FRAMELESS TORQUE MOTOR

FTM-R109-W04

Mechanical reference and winding selection

CONFIGURATION REFERENCE - not an approved production or order drawing

FTM-R109-W04 is a 85 mm frameless motor reference with a 56.5 mm rotor bore and 13 mm iron stack. Its 76 rpm/V winding documents 1.25 N.m at 8.14 A RMS under the 55 deg C winding-rise condition. Use the references to discuss your winding, housing and duty cycle.

Stator outside diameter	85 mm
0 / -0.08 mm	
Stator inside diameter	65 mm
0 / -0.06 mm	
Rotor outside diameter	64.4 mm
±0.05 mm	
Rotor bore	56.5 mm
+0.04 / 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-R109 STEP and CAD views describe a shared mechanical reference, not winding internals or verified surface finishes. The CAD including modeled leads spans approximately 46 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: 1.25 N.m; current 8.14 A RMS.

At 105 deg C winding rise: 2.1 N.m; current 13.64 A RMS.

For 10 seconds: 5.5 N.m; current 36.63 A RMS.

For 2 seconds: 9.1 N.m; current 73.15 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	12-60 V
Typical voltage 48 V; drive matching requires review	
Rated output power	650 W
±10%; documented typical 48 V basis	
Speed coefficient	76 rpm/V
±10%; documented unit	
No-load speed	3630 rpm
±10%; not a loaded operating point	
Listed loaded speed	3070 rpm
±10%; load/drive/thermal point requires confirmation	
Line resistance	0.144 ohm
±10%; measurement temperature not specified	
Line inductance	0.173 mH
±10%; measurement frequency not specified	
Torque constant	0.107 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	0.125 V.s/rad
±10%; electrical convention requires confirmation	
Winding connection	Y star
Documented connection	
Rotor poles	28
28 rotor poles; slot count is not specified in the reviewed drawing	
Mass	285 g
±10%; documented value	
Rotor inertia	65 kg.mm^2
±10%; documented value	
Electrical time constant	1.47 ms
±10%; documented value	
Motor constant	0.379 N.m/sqrtW
±10%; documented value	

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