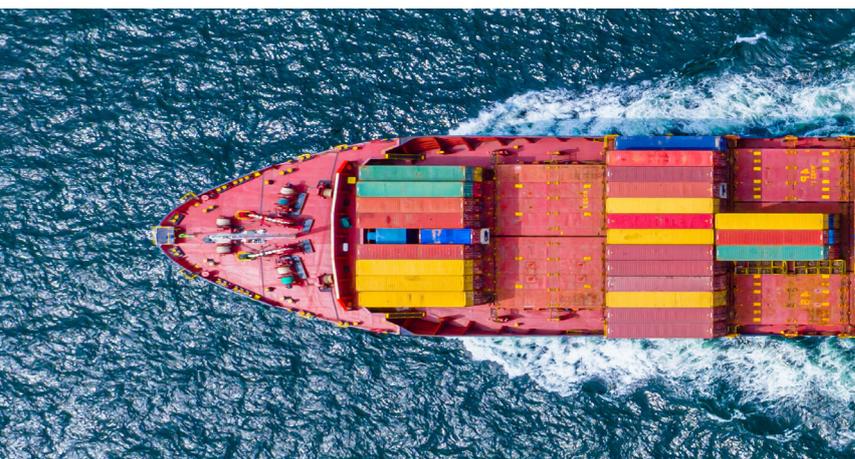


EU Directives and Regulations for Marine Motors

Requirements for 'Marine products' in Europe



The Directive 2009/125/EC (Ecodesign) is the framework directive setting the Ecodesign requirement for energy-related products in Europe.

Under the Ecodesign Directive, product-specific regulations define the energy efficiency requirements and limits for different product groups (27 groups). One of them, (EU) 2019/1781 and its amending regulation (EU) 2021/341, is for electric motors and VSDs.

The definition, 'shall not apply to means of transport for persons or goods' in the Ecodesign Directive is often misinterpreted and misunderstood in regards to exempt products, like motors,- that are used in 'Marine' applications.

Regulation only exempts 'motors designed specifically for the traction of electric vehicles' but nothing else related to 'means of transport'. This means that one should not just refer to the Directive text conclusions of the implementing provisions for product groups and products.

— Interpretation by ADCO

The ADCO (Administrative Cooperation) group that works under DG Energy has been publishing the document 'Frequently Asked Questions (FAQ) on the Ecodesign Directive and its Implementing Regulations' to respond questions related to EU directives and regulations.

On this topic, ADCO wrote back in April 2015 the following:

'The ecodesign regulations do not specifically mention whether components of and appliances for means of transport fall under their scope, but the Ecodesign Directive specifies in its Article 1(3) that the Directive does not apply to "means of transport for persons or goods". Therefore, products that are specifically designed only for application in means of transport (including mobile homes and caravans) and no other applications are exempted from ecodesign regulations.'

It is clear then that if motors and other products are specifically designed only for 'Marine' they can be exempted, but in applications like fans, pumps etc. where the same motors and other products can be used both in industrial and marine applications, they are not exempted.



EU Ecodesign Regulation (EU) 2019/1781 and the amending Regulation (EU) 2021/341

Motors within the scope of the regulation

For the first time the regulation also covers 60 Hz motors extending the coverage of electric motors and VSDs beyond the existing requirement for 50Hz and 50/60Hz motors.

Published in February 2021, the amending Regulation 2021/341 introduces 60 Hz energy efficiency tables that are aligned with the tables in the standard EN IEC 60034-30-1. It is also a clear indication that motors rated for 60 Hz operation are covered by the Regulation.

Regulation (EU) 2019/1781 scope	
Included in the scope starting July 1, 2021	Exempted from the scope:
<ul style="list-style-type: none">• 3-phase single-speed motors rated for direct-on-line (DOL) operation• Rated output power from 0.12 to 1000 kW• Rated voltage up to 1000 V and 50 Hz, 60 Hz or 50/60 Hz• 2-, 4-, 6-, or 8-pole• Continuous duty (S1, S3 \geq 80% or S6 \geq 80%)• Motors with protection types Ex ec, Ex d, Ex de or Ex t• Motors with cooling method IC418 (TEAO)• Brake motors with external brake	<ul style="list-style-type: none">• Motors designed specifically for the traction of electric vehicles• Motors with cooling method IC410 (TENV)• Motors completely integrated into a product (for example, into a gear, pump, fan, or compressor) and whose energy performance cannot be tested independently from the product, even with the provision of a temporary end shield and drive-end bearing• Motors with an integrated variable speed drive whose energy performance cannot be tested independently from the variable speed drive• Motors specifically designed and specified to operate exclusively<ul style="list-style-type: none">- at altitudes exceeding 4000 m above sea level- where the ambient temperature exceeds +60 °C- maximum operating temperature above +400 °C- where the ambient temperature is below -30 °C- water coolant below 0 °C or above 32 °C• Motors specifically designed and specified to operate wholly immersed in liquid• Motors placed on the market before July 1, 2029 as substitutes for identical motors integrated in products placed on the market before July 1, 2022, and specifically marketed as such
<p>Included in the scope starting July 1, 2023 - additions from July 1, 2021</p> <ul style="list-style-type: none">• 3-phase 2-, 4-, and 6-pole single-speed motors from 75 kW up to 200 kW (not for Ex motors) must be IE4• 3-phase 2-, 4-, 6-, and 8-pole single-speed motors with protection type Ex eb must be IE2• 1-phase single speed motors must be IE2	

