



MW MOTORS
We challenge the norm



MWM 55kW Motor Controller

**High-intergrated, High Precision
& High Efficiency**

MWM 55kW Motor Controller

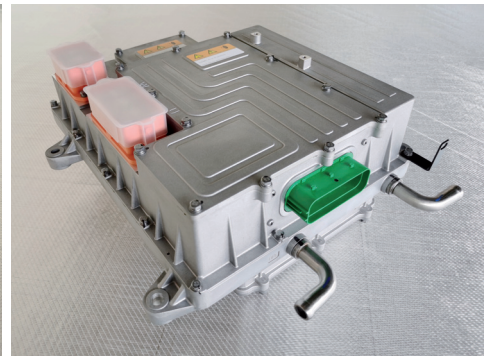
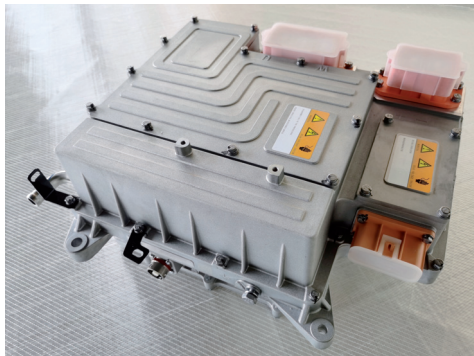
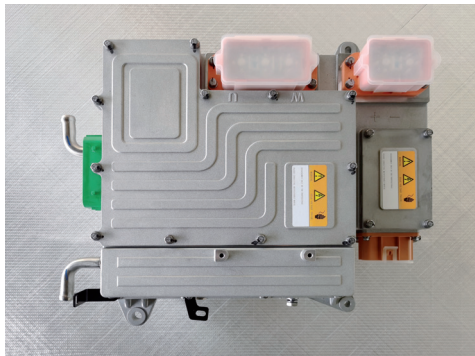
The power electronic unit referred to in this paper includes: MCU, DCDC, high voltage junction box. The MCU unit operates in the forward, reverse, electric under neutral, electric, and feed modes according to the vehicle controller (VCU) control command, and cooperates with the vehicle system of the electric vehicle to realize the switching, driving/braking of the main circuit (cruise and shift), parking, fault alarm and handling functions, while meeting the performance requirements of high and low voltage, EMC, protection level, vibration and collision.

The DCDC module sub-unit converts the high voltage provided by the power battery into a low-voltage DC power supply for charging the vehicle battery or the vehicle low-voltage electrical appliance. The DC input of the DCDC can withstand a wide voltage range to ensure compatibility with different power battery systems. At the same time, it can meet the functions of fault status feedback, fault self-protection, and delayed vehicle power-off.

The cooling method of the motor controller is liquid cooling, and the flow rate of the required cooling liquid is 8-10L/min. The motor controller shares a set of cooling systems with the DCDC. The junction box unit assigns input high voltage to each subunit, and has various high voltage loop over current protection functions.

Application range

Applicable to new energy A00 class passenger cars, micro-trucks, micro-vans and other logistics vehicles.



Warning: All the parameter list in this document are standard substance, any value set out of this range need calibration by MWM.



Warranty: Full 3 year warranty IF the part is used in a vehicle produced by MW Motors & installed by a MW Motors staff member. Otherwise no warranty.



MW MOTORS
We challenge the norm

Basic information & working environment

Index	Parameter	Remark
Dimensions	435 × 377 × 181mm	Adjusted according to user needs
Weight (Kg)	14	Adjusted according to user needs
Cooling method	Liquid cooling, water/glycol 50%/50%, coolant flow: ≥8L/min.	Withstand 0.2Mpa water pressure
Water inlet temperature	≤65°C	
Water outlet temperature	Typical value 60°C, but not more than 75°C	
Operating temperature	-40°C-+85°C	
Storage temperature	-40°C-+105°C	
Working relative humidity range	≤95%	
Product protection package rating	IP67	

Note: Within the scope of the environmental requirements specified in the above table, the power electronics unit should be able to fully exert its product performance.

