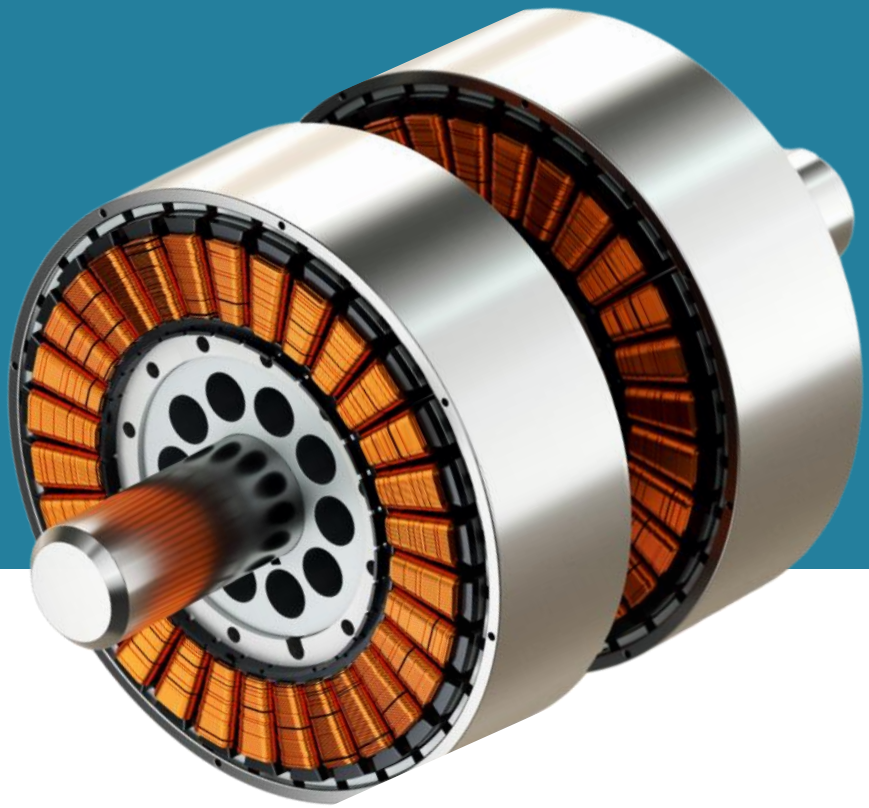
MAGNETIC INNOVATIONS

COMBINED HIGH TORQUE MOTORS

OF THE MI-F SERIES

Frameless PMSM

High Torque Motors



the direct drive motor company

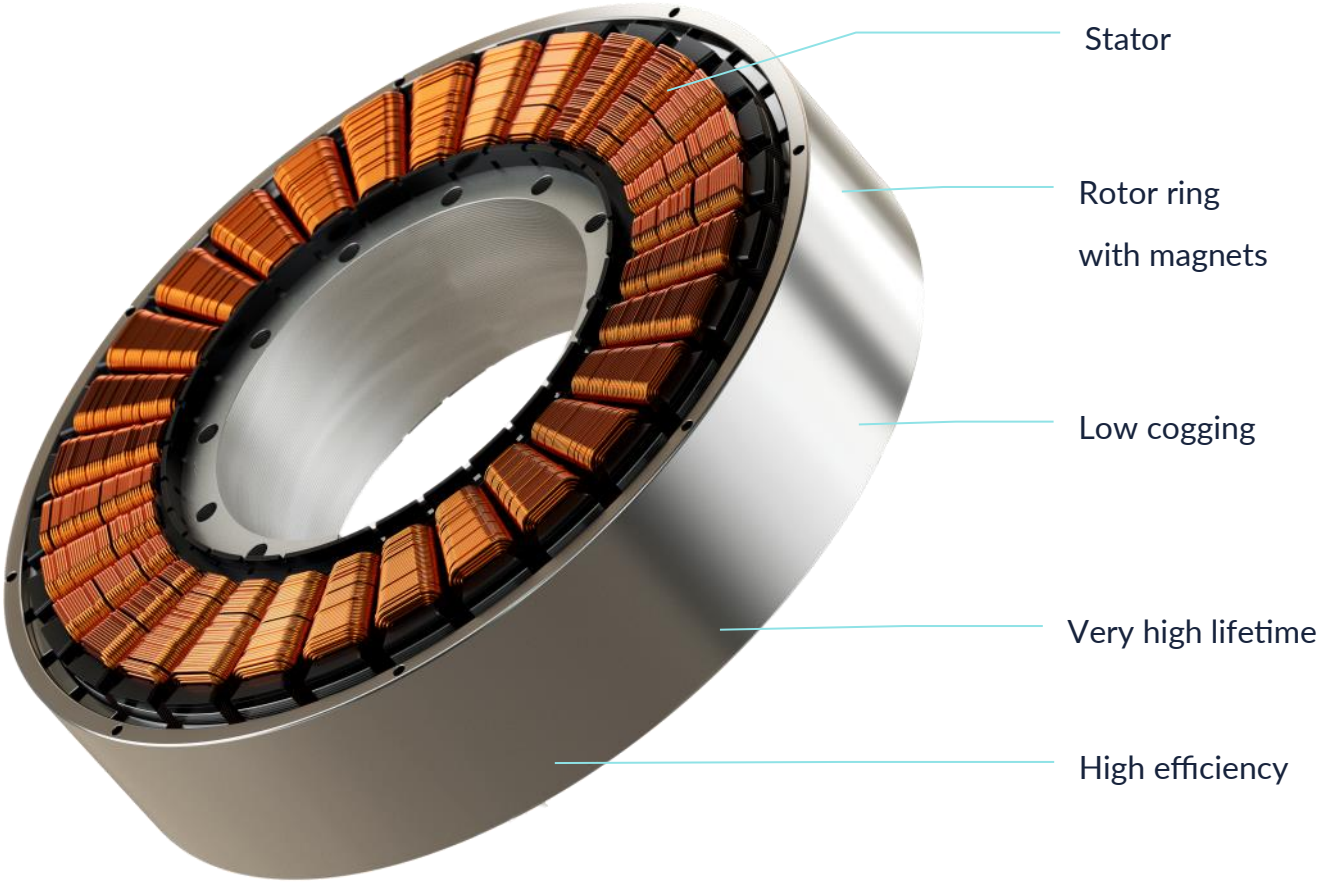
COMPACT, POWERFUL, AND PRECISE

The MI-F series are designed to be built in the integral part of a system. With its outrunner and frameless design, size and weight are decreased making the motors easy to use in various applications.

Rotor and Stator Design
The MI-F torque series features a high-performance rotor assembled with permanent magnets, providing excellent torque at low speeds with minimal cogging. The high-efficiency stator with optimized windings and laminated core, is designed to minimize eddy current losses and maximize torque output.

The frameless architecture allows for direct integration into your mechanical structure, resulting in a compact, low-maintenance, and highly efficient motion solution.

Torque Motor Benefits
The motor's ability to deliver excellent torque at low rotational speeds ensures optimal airflow without the need for gearboxes or belt drives, simplifying the design and reducing energy losses.



WHY COMBINE TORQUE MOTORS?

