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# City Multi VRF

Seasonal Efficiency Explained



**CITY MULTI**



Cooling | Heating | Ventilation | Controls

# The Need for Energy Efficient Buildings and Products

CITY MULTI

This Mitsubishi Electric guide gives an overview of the Ecodesign Directive for Energy Related Products (ErP). The guide details how building services products are affected by ErP in terms of manufacturing, testing and market impact.

This guide also covers the calculation of seasonal efficiency under EN14825 and explains the use of different indoor units in efficiency testing. A comparison between EN14825 and Part L efficiency is also covered. 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 will become part of UK law, so its regulations on the energy performance of products such as chillers will remain in place.

Buildings account for around half of all UK greenhouse emissions, so tough legislation is demanding increased energy efficiency of the entire building, including the products within it. As well as helping to meet robust Government targets, reducing energy use in a building by using energy efficient products will also benefit individuals and businesses. Running and operational costs are lowered and the impact on the environment is reduced; helping to adhere to corporate and social responsibility directives.





# Ecodesign Directive for Energy Related Products

The Ecodesign Directive for Energy Related Products (ErP) is European legislation designed to improve the energy efficiency of all products which “generate, transfer or measure energy” - whether that is electricity, gas or other fossil fuel. The legislation was first introduced in 2009 and is very broad scope, covering consumer electricals such as fridges, washing machines and televisions, and commercial products such as 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 are applied to products to show customers the energy efficiency and how the product compares against other 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<sub>2</sub> 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.

➔ This extensive range of products is broken down into “lots”.

➔ Ecodesign has come into force for each lot over the last few years



**ErP Lot 10**  
Air Conditioners <12kW  
(mainly Split Systems)  
January 2013



**ErP Lot 1**  
Boilers, Heat Pumps  
(Ecodan)  
September 2015



**ErP Lot 21/6**  
Comfort Chillers,  
Air Conditioners >12kW (VRF)  
January 2018

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. 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.

## 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. Therefore it is widely accepted that seasonal energy efficiency is the most appropriate efficiency figure to use when assessing how a heating or cooling system will perform when installed in a building. The seasonal efficiency numbers, SEER (Season Energy Efficiency Ratio) for cooling and SCOP (Seasonal Coefficient of Performance) for heating are used for building energy models, run cost calculations and crucially the MEPS for a particular 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. 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. If we take the example of comfort chillers, they must meet the MEPS for seasonal space cooling energy efficiency listed below:

Source	Cooling Capacity	Minimum Efficiency 1/1/2018	Minimum Efficiency 1/1/2021
Air cooled	<400kW	149%	161%
Air cooled	≥400kW	161%	179%
Water cooled	<400kW	196%	200%
Water cooled	≥400kW	227%	252%
Water cooled	<1500kW	245%	272%
Water cooled	≥1500kW		

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. For example, when a chiller can be used as a comfort chiller and as a high temperature process chiller, the Directive would consider this to be a comfort chiller as one of its functions is to 'provide cooling of a space for the thermal comfort of human beings'. This dual use chiller would have to comply with the standard for seasonal space cooling energy efficiency.

➔ 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

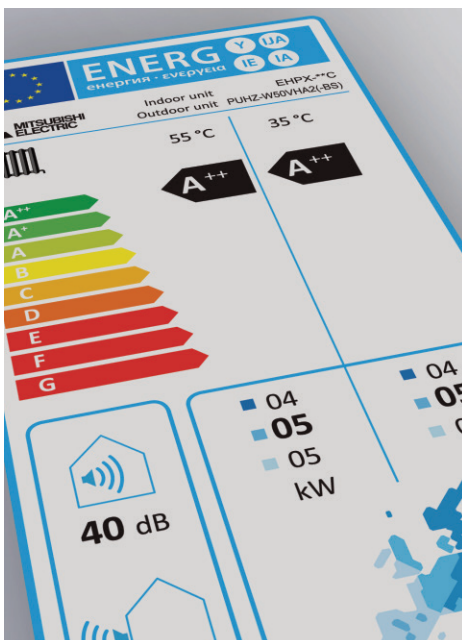
The standards set by the ErP have already had a significant impact on the products that are available to specifiers. Products such as chillers which can be a large proportion of energy consumption in buildings have undergone major developments by manufacturers so that they have been optimised for good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

The energy labelling of products and technical product fiches mean 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 come into force. It will be 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.

