg

Strasbourg also serves as basis for calculating the SEER.



Warm (Athens)			
Temperature conditions			
Partial load	Outdoors		Indoors
	DB	WB	DB
—	—	—	20°C
100%	2°C	1°C	20°C
64%	7°C	6°C	20°C
29%	12°C	11°C	20°C

Moderate (Strasbourg)			
Temperature conditions			
Partial load	Outdoors		Indoors
	DB	WB	DB
88%	-7°C	-8°C	20°C
54%	2°C	1°C	20°C
35%	7°C	6°C	20°C
15%	12°C	11°C	20°C

Cold (Helsinki)			
Temperature conditions			
Partial load	Outdoors		Indoors
	DB	WB	DB
61%	-7°C	-8°C	20°C
37%	2°C	1°C	20°C
24%	7°C	6°C	20°C
11%	12°C	11°C	20°C

The Directive for ENER Lot 10 states that air conditioners under 12kW will have to satisfy minimum SCOP and SEER levels, depending on the refrigerant global warming potential (GWP). It should be noted that most air conditioning systems less than 12kW contain refrigerants with a GWP of more than 150. The table below shows the requirements where SCOP is based in the moderate temperature range:

	Min SEER	Min SCOP
If GWP of refrigerant is > 150	3.60 (D Rating)	3.40 (A Rating)
If GWP of refrigerant is < or = 150	3.24	3.06

A key point to bear in mind is that minimum SEER and SCOP levels will be increased again in 2014 and for each subsequent year until 2019.

Further information

If you missed the CPD seminar on **The Ecodesign Directive for Energy Related Products (ErP)** you can call your Mitsubishi Electric Regional sales office to arrange an in-house presentation of this information.

If you would like to receive invitations to future CPD events, please email lesmarcomms@meuk.mee.com

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