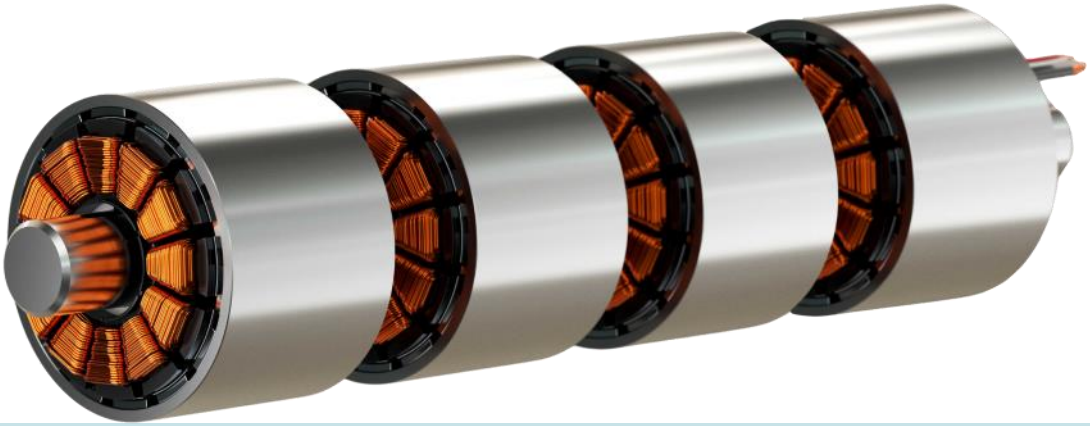
To meet growing demands for torque output in compact systems, multiple frameless torque motors from the MI-F series can be mounted in a combined configuration.
By stacking two or more motors within a single cylindrical assembly, you significantly increase torque performance while maintaining system efficiency and control simplicity.

This modular approach:

- Enables higher continuous and peak torque without increasing footprint
- Simplifies integration – all motors are controlled by a single inverter
- Retains the benefits of direct drive:
  - ⇒ Zero backlash, high dynamic response, and minimal maintenance

What We Provide vs. What You Develop

- **We Provide**: High-performance frameless torque motors, integration advice, and electrical specifications.
- **You Develop**: Shaft and bearing structure, rotor housing, alignment tooling, and final mechanical assembly.



Why Choose Combined MI-F Torque Motors?

Magnetic Innovations' high-torque motors are the right solution for advanced direct-drive systems, offering:

- High Dynamics
- High Torque Density
- High Efficiency
- High Reliability and Long Lifetime
- Low Maintenance Requirements

SPECIFICATIONS COMBINED PMSM MI-F 40

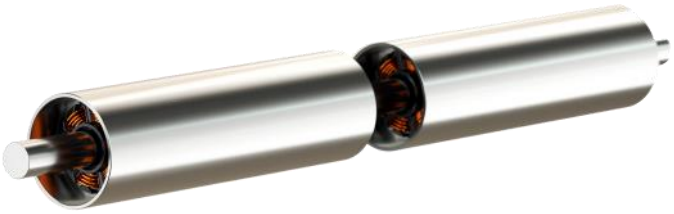
Combining two MI-F 40 torque motors within a single cylindrical assembly enables significantly higher torque output while preserving the benefits of direct-drive.

PERFORMANCE DATA

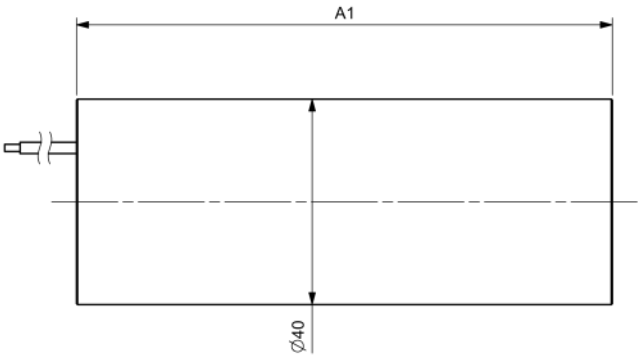
Parameters	Unit	Value (2 motors)
Continuous Torque (no cooling)	Nm	1.6
Max RPM (no load)	rpm	1525
Continuous Torque (forced air)	Nm	3.0
Max RPM (forced air)	rpm	1525
Peak Torque	Nm	5.7
Pole Pairs	-	7
Bus Voltage (DC)	VDC	60

