City Multi VRF and Hybrid VRF Seasonal Efficiency Explained

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This Mitsubishi Electric guide gives an overview of the **Ecodesign Directive for Energy Related Products (ErP).**

The guide details how air conditioning products are affected by ErP in terms of manufacturing, testing and reporting.

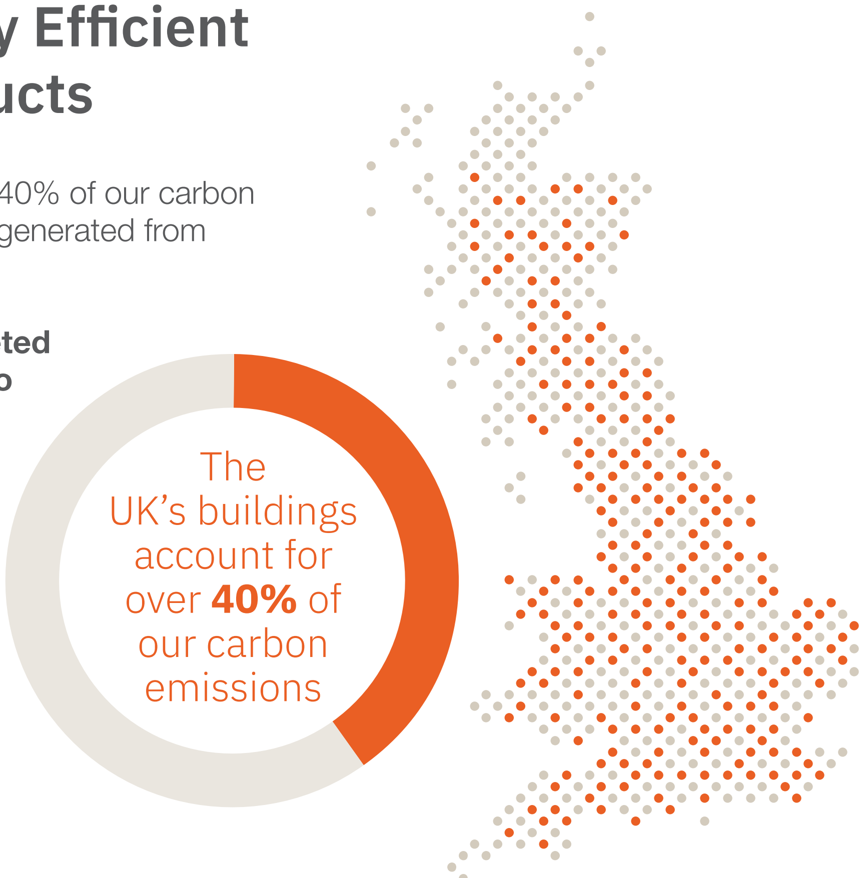
In addition, it covers the calculation of seasonal efficiency under EN14825, including a comparison between this EN standard and Part L of the UK Building Regulations.

The Need for Energy Efficient Buildings and Products

The UK's buildings account for over 40% of our carbon emissions, and nearly 90% of this is generated from heating and cooling systems.*

The whole industry is being targeted to create greener buildings and to kit them out with HVAC systems which provide the very best, long-term performance in terms of energy efficiency, ease of service and maintenance, as well as occupant wellbeing.

The use of more energy efficient equipment means that operational costs are lowered and the impact on the environment is reduced - helping us all adhere to corporate and social responsibility directives.



*Source: UK Green Building Council

Ecodesign Directive for Energy Related Products

The Ecodesign Directive for Energy Related Products (ErP) is a European legislation designed to improve the energy efficiency of all products which “generate, transfer or measure energy” - whether through electricity, gas or other fossil fuel.

Introduced in 2009, the ErP legislation covers a broad range of domestic and commercial products including everything from televisions and fridges to boilers, heat pumps and air conditioning systems.

The Ecodesign Directive deals with all aspects of product performance, from manufacture to transportation to market, use and disposal. When considering how to reduce the impact of a product, the EU considers those stages of a product’s lifecycle that have the most impact on the environment.

In particular for HVAC products, Ecodesign ErP sets out to:

1 **Compel manufacturers to make and sell products that meet strict energy performance criteria by defining Minimum Efficiency Performance Standards (MEPS) for seasonal efficiency during operation.**

Products that do not meet this minimum seasonal efficiency cannot be sold in the EU. A product that does not meet the criteria of the ErP will not receive a CE conformity label. The ErP applies equally to products manufactured outside the EU, which cannot be imported without the CE conformity label.

2 **Accelerate market transformation to more energy efficient products - energy labels must be applied to all products under 12kW, to allow the customer to view and compare energy efficiency data between similar products and technologies.**

The use of energy labels has proved very successful and now customers expect to see labels on all fridges, televisions and other electrical appliances. CO_2 emissions from primary energy consumption are reflected in this labelling to allow consumers to compare products using different energy sources, for example fossil fuel systems compared to electric systems.

3 **Define a robust, accurate and transparent seasonal efficiency calculation method that all manufacturers must adhere to.**

All manufacturers must produce datasheets or “product fiches” in a uniform way showing part load efficiencies and confirming MEPS has been achieved. These fiche documents must be available on a public platform i.e. on the manufacturer’s website.