Motor controller operating performance parameters

Index	Parameter	Remark
Bus Voltage (V)	321.2	
Rated Power (kW)	25	
Peak Power (kW)	55	
Continuous operating current (A)	85	
Maximum output frequency (Hz)	1000Hz	
Maximum Working current (A)	245	
Input voltage range (V)	240-410	Adjustable according to the vehicle's power voltage
Maximum efficiency (%)	≥98%	
Active discharge time (S)	≤3	
Passive discharge time (min)	≤3	
Rated control voltage (V)	12	
Control voltage range (V)	9-16	
Control Current (A)	≤2	
Static power consumption (mA)	≤1	Adjusted according to the low voltage power-on mode
Torque response time (ms)	≤200	Reach peak torque
Speed response time (ms)	≤200	Reach peak speed
Torque control accuracy	±3%	Above rated torque; ±3Nm below rated torque
Speed control accuracy	±1%	Above rated speed ±3rpm below rated speed



Warning: All the parameter list in this document are standard substance, any value set out of this range need calibration by MWM.



Warranty: Full 3 year warranty IF the part is used in a vehicle produced by MW Motors & installed by a MW Motors staff member. Otherwise no warranty.



MW MOTORS
We challenge the norm

DCDC Performance Parameters

Index	Parameter	Remarks	
	System operating voltage (VDC)	6-18	
	Rated input voltage (V)	321.2	
	Input voltage range (V)	+210-+410	
	Output rated voltage (VDC)	14.2±0.25	
	Output voltage accuracy	±2%	
	Rated output current (A)	90	
	Peak output current (A)	110±10	
	Rated output power (kW)	1.26	Continuous operation at full load
	Peak output power (kW)	1.5	Lasts 6 minutes, based on peak output current
	Efficiency	≥85%	50%-90% load, Peak efficiency ≥95%
	Output voltage rise time (ms)	≤200	
	Output voltage ripple noise (mV)	≤200	PK-PK
	Control method	CAN control and EN high, Effective relationship	

Junction box operating performance parameters

Index	Parameter	Remarks
	DCDC distribution insurance (A)	10
	PTC distribution insurance (A)	15
	Air conditioning distribution insurance (A)	20

CAN Matrix Protocol

This product communication method uses CAN 2.0B & Hard wire, supports ISO11898, and the vehicle dynamic CAN network interaction information, the protocol matrix can be applied to the Alpha business docking personnel.



Warning: All the parameter list in this document are standard substance, any value set out of this range need calibration by MWM.



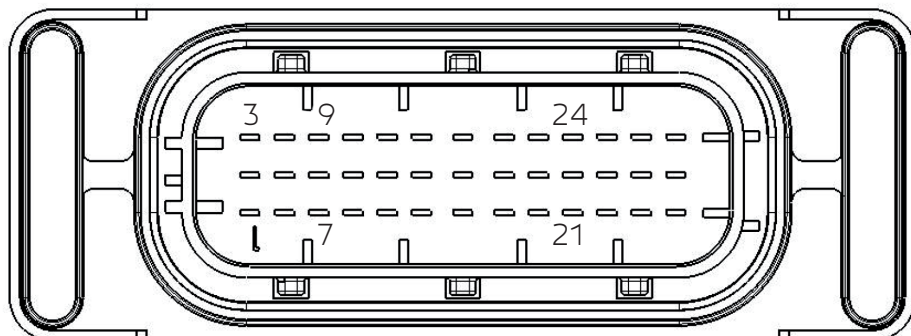
Warranty: Full 3 year warranty IF the part is used in a vehicle produced by MW Motors & installed by a MW Motors staff member. Otherwise no warranty.