**Owners looking to improve their EPC rating can easily compare and specify equipment that offers the best possible energy efficiency performance.**

As we move into 2018 the emphasis on the energy performance of products will become ever more prominent. Specifiers looking to ensure that they are providing their clients with the best possible solutions can rely on reputable manufacturers to provide the information and support they need to ensure that products go beyond mere compliance, and provide the very best long-term performance in terms of efficiency, ease of maintenance and occupant wellbeing.



### Different methods for efficiency calculation - not just a number

There are different methods available to calculate SEER and SCOP for heating and cooling products.

Each method has been deemed as the correct or preferred calculation method for a particular application at a particular time. However not having a definitive, accurate and transparent industry calculation standard has led to confusion and misinterpretation when assessing the seasonal efficiency of a product and when comparing different manufacturers and technologies.

**Building owners and users demand clarity and confidence on how their HVAC equipment will perform in the real world.**





# EN14825 - Overview

European standard EN14825 is the seasonal efficiency calculation method that underpins ErP for air conditioning systems. EN14825 full title:

**“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”**

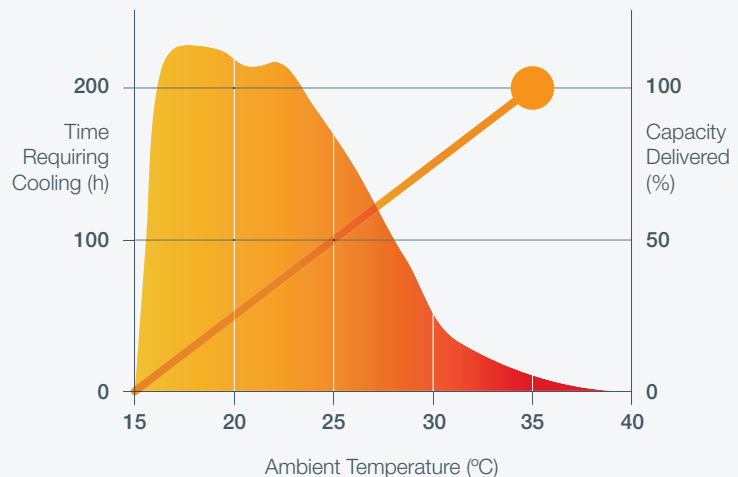
Performance at different part load conditions is the critical component of EN14825. Part load conditions reflect different ambient conditions to determine the performance of products across the year; hence an accurate seasonal efficiency is produced. Products that use inverter technology are able to 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.

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.

### 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

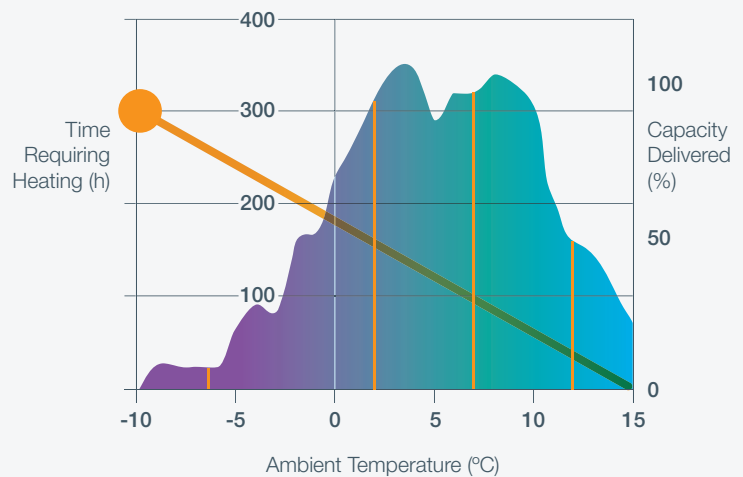
$$\text{SEER} = \frac{\text{total kWh out}}{\text{total kWh in}}$$



## 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

$$\text{SCOP} = \text{total kWh out} / \text{total kWh in}$$

# 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.

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 seasonal efficiency data on our VRF air conditioning products in accordance with EN14825 using a range of indoor units. We aim to be as clear and transparent as possible showing how the seasonal efficiencies of our systems are calculated.

