Product datasheet

Version: 25/02/2026

Motenergy - ME1905 - 13 kW PMSM motor

Reference : MOT-ME1905-13KW-IP65

Brand : MOTENERGY

Options :

No variants

3D Model : Available

EAN-13 : 3768571049321

- Manufacturer reference (MPN): **ME1905** (same motor as the former reference **ME1507**)
- Brand: **Motenergy**
- Designation: **Permanent-magnet synchronous motor PMSM/PMAC Motenergy ME1905 (ex ME1507) – three-phase star (Y), axial air-gap dual stator, 5 V sin/cos encoder, KTY84-130 sensor, IP65**

General description

The **ME1905 / ME1507** is a **brushless permanent-magnet synchronous motor (PMSM / PMAC)** intended for traction and drive systems in **mobile/on-board** environments. Its **three-phase star** architecture with an **axial air gap** and **dual stator** targets compact integration and behavior suited to propulsion applications (torque available at low speed, wide speed range).

From an integration standpoint, the motor is used with a **PMSM inverter in field-oriented control (FOC)** leveraging a **5 V sin/cos encoder** and the **KTY84-130 temperature measurement** for closed-loop control and thermal protection. Published parameter sets (pole pairs, constants, R/L) support clean current/speed loop tuning and repeatable commissioning on a vehicle, machine, or test bench.

Key advantages

- **Brushless PMSM technology**: no brush-related maintenance, suitable for intensive duty.
- **Axial air-gap / dual-stator topology** and **Y connection**: compact integration for traction/propulsion.
- **Integrated sensors for closed-loop control**: **5 V sin/cos** encoder + **KTY84-130** (precise control, thermal protections).
- **Overload capability**: up to **600 Arms for 1 minute** (launches, traction transients).

- **Engineering data available** (Ke, Kt, R, L, poles, inertia): FOC parameterization and simulations (losses, dynamics).
- **Standard mechanical interface**: **Ø28.575 mm (1-1/8")** shaft with **6.35×6.35 mm** keyway, **1/2-13** threads (**19 mm** depth).

Technical specifications

Parameter	Value
Technology	Permanent-magnet synchronous motor **PMSM/PMAC**, brushless
Phasing / connection	**3 phases**, **star (Y)**
Architecture	**Axial air gap**, **dual stator**
Continuous power	**13 kW**
Peak power	**48 kW @ 600 A** (data reference at **100 VDC**)
Continuous current	**157 Arms**
Peak current	**600 Arms (1 min)**
Continuous torque	**32 Nm**
Maximum torque	**120 Nm**
Maximum speed	**8000 rpm**
Efficiency	**92%** (motor data); **≈90%** for motor+inverter set at **100 VDC**
Ingress protection	**IP65**
Maximum temperature	**140 °C**
Internal phase resistance (25 °C)	**0.0027 Ω**
Phase-to-phase inductance (@1000 Hz)	**62–110 µH**
Voltage constant (Ke)	**0.026 V/RPM**
Torque constant (Kt)	**0.22 Nm/A**
Poles	**10** (i.e. **5 pole pairs**)
Rotor inertia	**960 kg·cm²**
Air gap	**2 mm**
Cooling	**Air**, **fully enclosed** motor
Sensors	**5 V sin/cos encoder**, **KTY84-130**
Mass	**21.4 kg**
Shaft	**Ø28.575 mm**, **6.35×6.35×50.8 mm** key
Mounting	**4× 1/2-13 threads**, **19 mm** depth
Overall dimensions (drawing)	**Ø250 mm** (envelope); **149 mm** length (excluding cables)
Sensor connector	**8-way Metri-Pack 150**; sin/cos + supply + shield + temperature pinout

Data derived from published parameter sets and manufacturer drawings.

Power vs supply voltage

Sizing hypothesis (order of magnitude, PMSM/FOC integration): for a reference nominal mechanical power of **13 kW** (η ≈ **0.92**), a reference continuous current of about **147 A RMS** on a **96 VDC** bus leads to available electrical power following

Pelec ≈ VDC × I; usable mechanical power then depends on efficiency and operating point (speed/torque/thermal).

DC bus voltage (VDC)	Assumed continuous current (A RMS)	Available electrical power (kW)	Typical mechanical power (kW) (η ≈ 0.92)
24	147	3.5	3.25
48	147	7.1	6.50
72	147	10.6	9.75
96	147	14.1	13.00
120	147	17.7	16.25

Test bench
Characterization tests of the **Motenergy ME1507** motor were performed on the EVEA test bench to establish its torque and power performance over the full operating range. The tested motor was an **ME1507**, S/N: **#20.08.032** and was driven by a **BLE4 96V – 700A** inverter (supply **96 V**) during a campaign dated **18/03/2021**.

