

HIGH POWER MOTOR MEMAX 1507 & 1616 -

It is a Radial Air Gap, Permanent Magnet Synchronous Motor (PMSM) with an Internal Permanent Magnet Rotor (IPM). PMAC AIR / Water Cooled motor is designed 96Vdc / 120Vdc for battery packs.

***Other windings are available for up to 700 VDC applications.**

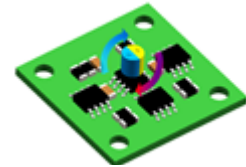
These motors has the same stator and rotor, the main difference is kind of cooling.	AIR cooled (IP65)	LIQUID cooled (IP67)
	ME MAX 1507	ME MAX 1616
<ul style="list-style-type: none"> Maximum Temperature: 140C Liquid Cooling requirements: 6-15 liters per minute, 1.5 Bar max pressure. Water is OK, but Glycol (radiator fluid) is best. The gasket is made of Silicone rubber. <p>Rotor Specifications Neodymium Magnets 150 C rating (180 C Option) Sinusoidal Back-EMF (3 Hall optional) Magnets Pass GM Salt Spray Test Nichol Plated Designed for Field Weakening</p> 		
Maximum rotor speed:	6000 rpm / (Max 8000 rpm)	6000 rpm / (Max 8000 rpm)
Structure of the motor:	12 turns per phase, 10 poles motor	
Recommended Voltage [V]	48V / 60V / 72V / 96V / 120V /144V	
Rated Speed (with nominal load)	~3800 RPM @96V / ~ 4600 RPM @120V / ~ 5500 RPM @144V [Voltage constant 0.026 V/RPM]	
Continuous current (Phase AC) :	157 Amps RMS	250 Amps RMS
Peak current (Phase AC) :	600 Amps RMS	600 Amps RMS
Continuous Power [kW]	16kW @96V / 19kW @120V	24kW @96V / 30kW @96V
Peak Power [kW]	55kW @96V / 66kW @120V	55kW @96V / 66kW @120V
Torque Constant:	0.22 Nm/Amp	0.22 Nm/Amp
Continuous Torque:	35Nm@160A	55Nm @250A
Maximum Torque:	120 Nm	120 Nm
Encoder:	Sin/Cos – 5V	Sin/Cos – 5V
Temperature sensor	KTY84-130	KTY84-130
Shaft diameter:	28.57mm	22,23mm
Weight netto:	20,5 kg.	24,4 kg.
Weight brutto with Packaging	22 kg.	28 kg.

Options:

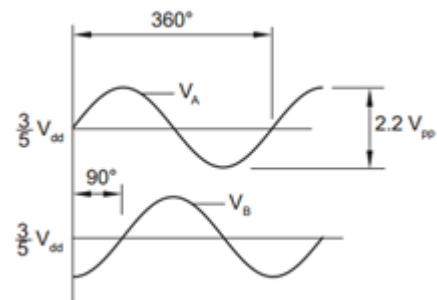
- 3 Hall Sensors, 120 electrical degrees
- Metric Shaft and Mounting face
- Windings for maximum speeds of 300-8000 rpm
- Voltages from 24 to 700 VDC systems
- Water Cooled Case for 80% more continuous power.
- 10,000 hour bearing set
- Longer motors (In axial direction) due to extruded case design
- Custom Colors – Private Label markings

Sin/Cos Encoder parameters

Power supply	$V_{dd} = 5\text{ V} \pm 5\%$
Operating Temperature	-40~+105°C
Maximum speed	60,000 rpm
Resolution	one sine/cosine wave per revolution
Sin/Cos outputs	Signal amplitude: $1.1\text{ V} \pm 0.2\text{ V}$
Power consumption	20mA
Accuracy	$\pm 0.6^\circ$
Hysteresis	1.62° at 30000 rpm



