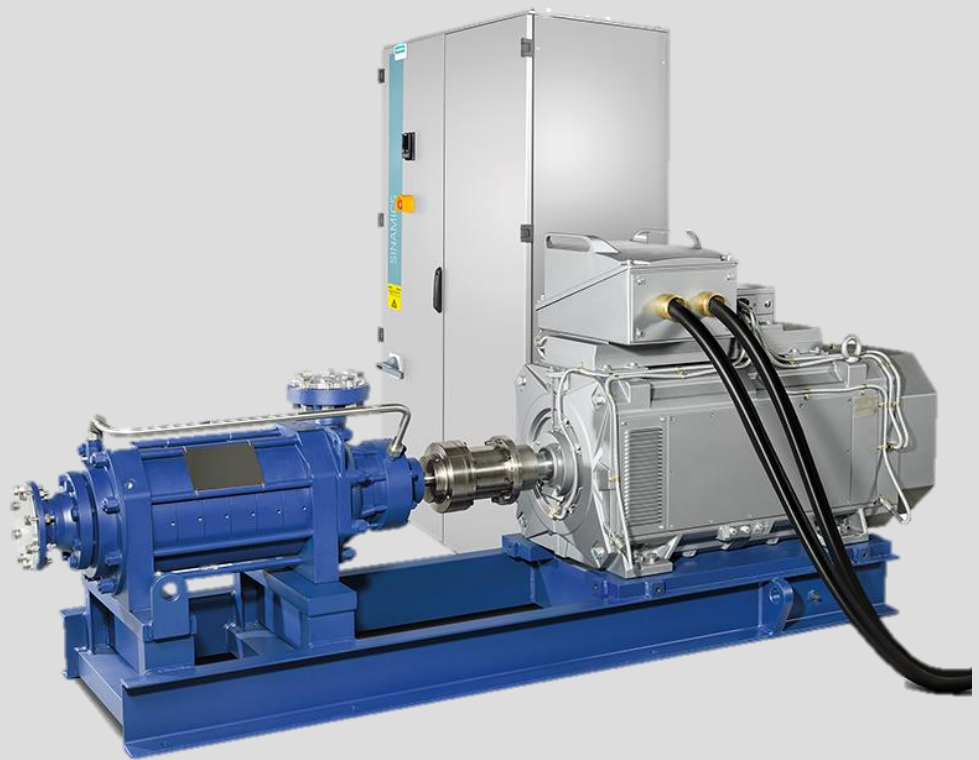


# EN 50598 Parts 1 + 2

## FAQ

January 2016



SINAMICS & SIMOTICS

**SIEMENS**

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## Questions relating to the standard

### Will the legal stipulation include exceptions? It is possible, for example, that individual applications etc. will be excluded?

At the present time, no exception rules are known.

### Is the date of 2018 for the European regulation already fixed –or is it still open?

According to what we know today, the date for the EU regulation is 2018.

### Why is there no 75%-case?

The points for the loss values in partial load operation were defined within the scope of activities associated with the standard. There, they were harmonized and coordinated with the parties involved – also including pump manufacturers – and represent a compromise for reasons relating to cost and accuracy.

### Does the standard make any statements regarding "old systems" and/or replacement?

The standard issues no statements in this regard. We are assuming that right of continuance (grandfathering) applies in this case.

### Efficiency class: What does reference value mean?

The reference CDM is a theoretical/calculated value defined in the standard. The reference motor is a load for the converter, defined in the standard.

### Are geared motors also affected?

The gearboxes are in the extended product approach, and not part of the PDS. Today, the status is that the effect of the gearbox (if documented) is only included in the generation of the application model. The system integrator/end user is responsible for the energy efficiency calculation with the corresponding load profile/operating data. At the present time, there are no specific efficiency classes for gearboxes.

Today, the new SIMOGEAR geared motors are always equipped with high efficiency induction motors, efficiency class IE2/IE3.

SIMOGEAR gearboxes have been developed according to the latest energy saving technology and – depending on the version – have extremely good efficiencies ranging from 94% to 98%.

### Operating points for CDM = at 90 %, for PDS and then again at 100 % - why is this?

For CDM the operating point is at 90%. This is because above 90%, the response is extremely non-linear as result of the increase in the harmonics – and is very dependent on the modulation technique used. In order to minimize these effects, 90% was agreed on when drawing up the standard.

For PDS, 100% was selected in order to address the complete power range.

## Questions relating to tools

### When will the tools be able to provide data regarding IE and IES classes?

The IE classes and the loss values at 8 operating points for the converters impacted by the standard (Sinamics G series) are published in SIOS (see link) and are available in the DT-K (data sheet).

