

Permanent Magnet Brushless DC Motor For Vehicle

More economical ! Zero pollution !

Overview

Electric Vehicle Driven-motor Analysis

As we all know, Battery technology is the bottlenecks that constrain large-scale automotive application. Under the premise of the insurmountable battery performance, how to improve energy efficiency and the driving course and improve the battery use life are the focus in the electric car industry. The following is two key points that advance the electric vehicle technology:

- The key point to improve the electric car performance is to use the proper driven-motor that conform to the characteristic of the battery.
- Under the constrain by the battery, electric vehicles mainly use for urban traffic, most of the time the vehicle is keeping at the start, acceleration, braking working condition, so the starter motor performance, speed up performance, the efficiency of low-speed, brake and energy renewable ability at the time of the taxiway, overload capability, electrical energy density, the reliability of electric vehicles motor is particularly important, and it's an important indicator of electric vehicles motor.

Based on the above two points, the driven-motor is the key that impact the electric vehicle performance, therefore, the ideal motor for electric vehicles must not only comply with the battery discharge characteristics, but also in line with the vehicles operation characteristics.

Parameter and Specification of the Electric Motors:

characteristics	DCM	PM	IM	SRM	MSM	BDM
Start	5	4	4	2	3	4
Low-speed	5	4	4	3	3	4
efficiency	3	3	4	3	5	5
Energy density	2	2	3	4	4	5
Overload	4	4	4	4	4	5
Regenerate	3	5	4	3	5	5
Reliability	2	2	2	5	4	4
Energe Cost	4	4	4	5	4	4
Controller cost	5	5	5	3	4	4
total	36	36	38	36	41	45

Brushless Magnet Motor

- High efficiency and energy saving, this motor operate efficiently in the whole speed range. It's more efficient than the brush DC motors, and the AC variable frequency motor (efficient on the rated frequency), compared to that two kinds motor, the brushless magnet motor has a qualitative improvement, with 20% -50% driving mileage improvement, and also increase battery life by 30%.
- Stepless speed system, the system to run positive, half speed inverted (adjustable), braking energy feedback, multi-overload overheating protection, overvoltage protection, undervoltage protection, CAN communications, signal speed, voltage, Current output .
- With controlled braking function, soft brakes, brake energy recovery, reducing mechanical brake noise and mechanical brake wear.
- Motor power density, small size, light weight, high-speed operation can be realized.
- Brushless structure, no sparks, no need for replacement of carbon brushes, protection grade: IP55, to prevent soil from entering the internal motors, compact structure, strong overload-resistant, long use life.

- Good low-speed performance, big starting torque , and small start the current , adapt to the needs of frequent cost overruns of the electric vehicles to and also save energy.