Motors rated for 50Hz, 60Hz or 50/60 Hz

What is the difference?

(EU) 2021/341 definition to motors rated for 50 Hz, 50/60 Hz or 60 Hz operation

In the amending Regulation 2021/341 the Annexes I, II, and III to the Regulation (EU) 2019/1781 are amended as follows:

‘For 50/60 Hz motors, the requirements above shall be met at both 50 Hz and 60 Hz at the rated output power specified for 50 Hz.’

and that:

‘For 50Hz or 60Hz motors the requirements above shall be met at respectively 50Hz or 60Hz at the rated output power specified respectively for 50 Hz or 60 Hz.’

What does this mean and how IE class will be indicated?

It means that a motor rated for only 50 Hz operation shall fulfill the requirement and IE limits as defined in tables 1, 2, and 3 of the Regulation for 50 Hz ratings.

In the same way, a motor rated only for 60 Hz operation shall fulfill the requirement and IE limit as defined for 60 Hz ratings in tables 3a, 3b, and 3c of the Regulation 2021/341.

In cases where a motor has a rating for both 50 Hz and 60 Hz operation, it has to fulfill the efficiency requirement as defined in the Regulation for the 50 Hz output power at both 50 Hz and 60 Hz supply. This is also valid even when the rated output power for 60 Hz would be higher than for 50 Hz.

In the latter case, 50/60 Hz rated motor, and where the output power is the same for 50 Hz and 60 Hz the same IE class, e.g. IE3 will be indicated for both 50 Hz and 60 Hz.

See example 1.

In cases where motor is rated for multiple operation points it can have different IE-classes and still be compliant with the EU Regulation. Examples 2 and 3 demonstrate this. Example 3 is not recommended by CEMEP members as it leaves ambiguity regarding the compliance at 50Hz output power on 60Hz operation.

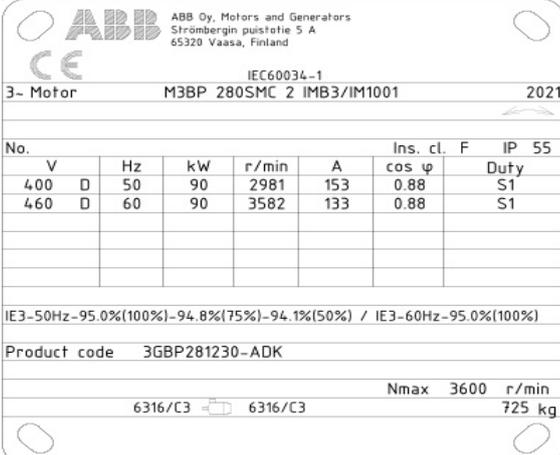


ABB Oy, Motors and Generators
Strömbergin puistotie 5 A
65320 Vaasa, Finland

IEC60034-1

3- Motor M3BP 280SMC 2 IMB3/IM1001 2021

No.		Ins. cl.		F	IP	55
V	Hz	kW	r/min	A	cos φ	Duty
400 D	50	90	2981	153	0.88	S1
460 D	60	90	3582	133	0.88	S1

IE3-50Hz-95.0%(100%)-94.8%(75%)-94.1%(50%) / IE3-60Hz-95.0%(100%)