Providing extensive seasonal efficiency data also addresses the varied needs of the market and gives confidence that we are doing the right thing.

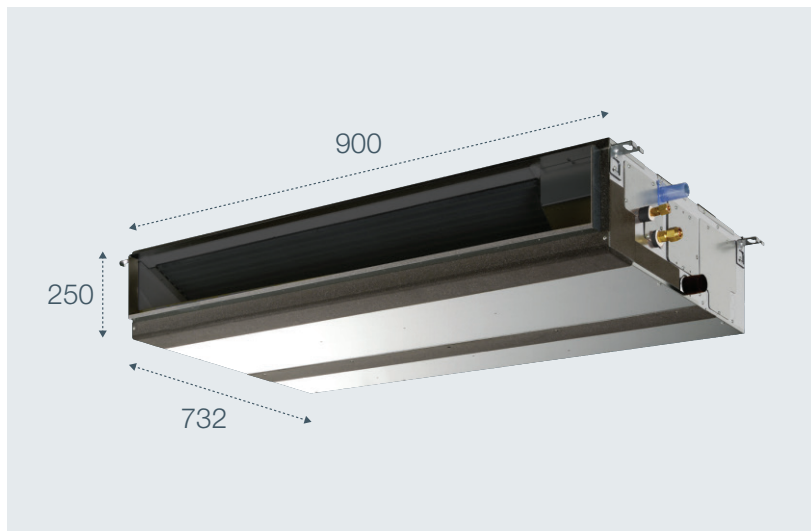
Outdoor Unit	kW (Cooling)	Indoor Units
P200	22.4	4
P250	28.0	4
P300	33.5	6
P350	40.0	6
P400	45.0	6
P450	50.0	6
P500	56.0	8
P550	63.0	8

## Type 1

### PEFY-P-VMA Standard Ducted Indoor Unit 5kW Model

Seasonal efficiencies calculated with these indoor units are “real world” data. PEFY 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.

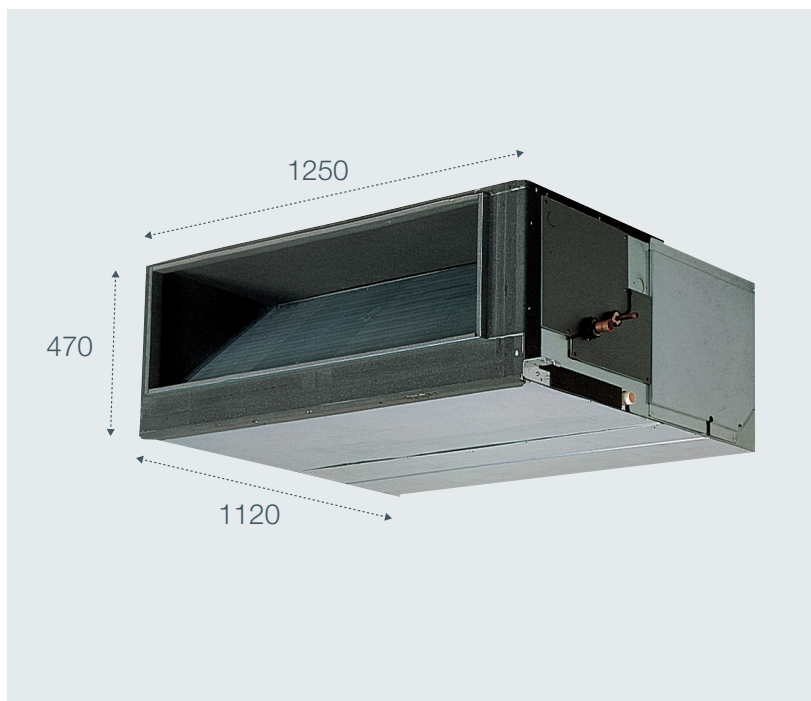


## Type 2

### PEFY-P-VMHS2 High Efficiency Ducted Indoor Unit 5kW Model

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. The specification and performance data for these models is available in the data book alongside the standard models.