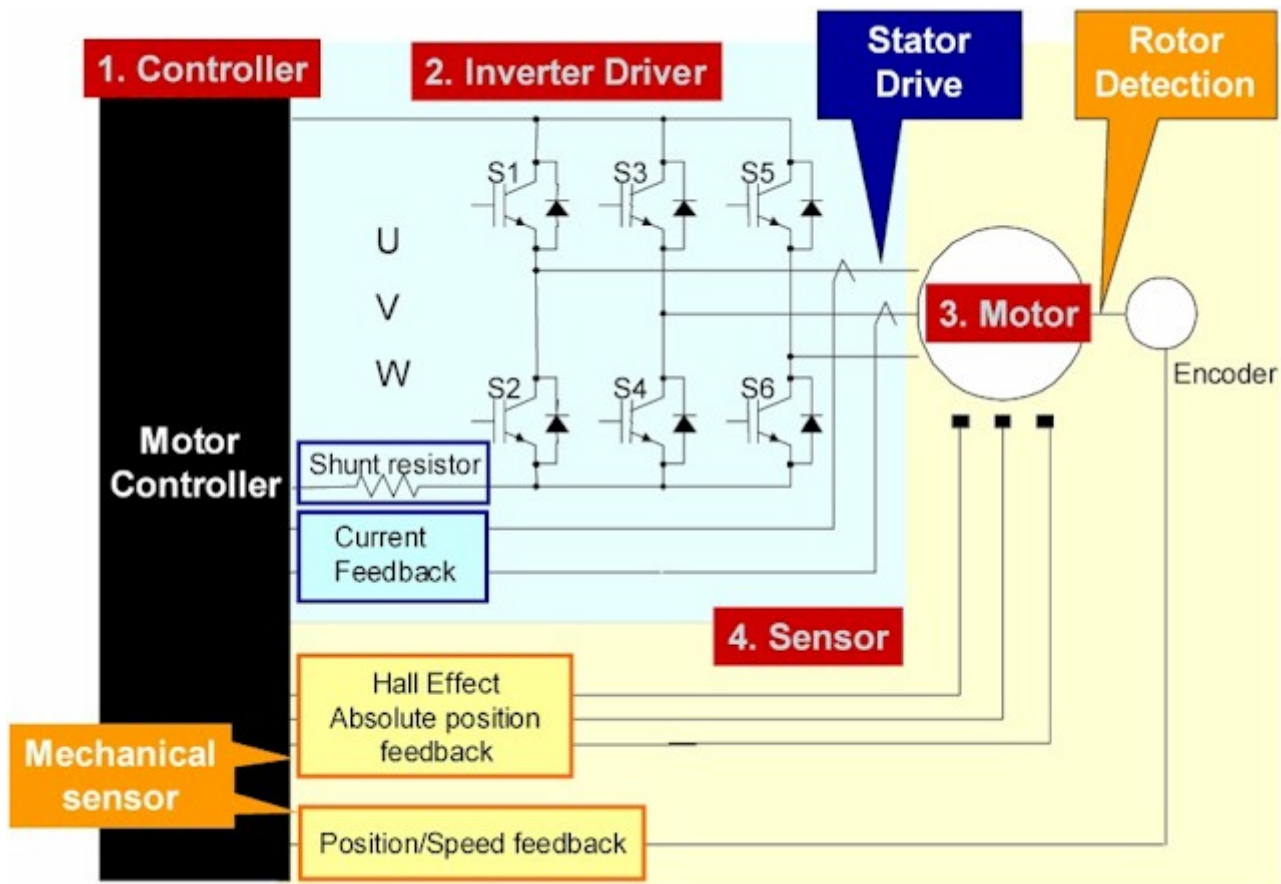
This electric motor drive is equipped with a dedicated high-quality, high-performance power modules and high-end import control chip, adapt industrial rated device, the ambient using temperature is -20 Degrees, and the military level requirements can up to -40 degree and reliable performance.

- This plug-in magnet motor is especially fit to the bumps along the way, repeated start, high-speed, high torque starter, positive run needs. Rotor has a strong magnetic field, jpower discharge effectively when sliding and braking, and do not need to absorb the excitation battery (with brush DC motors or AC motor needs).