The extensive range of products covered by ErP is broken down in to "Lots". Below are the Lots relevant to our air conditioning systems.

ErP Lot 10:	Air conditioners < 12kW (mainly split systems) - January 2013
ErP Lot 1:	Boilers, heat pumps - September 2015
ErP Lot 21/6:	Comfort chillers, air conditioners > 12kW (VRF) - January 2018

The ErP applies only to new products installed from 1st January 2018 - whether in a new-build project or as part of an upgrade or refurbishment. Products which are already installed and in-use do not have to be replaced if they do not meet the MEPS for their particular lot.

How efficient is a product?

HVAC products will vary performance over the changing seasons and application conditions. Peak heating or cooling output is required for less than 10% of the year.

Seasonal Efficiency takes in to account the energy efficiency of the system at varying temperatures and partial loads over the course of a year.

Therefore it is widely accepted that seasonal energy efficiency is the most appropriate and accurate efficiency figure to use when assessing how a heating or cooling system will perform when installed in a building.

Seasonal efficiency numbers are defined as:

SEER	Seasonal Energy Efficiency Ratio for Cooling
SCOP	Seasonal Coefficient of Performance for Heating

Using a plants SEER or SCOP has been widely adopted in the UK HVAC industry to build energy models, run cost calculations and ensure products meet the MEPS of their ErP Lot.

Setting the Standard - MEPS

One of the most significant aspects of the ErP is that it requires measurement of the efficiencies to be carried out by manufacturers to agreed national and European standards.

As part of the Brexit transition, Part L is likely to be updated to incorporate the Lot 21/6 EN14825 methodology.

These standards are set out in the Official Journal of the European Union (OJEU), and they provide a 'presumption of conformity with the Regulations.' The MEPS required for products are widely agreed to be very demanding.

For air conditioning outdoor units, they must meet the MEPS for seasonal energy efficiency listed below:

	Minimum efficiency: 1/1/2018		Minimum efficiency: 1/1/2021	
	Cooling	Heating	Cooling	Heating
Air-to-air air conditioners, driven by an electric motor, except rooftop air conditioners	181% (4.60)	133% (3.40)	189% (4.80)	137% (3.50)

Information from Official Journal of the European Union, EU 2016/2281, Annex II Tables 3 and 4.

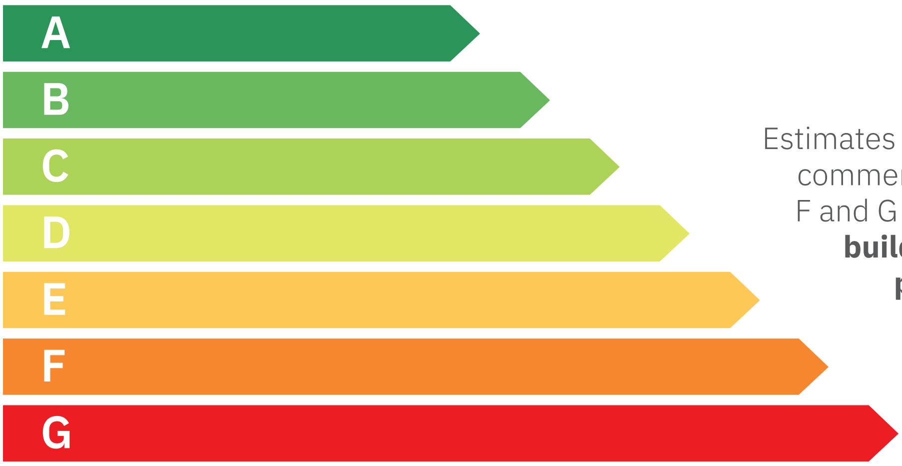
Cooling capacity and Global Warming Potential (GWP) of the refrigerant are also taken into account when setting these minimum targets. It is important to note that the requirements of the ErP are very specific, and compliance with the directive may or may not apply to a product depending on how it is used in a project.

There are detailed guidelines to accompany Regulation 2016/2281 that offer more in-depth advice on how the energy efficiency measures should be applied to a type of product.

Why ErP and energy labelling matter today

The standards set by the ErP have already had a significant impact on the products that are available to specifiers. Products such as chillers, which can be a large proportion of energy consumption in buildings, have undergone major developments by manufacturers in order to optimise energy performance.

The energy labelling of products under 12kW, together with technical product fiches, means that comparing and specifying for energy efficiency has never been easier; particularly as all products must be assessed using the same methodology. This is especially important for existing commercial buildings, as from 1st April 2018 the new Minimum Energy Efficiency Standards for buildings came into force. **It is now illegal to let a building which has an Energy Performance Certificate (EPC) rating below E**.



Estimates are that around 20% of the UK's commercial building stock falls into the F and G EPC categories - **making those buildings valueless in terms of potential rental income**

Building owners looking to improve their energy efficiency can easily compare and specify equipment which offers the best possible performance.

