



Mack® Motor

(MKM) BRUSHLESS MOTOR

Sinusoidal Brushless Servomotors (8 poles) to be coupled with AXOR Drives (Mack Drive, MiniMagnum, Magnum 400). Torque ranges from 1.0 to 11 Nm. Typical application are axis controlled by CNC which require high stability at low speed.



| SERIES | | MKM 70 | | | | MKM 85 | | | MKM 120 | | | |
|--|--|--|-----------------|-----|------|--------|------------------|-----|---------|----------------|------|---|
| SIZE | | S | M | L | XL | S | M | L | S | M | L | |
| Mo | stall Torque ($\Delta t=100^{\circ}\text{C}$) (Nm) | 0.9 | 1.5 | 2.0 | 2.7 | 1.8 | 3.3 | 5 | 4 | 7.5 | 11 | |
| Mo ¹ | stall Torque ($\Delta t=70^{\circ}\text{C}$) (Nm) | 0.8 | 1.35 | 1.8 | 2.45 | 1.65 | 3 | 4.5 | 3.6 | 6.8 | 10 | |
| 400 V _{AC} | Stall Ac Current | Io ¹ (Arms) | — | — | — | 1.1 | 2 | 2.8 | 2.3 | 4.3 | 6.5 | |
| Motor's voltage | Torque Constant | K _r (Nm / Arms) | — | — | — | 1.5 | 1.5 | 1.6 | 1.55 | 1.6 | 1.55 | |
| | Rated Speed | N _n (Rpm) | — | | | 3000 | | | 3000 | | | |
| 230 V _{AC} | Stall Ac Current | Io ¹ (Arms) | 1.1 | 1.5 | 2 | 2.5 | 2 | 3.3 | 4.7 | — | — | |
| Motor's voltage | Torque Constant | K _r (Nm / Arms) | 0.7 | 0.9 | 0.9 | 1 | 0.8 | 0.9 | 0.95 | — | — | |
| | Rated Speed | N _n (Rpm) | 3000 | | | 3000 | | | — | | | |
| J | Rotor Inertia (std) | (Kg ^m ²) · 10 ⁻⁴ | 0.35 | 0.7 | 1.0 | 1.3 | 1.3 | 2.2 | 3.1 | 9 | 14 | |
| J _H | Higher Rotor Inertia (opt) | (Kg ^m ²) · 10 ⁻⁴ | 1.9 | 2.2 | 2.5 | 2.8 | 6.3 | 7.2 | 8.2 | 30 | 35 | |
| J _B | Brake Inertia | (Kg ^m ²) · 10 ⁻⁴ | 0.045 | | | 0.122 | | | 0.4 | | | |
| BRAKE stall torque (24 V _{DC} +6% -10%) | | | 2 Nm (0.45 Adc) | | | | 4.5 Nm (0.5 Adc) | | | 9 Nm (0.8 Adc) | | |
| MODULE | | | 2 | 4 | 6 | 8 | 2 | 4 | 6 | 2 | 4 | 6 |

Mo is referred to: speed $5 < n < 100$ rpm - mounted motor on reference aluminium flange (300x300x6.5 mm, 65°C max) - Resolver feedback - no brake
 Mo¹ with electronic encoder feedback (Mo -10%) - with brake -5%

STANDARD FEATURES

- Sinusoidal B.E.M.F.
- Higher rotors inertia
- Permanent rare earth magnets
- Very low fluctuations of torque at minimum speed
- Two different Nominal Voltages (230 and 400 V_{AC})
- Feedback: Mack® Serial Encoder
- ¹Ambient temperature: 0 ÷ 40°C max
- storage -20 ÷ 60°C
- ¹Ambient Humidity: - operating and storage 85% RH max
- Altitude (m.s.l.): - operating and storage 1000m
- Vibration: 5g max
- Insulation class: F
- Protection class: IP54
- Ball-bearing life ≥ 20.000h

OPTIONS

- Holding brakes
- Protection class: IP65
- Special flanges and shafts
- J_H Higher rotor inertia (additional)
- Thermal Switch
- Feedback: - Comm. Incremental Encoder
- Absolute Multiturn Encoder
- Resolver

CABLE SPEC.