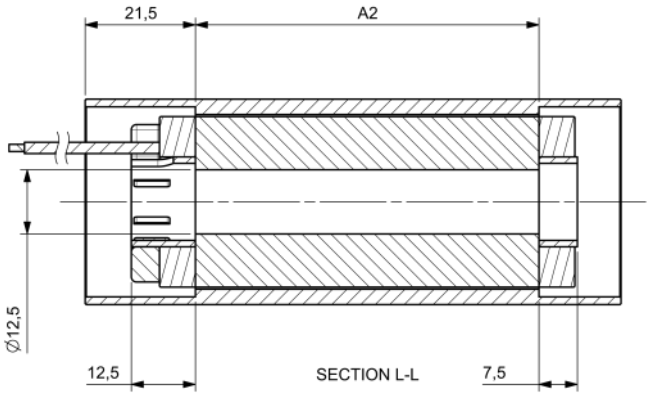
The following values are indicative numbers and have to be specified in more detail based on the application. Peak torques are only applicable for short durations and should be discussed in detail to match specific requirements.

MECHANICAL DIMENSIONS



Model no.	A1	A2	OD
MI-F 40-100	137,5	100	40





SPECIFICATIONS COMBINED PMSM MI-F 110

By combining MI-F 110 motors, you create a compact, high-torque drive system that eliminates the need for gearboxes or belts – offering scalability with up to five units.

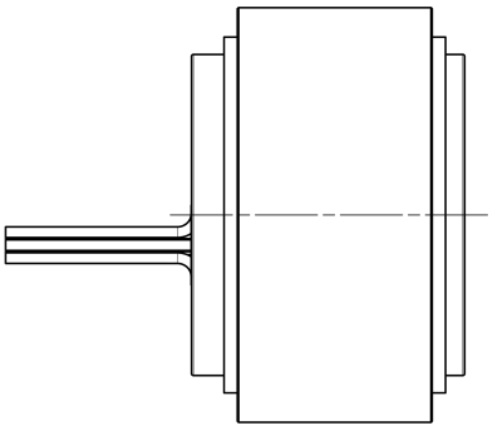
PERFORMANCE DATA

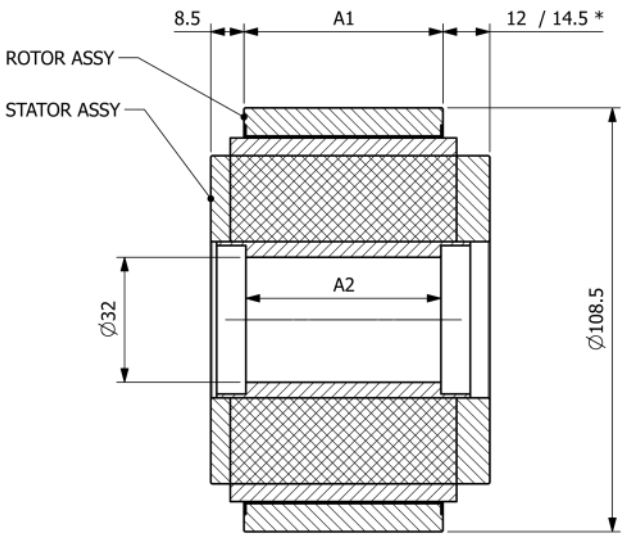
Number of combined motors	Unit	2	3	4	5
Continuous Torque (no cooling)	Nm	24	34	43	51
Max RPM (no load)	rpm	2500	2275	1700	1350
Continuous Torque (forced air)	Nm	31	44	56	66
Max RPM (forced air)	rpm	2800	2275	1700	1350
Peak Torque	Nm	81	120	158	195
Pole Pairs	-	7	7	7	7
Bus Voltage (DC)	VDC	600	600	600	600