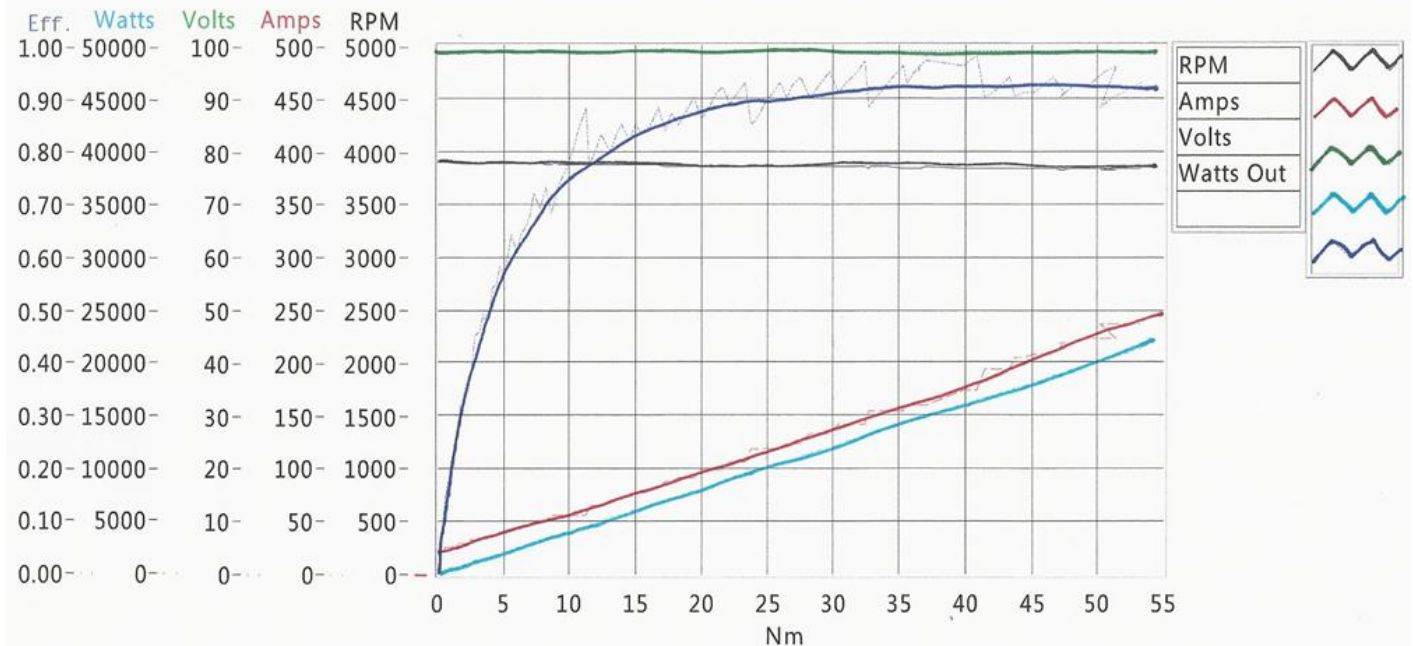
Timing diagram



V_B leads V_A for clockwise rotation of magnet.

Test Curve of the motor:

ME1507 CCW 2016.01.05



Regarding Motor Supply Voltage / RPM and Power.

For example if motor is with windings 72V, this motor can also be run at lower (or Higher) voltages, such as 48V (or 96-120V). The difference is that you wouldn't get as much power output since a lower voltage is associated a lower max attainable rpm. As power (W or Nm/s) is the product of angular speed (1/seconds) and torque (nm), with the same amount of torque and a lower rpm, you would have a lower power output.

You can achieve the same amount of torque at any voltage as torque is directly dependent on current. You may see something called a torque constant, such as Nm/A or ft-lbs/A. Simply multiply by the current, and you'll get the torque output before accounting for mechanical and electrical losses.