The emphasis on the energy performance of products will become even more prominent moving forward. Specifiers can now rely on reputable manufacturers to supply them with the data and support required to select products and systems which provide the best long-term energy performance for their application.

It is important to note that when EU regulations are transposed at the time of the UK's exit from the European Union (known as the Great Repeal Bill), the ErP Directive is likely to become part of UK law.

Different methods for efficiency calculation - not just a number

There are 2 different methods for calculating seasonal efficiency: **EN14825** - which underpins ErP and is laid out by the European Commission and **Part L** - which is a component of the UK Building Regulations.

Each method has been deemed as the correct or preferred calculation for a particular application. **Building contractors, owners and end users need to demand clarity and confidence around how their HVAC equipment will perform in the real world.**

EN14825 - Overview

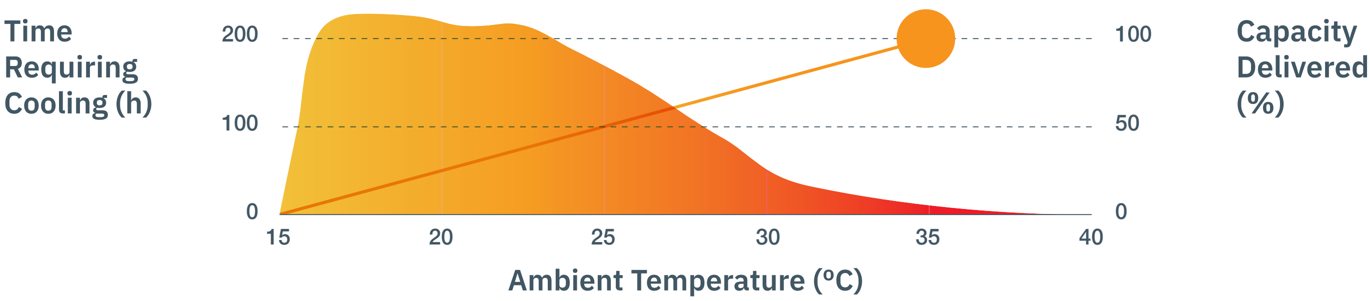
The EN14825 standard covers 'Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors,for space heating and cooling - Testing and rating at part load conditions and calculation of seasonal performance.'

Performance at different part load conditions is the critical component of EN14825. Part load conditions reflect different ambient conditions to determine the performance of products across the year; hence an accurate seasonal efficiency is produced. Products that use inverter technology are able to perform better under part load conditions. Manufacturers are focused on improving efficiency of their products under part load conditions as they will have higher SEER and SCOP figures under EN14825 and provide better real world performance.

EN14825 is a detailed calculation method that takes into account all power consumption of the system at all times, including standby power when the system is off. Power consumption of indoor units is not taken into account to allow VRF and chiller systems to be assessed in the same way. The calculation method also allows for cycling of the system at the part load conditions and any supplementary heaters.

EN14825 - Cooling

EN14825 uses the number of hours that is spent at each degree Celsius in a cooling season. Indoor temperature conditions are 27°CDB/19°CWB.



The 100% load condition is 35°C outdoor temperature. This is the same as nominal or rated conditions as indicated by the orange circle. We have a linear capacity profile and on average, below 15°C we no longer need cooling. The standard calls for equipment to be tested at 100%, 75%, 50% and 25% part load conditions. These relate to 35, 30, 25 and 20 degrees Celsius ambient temperature respectively. At these four conditions the capacity and power input are tested and are used to calculate a spot EER. Each individual 1° increment is then given a calculated EER. **Example:**

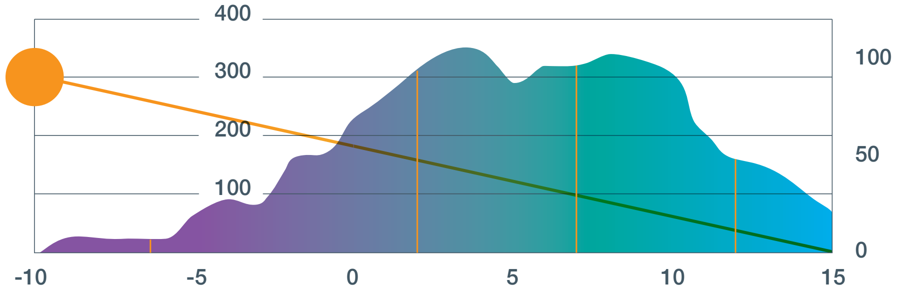
Ambient Temp (°C)	Hours	kW Out	kWh Out	EER	kWh In
35	**13**	**20**	**260**	**3.0**	**87**
34	17	19	323	3.1	104
33	24	18	432	3.2	135
32	31	17	527	3.3	160
31	39	16	624	3.4	184
30	**63**	**15**	**945**	**3.5**	**270**

SEER = total kWh out / total kWh in

The number of hours is multiplied by the spot capacity at each condition to give energy delivered at the particular ambient temperature. The EERs are used to calculate energy consumed. These figures are totalled to give an SEER when the unit is operating in cooling mode.

EN14825 - Heating

The “average” temperature/time profile is used for the UK heating season; we have many more hours between 2°C and 7°C. Indoor temperature condition is 20°CDB.



