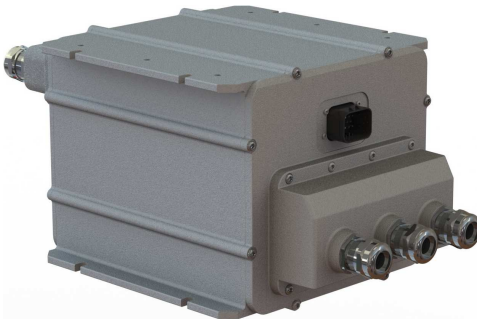


PRODUCT DATASHEET

Clean Wave Technologies offers a range of electric drive system products that are specialized for electric and hybrid electric vehicle traction drive applications. Electric drive systems include an advanced electric traction motor and matched power electronic Drive Control Unit (DCU), comprising a variable frequency AC inverter drive with integrated digital and analog electronics, proprietary adaptive machine controls, embedded system controls, and CAN communication interface.

PowerFlow™ electric drive systems provide industry leading performance and power density, producing higher power at considerably lower weight and smaller size than any other commercially available products.

Product Name	PowerFlow™ Electric Drive System
Model Number	M20A2-1X1



Drive Control Unit (DCU)



Electric Traction Motor

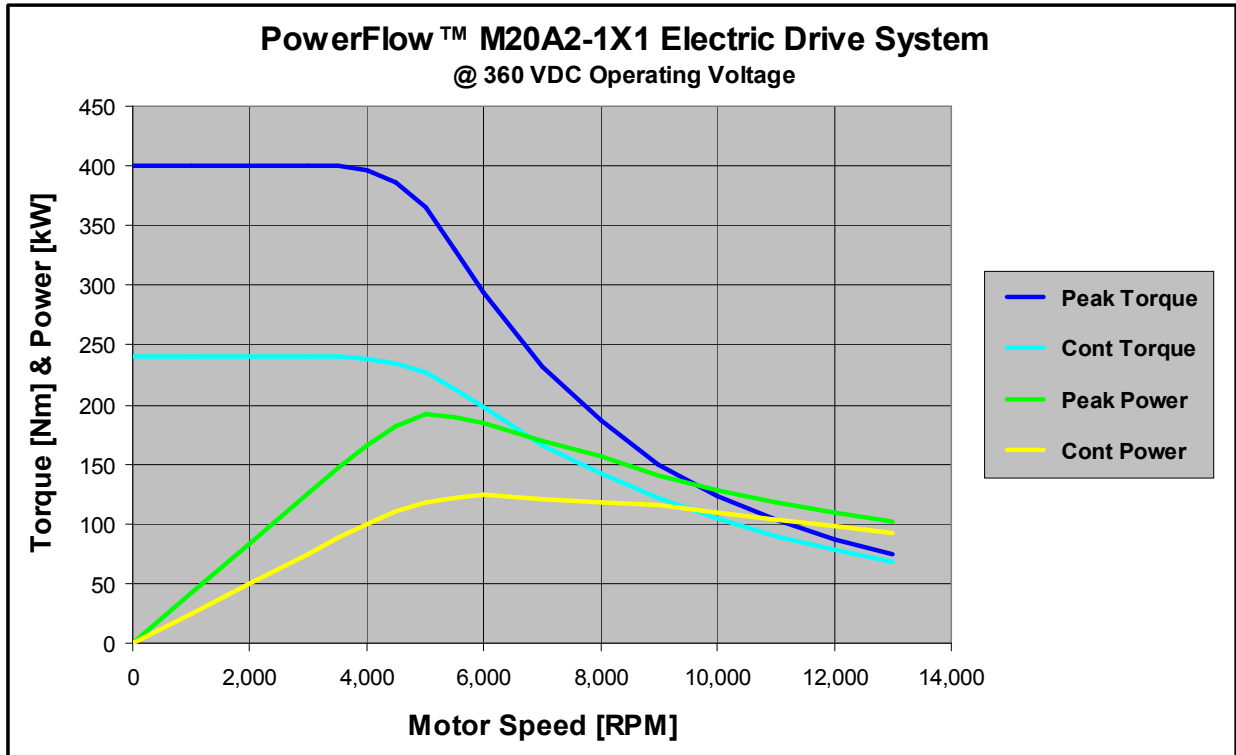
PowerFlow™ M20A2-1X1 Electric Drive System

System Specifications	
Operating Voltage, Nominal	360 VDC
Operating Voltage, Range	50 to 450 VDC
Power, Peak	190 kW
Power, Continuous	120 kW
Torque, Peak (duration 6 seconds minimum)	400 Nm / 0 to 3,500 RPM
Torque, Peak (duration 30 seconds minimum)	350 Nm / 0 to 3,500 RPM
Torque, Continuous	240 Nm / 0 to 3,500 RPM
System Efficiency, Peak	93 %
Environmental Protection Rating	IP67
Regenerative Braking	Adjustable Profiles & Levels

Electric Traction Motor Specifications	
Model Number	M20A2
Motor Type	3-Phase AC Induction
Speed, Maximum	13,000 RPM
Motor Efficiency, Peak	95 %
Ambient Operating Temperature	-40 to +85 °C
Cooling System	Fluid
Cooling Fluid	Standard ATF
Cooling Fluid Flow Rate	10 LPM
Cooling Fluid Pressure Drop through Motor	60 kPa
Inlet Cooling Fluid Temperature	-40 to +85 °C
Weight	58 kg

Drive Control Unit (DCU) Specifications	
Model Number	1X1
Drive Type	3-Phase Variable Frequency AC Inverter
Drive Efficiency, Peak	98 %
Control Voltage, Nominal	12 VDC
Control Voltage, Range	9 to 16 VDC
Control Current, Typical Continuous	2.5 A
Communication Interface	CAN 2.0 A or 2.0 B
Ambient Operating Temperature	-40 to +75 °C
Cooling System	Fluid
Cooling Fluid	50/50 EGW or PGW
Cooling Fluid Flow Rate	10 LPM
Cooling Fluid Pressure Drop through DCU	10 kPa
Inlet Cooling Fluid Temperature	-40 to +75 °C
Weight	11 kg

Torque & Power Performance



System Efficiency

