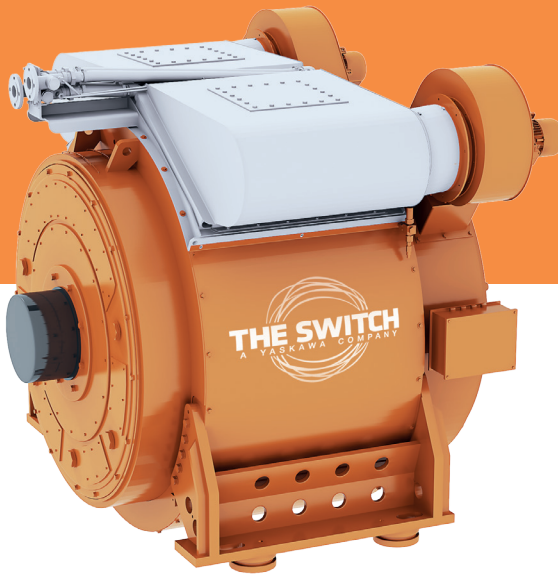




PMM 500 – 5800 kW

0 – 600 rpm



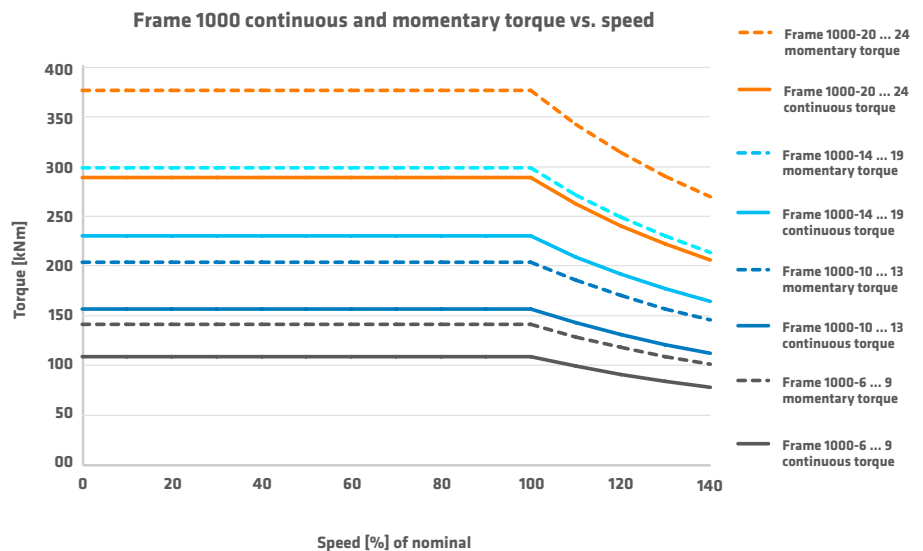
Built for a wide range of rugged marine applications

The Switch PMM is a brushless permanent magnet synchronous machine designed and built according to international standards such as IEC. It can be delivered with various certificates issued by worldwide classification societies, including LR, BV and DNV. The machine can be used either as a generator, for instance, a shaft generator, or as a motor, for example, for the main propulsion.

The Switch PMM can be tailored to meet every customer's special requirements with regard to speed range, cooling, voltage and other specifications. Excellent scalability in axial length results in the widest possible torque range. The production facility for these machines is certified according to ISO 9001 quality standards.

Operational range

The machine is designed to meet specific operational speed range requirements.



Technical data

	Frame 1000-6	Frame 1000-7	Frame 1000-8	...	Frame 1000-12	Frame 1000-13	Frame 1000-14
Max. continuous torque [kNm]	73	85	97	...	145	157	170
Shaft height [mm]							
Speed range [rpm]							
Output power at 100 rpm [kW] ¹	730	850	980	...	1460	1560	1710
Current at 100 rpm [A] ²	660	770	890	...	1330	1420	1550
Efficiency at 100 rpm [%]	95.8	95.9	96.0	...	96.0	96.2	96.2
Max. momentary torque [% of nominal]	130						
Machine weight without/with shaft or bearings [t]	11.0/13.3	11.4/13.7	11.8/14.1	...	14.8/17.4	15.2/17.8	16.1/19.0
Rotor weight without/with shaft or bearings [t]	1.1/1.78	1.3/1.98	1.5/2.18	...	2.3/3.3	2.5/3.5	2.65/4.15
Rotor inertia without/with shaft or bearings [kgm ²]	660/665	675/680	690/695	...	750/760	765/775	835/855
Protection class ³	IP44						
Cooling type	IC8A6W						
Number of poles							
Nominal voltage [V] ⁴							
Max. ambient temperature [°C]							
Max. cooling liquid temperature [°C]							
Insulation class ⁵							
Thermal class							
Cooling fan power. max [kW]	2 x 1.8	2 x 1.8	2 x 1.8	...	2 x 1.8	2 x 1.8	2 x 1.8
Cooling liquid flow rate. max. [m ³ /h]	3.9	4.4	5.0	...	7.4	7.5	8.3

