

ABB e-mobility motors for heavy working machine applications



01 Each motor is optimized based on end-customer criteria, using advanced calculation tools and on well proven building blocks.

Optimized e-Drivetrain motor platform using our broad technology portfolio, ensuring maximum performance and reliability.

ABB has been active in the industrial and vehicle market for motor solutions for more than 100 years, designing and supplying reliable motors to be operated in harsh environments and tough conditions.

We are addressing the e-mobility market by combining our know how in high volume manufacturing from industrial motors to customized motors for the railway business.

ABB's e-mobility motors AMXE for heavy working machines are optimized for each machine's work cycle and specific customer preferences. These motors are making headway fast in applications such as mining, construction, material handling, agriculture, airport vehicles, Electric Boat and Vessel etc.

Using our broad technology portfolio, we can choose the best fit-for-purpose solution for the customer. We focus on providing the right solution not only for optimizing performance and reliability, but also for minimizing the total cost of ownership.

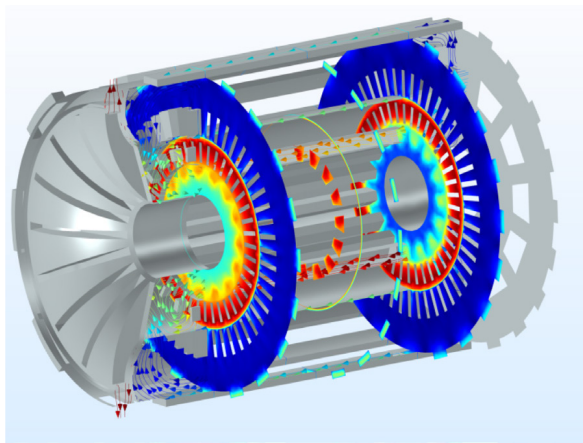
With ABB's e-mobility drivetrain it is easy build small vessels like tugs and tourist ferries, as the mobile drive and traction motor are designed to be compact and work in harsh conditions. As such they don't need electrical rooms or cabinets but can be installed in small spaces like in catamaran fins or on bulkheads.

Collaborative design process

Collaboration is a key value for ABB.

We invite OEMs to join us to develop customized motors to fulfill the needs of their customers.

Should the motor be optimized for efficiency, performance or low weight? Or, for lowest environmental impact, free of permanent magnets from rare-earth minerals? Using advanced calculation tools, we customize each motor based on your needs while ensuring robustness from well proven building blocks.



02 Each motor is customized based on end-customer criteria, using advanced calculation tools and based on well proven building blocks.

With such criteria in mind, we can determine the optimal motor design. With the advanced simulation models used and our extensive experience, the results are quickly available, and the performance is known before the testing starts which shortens lead time and lower cost.

- Permanent magnet assisted synchronous reluctance technology
- Liquid cooling to provide cooling event at standstill and reduce noise
- Easy installation with HES880 drive

Typical motor examples

Frame size	132	160	200	250	315
Peak torque	600	1000	2000	2500	3500
Peak power	251	240	300	360	750
Continuous torque	229	500	850	1800	2600
Continuous power	96	170	200	250	330
Diameter, mm	270	308	387	474	585
Length, mm	423	630	635	635	700
Weight, kg	95	190	310	470	670
Cooling	Liquid	Liquid	Liquid	Liquid	Liquid

Importance Notes:

The AMXE Motor has frame size from 132 to 315. It will be designed optimized Motor with customer machine and application.

ABB will be submitted correct data sheet for your application and machine with our offer.

The technical data is only for reference. Please contact ABB representative.

DATA SHEET

AMXE132

Technical data

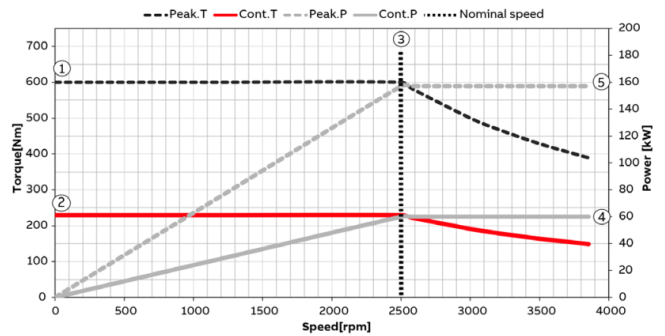
Motor type		Peak torque Nm	Peak power kW	Peak current A	Max speed rpm	Continuous torque Nm	Continuous power kW	Continuous current A	Nominal speed rpm
AMXE132S	AMXE132S-L1	360	57	119	3766	138	22	46	1500
	AMXE132S-L2	360	75	156	4945	138	29	60	2000
	AMXE132S-L3	360	94	192	5000	138	36	74	2500
	AMXE132S-L4	360	113	227	5000	138	43	87	3000
	AMXE132S-L5	360	132	278	5000	138	51	107	3500
	AMXE132S-L6	360	152	313	5000	138	58	120	4000
AMXE132L	AMXE132L-L1	600	94	160	2466	229	36	59	1500
	AMXE132L-L2	600	126	211	3287	229	48	79	2000
	AMXE132L-L3	600	157	256	3850	229	60	95	2500
	AMXE132L-L4	600	188	313	4932	229	72	119	3000
	AMXE132L-L5	600	220	360	5000	229	84	136	3500
	AMXE132L-L6	600	251	417	5000	229	96	159	4000