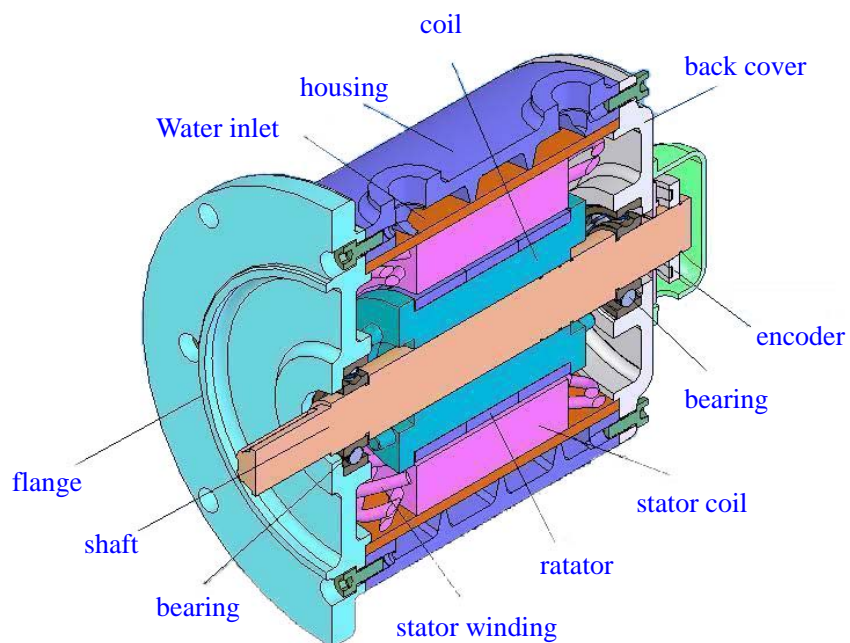
- Energy feedback effect, good electric baking effect.
- The system can use lead-acid batteries, lithium batteries, fuel cells, allowing the battery voltage range of -30% - +20%. Electric motor and drive can meet multiple needs with wind-cooled or water-cooled way.
- The electric motor use imported oil high-speed bearings, maintenance-free, and also with high reliability and long life. Equipped with high-speed non-contact transformer structure pedal, its quality is enhance much than contact-type pedal or pedal and ensure reliable operation of the vehicle balance.
- There are horizontal electric, hanging, along with convex end caps, and can be biaxial stretching, spline extension, and can be tailored in accordance with the requirements of various voltage vehicle, all kinds of speed, a variety of power requirements motors, electric power can be made dual-use motor.