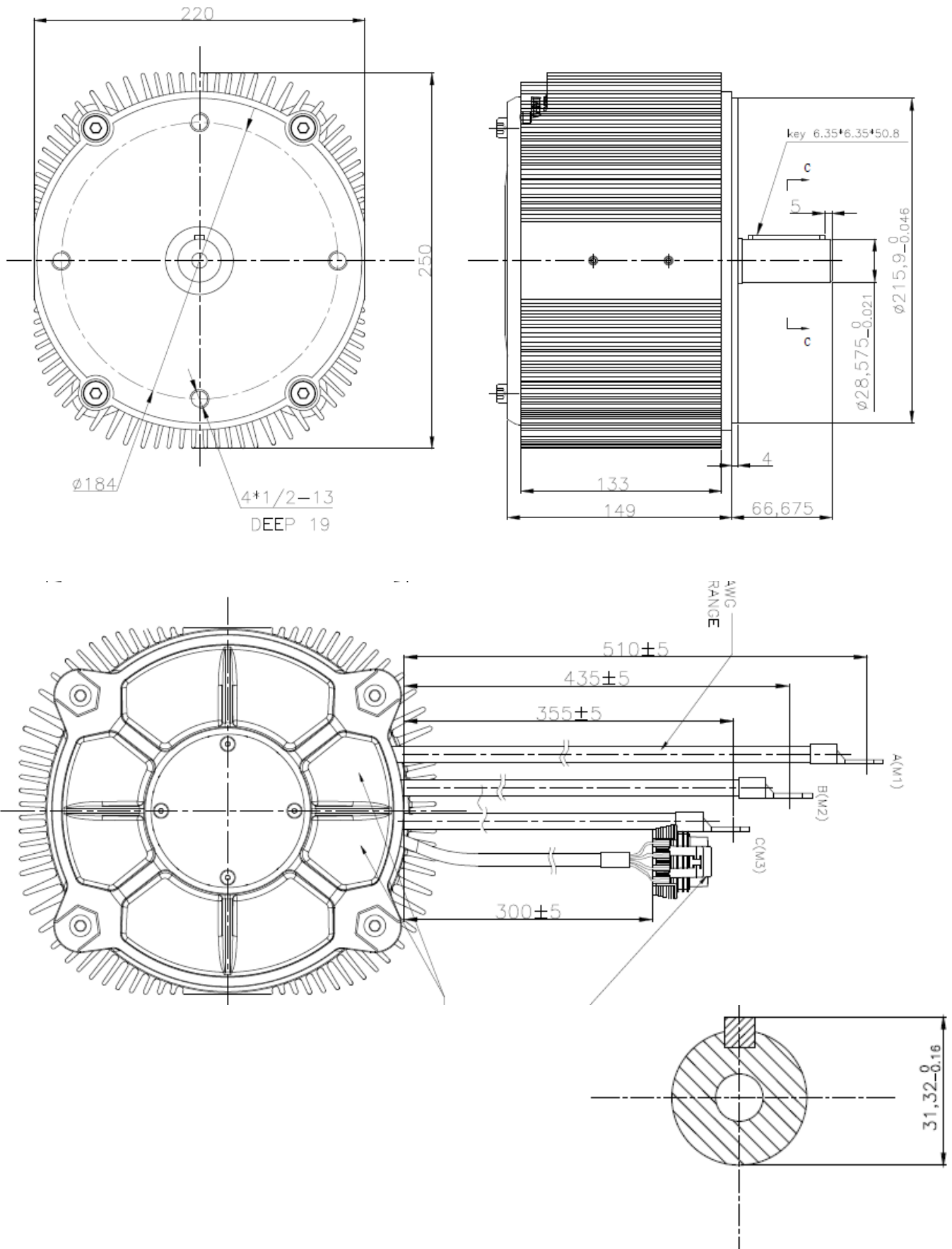
The main limiting factor on the amount of current you can pump into a motor is heat, which can melt the insulating varnish if too high.

At respectively currents **the motor torque** at any supply voltage (48V or 72V or 96V) **will be the same.**