MW MOTORS
We challenge the norm

Electrical Pin Definition

Motor controller low voltage connector



Pin	Features	Rated current (A)	Minimum value	Maximum (A)	Signal Type	Remarks
1	EXTW_KL30_SUPPLY	1.2	/	2	analog	Low voltage power positive
2	EXTW_KL30_SUPPLY	1.2	/	2	analog	Low voltage power positive
3	EXTID_KL15	0.2	/	2	analog	Key signal
4	VMS_INVERTER_ENABLE	0.3	/	0.5	digital	IGBT enable
5	EXTGND_KL30	1.2	/	2	analog	Low voltage power ground
6	EXTGND_KL30	1.2	/	2	analog	Low voltage power ground
7	EXTC_CAN_HI	0.1	/	0.2	digital	CAN communication CAN high signal
8	EXTC_CAN_LO	0.1	/	0.2	digital	CAN communication CAN low signal
9	EXTAN_MOTOR_TEMP_1	0.1	/	0.2	analog	Temperature sensor positive signal
10	EXTGND_MOTOR_TEMP_1	0.1	/	0.2	analog	Temperature sensor negative signal
11	EXTP_R1	0.3	/	0.5	analog	Resolver excitation, positive
12	EXTP_R2	0.3	/	0.5	analog	Resolver excitation, negative
13	EXTP_S1	0.3	/	0.5	analog	Resolver sinusoidal signal, positive
14	EXTP_S2	0.3	/	0.5	analog	Resolver cosine signal, positive
15	EXTP_S3	0.3	/	0.5	analog	Resolver sinusoidal signal, negative
16	EXTP_S4	0.3	/	0.5	analog	Resolver cosine signal, negative
17	HVIL_DC1_IN	0.02	/	0.05	digital	High voltage input loop interlock, into
18	HVIL_DC1_OUT	0.02	/	0.05	digital	High voltage input loop interlock, out
19	HVIL_DC2_IN	0.02	/	0.05	digital	Junction box loop interlock, into
20	HVIL_DC2_OUT	0.02	/	0.05	digital	Junction box loop interlock, out
21	DCDC_ENABLE	0.3	/	1	digital	DCDC enable
22	CAN_DCDC_L	0.3	/	0.5	analog	DCDC CAN communication CAN low signal
23	CAN_DCDC_H	0.3	/	0.5	digital	DCDC CAN communication CAN high signal
24	DCDC_GND	0.3	/	0.5	power ground	DCDC ground



Warning: All the parameter list in this document are standard substance, any value set out of this range need calibration by MWM.

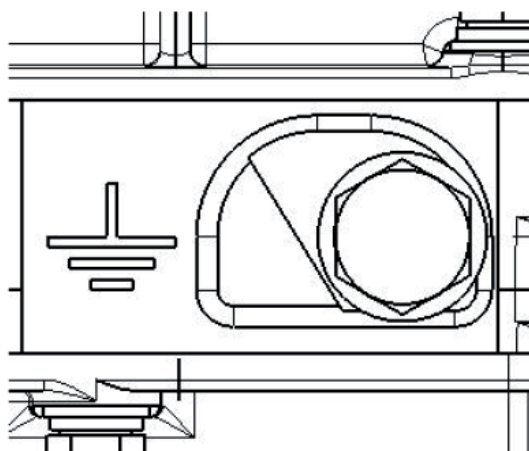
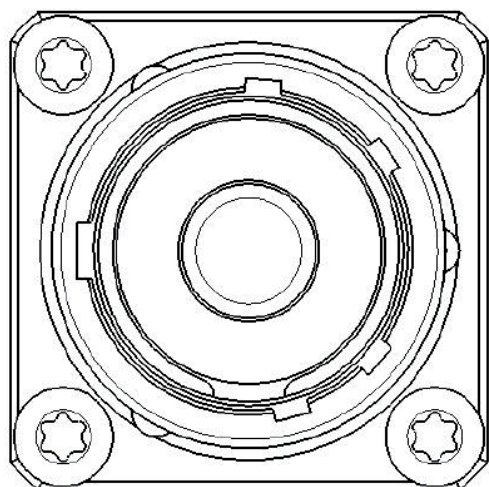


Warranty: Full 3 year warranty IF the part is used in a vehicle produced by MW Motors & installed by a MW Motors staff member. Otherwise no warranty.



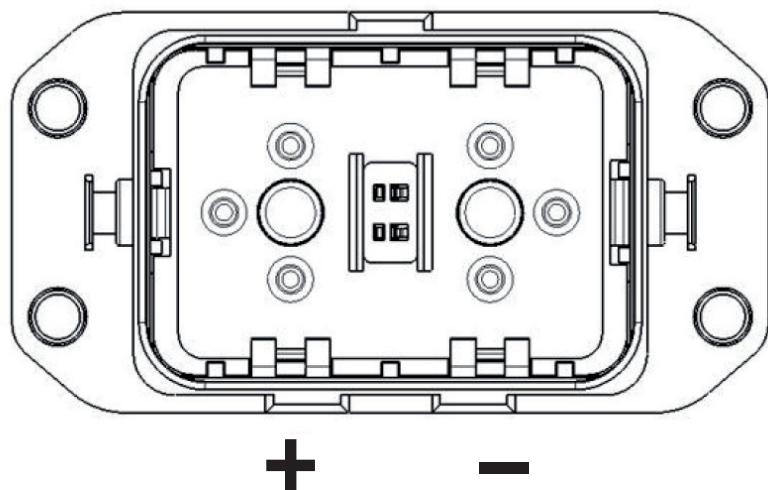
MW MOTORS
We challenge the norm

DCDC Connector



Pin	Features	Rated current	Min. value	Maximum	Signal Type	Remarks
1	DCDC output is positive (A)	90	/	110	DC	/
2	DCDC output is negative (A)	90	/	110	DC	DCDC negative: grounding on the housing

Motor controller bus connector matching



Pin	Features	Rated current	Minimum value	Maximum	Signal Type	Remarks
A	Battery positive (A)	80	/	180	DC	/
B	Battery negative (A)	80	/	180	DC	/



Warning: All the parameter list in this document are standard substance, any value set out of this range need calibration by MWM.