BLDC motor system Diagram

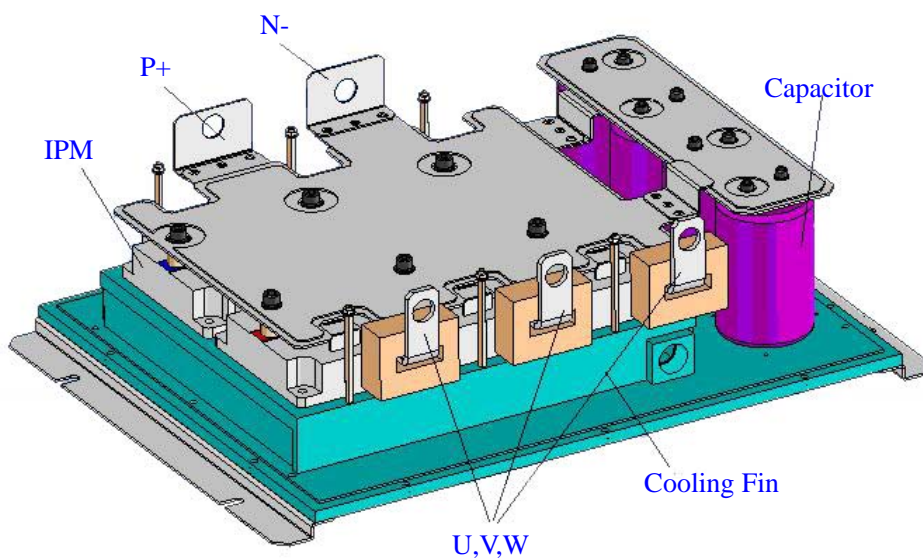
- schematic module



-BLDC motor instruction



-Controller power unit instruction



EV-Bus BLDC motor

Motor



Controller



Data sheet

Item	Rated Power	Battery Voltage	Rated Speed	Max Speed	Rated Torque	Max Torque	Max Power	Rated Current	EFF%	IP	Insulation	Cooling	Net Weight
BL80-1	80 kW	320V	3200 rpm	4000 rpm	238N · m	477N · m	160 kW	294A	97.0%	IP55	F	water	196kg
BL80-2	80 kW	360V	3500 rpm	4000 rpm	218N · m	450N · m	180 kW	244A	97.0%	IP55	F	water	210 kg
BL90-3	90 kW	360V	3500 rpm	4000 rpm	246N · m	540N · m	200 kW	275A	97.0%	IP55	F	water	230 kg
BL90-3	90 kW	320V	3200 rpm	4000 rpm	268N · m	537N · m	180 kW	330A	97.0%	IP55	F	water	312 kg
BL100-1	100 kW	360V	3500 rpm	4000 rpm	273N · m	600N · m	230 kW	305A	96.0%	IP55	F	water	240 kg
BL120-1	120 kW	320V	3200 rpm	4000 rpm	358N · m	716N · m	240 kW	441A	97.2%	IP55	F	water	230 kg
BL120-2	120 kW	360V	3500 rpm	4000 rpm	327N · m	700N · m	260 kW	366A	96.3%	IP55	F	water	280 kg
BL140-1	140 kW	360V	3500 rpm	4000 rpm	382N · m	850N · m	300 kW	427.9A	96.4%	IP55	F	water	310 kg
BL150-1	150 kW	360V	3500 rpm	4000 rpm	409N · m	900N · m	350 kW	458A	96.6%	IP55	F	water	330 kg
BL160-1	160 kW	360V	3500 rpm	4000 rpm	437N · m	1000N · m	360 kW	488A	96.6%	IP55	F	water	350 kg
BL200-1	200 kW	360V	4500 rpm	5000rpm	424N · m	1000N · m	420 kW	578A	96.7%	IP55	F	water	350 kg