¹Generator mode ² Nominal voltage 690 V ³ Higher class optional ⁴ Medium voltage optional ⁵ H-class optional

Features	Main benefits	Features
Excitation with Neodymium magnets	<ul style="list-style-type: none"> - Excellent efficiency, especially at part loads - Brushless, no slip rings needed, no wearing parts - No external exciters needed - No automatic voltage regulator (AVR) needed - Low rotor weight and inertia - In generator mode, possible to start from blackout - Very low vibration levels 	Control with frequency converter
Redundancy	<ul style="list-style-type: none"> - At part loads, possibility to use one drive/winding system to increase efficiency and reduce fuel use 	Form-wound, mica-insulated winding impregnated with global VPI
Protection class IP54	<ul style="list-style-type: none"> - Closed system, no external particles or dirt can enter the machine 	Flexible design Bearing/shaft connection

Frame 1000-15	Frame 1000-16	Frame 1000-17	Frame 1000-18	Frame 1000-19	Frame 1000-20	Frame 1000-21	Frame 1000-22	Frame 1000-23	Frame 1000-24
182	194	206	218	230	242	254	266	278	290
1000									
0 ... 600									
1830	1960	2080	2200	2320	2445	2565	2685	2810	2930
1660	1780	1890	2000	2110	2220	2330	2440	2550	2660
96.2	96.3	96.3	96.3	96.4	96.4	96.4	96.4	96.5	96.5
16.5/19.4	16.9/19.8	17.3/20.2	17.7/20.6	18.1/21.0	19.0/22.5	19.4/22.9	19.8/23.3	20.2/23.7	20.6/24.1
2.85/4.35	3.05/4.55	3.25/4.75	3.45/4.95	3.65/5.15	3.85/5.8	4.05/6.0	4.25/6.2	4.45/6.4	4.65/6.6
850/870	865/885	880/900	895/915	910/930	980/1010	995/1025	1010/1040	1025/1055	1030/1070

/7 (Forced air-cooling with external air-to-liquid heat-exchanger)

24									
450/500/690									
45									
38									
F									
B									
2 x 3.5	2 x 3.5	2 x 3.5	2 x 3.5	2 x 3.5	2 x 3.5	2 x 3.5	2 x 3.5	2 x 3.5	2 x 3.5
8.9	9.2	9.8	10.4	10.6	10.8	11.3	11.9	12.0	12.5

Main benefits

- Variable speed operation, decouples the machine rotation speed from grid's voltage and frequency
- Maximized system efficiency
- In shaft generator applications, both PTI and PTO modes available
- Full torque available starting from zero speed
- Momentary overloading for clearing ice loads, foreign parts on propeller or other

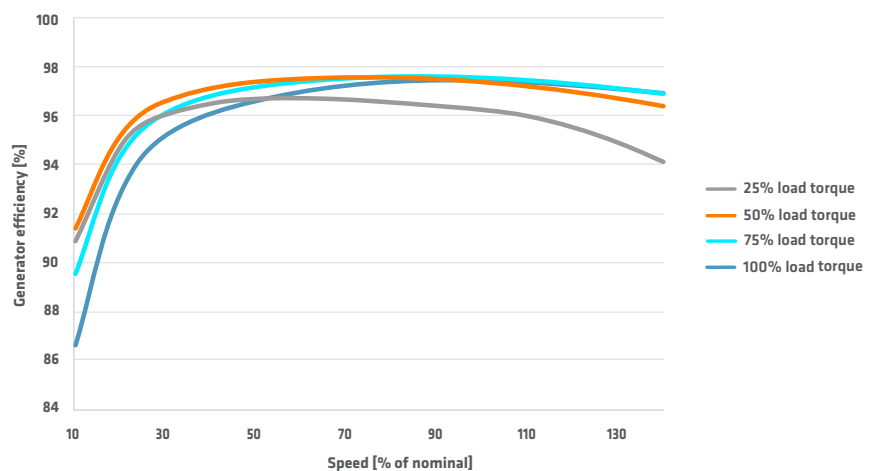
- Best possible protection against mechanical vibrations, chemical corrosion and electrical surges
- Proven technology
- Easily scalable up to medium voltages