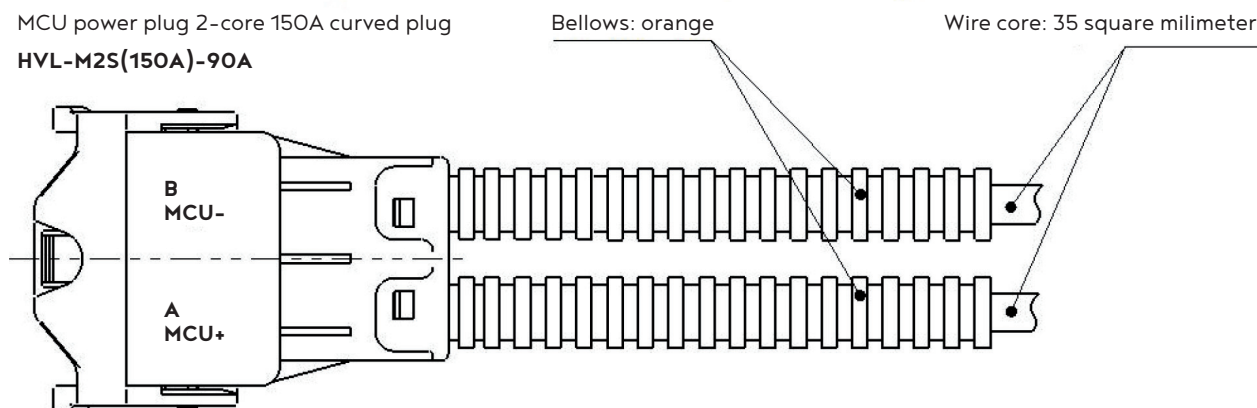
Warranty: Full 3 year warranty IF the part is used in a vehicle produced by MW Motors & installed by a MW Motors staff member. Otherwise no warranty.



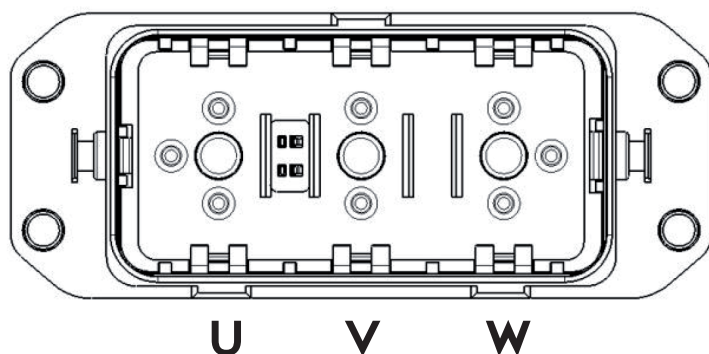
MW MOTORS
We challenge the norm

High voltage bus design recommendations

High-voltage cable characteristics: working voltage 600V, withstand voltage 3000V, shielded cable, density 80%-85%.



Motor controller three-phase output connector



Pin	Features	Rated current	Minimum value	Maximum	Signal Type	Remarks
A	Motor U phase (A)	150	/	300	AC	/
B	Motor V phase (A)	150	/	300	AC	/
C	Motor W phase (A)	150	/	300	AC	/



Warning: All the parameter list in this document are standard substance, any value set out of this range need calibration by MWM.

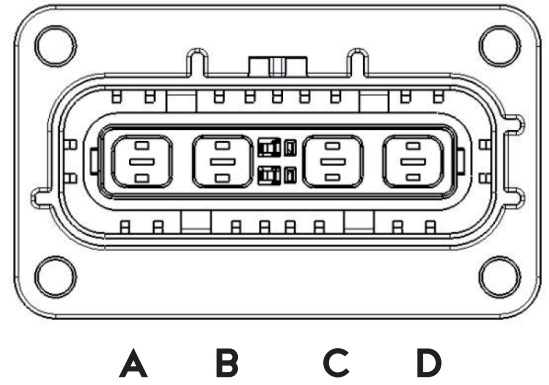


Warranty: Full 3 year warranty IF the part is used in a vehicle produced by MW Motors & installed by a MW Motors staff member. Otherwise no warranty.