Motor



Controller



Pedal



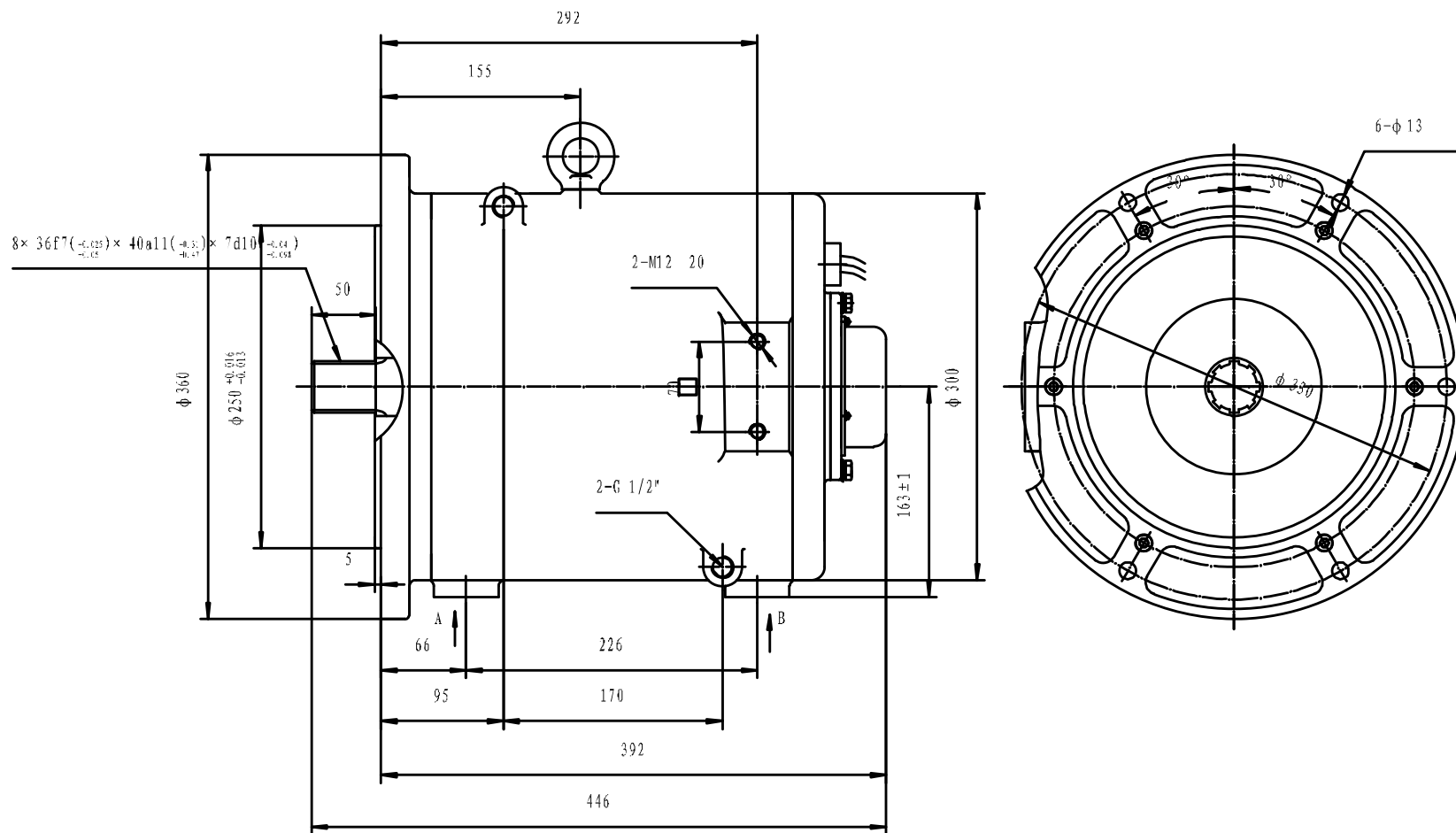
Data sheet

Item	Rated Power	Battery Voltage	Rated Speed	Max Speed	Rated Torque	Max Torque	Max Power	Rated Current	EFF%	IP	Insulation	Cooling	Net Weight
BL45-1	45 kW	320V	3200 rpm	4000 rpm	134N · m	268N · m	90.0 kW	165A	96.8%	IP55	F	water	83kg
BL45-2	45 kW	320V	3500 rpm	4000 rpm	123N · m	260N · m	100 kW	171A	94.8%	IP55	F	water	152 kg
BL45-3	45 kW	320V	6000 rpm	6500 rpm	70N · m	140N · m	100 kW	120.6A	94.8%	IP55	F	water	122 kg
BL50-1	50 kW	320V	3500 rpm	4000 rpm	136N · m	300N · m	110 kW	190.3A	94.8%	IP55	F	water	160 kg
BL50-2	50 kW	320V	6000 rpm	6500 rpm	78N · m	300N · m	160 kW	168A	94.9%	IP55	F	water	126 kg
BL55-1	55 kW	320V	6000 rpm	6500 rpm	86N · m	180N · m	120 kW	168A	94.9%	IP55	F	water	130 kg
BL60-1	60 kW	320V	3500 rpm	4000 rpm	164N · m	360N · m	130 kW	228A	95.0%	IP55	F	water	170 kg
BL60-2	60 kW	320V	6000 rpm	6500 rpm	94N · m	200N · m	130 kW	189A	95.0%	IP55	F	water	136 kg



BL70-1	70 kW	320V	3500 rpm	4000 rpm	191N • m	430N • m	150 kW	237A	95.1%	IP55	F	water	180 kg
BL75-1	75 kW	320V	3500 rpm	4000 rpm	205N • m	450N • m	160 kW	397A	95.2%	IP55	F	water	188 kg

Dimension



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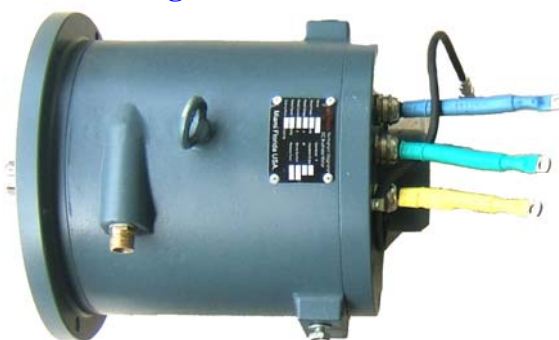
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Air Cooling Motor



