# TRM-230 Technical Information

| | Motor Parameters | Symbols | Units | TML-230-030 | | TML-230-060 | | TML-230-120 | |
|---|---|---|---|---|---|---|---|---|---|
| PERFORMANCE | DC Bus Voltage | $V_{DC}$ | V | 24 | 48 | 24 | 48 | 24 | 48 |
| | Rated Torque | $T_r$ | Nm | 28.9 | | 55.8 | | 97.2 | |
| | Peak Torque | $T_p$ | Nm | 45.8 | | 92.5 | | 183.9 | |
| | Rated Speed | $N_r$ | rpm | 105 | 255 | 70 | 165 | 40 | 100 |
| | No-Load Speed | $N_{no\text{-}load}$ | rpm | 160 | 325 | 100 | 210 | 60 | 125 |
| | Torque Constant | $K_t$ | Nm/A | 1.71 | | 2.63 | | 4.21 | |
| | Voltage Constant | $K_v$ | V/rpm | 0.146 | | 0.225 | | 0.36 | |
| | Max. Cogging Torque | $T_{cog}$ | % | <1 | | | | | |
| | Torque Ripple | $T_{ripple}$ | % | <1 | | | | | |
| ELECTRICAL | Number of Pole | 2p | -- | 32 | | | | | |
| | Rated Current | $I_r$ | $A_{rms}$ | 16.9 | | 21.2 | | 23.1 | |
| | Peak Current | $I_p$ | $A_{rms}$ | 27 | | 35.4 | | 44 | |
| | Line Resistance | $R_{LL}$@25°C | Ohm | 0.32 (±20%) | | 0.26 (±20%) | | 0.28 (±20%) | |
| | Line Inductance | $L_{LL}$@60Hz | mH | 1.64 (±30%) | | 1.79 (±30%) | | 2.15 (±30%) | |
| MECHANICAL & THERMAL | Stator Weight | $W_s$ | kg | 3.74 | | 6.7 | | 12.53 | |
| | Rotor Weight | $W_r$ | kg | 1.89 | | 3.81 | | 7.65 | |
| | Total Weight | $W_{total}$ | kg | 5.63 | | 10.51 | | 20.18 | |
| | Mech. Time Constant | $K_{mech}$ | ms | 1.69 | | 1.22 | | 1.03 | |
| | Thermal Resistance (2) | $R_{th}$ | °C/W | 0.439 | | 0.321 | | 0.248 | |
| | Inertia | J | $kg.m^2$ | 0.0130 | | 0.02620 | | 0.05260 | |
| | Motor Constant | $K_m$ | Nm/√W | 1.62 | 1.04 | 2.76 | 1.8 | 4.82 | 3.05 |
| | Rotor ID | | mm | 148 | | | | | |
| | Stator OD | | mm | 230 | | | | | |

| | Motor Parameters | Symbols | Units | TMH-230-030 | | TMH-230-060 | | TMH-230-120 | |
|---|---|---|---|---|---|---|---|---|---|
| PERFORMANCE | DC Bus Voltage | $V_{DC}$ | V | 310 | 560 | 310 | 560 | 310 | 560 |
| | Rated Torque | $T_r$ | Nm | 29 | | 55.6 | | 95.9 | |
| | Peak Torque | $T_p$ | Nm | 95.8 | | 192.8 | | 384.7 | |
| | Rated Speed | $N_r$ | rpm | 285 | 545 | 255 | 485 | 205 | 385 |
| | No-Load Speed | $N_{no\text{-}load}$ | rpm | 355 | 650 | 305 | 560 | 240 | 440 |
| | Torque Constant | $K_t$ | Nm/A | 10 | | 11.58 | | 14.76 | |
| | Voltage Constant | $K_v$ | V/rpm | 0.855 | | 0.99 | | 1.26 | |
| | Max. Cogging Torque | $T_{cog}$ | % | <1 | | | | | |
| | Torque Ripple | $T_{ripple}$ | % | <1 | | | | | |
| ELECTRICAL | Number of Pole | 2p | -- | 32 | | | | | |
| | Rated Current | $I_r$ | $A_{rms}$ | 2.9 | | 4.8 | | 6.5 | |
| | Peak Current | $I_p$ | $A_{rms}$ | 10.35 | | 18 | | 27.9 | |
| | Line Resistance | $R_{LL}$@25°C | Ohm | 10.48 (±20%) | | 5.26 (±20%) | | 3.62 (±20%) | |
| | Line Inductance | $L_{LL}$@60Hz | mH | 56.5 (±30%) | | 34.9 (±30%) | | 26.9 (±30%) | |
| MECHANICAL & THERMAL | Stator Weight | $W_s$ | kg | 4.32 | | 6.81 | | 12.57 | |
| | Rotor Weight | $W_r$ | kg | 1.89 | | 3.81 | | 7.65 | |
| | Total Weight | $W_{total}$ | kg | 6.21 | | 10.62 | | 20.22 | |
| | Mech. Time Constant | $K_{mech}$ | ms | 1.67 | | 1.26 | | 1.07 | |
| | Thermal Resistance (2) | $R_{th}$ | °C/W | 0.439 | | 0.321 | | 0.248 | |
| | Inertia | J | $kg.m^2$ | 0.0130 | | 0.02620 | | 0.05260 | |
| | Motor Constant | $K_m$ | Nm/√W | 0.99 | 0.71 | 1.44 | 1.05 | 2.11 | 1.54 |
| | Rotor ID | | mm | 148 | | | | | |
| | Stator OD | | mm | 230 | | | | | |