Due to the size of these units they are rarely chosen for real world applications. Performance figures calculated with these models can be used to compare SEER and SCOP values for different manufacturers under EN14825.





# 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<sub>2</sub> emissions.

“Seasonal space cooling energy efficiency” -  $\eta_{sc}$  (%) and “Seasonal space heating energy efficiency” -  $\eta_{sh}$  (%) 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  $\eta_{sc} > 149\%$

## Bringing it all together - The Product Fiche

All manufacturers must produce datasheets in a uniform way showing heating and cooling efficiencies at part load conditions. The datasheets must also show all ancillary power consumption and the final seasonal space cooling or heating energy efficiency percentage. These datasheets are also known as “product fiches” and must be available on a public platform i.e. on the manufacturer’s website.

ErP product fiches will make like for like comparisons of different heating and cooling products on the market much easier. The indoor unit model used for efficiency calculations under EN14825 must also be displayed on the fiche document. This will further enhance the transparency of system performance and increase confidence in the industry. VRF product fiches produced by Mitsubishi Electric will use high efficiency ducted indoor units PEFY-P-VMHS2. Mitsubishi Electric will also provide seasonal efficiency data calculated to EN14825 using standard ducted indoor units PEFY-P-VMA.

Product Fiches for all Mitsubishi Electric heating and cooling products can be found online at [erp.mitsubishielectric.eu/erp](http://erp.mitsubishielectric.eu/erp)



# Product Fiches

## Cooling

### PURY-P200YNW-A

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)			
$T_j = +35^\circ\text{C}$	Pdc	22.40	kW
$T_j = +30^\circ\text{C}$	Pdc	16.51	kW
$T_j = +25^\circ\text{C}$	Pdc	10.61	kW
$T_j = +20^\circ\text{C}$	Pdc	10.15	kW
Degradation co-efficient Air Conditioners**	Cd	0.25	-
Power consumption in modes other than 'active Mode'			
Off Mode	Poff	0.000	kW
Thermostat Off Mode	Pto	0.089	kW

Item	Symbol	Value	Unit
Seasonal space cooling energy efficiency	$\eta_{s,c}$	309	%
Declared energy efficiency ratio or gas utilisation efficiency / auxiliary energy factor for part load at given outdoor temperatures $T_j$			
$T_j = +35^\circ\text{C}$	EERd or GUEc, bin/AEFc, bin	5.05	%
$T_j = +30^\circ\text{C}$	EERd or GUEc, bin/AEFc, bin	6.11	%
$T_j = +25^\circ\text{C}$	EERd or GUEc, bin/AEFc, bin	11.11	%
$T_j = +20^\circ\text{C}$	EERd or GUEc, bin/AEFc, bin	16.21	%
Crankcase heater mode	Pck	0.044	kW
Standby Mode	PSB	0.084	kW

## Heating

### PURY-P200YNW-A

Item	Symbol	Value	Unit
Rated heating capacity	$P_{rated,h}$	25.00	Kw
Declared heating capacity for part load at indoor temperatures 20°C and outdoor temperature $T_j$			
$T_j = -7^\circ\text{C}$	Pdh	21.09	kW
$T_j = +2^\circ\text{C}$	Pdh	13.45	kW
$T_j = +7^\circ\text{C}$	Pdh	8.65	kW
$T_j = +12^\circ\text{C}$	Pdh	5.64	kW
$T_j =$ bivalent temperature	Pdh	22.12	kW
$T_j =$ operation limit	Pdh	15.13	kW
For air to water heat pumps $T_j = -15^\circ\text{C}$ (if Pdh TOL<-20°C)	Pdh	-	kW
Bivalent temperature	Tbiv	-7.0	°C
Degradation co-efficient heat pumps**	Cdh	0.25	-
Power consumption in modes other than 'active Mode'			
Off Mode	Poff	0.000	kW
Thermostat Off Mode	Pto	0.089	kW
Crankcase heater Mode	Pck	0.044	kW