Water Cooling Motor



Item	Rated Power	Battery Voltage	Rated Speed	Max Speed	Rated Torque	Max Torque	Max Power	Rated Current	EFF%	IP	Insulation	Cooling	Net Weight
BL5-1	5.0 kW	72 V	1200 rpm	1500 rpm	39.8 N · m	80N · m	10.0 kW	75.9 A	93.0%	IP55	F	IC411	7.5 kg
BL5-2	5.0 kW	72 V	1500 rpm	2000 rpm	31.8 N · m	70N · m	10.0 kW	75.9 A	93.1%	IP55	F	IC411	48 kg
BL5-2	5.0 kW	72 V	1600 rpm	2000 rpm	30.8 N · m	60N · m	10.0 kW	75.9 A	93.1%	IP55	F	IC411	48 kg
BL5-3	5.0 kW	72 V	3000 rpm	3500 rpm	15.9 N · m	30N · m	12.0 kW	75.9 A	93.4%	IP55	F	IC411	33 kg
BL5-4	5.0 kW	96 V	3000 rpm	3500 rpm	15.9 N · m	30N · m	12.0 kW	75.9 A	93.4%	IP55	F	IC411	33 kg
BL5-5	5.0 kW	72 V	2800 rpm	3000 rpm	17 N · m	34N · m	10.0 kW	82 A	95.4%	IP55	F	IC411	32 kg

BL5-6	5.0 kW	320 V	2800 rpm	3000 rpm	17 N • m	34N • m	10.0 kW	20 A	95.4%	IP55	F	IC411	32 kg
BL5-7	5.0 kW	72 V	3500 rpm	3500 rpm	13.6 N • m	30N • m	12.0 kW	75.9 A	93.4%	IP55	F	IC411	33 kg
BL6-1	6.0 kW	72 V	2000 rpm	2500 rpm	28.7 N • m	60N • m	12.0 kW	91.3 A	93.1%	IP55	F	IC411	48 kg
BL6-2	6.0 kW	72 V	3500 rpm	4000 rpm	16.3 N • m	35N • m	13.0 kW	91.3 A	93.5%	IP55	F	IC411	36 kg
BL6-3	6.0 kW	96 V	3500 rpm	4000 rpm	16.3 N • m	35N • m	13.0 kW	62.5 A	93.5%	IP55	F	IC411	36 kg
BL6-4	6.0 kW	144 V	3500 rpm	4000 rpm	16.3 N • m	35N • m	13.0 kW	46.2A	93.5%	IP55	F	IC411	36 kg
BL6-5	6.0 kW	288 V	8500 rpm	9000 rpm	6.7 N • m	15N • m	12.0 kW	23.1A	92.8%	IP55	F	IC411	9 kg
BL7-1	7.0 kW	144 V	4500 rpm	5000 rpm	14.8 N • m	30N • m	15.0 kW	53.9A	92.8%	IP55	F	IC411	38 kg
BL7.5-1	7.5 kW	144 V	4500 rpm	5000 rpm	15.9 N • m	35N • m	16.0 kW	57.2A	93.5%	IP55	F	IC411	40 kg
BL7.5-2	7.5 kW	320 V	3200 rpm	4000 rpm	22.4 N • m	44.8N • m	15.0 kW	27.6A	96.6%	IP55	F	IC411	32 kg
BL8-1	8.0 kW	144 V	3500 rpm	4000 rpm	22 N • m	56N • m	16.0 kW	60.5A	93.5%	IP55	F	IC411	40 kg
BL8-2	8.0 kW	144 V	7000 rpm	7500 rpm	10.9 N • m	20N • m	16.0 kW	61.6A	93.5%	IP55	F	IC411	36 kg
BL8-3	8.0 kW	288 V	8500 rpm	9000 rpm	20 N • m	20N • m	16.0 kW	30.8A	92.8%	IP55	F	IC411	11kg
BL10-1	10 kW	72 V	1500 rpm	2000 rpm	63.7 N • m	20N • m	25.0 kW	154A	93.6%	IP55	F	IC411	62 kg
BL10-2	10 kW	144 V	1500 rpm	2000 rpm	63.7 N • m	20N • m	25.0 kW	77A	93.6%	IP55	F	IC411	43 kg
BL10-3	10 kW	144 V	3500 rpm	2000 rpm	27 N • m	60N • m	20.0 kW	77A	93.6%	IP55	F	IC411	43 kg
BL11-1	11 kW	320 V	3200 rpm	3500 rpm	32.8N • m	66N • m	22.0 kW	40.4A	96.7%	IP55	F	IC411	38 kg
BL12-1	12 kW	144 V	3500 rpm	4000 rpm	32.7N • m	70N • m	30.0 kW	91.3A	93.7%	IP55	F	IC411	46 kg
BL12-2	12 kW	144 V	4000 rpm	4000 rpm	28.7N • m	60N • m	25.0 kW	91.3A	93.7%	IP55	F	IC411	46 kg
BL15-1	15 kW	320 V	3200 rpm	3500 rpm	44.8N • m	89.6N • m	30.0 kW	55A	96.6%	IP55	F	water	47 kg
BL15-2	15 kW	144 V	3500 rpm	4000 rpm	40.1N • m	90N • m	40.0 kW	114.4A	96.6%	IP55	F	water	48 kg
BL15-3	15 kW	144 V	4500 rpm	5000 rpm	31.8N • m	65N • m	30.0 kW	114.4A	93.8%	IP55	F	water	48 kg