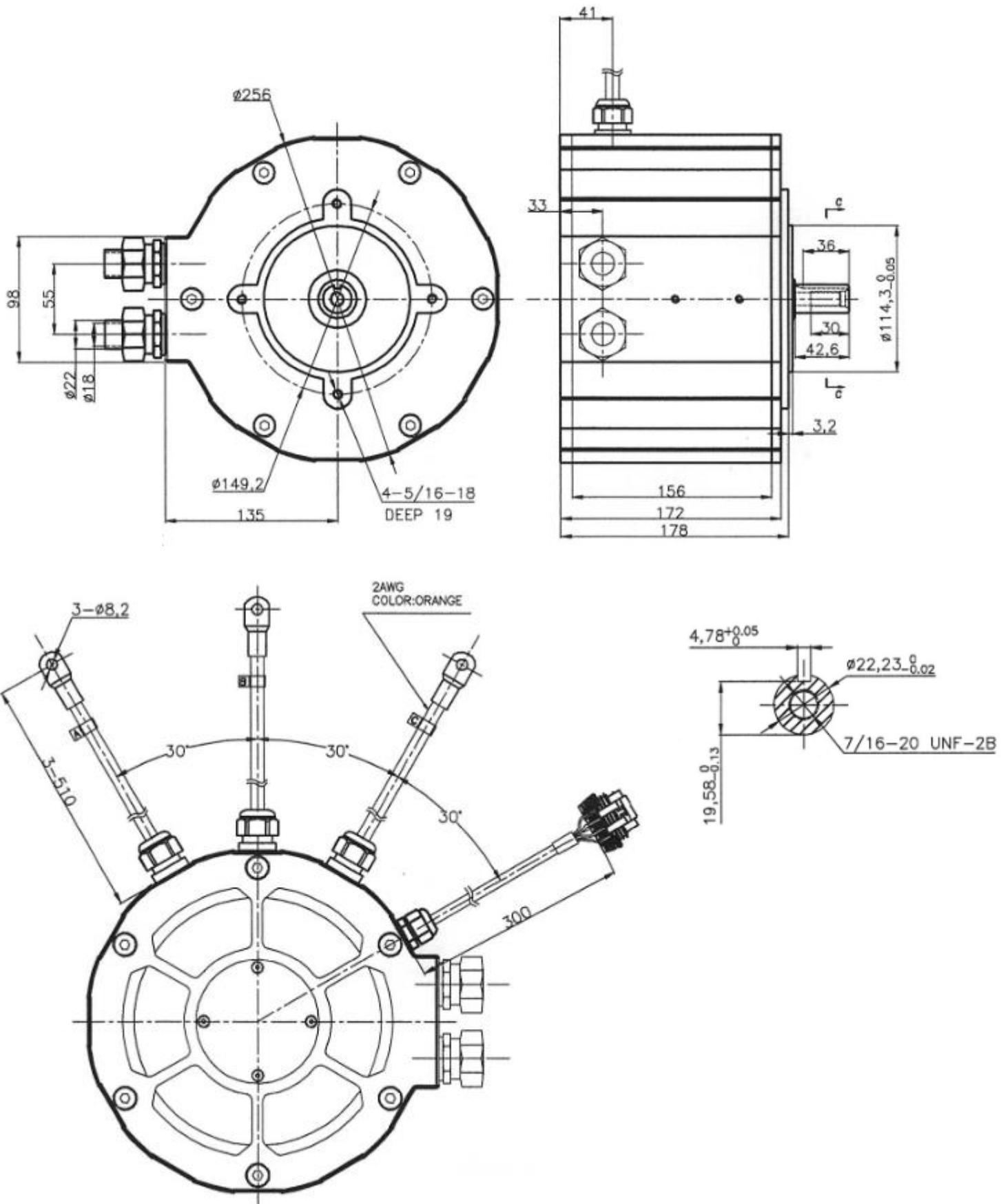
Duration of max Power / Torque is defined by motor (& controller) overheating.

Therefore if motor (& controller) cooling is very good duration time of max Power / Torque can be more longer.

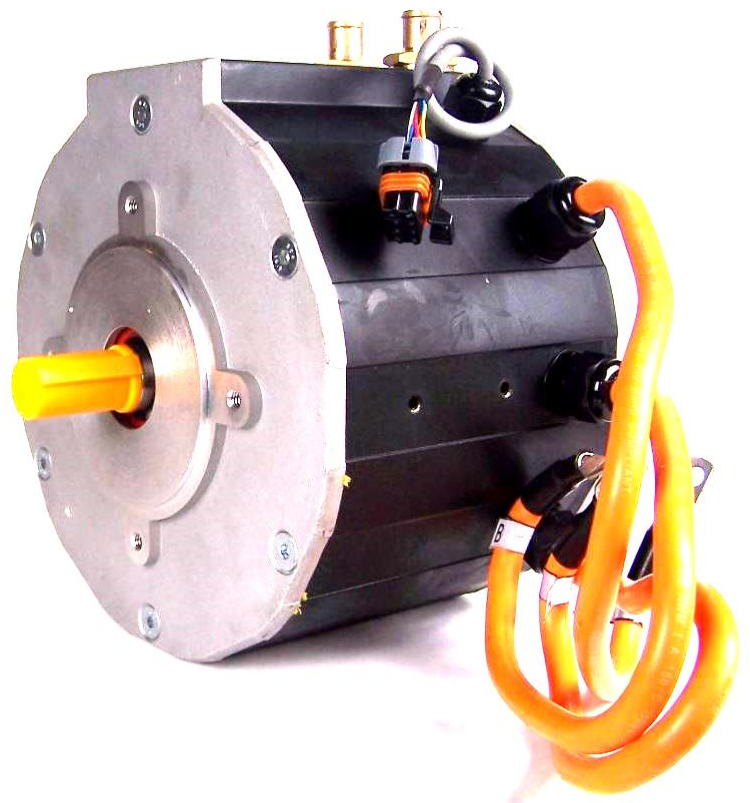
DRAWING of AIR Cooled motor :



DRAWING of LIQUID Cooled motor :



ME MAX 1616 – Liquid cooled motor pictures



ME MAX 1507 – AIR cooled motor pictures





On the pictures below you can see the difference between
HPM-10K vs ME MAX 1507