Product code 3GBP281230-ADK

Nmax 3600 r/min
6316/C3 6316/C3 725 kg

Example 1

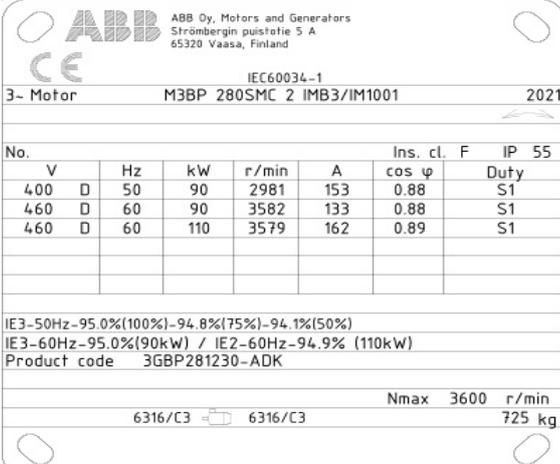


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65320 Vaasa, Finland

IEC60034-1

3- Motor M3BP 280SMC 2 IMB3/IM1001 2021

No.		Ins. cl.		F	IP	55
V	Hz	kW	r/min	A	cos φ	Duty
400 D	50	90	2981	153	0.88	S1
460 D	60	90	3582	133	0.88	S1
460 D	60	110	3579	162	0.89	S1

IE3-50Hz-95.0%(100%)-94.8%(75%)-94.1%(50%)
IE3-60Hz-95.0%(90kW) / IE2-60Hz-94.9% (110kW)

Product code 3GBP281230-ADK

Nmax 3600 r/min
6316/C3 6316/C3 725 kg

Example 2

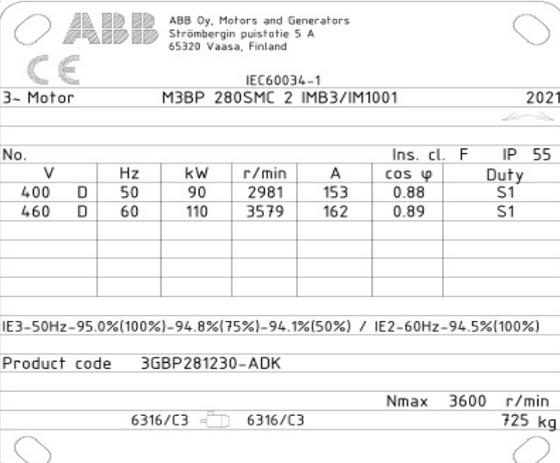


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Strömbergin puistotie 5 A
65320 Vaasa, Finland

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3- Motor M3BP 280SMC 2 IMB3/IM1001 2021

No.		Ins. cl.		F	IP	55
V	Hz	kW	r/min	A	cos φ	Duty
400 D	50	90	2981	153	0.88	S1
460 D	60	110	3579	162	0.89	S1

IE3-50Hz-95.0%(100%)-94.8%(75%)-94.1%(50%) / IE2-60Hz-94.5%(100%)

Product code 3GBP281230-ADK

Nmax 3600 r/min
6316/C3 6316/C3 725 kg

Example 3

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Motors on ships

It is possible that there are no requirements for motors on ships to fulfill. In such cases it would mean that no CE mark will be affixed to motors.

The Regulation does not cover induction motors rated for duty types S2, S4, S5, S7, S8, S9 and S10 as well as for S3 <80% and S6 <80% as defined by the IEC 60034-1. Restamping standard induction motors to these duty types e.g. S9 does not make the motors exempted. If it is rated and capable of operating direct-on-line operation it is in the scope of the Regulation.



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CE mark

The CE mark can only be affixed to motors and products that fulfill the requirements of all relevant European directives and regulations to the product. The assessment for a product shall be done by the manufacturer and is generally done by applying harmonized EN standards. After compiling technical documentation including tests, calculations, risk assessment etc. the CE mark can be affixed to the products.

There are four relevant EU Directives, them separately requiring the CE mark. For 'standard' electric motors three of them apply: Directive 2014/35/EU (LVD), Directive 2009/125/EC (Ecodesign) with the motor specific Regulation 2019/1781, and Directive 2011/65/EU with the amending annexes. For motors intended for potentially explosive atmospheres Directive 2014/34/EU (ATEX) replaces Directive 2014/35/EU (LVD), whereas some parts of the Machinery Directive 2006/42/EC also apply.

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		IEC60034-1							
3- Motor		M3BP 280SMC 2 IMB3/IM1001		2021					
No.	V	Hz	kW	r/min	A	Ins. cl.	F	IP	55
						cos φ		Duty	
	400	D 50	90	2981	153	0.88		S1	
	460	D 60	90	3582	133	0.88		S1	
	460	D 60	110	3579	162	0.89		S1	
IE3-50Hz-95.0%(100%)-94.8%(75%)-94.1%(50%) IE3-60Hz-95.0%(90kW) / IE2-60Hz-94.9% (110kW) Product code 3GBP281230-ADK									
					Nmax 3600 r/min				
					6316/C3 → 6316/C3		725 kg		

For more information please contact your local ABB representative or visit:
abb.com/motors&generators

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