

DOLSynRM Concept introduction up to IE5 efficiency

SynRM benefits available for fixed speed applications

Tailored high efficiency motors for OEMs

Your DOLSynRM benefits

- Cost efficient high efficiency motor technology
- Sustainable and secure magnet-free design
- High reliability due to low bearing temperature
- Service-friendliness

DOLSynRM concept

As beneficial as speed control may be, there are still many applications where it is not an alternative. DOLSynRM makes SynRM technology available for fixed speed applications as well.

There is a cage in the rotor, and during starting, the motor works like an induction motor. After reaching full speed, the motor synchronizes and continues operation as a synchronous reluctance motor with eliminated rotor losses and high efficiency.

These motors are optimized exclusively for fixed speed, i.e. direct-on-line use. A frequency converter intended for variable speed SynRM motors cannot be used for DOLSynRM motors. Operation with scalar control may be possible but functionality should be verified case by case. There are other SynRM motors optimized for variable speed applications.

DOLSynRM concept is most favorable in 1-200kW power range and 4-pole execution, while two or even six poles can be studied. It is suitable for most pumps, fans, compressors and other applications where load inertia is not particularly high and where high starting torque is not required.



This means that DOLSynRM can cover the majority of motor requirements – making it an ideal tool for finding a solution for customer specific needs.

SynRM technology platform

The novelty of new synchronous motor technologies, such as ABB's SynRM, is that rotor losses are virtually eliminated. The development of SynRM motors is focused on small motors, where rotor losses have the most significant impact.

Eliminating one loss element compared to induction technology means there is more freedom to find cost effective ways to boost motor efficiency. As a result, it is today possible to achieve efficiency levels that were unimaginable only a few years ago. The core of the SynRM concept is its variety of rotor technologies combined with classical, proven stator technology and mechanical motor design.

Typical electrical performance

		Speed r/min	Efficiency			Power factor cos φ	Current		Torque		
			Full load 100%	3/4 load 75%	1/2 load 50%		I _N A	I _S /I _N	T _N Nm	T _f /T _N [*]	T _b /T _N ^{**}
Output kW	Frame size										
1500 r/min (50 Hz) 400 V network											
1.5	90	1500	88.2	87.4	84.7	0.64	3.84	7.5	9.55	3.1	3.1
15	160	1500	93.9	94.0	93.2	0.72	32.0	6.6	95.5	3.7	2.1
90	280	1500	96.1	96.1	95.4	0.73	185	10	573	4.3	2.1

SynRM motors for variable speed applications

- IE4 SynRM motors 5.5kW to 315kW
- Compact HO SynRM motors 1.1kW to 350kW
- IE5 SynRM² concept for OEMs 1kW to 15kW

*) Locked rotor torque

**) Max. torque in synchronous operation

For more information please contact:

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