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BL18-1	18 kW	144 V	3500 rpm	4000 rpm	49N • m	120N • m	40.0 kW	137.5A	94.5%	IP55	F	water	55 kg
BL20-1	20 kW	144 V	3500 rpm	4000 rpm	55N • m	140N • m	50.0 kW	152.9A	94.6%	IP55	F	water	58 kg
BL22-1	22 kW	320V	3200 rpm	4000 rpm	65.7N • m	131.4N • m	45.0 kW	80.9A	96.8%	IP55	F	water	55 kg
BL22-2	22 kW	144 V	3500 rpm	4000 rpm	60N • m	150N • m	56.0 kW	168.3A	94.7%	IP55	F	water	92 kg
BL25-1	25 kW	288 V	3500 rpm	4000 rpm	68N • m	170N • m	60.0 kW	95.1A	94.8%	IP55	F	water	98 kg
BL25-2	25 kW	288 V	4000 rpm	4500 rpm	60N • m	130N • m	60.0 kW	95.1A	94.8%	IP55	F	water	58 kg
BL27-1	27 kW	288 V	3500 rpm	4000 rpm	74N • m	180N • m	65.0 kW	103.4A	94.8%	IP55	F	water	102 kg
BL27-2	27 kW	288 V	4000 rpm	4500 rpm	60N • m	130N • m	60.0 kW	103.4A	94.8%	IP55	F	water	62 kg
BL30-1	30 kW	320 V	3200 rpm	4000 rpm	89.6N • m	179.2N • m	60.0 kW	110A	96.7%	IP55	F	water	63 kg
BL30-2	30 kW	288V	3500 rpm	4000 rpm	82N • m	200N • m	70.0 kW	152.9A	94.5%	IP55	F	water	110 kg
BL35-1	35 kW	320V	3200 rpm	4000 rpm	110N • m	221N • m	70.0 kW	128.7A	96.9%	IP55	F	water	70 kg
BL35-2	35 kW	288V	3500 rpm	4000 rpm	95.5N • m	210N • m	75.0 kW	181.5A	94.6%	IP55	F	water	114kg
BL35-3	35 kW	333V	6000 rpm	6500 rpm	55N • m	120N • m	70.0 kW	116.6A	94.9%	IP55	F	water	62kg
BL37-1	37 kW	288V	3500 rpm	4000 rpm	101N • m	220N • m	80.0 kW	188.1A	94.6%	IP55	F	water	117 kg
BL40-1	40 kW	320V	3200 rpm	4000 rpm	119.N • m	238N • m	80.0 kW	148A	96.6%	IP55	F	water	80 kg
BL40-2	40 kW	288V	3500 rpm	4000 rpm	109N • m	230N • m	86.0 kW	203A	94.7%	IP55	F	water	122 kg
BL40-3	40 kW	333V	6000 rpm	6500 rpm	62N • m	130N • m	80.0 kW	133A	94.9%	IP55	F	water	65 kg



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