FRAMELESS TORQUE MOTOR

# FTM-R104-W01

## Mechanical reference and winding selection

CONFIGURATION REFERENCE - not an approved production or order drawing

FTM-R104-W01 is a 60 mm frameless motor reference with a 35 mm rotor bore and 13 mm iron stack. Its 52 rpm/V winding documents 0.47 N.m at 2.04 A RMS under the 55 deg C winding-rise condition. Use the references to discuss your winding, housing and duty cycle.

| | |
|---|---|
| Stator outside diameter | 60 mm |
| 0 / -0.07 mm | |
| Stator inside diameter | 43 mm |
| 0 / -0.06 mm | |
| Rotor outside diameter | 42.4 mm |
| ±0.05 mm | |
| Rotor bore | 35 mm |
| +0.03 / 0 mm | |
| Iron stack length | 13 mm |
| ±0.20 mm | |
| Rotor axial length | 13 mm |
| ±0.05 mm | |
| Motor body axial envelope | <=23 mm |
| Maximum; excludes lead routing; confirm the configured installation drawing. | |
| Power lead length | 200 mm |
| Drawing reference; customization available for review | |

The FTM-R104 STEP and CAD views describe a shared mechanical reference, not winding internals or verified surface finishes. The CAD including modeled leads spans approximately 45.65 mm axially. The 200 mm lead-length reference is separate from that modeled envelope. 13 mm is the iron stack, separate from the drawing body reference of 23 mm and the CAD lead projection. Reserve space for shaft retention, leads and feedback before freezing the housing.

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## Temperature rise, timed peaks and configuration scope

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At 55 deg C winding rise: 0.47 N.m; current 2.04 A RMS.

At 105 deg C winding rise: 0.78 N.m; current 3.41 A RMS.

For 10 seconds: 1.99 N.m; current 9.13 A RMS.

For 2 seconds: 3.3 N.m; current 18.26 A RMS.

Documented performance and electrical entries are generally ±10%. Temperature rise is relative to ambient, not the absolute winding temperature. The source documentation does not fully define the housing heat sink, ambient temperature or repeated-peak recovery cycle. These ratings require application review; they are not independently measured results. Reference publication does not establish a configured production rating.

Documented dimensions and ratings support initial selection. Confirm the configured winding, installation drawing and operating conditions for your application.

Customization: submit the loaded torque-speed point, bus and current conventions, complete housing/bore/lead space, cooling and ambient, peak/recovery cycle, sensor needs and quantities. Final dimensions, supplied components and delivery terms are agreed for the reviewed configuration.

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## Winding reference values and unknown entries

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| | |
|---|---|
| Drive voltage range | 12-48 V |
| Typical voltage 48 V; drive matching requires review | |
| Rated output power | 160 W |
| ±10%; documented typical 48 V basis | |
| Speed coefficient | 52 rpm/V |
| ±10%; documented unit | |
| No-load speed | 2420 rpm |
| ±10%; not a loaded operating point | |
| Listed loaded speed | 1990 rpm |
| ±10%; load/drive/thermal point requires confirmation | |
| Line resistance | 1.28 ohm |
| ±10%; measurement temperature not specified | |
| Line inductance | 1.22 mH |
| ±10%; measurement frequency not specified | |
| Torque constant | 0.16 N.m/A |
| ±10%; current convention must be checked with the drive | |

These are documentation references, not independent measurements or an approved drive setup. Unknown or withheld entries are not zero. No-load speed, temperature rise and peak duration retain separate meanings.

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## Winding reference values and unknown entries

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| | |
|---|---|
| Back EMF constant | 0.18 V.s/rad |
| ±10%; electrical convention requires confirmation | |
| Winding connection | Y star |
| Documented connection | |
| Slots / rotor poles | 18 / 20 |
| Documented arrangement | |
| Mass | 164 g |
| ±10%; documented value | |
| Rotor inertia | 16 kg.mm^2 |
| ±10%; documented value | |
| Electrical time constant | 1.17 ms |
| ±10%; documented value | |
| Motor constant | 0.19 N.m/sqrtW |
| ±10%; documented value | |

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