*Specifications are valid with coolant at 65°C (inlet), 15 l/min and in a 40°C ambient unless stated otherwise. Actual performance will vary with drive cycle, cooling and installation details.

Motor specification

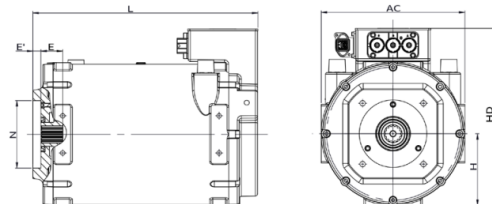
	Specification	AMXE132S	AMXE132L
Operating conditions	Operating voltage (battery)	450-800 VDC	
	Coolant type	Water glykol	
	Coolant temperature	≤ 65 °C	
	Coolant flow	5 - 25 lpm	
	Pressure drop	< 1 bar	
	Ambient temperature	-40 °C to +55 °C	
Electrical and physical properties	Machine type	Permanent Magnet Synchronous Motor (PMSM)	
	Weight	68 kg	95 kg
	Inertia	0,0454 kg·m ²	0,0730 kg·m ²
	Max speed	5000 rpm	
	IP class	Up to IP6K9K	
	Shock loads (ISO 16750)	Up to 50 g	
Interfaces	Electrical connection	Terminal box with bolt connection	
	Flange	SAE C according to SAE J744 (or acc. to customer specification)	
	Shaft	Shaft end SAE C 14T 12/24 DP (or acc. to customer specification)	
	Cooling connection	2 x G1/2" internal thread ISO 1179-1 ports	
Options	Resolver	X	
	Hybrid bearings	X	
	Relubricated bearings	X	
	Electrical connection	PowerLok with HVIL	
	Shaft grounding	X	

Performance

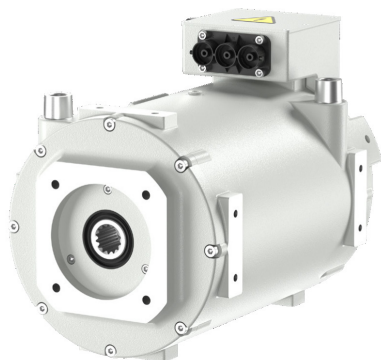


1. Peak torque during 30s at 65° coolant temperature, can be achieved up to nominal speed 3.
2. Continuous torque (S1 duty) at 65° coolant temperature, can be achieved up to nominal speed 3.
3. Nominal speed
4. Continuous power (S1 duty) at 65° coolant temperature, can be achieved from speed 3 to max speed.
5. Peak power during 30s at 65° coolant temperature, can be achieved from nominal speed 3.

Main dimensions



Motor type	A	E	E'	H	HD	L	N
AMXE132S	270	41	15	135	333	335	127 H7
AMXE132L	270	41	15	135	333	423	127 H7