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	$\eta_{s,c}$	309	%
Declared coefficient of performance or gas utilisation efficiency / auxiliary energy factor for part load at given outdoor temperatures $T_j$			
$T_j = -7^\circ\text{C}$	COPd or GUEh, bin/AEFh, bin	2.50	%
$T_j = +2^\circ\text{C}$	COPd or GUEh, bin/AEFh, bin	3.96	%
$T_j = +7^\circ\text{C}$	COPd or GUEh, bin/AEFh, bin	7.22	%
$T_j = +12^\circ\text{C}$	COPd or GUEh, bin/AEFh, bin	10.07	%
$T_j =$ bivalent temperature	EERd or GUEh, bin/AEFc, bin	2.61	%
$T_j =$ operation limit	EERd or GUEh, bin/AEFc, bin	1.99	%
For water to air heat pumps $T_j = -15^\circ\text{C}$ (if Pdh TOL<-20°C)	EERd or GUEh, bin/AEFc, bin	-	%
For water to air heat pumps Operation limit temperature	TOL	-	°C
Supplementary Heater			
Electric back-up heating capacity*	elbu	0.000	kW
Type of energy input Standby mode	PSB	0.084	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.

This calculation method is not robust and many interpretations of seasonal efficiency can arise.



### Limitations of NDBSCG (Part L) Seasonal Efficiency Calculation:

- 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				

Part L is likely to be updated to use Lot 21/6 EN14825 methodology in its next version; this is due in 2019. Despite its current limitations, the Part L method for calculating seasonal efficiency is widely used in the UK. Mitsubishi Electric will also publish SEER and SCOP data calculated to the Part L standard using standard ducted indoor units PEFY-P-VMA.



# Standards Overview

Seasonal Efficiency	Best Possible	Standard	Part L
Testing Standard	EN14825	EN14825	NDBSCG (modified for UK conditions inc. heating)
Indoor Unit	High Efficiency Ducted PEFY-P-VMHS2*	Standard Ducted PEFY-(W)P-VMA (high selling UK model)	Standard Ducted PEFY-P-VMA (high selling UK model)
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

\* Not used with HVRF systems

# Product Data

## R32 HVRF Heat Recovery - High Efficiency



Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)
PURY-EM200YNW-A	N/A	N/A	5.87	3.72	11.37	5.80
PURY-EM250YNW-A	N/A	N/A	5.62	3.60	10.22	5.42
PURY-EM300YNW-A x 2 Main HBC	N/A	N/A	5.10	3.52	10.75	6.30
PURY-EM300YNW-A x 1 Main HBC	N/A	N/A	4.59	3.31	9.16	5.98

## R32 HVRF Heat Recovery - Standard Efficiency



Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)
PURY-M200YNW-A	N/A	N/A	5.53	3.62	10.71	5.64
PURY-M250YNW-A	N/A	N/A	5.28	3.53	9.60	5.32
PURY-M300YNW-A x 2 Main HBC	N/A	N/A	4.65	3.51	9.80	6.28
PURY-M300YNW-A x 1 Main HBC	N/A	N/A	4.19	3.30	8.35	5.97

## R410A HVRF Heat Recovery - High Efficiency



Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)
PURY-EP200YNW-A	N/A	N/A	5.58	3.52	10.81	5.49
PURY-EP250YNW-A	N/A	N/A	5.34	3.24	9.71	4.88
PURY-EP300YNW-A x 2 Main HBC	N/A	N/A	4.85	3.17	10.22	5.67
PURY-EP300YNW-A x 1 Main HBC	N/A	N/A	4.37	2.98	8.71	5.39
PURY-EP350YNW-A x 2 Main HBC	N/A	N/A	4.65	2.93	8.89	5.35
PURY-EP350YNW-A x 1 Main HBC	N/A	N/A	4.19	2.75	7.26	6.66
PURY-EP400YNW-A	N/A	N/A	4.60	3.06	8.32	5.21
PURY-EP450YNW-A	N/A	N/A	4.48	2.87	7.66	4.91
PURY-EP500YNW-A	N/A	N/A	4.42	2.84	6.80	5.05