- Modular design allows customization
- Adjustable mechanical interfaces

- Complete machine includes shaft and bearings

Typical efficiencies of The Switch PMM at various speeds and load levels

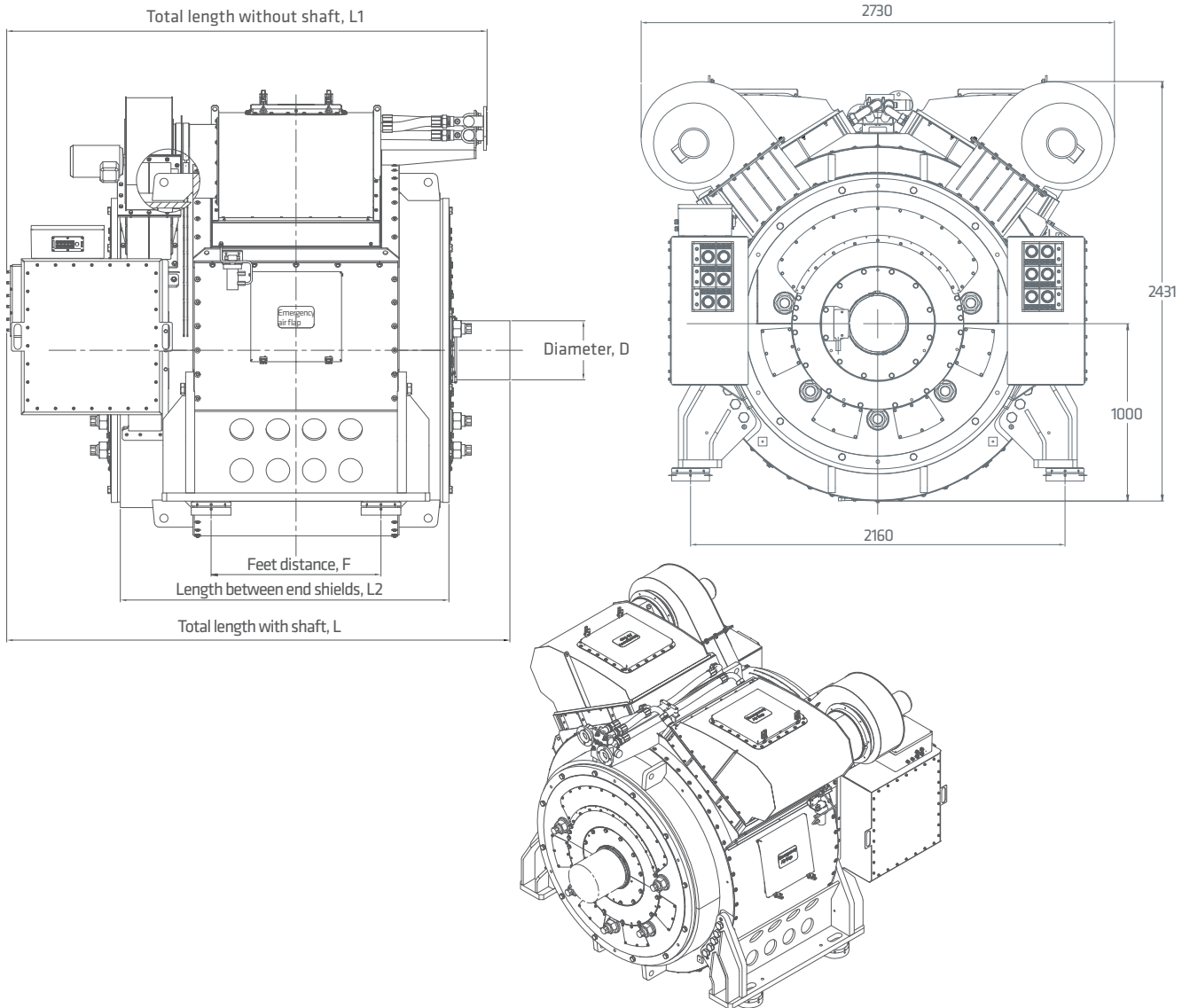
This chart illustrates typical efficiencies vs speed at different loading levels, which also takes the external cooling fan power consumption into account.



Exact efficiency value depends on the nominal speed of the application.

Technical drawings

Interface dimensions can be tailored according to customer specifications.



Machine dimensions	L	L2	F	D
With shaft				
Frame 1000-20 ... 24	3460	2649	1035	300 m6
Frame 1000-14 ... 19	3060	2249	935	300 m6
Frame 1000-10 ... 13	2793	1859	935	300 m6
Frame 1000-6 ... 9	2542	1640	578	300 m6
Without shaft	L1			
Frame 1000-20 ... 24	2960	2649	1035	-
Frame 1000-14 ... 19	2560	2249	935	-
Frame 1000-10 ... 13	2293	1859	935	-
Frame 1000-6 ... 9	2042	1640	578	-