The calculation for heating is very similar to cooling. A design condition is selected at -10°C as the 100% value. Four points are then selected at -7°C, +2°C, +7°C and +12°C for part load conditions. The COPs are used to calculate energy consumed. These figures are totalled to give an SCOP when the unit is operating in heating mode. **Example:**

Ambient Temp (°C)	Hours	kW Out	kWh Out	COP	kWh In
-7	**24**	**20**	**480**	**3.0**	**160**
-6	27	19	513	3.1	165
-5	68	18	1224	3.2	382
-4	91	17	1547	3.3	469
-3	89	16	1424	3.4	419
-2	165	15	2475	3.5	707
-1	173	14	2422	3.6	673
0	240	13	3120	3.7	843
1	280	12	3360	3.8	884
2	**320**	**11**	**3520**	**3.9**	**903**

SCOP = total kWh out / total kWh in

Indoor Units

ErP Lot 21/6 specifies the following quantities of equal sized indoor units when connected to the VRF outdoor unit for EN14825 testing:

Outdoor Unit	200	250	300	350	400	450	500	550
kW (Cooling)	22.4	28.0	33.5	40.0	45.0	50.0	56.0	63.0
Indoor units	4	4	6	6	6	6	8	8

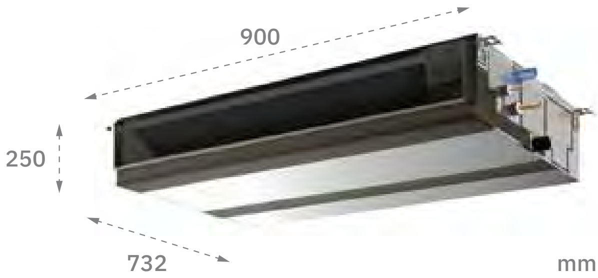
The indoor unit type and design is not specified in the Lot standard. Different indoor unit types and designs will produce different SEERs and SCOPs when the system is assessed under EN14825. Larger indoor units delivering a relatively small capacity will lead to higher seasonal efficiencies for the system.

Mitsubishi Electric has produced EN14825 seasonal efficiency data for VRF and Hybrid VRF air conditioning systems using two different types of indoor unit. Providing extensive seasonal efficiency data will help address the varied needs of our customers and end users.

Indoor unit type 1 | PEFY-VMA - standard ducted indoor unit | 5kW model VRF

Seasonal efficiencies calculated with these indoor units are "real world" data. PEFY-VMA models are the best-selling type of indoor unit and used in numerous applications.

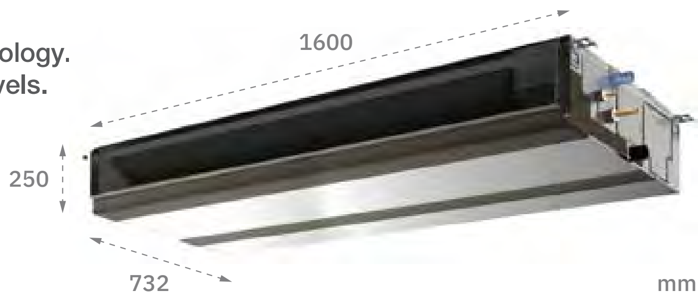
SEER and SCOP figures calculated using these indoor units can be used to determine run costs and whole life cycle system costs.



Indoor unit type 2 | PEFY-VMA3(2) - high efficiency ducted indoor unit | 5kW model VRF

These indoor units have been designed to optimise seasonal efficiencies within the test standard methodology. As a result they give the 'best possible' efficiency levels.

High efficiency models are wider than their equivalent standard version and therefore may not be suitable for the same real world applications. Performance figures calculated with these models can be used to compare SEER and SCOP values between our product ranges.



Both types of indoor units are available to purchase from Mitsubishi Electric UK.

Providing EN14825 seasonal efficiency data using both types of indoor units allows our customers to compare the efficiency of our systems against all other manufacturers. The specification and performance data for both indoor model types is available in the Mitsubishi Electric data book and product information sheets, found in our document library: **library.mitsubishielectric.co.uk**

Primary Energy

As different technologies and product types are grouped together in the same lot, Ecodesign normalises the seasonal efficiencies of each product by considering "primary energy".

This enables fossil fuel heating and cooling products to be directly compared to electrically driven products when considering efficiency and CO_2 emissions.

"Seasonal space cooling energy efficiency" - ηsc (%) and **"Seasonal space heating energy efficiency" - ηsh (%)** are normalised primary energy efficiencies that must be calculated for all products.

The calculations for electrically driven air to air heat pumps are as follows:

$$\eta sc = ((SEER/2.5)-0.03) \times 100$$

$$\eta sh = ((SCOP/2.5)-0.03) \times 100$$

The conversion coefficient of 2.5 represents electricity generation efficiency at 40%. There is also a 3% deduction for end user temperature control.

ErP Lot 21/6 demands a Minimum Efficiency Performance Standard (MEPS) for cooling products of ηsc > 189%.