MW MOTORS
We challenge the norm

Junction box connector seat

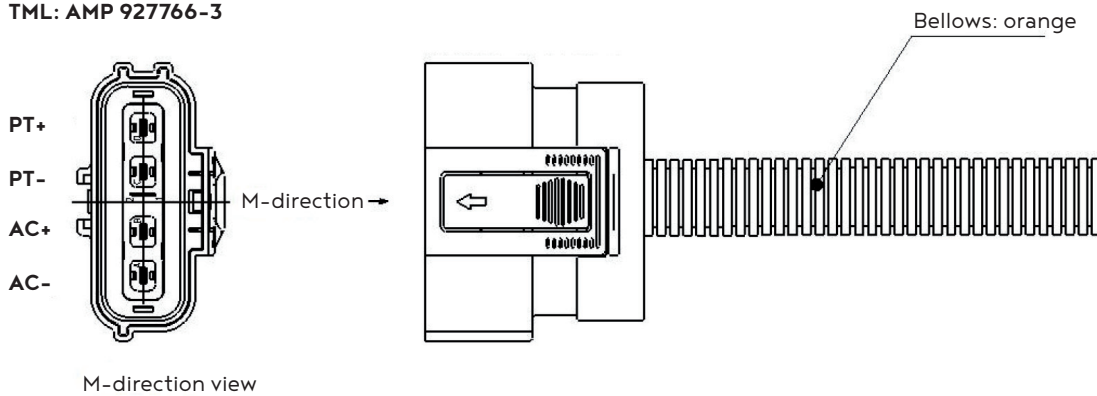


Pin	Features	Rated current	Minimum value	Maximum	Signal Type	Remarks
A	Compressor positive (A)	11	/	/	DC	/
B	Compressor positive (A)	11	/	/	DC	/
C	PTC negative (A)	7.5	/	/	DC	/
D	PTC negative (A)	7.5	/	/	DC	/

Junction box connector plug-in cable design recommendations

Cable characteristics: working voltage 600V, withstand voltage 3000V, shielded cable, density 80%

HSG: JONHON HVIL-M4S(16A)-00A-I
TML: AMP 927766-3



No	Size	Type	Remarks
PT+	2.5	EV2.5	Working voltage 600V, withstand voltage 3000V, shielded cable, density 80%
PT-	2.5	EV2.5	Working voltage 600V, withstand voltage 3000V, shielded cable, density 80%
AC+	2.5	EV2.5	Working voltage 600V, withstand voltage 3000V, shielded cable, density 80%
AC-	2.5	EV2.5	Working voltage 600V, withstand voltage 3000V, shielded cable, density 80%



Warning: All the parameter list in this document are standard substance, any value set out of this range need calibration by MWM.