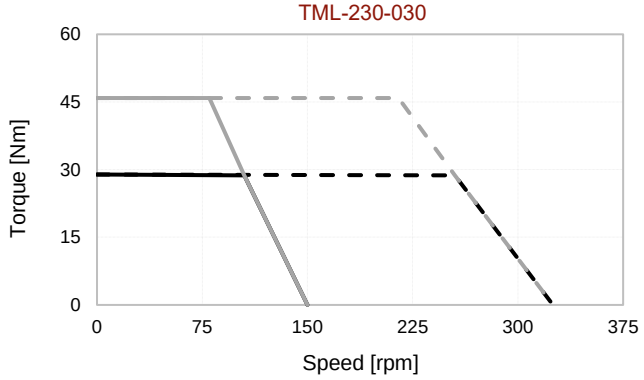
1. All performance and electrical specifications are obtained at 25°C ambient and may change ±10%. 2. Housed version of motor mounted to 340 mm sq. x 15 mm aluminum heat sink (maximum winding temperature is 120°C). 3. Higher torque and speed values as well as dimensions on request.

# TM(L/H)-230 Torque-Speed Curves

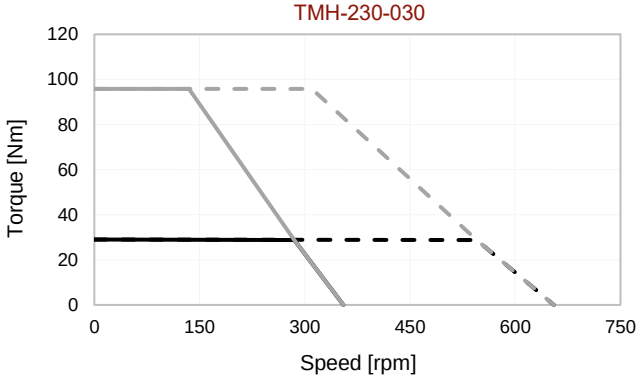
Tr: Rated Torque
Tp: Peak Torque

@Tr 24V @Tr 48V @Tr 310V @Tr 560V
@Tp 24V @Tp 48V @Tp 310V @Tp 560V

## TML-230-030




## TMH-230-030

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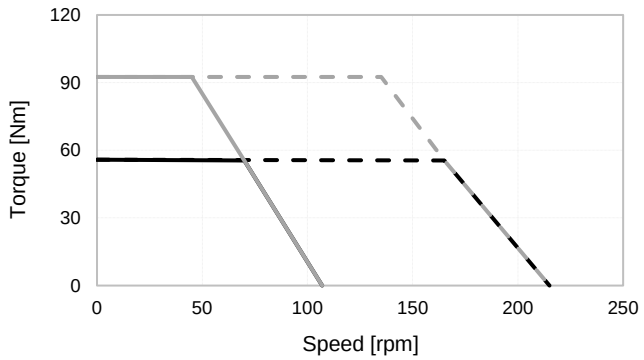
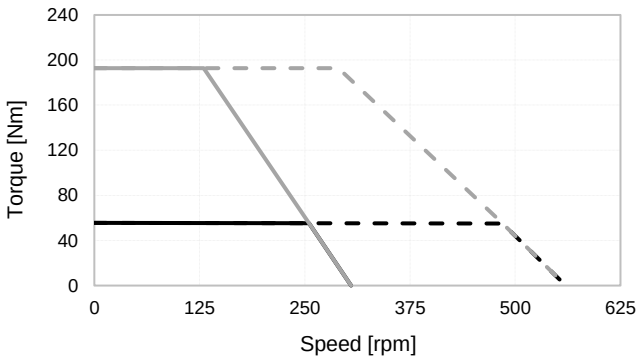
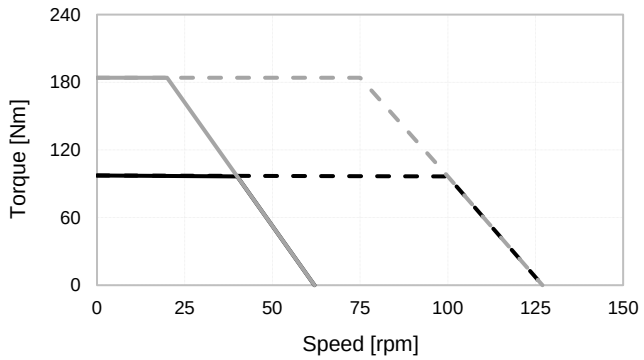