The Product Fiches

Under ErP, all manufacturers must produce datasheets in a uniform way, showing heating and cooling efficiencies at part load conditions of their outdoor units. These datasheets must also show all ancillary power consumption, as well as details of the indoor unit used for the efficiency calculation under EN14825.

These datasheets are known as **'product fiches'** and must be available on a public platform such as the manufacturer's website.

ErP product fiches make like-for-like comparisons of different heating and cooling products much easier. Together with energy efficiency labelling, these fiches further enhance the transparency of system performance across the industry.

Product fiches for all Mitsubishi Electric heating and cooling products can be found here:
erp.mitsubishielectric.eu/erp

Product Fiches

VRF product fiches produced by Mitsubishi Electric use high efficiency ducted indoor units PEFY-VMA3(2).

Cooling PURY-EM200YNW-A1

Item	Symbol	Value	Unit
Rated cooling capacity	$P_{rated,c}$	22.40	Kw
Declared cooling capacity for part load at given outdoor temperatures T_j and indoor 27°/19°C (dry/wet bulb)			
T_j = +35°C	Pdc	22.40	kW
T_j = +30°C	Pdc	16.51	kW
T_j = +25°C	Pdc	10.61	kW
T_j = +20°C	Pdc	12.67	kW
Degradation co-efficient Air Conditioners**	C_d	0.25	-
Power consumption in modes other than 'active mode'			
Off mode	P_{OFF}	0.000	kW
Thermostat off mode	P_{TO}	0.071	kW

Item	Symbol	Value	Unit
Seasonal space cooling energy efficiency	$\eta_{s,c}$	259	%
Declared energy efficiency ratio or gas utilisation efficiency / auxiliary energy factor for part load at given outdoor temperatures T_j			
T_j = +35°C	EER_d	4.36	
T_j = +30°C	EER_d	6.53	
T_j = +25°C	EER_d	9.36	
T_j = +20°C	EER_d	7.73	
Crankcase heater mode	P_{CK}	0.035	kW
Standby mode	P_{SB}	0.063	kW

Heating PURY-EM200YNW-A1

Item	Symbol	Value	Unit
Rated heating capacity	$P_{rated,h}$	22.50	Kw
Declared heating capacity for part load at indoor temperatures 20°C and outdoor temperature T_j			
T_j = -7°C	Pdh	19.90	Kw
T_j = +2°C	Pdh	12.12	Kw
T_j = +7°C	Pdh	7.79	Kw
T_j = +12°C	Pdh	6.40	Kw
T_j = bivalent temperature	Pdh	22.50	Kw
T_j = operation limit	Pdh	12.10	Kw
For air to water heat pumps T_j = -15°C (if Pdh TOL<-20°C)	Pdh	-	Kw
Bivalent temperature	T_{biv}	-10.0	°C
Degradation co-efficient heat pumps**	C_{dh}	0.25	-
Power consumption in modes other than 'active mode'			
Off mode	P_{OFF}	0.000	Kw
Thermostat off mode	P_{TO}	0.071	Kw
Crankcase heater mode	P_{CK}	0.035	Kw

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	$\eta_{s,h}$	147	%
Declared coefficient of performance or gas utilisation efficiency / auxiliary energy factor for part load at given outdoor temperatures T_j			
T_j = -7°C	COP_d	2.40	
T_j = +2°C	COP_d	3.52	
T_j = +7°C	COP_d	5.39	
T_j = +12°C	COP_d	5.75	
T_j = bivalent temperature	COP_d	2.07	
T_j = operation limit	COP_d	1.85	
For air to water heat pumps T_j = -15°C (if Pdh TOL<-20°C)	COP_d	-	
For air to water heat pumps: Operation limit temperature	T_{OL}	-	°C
Supplementary heater			
Electric back-up heating capacity*	elbu	0.000	Kw
Type of energy input Standby mode	P_{SB}	0.063	Kw

Part L

Part L of the UK Government Building Regulations addresses the conservation of fuel and power in a building.

It outlines how building services such as air conditioning can help comply with carbon reduction targets. The Non-Domestic Building Services Compliance Guide (NDBSCG) sits alongside Part L and outlines technical information and calculations to help building professionals comply with planning regulations.

Both Part L and NDBSCG are advisory documents that give guidance and suggested methods of carbon reduction. In particular NDBSCG outlines a basic method of calculating the seasonal efficiency of air conditioning systems. Limitations of NDBSCG (Part L) seasonal efficiency calculations are as follows:

- No defined heating part load profile - heating SCOP cannot be calculated
- No specified indoor temperatures
- No standby power consideration
- No correction factors / calculations for system cycling
- Indoor unit model does not have to be specified

Part L Cooling

The calculation uses a weighted average of EERs to obtain SEER. As no indoor temperature is specified in the calculation method, Mitsubishi Electric uses 21°CDB/15°CWB for EER calculation. **Example:**

Part load condition	100%	75%	50%	25%
Ambient Temp (°C) dry bulb	35	30	25	20
EER	**3.0**	**3.5**	**4.0**	**4.5**
Weighting	3%	33%	41%	23%

