

Motenergy - ME1114 - PMSM Motor 24-96V



Reference : MOT-ME1114-96V-32KW

Brand : MOTENERGY

Options :

No variants

3D Model : Available

EAN-13 : 3769482716053

Manufacturer Part Number (MPN): **ME1114 / ME1904** - Brand: **Motenergy**

Permanent magnet synchronous motor (PMSM/PMAC) brushless axial-flux 24-96 VDC, 10 kW continuous / 24 kW peak, sin/cos position sensor – Motenergy ME1114 (ME1904)

General description

The **Motenergy ME1114 (ME1904)** is a **three-phase permanent magnet synchronous motor** of the **PMSM/PMAC brushless** type, designed for **low-voltage battery** traction and drive systems. Its **dual-stator axial-flux** architecture targets a strong balance between power density and compactness, typically operated via a **three-phase inverter** supplied from **24 to 96 VDC** (common field integrations up to 96 V depending on the inverter, protection devices, and battery architecture).

The motor integrates a **sin/cos rotor position sensor (5 V)** for field-oriented control (FOC) and a **KTY84-130 temperature sensor** for thermal protection and the inverter's torque/current limiting strategy. It is intended for **electric mobility and onboard machinery** integrations (retrofit, light utility vehicles, AGVs, industrial auxiliaries), where final performance (torque, efficiency, heating) depends directly on **inverter parameterization** and on **proper sizing of the battery system and protections**.

With a **constant nominal machine current** (integration reference **125 A RMS**), the **available electrical power** and the associated mechanical power capability increase **linearly with the DC bus voltage**, subject to thermal limits and inverter sizing.

Key advantages

- **PMSM/PMAC brushless technology**: high-performance control (FOC) and no brush-related maintenance.

- **Integrated sin/cos sensor (5 V)**: rotor feedback suitable for inverters requiring precise position measurement.
- **Wide DC voltage range 24–72 V**: compatible with common low-voltage battery architectures used in retrofit/onboard applications.
- **Forced-air cooling (open-frame motor)**: well-suited to integrations where airflow is available and controlled.
- **Electromagnetic data available** (resistance, inductance, torque constant, poles): simplifies inverter commissioning and system modeling.

Technical specifications

Technology	Permanent magnet synchronous motor PMSM/PMAC , brushless
Architecture	Axial flux, dual stator
Phases / connection	3 phases, star (Y) connection
DC bus voltage (inverter)	24–96 VDC (commonly used integration range depending on inverter and protection scheme)
Power	10 kW continuous, 24 kW peak (usage reference at 72 V); 13.3 kW continuous, 32 kW peak (integration reference at 96 V, at equivalent nominal current)
Recommended maximum speed	5000 rpm
Torque (nominal at 72 V, continuous)	18 N·m
Current (continuous)	125 A RMS
Current (peak)	400 A RMS (1 min)
Max efficiency	92%
Pole pairs	4
Winding resistance	0.065 Ω phase-to-phase
Inductance	0.05 mH
Torque constant	0.12 N·m/A
Rotor inertia	45 kg·cm²
Rotor sensor	Sin/Cos 5V
Temperature sensor	KTY84-130 , max temperature 150 °C
Cooling	Fan-cooled , open-frame housing
Ingress protection rating	IP20
Mass	10.9 kg (without cables)
Cables / connectors	Phase cables 3 × 16 mm² ; signal connector 8-pin Metri-Pack 150 (12047937)
Mechanical interface (shaft)	Ø 22.23 mm (7/8") ; geometry and mounting pattern per ME1114 drawing

DC bus voltage (VDC)	Assumed nominal current (A RMS)	Available electrical power (kW) = VDC × I	Typical mechanical power (kW) (order of magnitude at $\eta \approx 0.92$)
24	125	3.0	2.76
36	125	4.5	4.14
48	125	6.0	5.52
72	125	9.0	8.28
96	125	12.0	11.04

PMSM inverter (FOC) integration calculation assumption: at maximum modulation, an order-of-magnitude estimate of the available three-phase power on the motor side follows **$P_{elec} \approx VDC \times IRMS$** ; the exploitable mechanical power then depends on efficiency and the operating point (speed/torque/thermal).

Typical applications

- **Electric retrofit** of light utility vehicles / service platforms in **24–96 V**.
- Drive for **mobile machinery**: small belt/chain-driven hydraulic pump, compressor, auxiliaries.
- **AGV/AMR**, light industrial tractors, internal shuttles, where PMSM control and sin/cos feedback provide fine control.
- Gearmotor assemblies for **conveying** or **handling**, subject to airflow management and appropriate IP protections.