DATA SHEET

AMXE160

Technical data

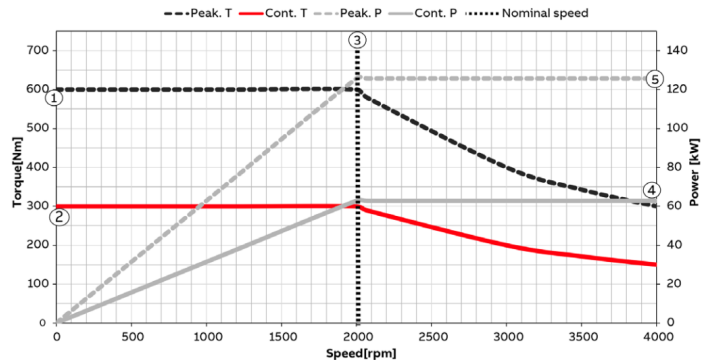
Motor type		Peak torque Nm	Peak power kW	Peak current A	Max speed rpm	Continuous torque Nm	Continuous power kW	Continuous current A	Nominal speed rpm
AMXE160S	AMXE160S-L1	595	62	103	2134	300	31	53	1000
	AMXE160S-L2	595	93	149	3145	300	47	75	1500
	AMXE160S-L3	595	124	197	4267	300	63	101	2000
	AMXE160S-L4	595	155	247	5000	300	78	129	2500
	AMXE160S-L5	595	186	298	5000	300	94	158	3000
	AMXE160S-L6	595	217	341	5000	300	109	178	3500
AMXE160L	AMXE160L-L1	980	102	168	2250	495	52	88	1000
	AMXE160L-L2	980	153	246	3268	495	77	128	1500
	AMXE160L-L3	980	204	331	4500	495	103	177	2000
	AMXE160L-L4	980	255	398	5000	495	129	202	2500
	AMXE160L-L5	980	306	473	5000	495	155	235	3000
	AMXE160L-L6	980	357	553	5000	495	180	282	3500

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Motor specification

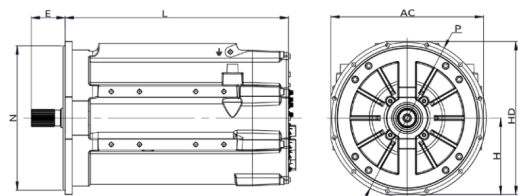
	Specification	AMXE160S	AMXE160L
Operating conditions	Operating voltage (battery)	450-750 VDC	
	Coolant type	Water glykol	
	Coolant temperature	≤ 65 °C	
	Coolant flow	5 - 25 lpm	
	Pressure drop	< 1 bar	
	Ambient temperature	-40 °C to +55 °C	
Electrical and physical properties	Machine type	Permanent Magnet Synchronous Motor (PMSM)	
	Weight	157 kg	206 kg
	Inertia	0,116 kg·m ²	0,156 kg·m ²
	Max speed	5000 rpm	
	IP class	Up to IP6K9K	
	Shock loads (ISO 16750)	Up to 50 g	
	Interfaces	Electrical connection	PowerLok with HVIL
Flange		SAE 3 housing flange (or acc. to customer specification)	
Shaft		DIN5480 - W50 x 2 x 24 x 9g (or acc. to customer specification)	
Cooling connection		2 x G1/2" internal thread ISO 1179-1 ports	
Options	Resolver	X	
	Hybrid bearings	X	
	Relubricated bearings	X	
	Shaft grounding	X	

Performance

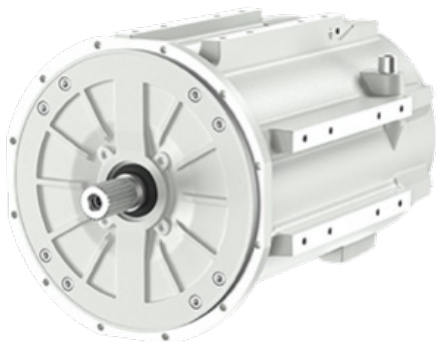


1. Peak torque during 30s at 65° coolant temperature, can be achieved up to nominal speed 3.
2. Continuous torque (S1 duty) at 65° coolant temperature, can be achieved up to nominal speed 3.
3. Nominal speed
4. Continuous power (S1 duty) at 65° coolant temperature, can be achieved from speed 3 to max speed.
5. Peak power during 30s at 65° coolant temperature, can be achieved from nominal speed 3.

Main dimensions



Motor type	AC	E	H	HD	L	N	P
AMXE160S	396	81	198	399	482	362 H8	410
AMXE160L	396		198	399	612	362 H8	410



DATA SHEET

AMXE200

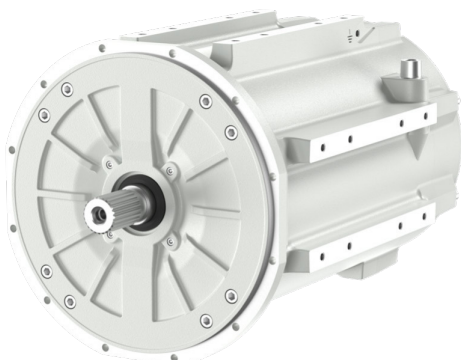
Technical data

Motor type		Peak torque Nm	Peak power kW	Peak current A	Max speed rpm	Continuous torque Nm	Continuous power kW	Continuous current A	Nominal speed rpm
AMXE200S	AMXE200S-L1	1211	233	397	4400	600	94	183	1500
	AMXE200S-L2	1195	266	420	4760	600	126	199	2000
	AMXE200S-L3	1166	305	441	5000	600	157	227	2500
	AMXE200S-L4	1129	314	464	5000	600	173	250	2750
AMXE200L	AMXE200L-L1	1877	295	595	4223	900	145	271	1500
	AMXE200L-L2	1822	382	636	4750	900	189	310	2000
	AMXE200L-L3	1758	460	691	5000	900	236	360	2500
	AMXE200L-L4	1641	516	741	5000	900	283	418	3000