Maximum values obtained:

Indicator	Maximum	RPM (at peak)	RMS current (A)	Power (W)	Torque (N·m)
Torque	133.5 N·m	500	607	6 991	133.5
Motor power	47 560 W (47.56 kW)	3 580	577	47 560	126.9
RMS current	607 A	500	607	6 991	133.5
Speed	6 000 rpm	6 000	323	44 619	71.0

Results analysis: the protocol consisted of sweeping motor speed over the **0 to 6,000 rpm** interval while simultaneously tracking speed, power, and torque. The curves highlight a **maximum torque of 133.5 N·m** reached at **500 rpm**, as well as a **maximum power of 47.56 kW** observed around **3,580 rpm**.

Conclusion: the behavior is representative of a traction drive with a stabilized torque region centered around **~130 N·m** between **500 and 3,500 rpm**, followed by a high-power region quasi-maintained (order of magnitude **~43 to 48 kW**) up to **6,000 rpm**, at the cost of a progressive torque decrease (down to **~71 N·m** at maximum speed). These results provide a usable basis for sizing and comparison against application needs in the **96 V / BLE4700A** configuration.

Typical applications

- **Electric retrofit**: propulsion of light vehicles/utility platforms, fixed ratio transmission or gearbox.
- **Electric mobility**: motorcycle, kart, small special-purpose machines (logistics, maintenance, airport).
- **Marine**: propulsion of small craft and auxiliary drives (depending on drivetrain).
- **Industry**: traction/translation (AGV, specialized carriers), pump/compressor drive via PMSM inverter.

Integration recommendations

- **Validate inverter / sensor compatibility**
  - Select a **PMSM/PMAC FOC** inverter accepting **5 V sin/cos** feedback and a **KTY84-130** temperature input.

    - Explicitly set: **5 pole pairs**, **Kt 0.22 Nm/A**, **Ke 0.026 V/RPM**, **R = 0.0027 Ω**, **L = 62–110 µH** (baseline for auto-tune and loop tuning).
    - Define operating limits: **157 Arms continuous**, **600 Arms transient (1 min)**, **8000 rpm**, and a derating strategy in case of thermal exceedance.
- **Mechanical installation, alignment and couplings**
    - Design the coupling while controlling **radial load** on the shaft (alignment, tolerances, hub/drivetrain selection).
    - Use the interface geometry: **Ø28.575 mm** shaft + **6.35 mm** key, **1/2-13** threads with **19 mm** depth (strict control of bolt length to avoid internal contact).
    - Verify envelope (**Ø250 mm**, **149 mm** length excluding cables) and reserve sufficient clearance around fins.
- **Airflow and thermal performance**
    - As cooling is **air** on a closed motor, provide **real airflow** around the motor (ducting, partitioning, extraction) and avoid confined zones.
    - Use the **KTY84-130** measurement to drive current/torque limiting thresholds and protect insulation (system **class H**).
- **Power cabling and protections**
    - Size harnesses and connections for **high currents** (up to **600 Arms** peak): conductor cross-sections, crimping, vibration robustness, heating, and routing minimizing current loop area.
    - Implement a coherent safety chain: **main contactor**, **precharge**, suitable **fuses**, emergency stop, and inverter fault management (overcurrent, overtemperature, sensor fault).
- **EMC best practices / low-level signals**
    - Physically separate **power** and **sensors**, use **shielded** cable for sin/cos, bond shields in a controlled manner, and ensure chassis ground continuity.
    - Follow the connector **pinout** (sin, cos, +5 V, 0 V, shield, temperature) and secure connectors in a vibratory environment.
- **Diagnostics access, maintenance and traceability**
    - Provide access to sensor signals and inverter diagnostics (fault logs, I/T°/speed values) for commissioning and maintenance.
    - Implement a periodic inspection procedure: torque checks, harness condition, cleanliness of air paths, consistency of sin/cos signals.

Operating conditions and limits

The performance envelope depends directly on the **complete system** (battery, inverter, cabling, cooling, transmission). Continuous capability relies on thermal control (limit **140 °C**) and the quality of airflow around a closed **air-cooled** motor. Electrical (continuous/peak current) and mechanical (speed) limits apply in operation, with coherent inverter calibration and properly sized protections. Final compliance (electrical safety, EMC, environmental robustness) results from the overall integration and remains the integrator’s responsibility.

Liability clause and technical warning

The data above is provided for technical guidance. Performance, durability, and regulatory compliance depend on real integration conditions (electrical sizing, protections, cooling, cabling, inverter parameterization, and operating environment). A complete system validation (tests, safety, EMC, and functional checks) is required prior to commissioning, under the integrator’s responsibility.