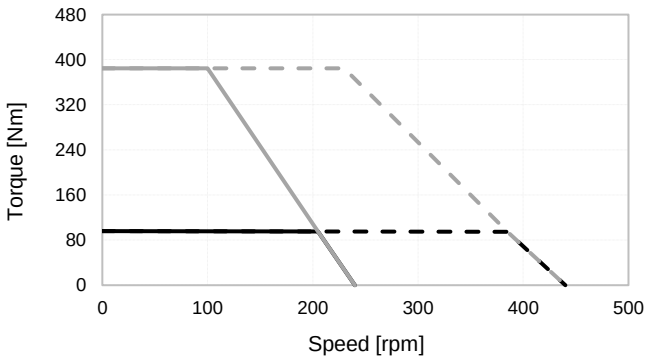

## TMH-230-060



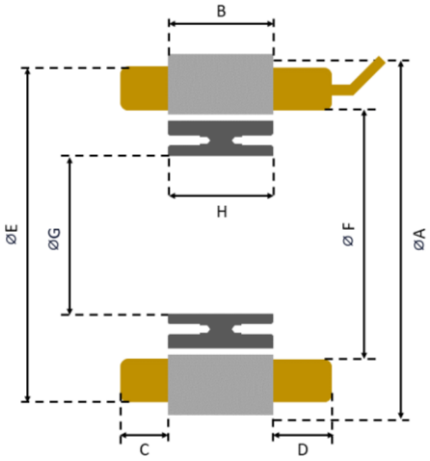

## TML-230-120

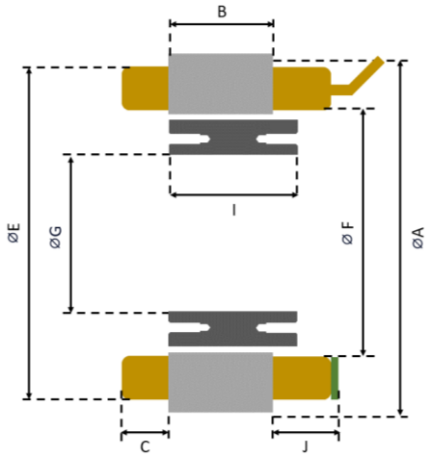



## TMH-230-120



# TM(L/H)-230 Outline Drawing




Hall Effect Sensor Option

| Model | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| | (mm) | (mm) | (mm) | (mm) | (mm) | (mm) | (mm) | (mm) | (mm) | (mm) |
| TM(L/H)-230-030 | 230 | 30 | 15 | 17 | 223 | 185 | 148 | 30.1 | 35.1 | 20 |
| TM(L/H)-230-060 | 230 | 60 | 15 | 17 | 223 | 185 | 148 | 60.2 | 65.2 | 20 |
| TM(L/H)-230-120 | 230 | 100 | 15 | 17 | 223 | 185 | 148 | 120.4 | 125.4 | 20 |

## Notes:

MOTOR LEADS:
230-TML: #11 AWG Teflon® insulated, 500 mm (optional) length, 1-Red, 1-White, 1-Black.
230-TMH: #14 AWG Teflon® insulated, 500 mm (optional) length, 1-Red, 1-White, 1-Black.

THERMISTOR LEADS:
#26 AWG Teflon® insulated, 500 mm (optional) length, 2-Brown or Blue.

SENSOR LEADS:
#23 AWG Teflon® insulated, 500 mm (optional) length, 1-Blue, 1-Green, 1-Brown, 1-White, 1-Yellow.

MOUNTING OPTION:
#Stator: 3x3 Keyway
#Rotor: (16X on each side) M5 Bolt Hole (For details refer to MDS Motor mounting documents)