## R410A HVRF Heat Recovery - Standard Efficiency

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)
PURY-P200YNW-A	N/A	N/A	5.26	3.43	10.19	5.35
PURY-P250YNW-A	N/A	N/A	5.02	3.18	9.13	4.79
PURY-P300YNW-A x 2 Main HBC	N/A	N/A	4.42	3.04	9.32	5.44
PURY-P300YNW-A x 1 Main HBC	N/A	N/A	3.98	2.86	7.64	5.17
PURY-P350YNW-A x 2 Main HBC	N/A	N/A	4.51	2.91	8.62	5.32
PURY-P350YNW-A x 1 Main HBC	N/A	N/A	4.06	2.74	7.04	6.62
PURY-P400YNW-A	N/A	N/A	4.24	2.93	7.67	4.99
PURY-P450YNW-A	N/A	N/A	4.33	2.79	7.40	4.78
PURY-P500YNW-A	N/A	N/A	4.12	2.80	6.34	4.98



## VRF Heat Recovery - High Efficiency

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)
PURY-EP200YNW-A	8.44	4.67	6.08	-	12.95	6.76
PURY-EP250YNW-A	8.67	4.49	6.35	-	13.57	7.29
PURY-EP300YNW-A	8.16	4.22	5.88	-	10.48	7.04
PURY-EP350YNW-A	8.40	4.10	6.44	-	10.78	7.24
PURY-EP400YNW-A	7.86	4.05	5.90	-	10.21	5.75
PURY-EP400YSNW-A	8.35	4.53	-	-	12.81	6.55
PURY-EP450YNW-A	7.75	3.86	5.93	-	10.33	5.83
PURY-EP450YSNW-A	8.43	4.47	-	-	13.07	6.85
PURY-EP500YNW-A	7.61	3.77	5.86	-	10.09	5.79
PURY-EP500YSNW-A	8.54	4.36	-	-	13.43	7.21
PURY-EP550YNW-A	7.30	3.60	5.62	-	9.67	5.53
PURY-EP550YSNW-A	8.29	4.23	-	-	11.84	6.94
PURY-EP600YSNW-A	8.02	4.07	-	-	10.30	6.79
PURY-EP650YSNW-A	8.10	4.06	-	-	10.40	6.95
PURY-EP700YSNW-A	8.31	4.01	-	-	10.67	7.08
PURY-EP750YSNW-A	8.03	3.96	-	-	10.36	6.31
PURY-EP800YSNW-A	7.76	3.93	-	-	10.08	5.58
PURY-EP850YSNW-A	7.75	3.82	-	-	10.20	5.59
PURY-EP900YSNW-A	7.70	3.73	-	-	10.27	5.64
PURY-EP950YSNW-A	7.63	3.70	-	-	10.14	5.64
PURY-EP1000YSNW-A	7.54	3.65	-	-	9.99	5.60
PURY-EP1050YSNW-A	7.36	3.58	-	-	9.75	5.50
PURY-EP1100YSNW-A	7.21	3.52	-	-	9.56	5.40