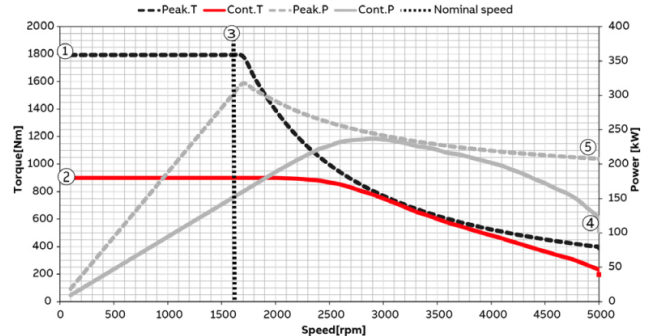
*Specifications are valid with coolant at 65 °C (inlet), 15 l/min and in a 40 °C ambient unless stated otherwise. Actual performance will vary with drive cycle, cooling and installation details.

Motor specification

	Specification	AMXE200S	AMXE200L
Operating conditions	Operating voltage (battery)	450-800 VDC	
	Coolant type	Water glykol	
	Coolant temperature	≤ 65 °C	
	Coolant flow	5 - 25 lpm	
	Pressure drop	< 1 bar	
	Ambient temperature	-40 °C to +55 °C	
Electrical and physical properties	Machine type	Permanent Magnet Synchronous Motor (PMSM)	
	Weight	229 kg	287 kg
	Inertia	0,283 kg·m ²	0,417 kg·m ²
	Max speed	5000 rpm	
	IP class	Up to IP69K	
	Shock loads (ISO 16750)	Up to 50 g	
Interfaces	Electrical connection	PowerLok with HVIL	
	Flange	SAE 3 housing flange (or acc. to customer specification)	
	Shaft	DIN5480 - W50 x 2 x 24 x 9g (or acc. to customer specification)	
	Cooling connection	2 x G1/2" internal thread ISO 1179-1 ports	
Options	Resolver	X	
	Hybrid bearings	X	
	Relubricated bearings	X	
	Shaft grounding	X	

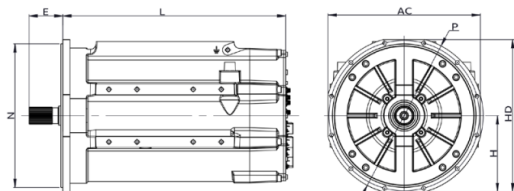


Performance



1. Peak torque during 30s at 65° coolant temperature, can be achieved up to nominal speed 3.
2. Continuous torque (S1 duty) at 65° coolant temperature, can be achieved up to nominal speed 3.
3. Nominal speed
4. Continuous power (S1 duty) at 65° coolant temperature, can be achieved from speed 3 to max speed.
5. Peak power during 30s at 65° coolant temperature, can be achieved from nominal speed 3.

Main dimensions



Motor type	A	E	H	HD	L	N	P
AMXE200S	434	96	217	434	530	410 H6	450
AMXE200L	434	96	217	434	635	410 H6	450

DATA SHEET

AMXE250

Technical data

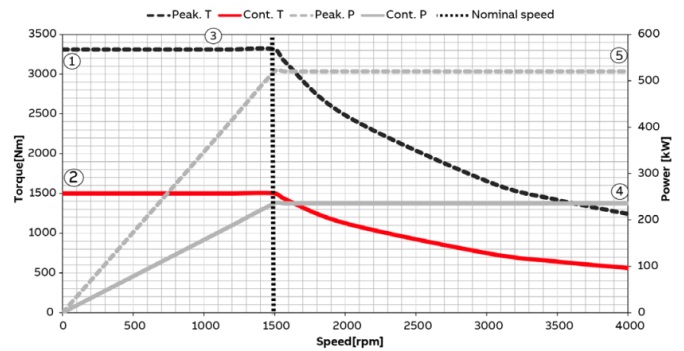
Motor type		Peak torque Nm	Peak power kW	Peak current A	Max speed rpm	Continuous torque Nm	Continuous power kW	Continuous current A	Nominal speed rpm
AMXE250L	AMXE250L-L1	3353	263	717	2800	1500	118	297	750
	AMXE250L-L2	3346	350	795	3120	1500	157	330	1000
	AMXE250L-L3	3330	436	889	3500	1500	196	374	1250
	AMXE250L-L4	3311	520	1009	4000	1500	236	424	1500

*Specifications are valid with coolant at 65 °C (inlet), 15 l/min and in a 40 °C ambient unless stated otherwise. Actual performance will vary with drive cycle, cooling and installation details.