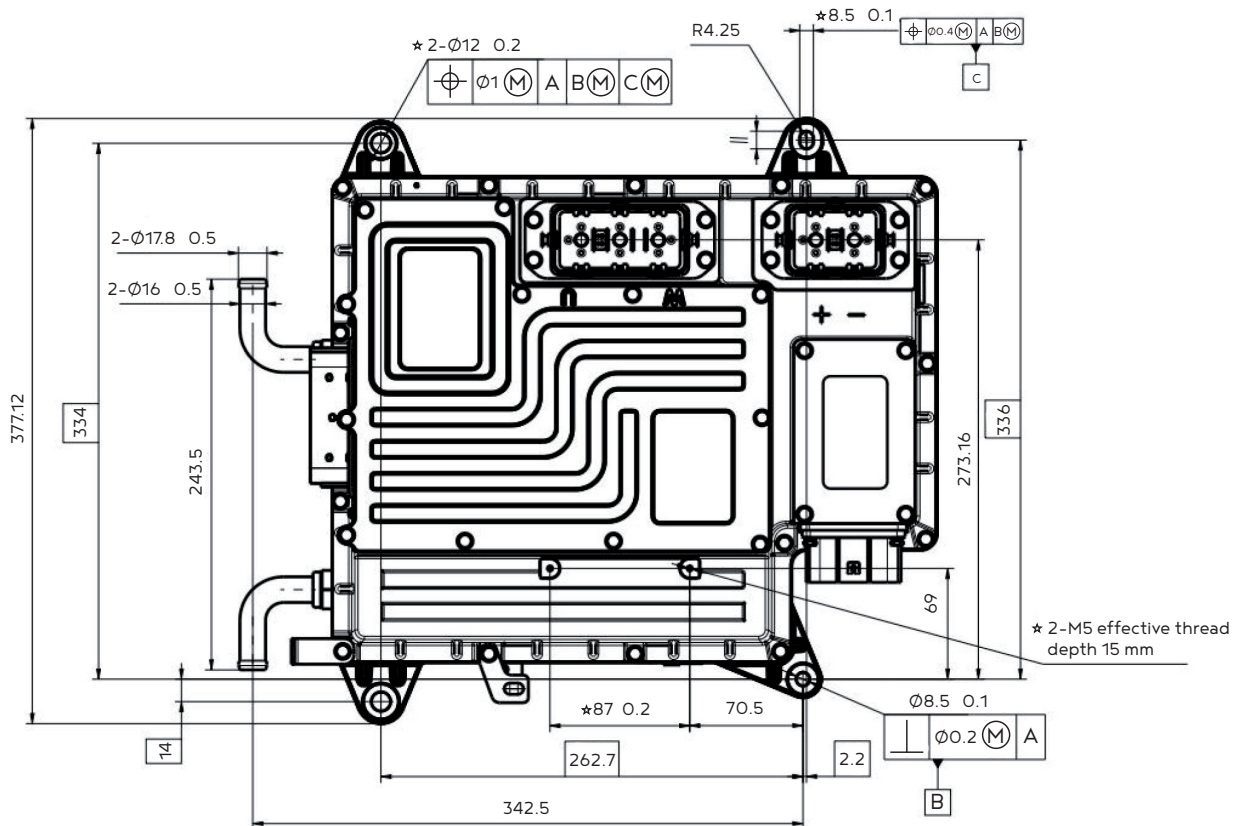
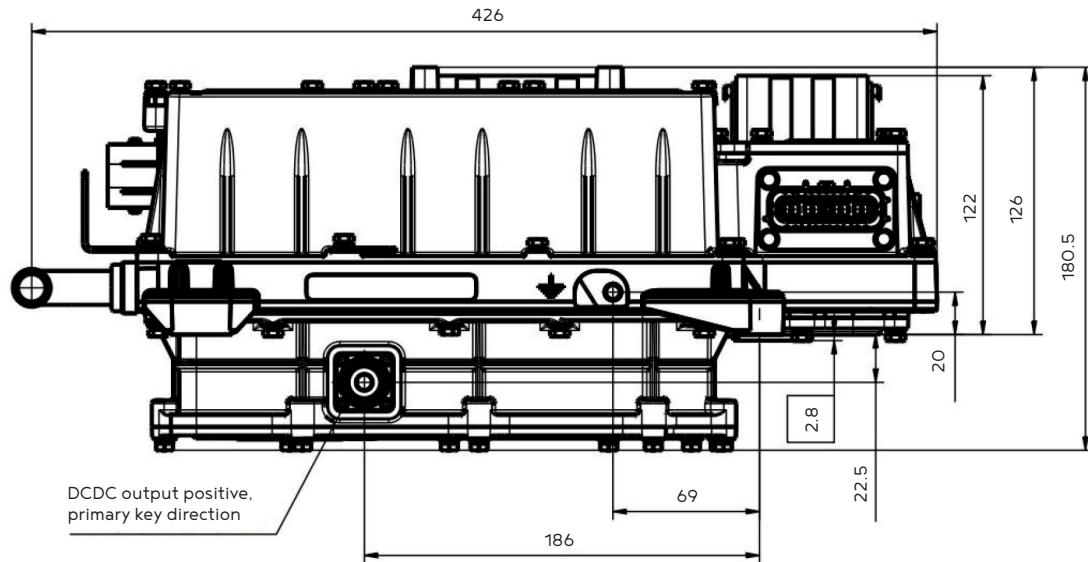


Warranty: Full 3 year warranty IF the part is used in a vehicle produced by MW Motors & installed by a MW Motors staff member. Otherwise no warranty.



MW MOTORS
We challenge the norm

Motor controller assembly 2D schematic diagram



Warning: All the parameter list in this document are standard substance, any value set out of this range need calibration by MWM.



Warranty: Full 3 year warranty IF the part is used in a vehicle produced by MW Motors & installed by a MW Motors staff member. Otherwise no warranty.



MW MOTORS
We challenge the norm