## VRF Heat Recovery - Standard Efficiency

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)
PURY-P200YNW-A	7.79	4.43	5.52	-	11.95	6.41
PURY-P250YNW-A	7.98	4.37	5.74	-	12.49	7.09
PURY-P300YNW-A	7.50	4.24	5.31	-	9.63	7.00
PURY-P350YNW-A	7.53	3.96	5.64	-	9.67	6.99
PURY-P400YNW-A	7.15	3.76	5.23	-	9.28	5.34
PURY-P400YSNW-A	7.71	4.31	-	-	11.83	6.24
PURY-P450YNW-A	7.28	3.66	5.44	-	9.71	5.53
PURY-P450YSNW-A	7.78	4.29	-	-	12.06	6.58
PURY-P500YNW-A	7.00	3.67	5.28	-	9.28	5.63
PURY-P500YSNW-A	7.87	4.25	-	-	12.29	6.87
PURY-P550YNW-A	6.70	3.53	5.05	-	8.88	5.42
PURY-P550YSNW-A	7.58	4.18	-	-	10.83	6.86
PURY-P600YSNW-A	7.34	4.09	-	-	9.42	6.76
PURY-P650YSNW-A	7.34	3.99	-	-	9.42	6.83
PURY-P700YSNW-A	7.45	3.88	-	-	9.56	6.85
PURY-P750YSNW-A	7.24	3.75	-	-	9.35	5.99
PURY-P800YSNW-A	7.05	3.67	-	-	9.15	5.21
PURY-P850YSNW-A	7.16	3.59	-	-	9.42	5.26
PURY-P900YSNW-A	7.22	3.55	-	-	9.63	5.36
PURY-P950YSNW-A	7.08	3.56	-	-	9.41	5.42
PURY-P1000YSNW-A	6.93	3.55	-	-	9.18	5.45
PURY-P1050YSNW-A	6.76	3.51	-	-	8.96	5.39
PURY-P1100YSNW-A	6.61	3.50	-	-	8.76	5.37



## VRF Heat Pump

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)
PUHY-P200YNW-A	8.44	4.70	5.98	-	11.92	6.80
PUHY-P250YNW-A	8.47	4.42	6.09	-	12.06	7.62
PUHY-P300YNW-A	8.00	4.24	5.66	-	9.71	7.14
PUHY-P350YNW-A	7.72	3.97	5.78	-	8.77	7.26
PUHY-P400YNW-A	7.75	3.77	5.67	-	9.17	5.54
PUHY-P400YSNW-A	8.35	4.55	-	-	11.80	6.59
PUHY-P450YNW-A	7.86	3.68	5.87	-	8.29	5.32
PUHY-P450YSNW-A	8.33	4.42	-	-	11.81	6.99
PUHY-P500YNW-A	7.66	3.69	5.77	-	9.50	5.46
PUHY-P500YSNW-A	8.35	4.28	-	-	10.16	6.18
PUHY-P550YSNW-A	8.08	4.18	-	-	10.68	7.12
PUHY-P600YSNW-A	7.85	4.09	-	-	9.52	6.89
PUHY-P650YSNW-A	7.82	3.90	-	-	10.24	6.27
PUHY-P700YSNW-A	7.63	3.87	-	-	8.67	7.08
PUHY-P750YSNW-A	7.63	3.76	-	-	8.92	6.22
PUHY-P800YSNW-A	7.68	3.71	-	-	8.41	6.10
PUHY-P850YSNW-A	7.75	3.61	-	-	8.67	5.42
PUHY-P900YSNW-A	7.80	3.56	-	-	8.22	5.36
PUHY-P950YSNW-A	7.82	3.99	-	-	9.68	7.15
PUHY-P1000YSNW-A	7.81	3.88	-	-	9.79	6.52
PUHY-P1050YSNW-A	7.81	3.81	-	-	9.91	6.29
PUHY-P1100YSNW-A	7.60	3.80	-	-	8.75	6.51
PUHY-P1150YSNW-A	7.60	3.73	-	-	8.87	5.95
PUHY-P1200YSNW-A	7.63	3.67	-	-	9.03	5.40
PUHY-P1250YSNW-A	7.65	3.63	-	-	8.72	5.31
PUHY-P1300YSNW-A	7.68	3.60	-	-	8.42	5.23
PUHY-P1350YSNW-A	7.71	3.57	-	-	8.13	5.16

## Mini VRF Heat Pump - Single Fan

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

## Mini VRF Heat Pump - Twin Fan

Seasonal Efficiency	Best Possible		Standard		Part L	
	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)	SEER (C)	SCOP (H)
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



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MELSmart Technical Services: 0161 866 6089

Technical Help - option 1

Warranty - option 3

Training - option 6 followed by option 1

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**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) or R134a (GWP:1430). \*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).

Effective as of June 2018



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