SEER = 3.92

Heating Calculation

As no heating calculation is defined in the calculation method, Mitsubishi Electric uses ambient temperatures and weightings from EN14825 in a simplified form. Following the cooling method, Mitsubishi Electric uses a weighted average of COPs to obtain SCOP. Indoor temperature is taken as 20°CDB. **Example:**

Part load condition	100%	75%	50%	25%
Ambient Temp (°C) dry bulb	-5	3	9	15
COP	**3.2**	**3.5**	**4.0**	**4.5**
Weighting	5%	40%	45%	10%

SCOP = 3.81

As part of the Brexit transition, Part L is likely to be updated to incorporate the EN14825 methodology. Despite its current limitations, the Part L method for calculating seasonal efficiency is widely used in the UK. Mitsubishi Electric also publishes SEER and SCOP data calculated to the Part L standard using standard ducted indoor units PEFY-VMA for all VRF and HVRF outdoor units.

Standards Overview

Seasonal Efficiency		Best Possible	Standard	Part L
Testing Standard		EN14825	EN14825	NDBSCG (modified for UK conditions inc. heating)
Indoor Unit	VRF	High efficiency ducted PEFY-P(M)-VMA3(2)	Standard ducted PEFY-P(M)-VMA	Standard ducted PEFY-P(M)-VMA
	HVRF	High efficiency ducted PEFY-W-VMA2	Standard ducted PEFY-W-VMA	Standard ducted PEFY-W-VMA
Indoor condition - cooling		27°CDB/19°CWB	27°CDB/19°CWB	21°CDB/15°CWB
Indoor condition - heating		20°CDB	20°CDB	20°CDB
System standby power / cycling included?		Yes	Yes	No
Indoor unit power consumption included?		No	No	No

Product Data

R32 HVRF Heat Recovery - High Efficiency

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP	SEER (C)	SCOP	SEER (C)	SCOP
PURY-EM200YNW-A1	6.55	3.76	5.87	3.50	11.37	5.80
PURY-EM250YNW-A1	6.64	3.69	5.62	3.50	10.22	5.42
PURY-EM300YNW-A1 – 2 x main HBC	7.17	3.62	6.01	3.50	10.75	6.30
PURY-EM300YNW-A1 – 1 x main HBC	6.32	3.48	5.29	3.36	9.16	5.98
PURY-EM350YNW-A1 – 2 x main HBC	7.23	3.56	6.01	3.50	10.82	6.14
PURY-EM350YNW-A1 – 1 x main HBC	6.36	3.29	5.29	3.23	8.84	7.65
PURY-EM400YNW-A1	6.61	3.55	5.64	3.50	9.90	6.11
PURY-EM450YNW-A1	6.78	3.55	5.59	3.50	10.17	6.16
PURY-EM500YNW-A1	6.59	3.60	5.12	3.50	9.88	6.19

R32 HVRF Heat Recovery - Standard Efficiency

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP	SEER (C)	SCOP	SEER (C)	SCOP
PURY-M200YNW-A1	6.23	3.65	5.53	3.50	10.71	5.64
PURY-M250YNW-A1	5.90	3.59	5.28	3.50	9.60	5.32
PURY-M300YNW-A1 – 2 x main HBC	6.38	3.54	5.47	3.50	9.80	6.28
PURY-M300YNW-A1 – 1 x main HBC	5.61	3.32	4.81	3.28	8.35	5.97
PURY-M350YNW-A1 – 2 x main HBC	6.69	3.56	5.79	3.50	10.28	6.24
PURY-M350YNW-A1 – 1 x main HBC	5.88	3.29	5.10	3.23	8.39	7.77
PURY-M400YNW-A1	6.12	3.55	4.90	3.50	9.42	6.27
PURY-M450YNW-A1	6.56	3.54	5.17	3.50	10.09	6.23
PURY-M500YNW-A1	5.87	3.59	4.81	3.50	9.03	6.21

R410A HVRF Heat Recovery - High Efficiency

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP	SEER (C)	SCOP	SEER (C)	SCOP
PURY-EP200YNW-A1			5.58	3.52	10.81	5.50
PURY-EP250YNW-A1			5.34	3.24	9.67	4.88
PURY-EP300YNW-A1 – 2 x main HBC			4.85	3.17	10.23	5.67
PURY-EP300YNW-A1 – 1 x main HBC			4.37	2.98	8.71	5.39
PURY-EP350YNW-A1 – 2 x main HBC			4.65	2.93	8.88	5.34
PURY-EP350YNW-A1 – 1 x main HBC			4.19	2.75	7.26	6.67
PURY-EP400YNW-A1			4.60	3.06	8.31	5.21
PURY-EP450YNW-A1			4.48	2.87	7.66	4.91
PURY-EP500YNW-A1			4.42	2.84	6.80	5.05