<https://support.industry.siemens.com/cs/document/94059311/sinamics-inverters-for-single-axis-drives%3A-expansion-of-power-loss-data-to-include-partial-load-operation?dti=0&pnid=13205&lc=en-WW>

In a first step, IES classes and PDS loss values according to EN50598-2 have been available in SinaSave since SPS / IPC / Drives 2015 for the following system combinations: SIMOTICS GP/SD VSD10 & SINAMICS G120, SIMOTICS FD & SINAMICS G120P, SIMOTICS GP/SD VSD4000 & SINAMICS G120.

## Questions relating to the portfolio

### Which converters does the standard apply to?

**EN 50598-2 is binding for the SINAMICS V20, G110, G120, G130, G150 and G180 series**

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#### Area of validity of the EN 50598-2 standard

##### EN 50598-2 must be applied for

- AC-AC converters/CDM without energy recovery functionality
- Motors with integrated converter/CDM (one product)
- Supply voltage: 100 V – 1000 V
- Power range: 0.12 kW – 1000 kW
- Independent of the motor technology

EN 50598-2 is mandatory for the following CDM:

- SINAMICS V20
- SINAMICS G110 family
- SINAMICS G120 family
- SINAMICS G130
- SINAMICS G150
- SINAMICS G180

##### EN 50598-2 can be optionally applied to:

- AC-AC converters/CDM capable of energy recovery
- AC-DC converters/CDM
- DC-AC converters/CDM
- Devices with other power and voltage classes
- **Any combinations of PDS (CDM and motor)**

In the first step, Siemens is planning to apply the EN 50598-2 for the following PDS:

- SIMOTICS FD & SINAMICS G120P
- SIMOTICS GP/SD VSD10 Line & SINAMICS G120
- SIMOTICS GP/SD VSD4000 Line & SINAMICS G120

## What are the loss values for SIMOTICS FD with SINAMICS G120P in comparison to SIMOTICS FD with SINAMICS S150?

The combination of SIMOTICS FD with SINAMICS G120P is significantly better than SIMOTICS FD with SINAMICS S150. The reason for this is that SINAMICS S150 is based on AFE (Active Front End) technology. The AFE comprises two modules (AIM (Active Interface Module) + ALM (Active Line Module)), which have higher losses than one module. This is the reason that the standard states that specifying the IE class and the 8 loss values for converters with AFE technology – such as the SINAMICS S150 – is only optional.

## Will a table be provided which will list which values / IES classes for which CDM / PDS?

For the CDM (converters), we have specified the IE class and the loss values at 8 operating points in tables in SIOS (see link).

<https://support.industry.siemens.com/cs/document/94059311/sinamics-inverters-for-single-axis-drives%3A-expansion-of-power-loss-data-to-include-partial-load-operation?dti=0&pnid=13205&lc=en-WW>

For PDS systems, the IES classes and the loss values at 8 operating points for the three systems SIMOTICS GP/SD VSD10 & SINAMICS G120, SIMOTICS FD & SINAMICS G120P, SIMOTICS GP/SD VSD4000 & SINAMICS G120 have been available in SinaSave since SPS / IPC / Drives 2015.

## Why is SINAMICS S not affected?

SINAMICS S is a multi-axis drive system. In the standard, multi-axis drive systems are only optional.

## How does our ECO mode fit into this landscape of standards?

The Eco mode has flux reduction in the partial load range. This results in low losses in the partial load range – and therefore also reduces the loss values in the partial load range stipulated in the standard.

<http://www.industry.siemens.com/drives/global/en/converter/Pages/energy-efficient-drives.aspx>

## Theoretically, can the optimized pulse pattern also be used with other motors?

The optimized pulse patterns have been specifically developed for SIMOTICS FD motors. As a consequence, these have not been tested with other motors. This is the reason that the optimized pulse patterns should not be used with other motors.

## In which IES class will our converters, coupled with a standard motor, be?

A general blanket statement cannot be made, it must be considered on a case-for-case basis.

**SIMOTICS GP/SD synchronous-reluctance study / SINAMICS G120: Extremely simple commissioning as the controller does not have to be parameterized. How does this function?**

Commissioning is simplified due to the fact that when the motor code is entered, the controller knows the motor parameters, and the current controller is then automatically set to the optimum values.

**Questions to the stakeholders**

**Who is responsible for specifying the IES class?**

The company/person that combines the motor and converter to create a PDS is responsible (e.g. a system integrator). For Siemens IDS systems, Siemens supplies the values and is responsible for the values it specifies (for the defined secondary conditions and constraints).

**At some stage, the plant/system builder must prove/verify that the standard/legislation has been complied with. How do these match the values determined under laboratory conditions? Can they be used in real life situations?**

The standard specifies that inaccuracies when determining the values must be added as safety margin.

**Web page:** <http://www.industry.siemens.com/topics/global/en/energy-efficient-production/legislation-and-standards/Pages/legislation-and-standards.aspx>

**CDM tables in SIOS**

<https://support.industry.siemens.com/cs/document/94059311/sinamics-inverters-for-single-axis-drives%3A-expansion-of-power-loss-data-to-include-partial-load-operation?dti=0&pnid=13205&lc=en-DE>