EVEA test bench results

Characterization tests of the **Motenergy ME1114 (1904)** motor were carried out on the **EVEA test bench** to establish torque and power performance across the full operating range. The motor was driven by a **ZAPI BLE2 inverter** supplied at **48 V**, with a nominal current capability of **550 A**, and with **field weakening enabled (ON)**. Ambient temperature during the test campaign was **20 °C**.

Maximum values obtained

Metric	Maximum	RPM (at peak)	Current RMS (A)	Power (W)	Torque (N·m)
Torque	68.3 N·m	148.5	389	878	68.3
Motor power	14 757 W (14.757 kW)	2 829	371	14 757	50.7
Current RMS	394 A	1 789.5	394	10 118	54.3
Speed	4 407 rpm	4 407	134	2 979	6.3

Results analysis

The protocol consisted of sweeping motor speed (approximately **15 to 4 407 rpm**) while recording **speed, RMS current, motor power, and torque**. The measurements highlight a **maximum torque of 68.3 N·m** (reached at very low speed, around **148.5 rpm**) and a **maximum power of 14.757 kW** observed around **2 829 rpm**.

Conclusion

A typical behavior is observed with a **torque plateau** (around **~54 N·m** over a wide range) and then, with **field weakening**, an extension of rotational speed beyond **~3 000 rpm** at the expense of a **progressive torque decrease**. This translates into a **power peak** followed by a drop at high speed. These results provide a solid basis for sizing and comparison against application requirements in the **48 V / field weakening ON** configuration.

Integration recommendations

- **Validate inverter / sensor compatibility**: verify support for the **5 V sin/cos** sensor by the power electronics (interface, levels, calibration, electrical direction) and the availability of a **KTY84-130** input (or an alternative strategy via an analog input / converter).
- **Motor setup (FOC)**: accurately enter electromagnetic parameters (pole pairs, resistance, inductance, torque constant) to secure commissioning/identification, limit overcurrents, and optimize efficiency/heating.
- **Mechanical integration**: rely on the **ME1114 drawing** for envelope, mounting pattern and the **Ø 22.23 mm** shaft interface; verify drivetrain alignment and allowable radial shaft loads for your architecture (pulley, sprocket, coupling).
- **Ventilation and thermal management**: the open-frame housing and **IP20** imply integration in a protected volume or a ventilated enclosure; ensure an airflow path and avoid hot-air recirculation, especially in continuous operation near 10 kW.
- **Cable and DC link sizing**: account for **125 A RMS continuous** and peak currents; size busbars/cables and crimps, and control voltage drop and heating (including on the inverter DC side).
- **Protections and safety chain**: integrate suitable fuses/breakers, DC contactor(s), precharge, emergency disconnect, and fallback logic on temperature fault (KTY) and rotor sensor fault.
- **EMC best practices**: twisted phase cables / controlled routing, shielding if needed, structured grounding, separation of power/signal (8-pin connector), and DC input filtering on the inverter depending on topology.
- **Diagnostics & maintenance access**: provide access to the signal connector, test points, and traceability of inverter settings (parameter set, firmware versions) to ensure repeatability in series production.

Operating conditions and limits

The **IP20** rating and the **open ventilated housing** require a protected environment (conductive dust, liquid splashes, mud) or system-level encapsulation/enclosure. The stated performance (10 kW continuous, 24 kW peak) can be achieved provided the integration offers sufficient **thermal capacity** (airflow, ambient temperature, duty cycle) and appropriate **inverter tuning** (current limits, speed limits, thermal management via the KTY84-130).

Final compliance (electrical safety, EMC, environmental robustness, endurance) depends on the complete architecture: battery, protection devices, wiring, mechanics, enclosure, and control software. Responsibility for compliance and validation prior to commissioning lies with the integrator.

Technical disclaimer

The above information is provided for technical guidance only, based on available documents and data. Performance, durability, and regulatory compliance depend on real-world integration, configuration, and operating conditions. Final

validation (calculations, functional testing, thermal, safety, and EMC) is required prior to commissioning, under the integrator's responsibility.

© EVEA Distribution – All rights reserved – contact@evea-solutions.com

This document is the exclusive property of EVEA Distribution. Any reproduction or distribution, even partial, is prohibited without prior written authorization.

The information contained in this datasheet is provided for information purposes only and may be modified without notice. This document does not constitute a contractual commitment.