R410A HVRF Heat Recovery - Standard Efficiency

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP	SEER (C)	SCOP	SEER (C)	SCOP
PURY-P200YNW-A1			5.26	3.43	10.17	5.35
PURY-P250YNW-A1			5.02	3.18	9.11	4.79
PURY-P300YNW-A1 – 2 x main HBC			4.42	3.04	9.34	5.44
PURY-P300YNW-A1 – 1 x main HBC			3.98	2.86	7.65	5.17
PURY-P350YNW-A1 – 2 x main HBC			4.51	2.91	8.63	5.33
PURY-P350YNW-A1 – 1 x main HBC			4.06	2.74	7.26	6.62
PURY-P400YNW-A1			4.24	2.93	7.67	4.98
PURY-P450YNW-A1			4.33	2.79	7.40	4.77
PURY-P500YNW-A1			4.12	2.80	6.34	4.98

R32 VRF Heat Recovery - High Efficiency

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP	SEER (C)	SCOP	SEER (C)	SCOP
PURY-EM200YNW-A1	7.74	4.39			13.11	7.40
PURY-EM250YNW-A1	7.37	4.29			13.90	7.51
PURY-EM300YNW-A1	6.97	4.15			10.78	7.63

R32 VRF Heat Recovery - Standard Efficiency

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP	SEER (C)	SCOP	SEER (C)	SCOP
PURY-M200YNW-A1	7.54	4.40			12.09	7.12
PURY-M250YNW-A1	7.08	4.17			12.70	7.29
PURY-M300YNW-A1	6.70	4.11			9.72	7.56

R32 VRF Heat Pump

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP	SEER (C)	SCOP	SEER (C)	SCOP
PUHY-M200YNW-A1	7.32	4.41			11.64	6.83
PUHY-M250YNW-A1	7.08	4.23			12.20	7.65
PUHY-M300YNW-A1	6.73	4.17			9.75	7.16

R410A VRF Heat Recovery - High Efficiency

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP	SEER (C)	SCOP	SEER (C)	SCOP
PURY-EP200YNW-A1	7.66	4.00	6.08	3.46	12.95	6.76
PURY-EP250YNW-A1	7.23	4.24	6.35	3.46	13.57	7.29
PURY-EP300YNW-A1	6.77	4.12	5.88	3.46	10.48	7.04
PURY-EP350YNW-A1	6.66	4.12	6.44	3.46	10.78	7.24
PURY-EP400YNW-A1	6.63	4.12	5.90	3.46	10.21	5.75
PURY-EP400YSNW-A1	7.60	3.88	5.90	3.36	12.81	6.55
PURY-EP450YNW-A1	6.61	4.10	5.93	3.46	10.33	5.83
PURY-EP450YSNW-A1	7.32	4.01	6.03	3.36	13.07	6.85
PURY-EP500YNW-A1	6.47	4.09	5.86	3.46	10.09	5.79
PURY-EP500YSNW-A1	7.12	4.11	6.16	3.36	13.43	7.21
PURY-EP550YNW-A1	6.21	4.09	5.62	3.46	9.67	5.53
PURY-EP550YSNW-A1	6.85	4.05	5.93	3.36	11.84	6.94
PURY-EP600YSNW-A1	6.61	3.99	5.70	3.36	10.30	6.79
PURY-EP650YSNW-A1	6.50	3.99	5.98	3.36	10.40	6.95
PURY-EP700YSNW-A1	6.52	3.99	6.25	3.36	10.67	7.08
PURY-EP750YSNW-A1	6.49	3.99	5.98	3.36	10.37	6.31
PURY-EP800YSNW-A1	6.44	3.99	5.72	3.36	10.08	5.58
PURY-EP850YSNW-A1	6.52	3.98	5.74	3.36	10.20	5.59
PURY-EP900YSNW-A1	6.56	3.97	5.75	3.36	10.27	5.64
PURY-EP950YSNW-A1	6.46	3.97	5.57	3.36	10.14	5.64
PURY-EP1000YSNW-A1	6.34	3.96	5.39	3.36	9.99	5.60
PURY-EP1050YSNW-A1	6.19	3.96	5.28	3.36	9.74	5.50
PURY-EP1100YSNW-A1	6.06	3.96	5.17	3.36	9.56	5.40

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R410A VRF Heat Recovery - Standard Efficiency

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP	SEER (C)	SCOP	SEER (C)	SCOP
PURY-P200YNW-A1	7.47	3.96	5.52	3.42	11.95	6.41
PURY-P250YNW-A1	6.94	4.05	5.74	3.42	12.49	7.09
PURY-P300YNW-A1	6.62	3.81	5.31	3.42	9.63	7.00
PURY-P350YNW-A1	6.60	3.72	5.64	3.42	9.67	6.99
PURY-P400YNW-A1	6.31	4.10	5.23	3.42	9.28	5.34
PURY-P400YSNW-A1	7.39	3.84	5.35	3.32	11.83	6.24
PURY-P450YNW-A1	6.40	4.03	5.44	3.42	9.71	5.53
PURY-P450YSNW-A1	7.09	3.93	5.46	3.32	12.06	6.58
PURY-P500YNW-A1	6.32	4.05	5.28	3.42	9.28	5.63
PURY-P500YSNW-A1	6.84	3.93	5.57	3.32	12.29	6.87
PURY-P550YNW-A1	6.06	4.05	5.05	3.42	8.88	5.42
PURY-P550YSNW-A	6.58	3.81	5.36	3.32	10.83	6.86
PURY-P600YSNW-A1	6.38	3.69	5.15	3.32	9.42	6.76
PURY-P650YSNW-A1	6.26	3.65	5.31	3.32	9.42	6.83
PURY-P700YSNW-A1	6.27	3.61	5.47	3.32	9.56	6.85
PURY-P750YSNW-A1	6.25	3.61	5.27	3.32	9.35	5.99
PURY-P800YSNW-A1	6.22	3.97	5.07	3.32	9.15	5.21
PURY-P850YSNW-A1	6.30	3.93	5.17	3.32	9.42	5.26
PURY-P900YSNW-A1	6.33	3.90	5.28	3.32	9.63	5.36
PURY-P950YSNW-A1	6.22	3.92	5.18	3.32	9.41	5.42
PURY-P1000YSNW-A1	6.05	3.92	5.09	3.32	9.17	5.45
PURY-P1050YSNW-A1	5.90	3.92	5.00	3.32	8.96	5.39
PURY-P1100YSNW-A1	5.77	3.92	4.90	3.32	8.76	5.37