- Mobile usage for chain tracks
- External sheating: PUR polyurethane
- Flame / oil resistance
- Trailing speed: 300m / min. max
- Acceleration: 20m / sec²
- Cycles: 5 million
- Minimum bending radius: 7xØ
- Operating temperature -25°C / +80°C
- DIN VDE approvals

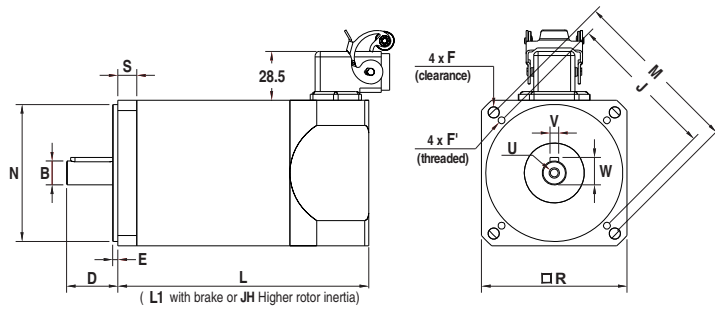
APPLICATION

- Wood working machines
- Machine tools
- Transfer machines
- Printing Machines
- Textile Machines
- Coding Machines
- Conveyors
- Packaging Machines
- Sewing Machines
- Jewellery Machines
- Actuators
- Door operators
- Antenna positioners
- CNC controlled axis
- Battery operated Equipment
- Upgrade replacement for stepper systems

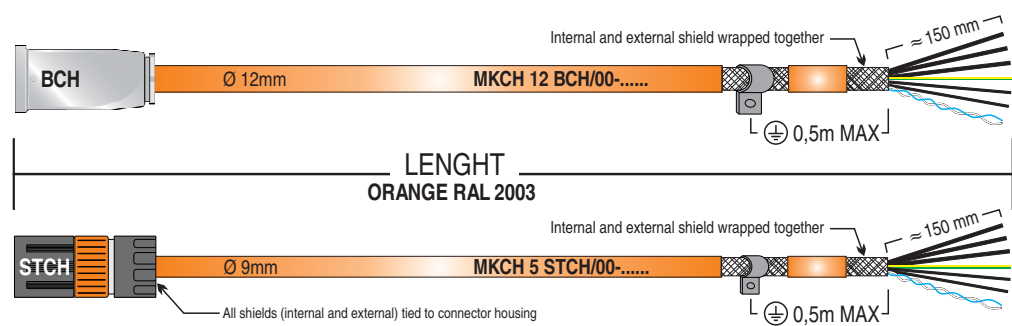
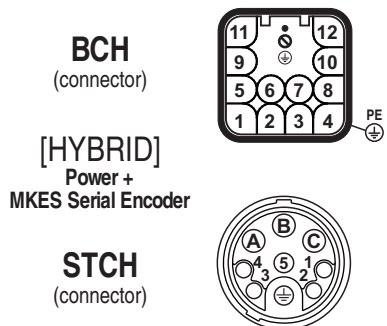


NOTE: ¹ Free from condensation

MECHANICAL DIMENSIONS



| REFERENCE | L | L1 | B _{h7} | D | V _{h9} | W | U | N _{h6} | M | F | J | F' | E | S | R | W | W1 (+ BRAKE) | W2 (+ JH) |
|-----------|--------|-----|-----------------|----|-----------------|--------|---------|-----------------|-----|-----|----|----------|-----|------|-----|------|--------------|-----------|
| SERIES Mo | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | kg | kg | kg |
| MKM 70 S | 0.9 Nm | 100 | 125 | 11 | 23 | 4 x 18 | M4 x 10 | 60 | 90 | 5.5 | 75 | 4.2 x 10 | 2.5 | 10 | 75 | 1.35 | 1.55 | 1.7 |
| MKM 70 M | 1.5 Nm | 125 | 150 | | | | | | | | | | | | | 1.9 | 2.1 | 2.3 |
| MKM 70 L | 2.0 Nm | 150 | 175 | | | | | | | | | | | | | 2.4 | 2.6 | 2.8 |
| MKM 70 XL | 2.7 Nm | 175 | 200 | | | | | | | | | | | | | 2.9 | 3.1 | 3.3 |
| MKM 85 S | 1.8 Nm | 115 | 145 | 14 | 30 | 5 x 25 | M4 x 10 | 80 | 100 | 6.5 | — | — | 3 | 11 | 85 | 2.2 | 2.5 | 3.0 |
| MKM 85 M | 3.3 Nm | 145 | 175 | | | | | | | | | | | | | 3.2 | 3.5 | 4.0 |
| MKM 85 L | 5 Nm | 175 | 205 | | | | | | | | | | | | | 4.2 | 4.5 | 5.0 |
| MKM 120 S | 4 Nm | 135 | 170 | 19 | 40 | 6 x 32 | M6 x 16 | 110 | 145 | 9 | — | — | 3.5 | 12.5 | 120 | 4.9 | 5.8 | 6.9 |
| MKM 120 M | 7.5 Nm | 170 | 205 | | | | | | | | | | | | | 7.3 | 8.2 | 9.3 |
| MKM 120 L | 11 Nm | 205 | 240 | | | | | | | | | | | | | 9.7 | 10.6 | 11.7 |