Motor specification

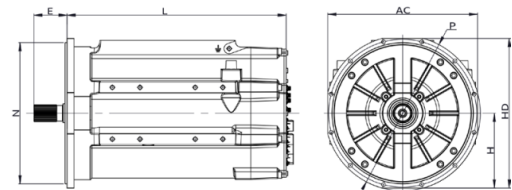
	Specification	AMXE250L
Operating conditions	Operating voltage (battery)	450-800 VDC
	Coolant type	Water glykol
	Coolant temperature	≤ 65 °C
	Coolant flow	15 - 25 lpm
	Pressure drop	< 1 bar
	Ambient temperature	-40 °C to +55 °C
Electrical and physical properties	Machine type	Permanent Magnet Synchronous Motor (PMSM)
	Weight	490 kg
	Inertia	1,22 kg·m ²
	Max speed	3500 rpm
	IP class	IP67
	Shock loads (ISO 16750)	Up to 10 g
Interfaces	Electrical connection	PowerLok with HVIL
	Flange	SAE 1 housing flange (or acc. to customer specification)
	Shaft	DIN5480 - W50 x 2 x 24 x 9g (or acc. to customer specification)
	Cooling connection	2 x G1/2" internal thread ISO 1179-1 ports
Options	Resolver	X
	Hybrid bearings	X
	Shaft grounding	X

Performance



1. Peak torque during 30s at 65° coolant temperature, can be achieved up to nominal speed 3.
2. Continuous torque (S1 duty) at 65° coolant temperature, can be achieved up to nominal speed 3.
3. Nominal speed
4. Continuous power (S1 duty) at 65° coolant temperature, can be achieved from speed 3 to max speed.
5. Peak power during 30s at 65° coolant temperature, can be achieved from nominal speed 3.

Main dimensions



Motor type	AC	E	H	HD	L	N	P
AMXE250L	538	96	271	542	635	511,18 H8	555



Applications

- Construction equipment
- Mining vehicles
- Cargo handling equipment
- Forestry segment
- Trucks
- E-Bus and Tram
- Airport and special vehicles
- Propulsion Motor for Boat and Ship
- Yacht



Sleek new hybrid-propulsion ferry keeps Norway's fjords clean and quiet



Niagara Falls with first US built all-electric vessels

Niagara Falls tour operator Maid of the Mist orders two new passenger vessels sailing on pure electric power, enabled by ABB's technology



ABB's role in developing energy efficient and greener solutions for the cruise and ship market is of-ten seen as an attraction by superyacht owners, especially as the arrival of smaller expedition cruise ships has coincided with the emergence of exploration yachts.



ABB is providing integral technology to one of the most innovative ship designs ever seen on the Norwegian fjords. The ferry will couple its striking appearance with ABB's cutting-edge maritime hybrid solution. The vessel's concept has been named "Vision of the Fjords"



The ABB e-drivetrain, including e-mobility motors and HES880 drives, in use by Epiroc, for the global mining group's 2nd-generation battery powered vehicles.



LRVs are trams and other light-weight train types. They all have in common that they run on a tight schedule, mainly in urban or suburban areas. There are also big differences between LRVs, affecting the design of their traction motors.



Zero-emission electric truck for ABB showcased in Swiss capital



The traction equipment converts the electrical energy from the overhead power line, generator or battery into the correct voltage and frequency for driving the traction motors.

HES880 mobile drive



Compact and rugged drive modules for heavy hybrid or full electric vehicles and marine applications.

HES880 Mobile Drive has been designed from the ground up as a compact drive that can tolerate harsh conditions and heavy operation. These design features make it ideal for heavy working machines and small vessels where it is not possible to protect the drive in special cabinets.

We wanted to make HES880 easy to use in all aspects. This is why it shares the same tool and parameter structure as our very popular ACS880 industrial drive family so that there is no new learning needed if you use both drive families. We have also worked hard to make the commissioning of the Mobile Drive as easy as possible. To help OEMs simplify logistics and reduce stock items we designed HES880 hardware to support 3 different operation modes, so it can act as an inverter, line converter or DC/DC converter.

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