R410A VRF Heat Pump

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP	SEER (C)	SCOP	SEER (C)	SCOP
PUHY-P200YNW-A1	7.50	4.39	5.98	3.42	11.92	6.80
PUHY-P250YNW-A1	7.00	4.21	6.09	3.42	12.06	7.62
PUHY-P300YNW-A1	6.70	4.16	5.66	3.42	9.71	7.14
PUHY-P350YNW-A1	6.70	4.24	5.78	3.42	8.77	7.26
PUHY-P400YNW-A1	6.39	4.13	5.67	3.42	9.17	5.54
PUHY-P400YSNW-A1					11.80	6.59
PUHY-P450YNW-A1	6.48	4.00	5.87	3.42	8.29	5.32
PUHY-P450YSNW-A1					11.81	6.99
PUHY-P500YNW-A1	6.32	3.91	5.77	3.42	9.50	5.46
PUHY-P500YSNW-A					10.16	6.18
PUHY-P550YSNW-A1					10.68	7.12
PUHY-P600YSNW-A1					9.52	6.89

R410A VRF Heat Pump

Seasonal Efficiency	Part L	
	SEER (C)	SCOP
PUHY-P650YSNW-A1	10.24	6.27
PUHY-P700YSNW-A1	8.67	7.08
PUHY-P750YSNW-A1	8.92	6.22
PUHY-P800YSNW-A1	8.41	6.10
PUHY-P850YSNW-A	8.67	5.42
PUHY-P900YSNW-A1	8.22	5.36
PUHY-P950YSNW-A1	9.68	7.15
PUHY-P1000YSNW-A1	9.79	6.52
PUHY-P1050YSNW-A1	9.91	6.29
PUHY-P1100YSNW-A1	8.75	6.51
PUHY-P1150YSNW-A1	8.87	5.95
PUHY-P1200YSNW-A1	9.03	5.40
PUHY-P1250YSNW-A1	8.72	5.31
PUHY-P1300YSNW-A1	8.42	5.23
PUHY-P1350YSNW-A1	8.13	5.16

R410A Mini VRF Heat Pump - Single Fan

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP	SEER (C)	SCOP	SEER (C)	SCOP
PUMY-SP112V(Y)KM	6.76	3.98			6.66	3.37
PUMY-SP125V(Y)KM	6.74	3.93			6.66	3.53
PUMY-SP140V(Y)KM	6.49	3.90			6.57	3.34

R410A Mini VRF Heat Pump - Twin Fan

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP	SEER (C)	SCOP	SEER (C)	SCOP
PUMY-P112V(Y)KM4	6.55	4.64			6.45	3.93
PUMY-P125V(Y)KM4	6.60	4.63			6.52	4.16
PUMY-P140V(Y)KM4	6.25	4.42			6.33	3.79
PUMY-P200YKM2	5.45	4.21			5.99	3.83

Changes for the Better

Telephone: 01707 282880

MELSmart Technical Services: 0161 866 6089
Technical Help - option 1
Warranty - option 3
Training - option 6 followed by option 1

email: air.conditioning@meuk.mee.com
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IRELAND Mitsubishi Electric Europe
Westgate Business Park, Ballymount, Dublin 24, Ireland. Telephone: (01) 419 8800 Fax: (01) 419 8890 International code: (003531)

Note: The fuse rating is for guidance only. Please refer to the relevant databook for detailed specification. It is the responsibility of a qualified electrician/electrical engineer to select the correct cable size and fuse rating based on current regulation and site specific conditions. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a fluorinated greenhouse gas, R410A (GWP:2088), R32 (GWP:675), R407C (GWP:1774), R134a (GWP:1430), R513A (GWP:631), R454B (GWP:466), R1234ze (GWP:7) or R1234yf (GWP:4). *These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. In case of Regulation (EU) No.626/2011 from IPCC 3rd edition, these are as follows. R410A (GWP:1975), R32 (GWP:550), R407C (GWP:1650) or R134a (GWP:1300).

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Mitsubishi Electric UK's commitment to the environment

Effective as of August 2020