| BCH pin | FUNCTION | (mm ²) | WIRE COLOR | MARK |
|--------------|-----------------|--------------------|---------------|-----------------|
| 10 / 11 / 12 | U / V / W MOTOR | 1.5 | BLACK | U-1 / V-2 / W-3 |
| 8 / 4 | (+) / (-) BRAKE | 0.75 | WHITE / BLACK | — |
| 5 / 1 | SE+ / SE- | 0.34 | BLU / WHITE | — |
| 9 | ALL SHIELDS | — | — | — |
| ⊕ | PE | 1.5 | GREEN YELLOW | — |
| 2-3-6-7 | N.C. | — | — | — |

| SCH pin | FUNCTION | (mm ²) | WIRE COLOR | MARK |
|-----------|-----------------|--------------------|--------------|-----------------|
| A / B / C | U / V / W MOTOR | 1 | BLACK | U-1 / W-2 / V-3 |
| 1 / 2 | (+) / (-) BRAKE | 0.5 | BLACK | 6 / 5 |
| 4 / 3 | SE+ / SE- | 0.34 | BLU / WHITE | — |
| ⊕ | PE | 1 | GREEN YELLOW | — |
| 5 | N.C. | — | — | — |

MACK® MOTOR ORDERING CODE **MACK® CABLE ORDERING CODE**

MKM 85 M 30 / 40 - 000 D 00 X P 0 MKES1 B R 1 XX - Sxxx

MKCH 12 BCH / 00 - 030 Sxxx

MOTOR LINE
 SERIES: 60,70,85,120
 SIZE: S, M, L, XL
NOMINAL SPEED
 Ex: 30 = 3000 Rpm
VOLTAGE: 23=230V_{ac}, 40=400V_{ac}

MOUNTING FLANGE:
 000 = standard (see above)
 001=499 = IEC metric
 501=999 = Axor's internal code
MOUNTING HOLES:
 D = B5 with thru holes (std)
 C = B14 with threaded holes (opt)

SHAFT KEY:
 X = with key (std)
 W = without key (opt)
SHAFT DIAMETER:
 00 = standard (see above)
 01=49 = IEC metric
 51=99 = Axor's code

TH.PROTECTION:
 P = PTC (std)
 N = w/out
BRAKE: 0 = w/out (std)
 1 = with (opt)

FEEDBACK:
 MKES1 = Mack® Serial Encoder
 MKEC1 = Mack® Comm. Encoder
 R020 = 2 p resolver (0° phasing)
 H01 = EQI1130 Absolute Encoder

CONNECTOR: B = Byonet (std), S = Screw M23 (opt)
 ST = Spring M15 (opt)

CONNECTOR'S ORIENTATION:
 R = Rear (std), F = Front (opt), T = Top (opt)

SPECIFIC MECHANICAL SPEC:
 X X
REDUCERS:
 R = Present
 X = Not Present
ROTOR INERTIA:
 X = (std)
 H = High Inertia (opt)
 (w/out brake)

PROTECTION CLASS:
 1 = IP54 (std), 2 = IP65 (opt)

| FLANGES & SHAFT OPTIONAL | B _{h7} | D | V _{p9} | W | U | N _{h6} | M | F | J | F' | E | S | R |
|---------------------------|-----------------|----|-----------------|------|-------|-----------------|-----|-----|----|--------|-----|----|-------|
| 063C11X (MKM70 all sizes) | 11 | 23 | 4x18 | 12.5 | M4x10 | 40 | — | — | 63 | M5x6 | 2.5 | 10 | 70 ∅ |
| 090D14X (MKM70 all sizes) | 14 | 30 | 5x25 | 16 | M4x10 | 60 | 90 | 5.2 | 75 | 4.2x10 | 2.5 | 10 | 70 □ |
| 100D11X (MKM70 all sizes) | 11 | 23 | 4x18 | 12.5 | M4x10 | 80 | 100 | 6.5 | — | — | 3 | 10 | 85 □ |
| 100D14X (MKM70 all sizes) | 14 | 30 | 5x25 | 16 | M4x10 | 80 | 100 | 6.5 | — | — | 3 | 10 | 85 □ |
| 100D19X (MKM85 all sizes) | 19 | 40 | 6x32 | 21.5 | M6x16 | 80 | 100 | 6.5 | — | — | 3 | 11 | 85 □ |
| 115D19X (MKM85 all sizes) | 19 | 40 | 6x32 | 21.5 | M6x16 | 95 | 115 | 9 | — | — | 3 | 11 | 100 □ |

NAME:
 Preassembled Hybrid cables
CURRENT RATING:
 12 = up to 12 Arms, 5 = up to 5 Arms
ASSEMBLY MOTOR SIDE:
 BCH = Byonet Hybrid connector
 STCH = Springtec M15 Hybrid connector (for MKCH 5... cable only)
 SCH = Screw M23 Hybrid connector
ASSEMBLY DRIVE SIDE:
 00 = Flying leads (no connector)
LENGHT: 030 = 3m 050 = 5m 070 = 7m 100 = 10m