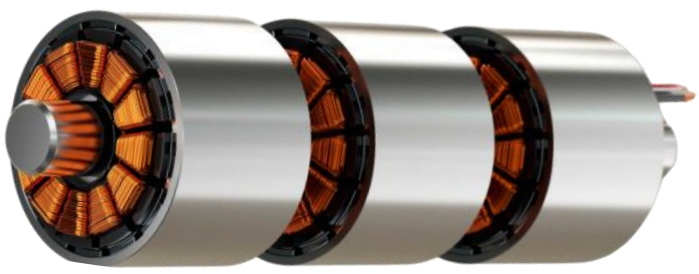
The following values are indicative numbers and have to be specified in more detail based on the application. Peak torques are only applicable for short durations and should be discussed in detail to match specific requirements.

MECHANICAL DIMENSIONS

Model no.	A1	A2	OD
MI-F 110-75	76	75	110







SPECIFICATIONS COMBINED PMSM MI-F 250

With the ability to combine up to five frameless MI-F 250 Torque motors in a single unit, you gain access to extremely high continuous and peak torques.

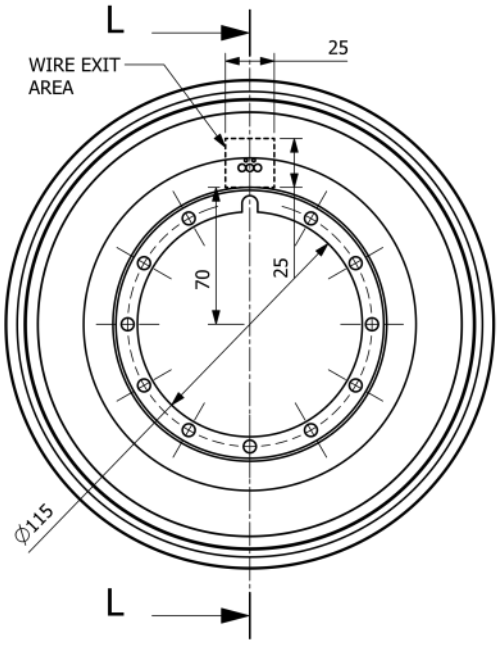
PERFORMANCE DATA

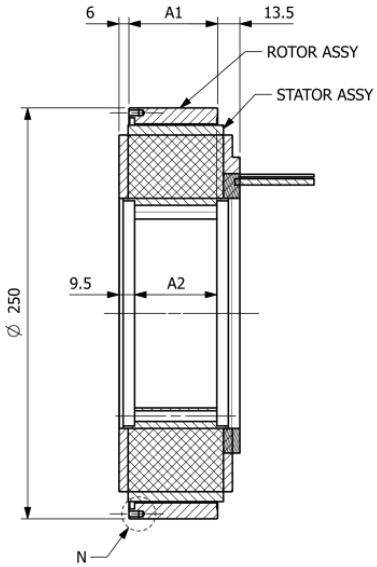
Number of combined motors	Unit	2	3	4	5
Continuous Torque (no cooling)	Nm	187	266	337	400
Max RPM (no load)	rpm	335	220	165	130
Continuous Torque (forced air)	Nm	243	346	438	520
Max RPM (forced air)	rpm	335	220	165	130
Peak Torque	Nm	640	945	1241	1529
Pole Pairs	-	16	16	16	16
Bus Voltage (DC)	VDC	600	600	600	600

The following values are indicative numbers and have to be specified in more detail based on the application. Peak torques are only applicable for short durations and should be discussed in detail to match specific requirements.

MECHANICAL DIMENSIONS

Model no.	A1	A2	OD
MI-F 110-75	76	75	110





CUSTOM HIGH TORQUE MOTORS

If your application requires a torque motor with different specifications, we can also develop a customized motor for you. Your motor can be customized in a variety of ways. For example, in size, cooling options, rpm and torque.

We can also completely design and built a custom motor for you. We can help at every step of the way.

Our strong design and R&D team will make sure that you will get the best cost optimized solution for your requirements.

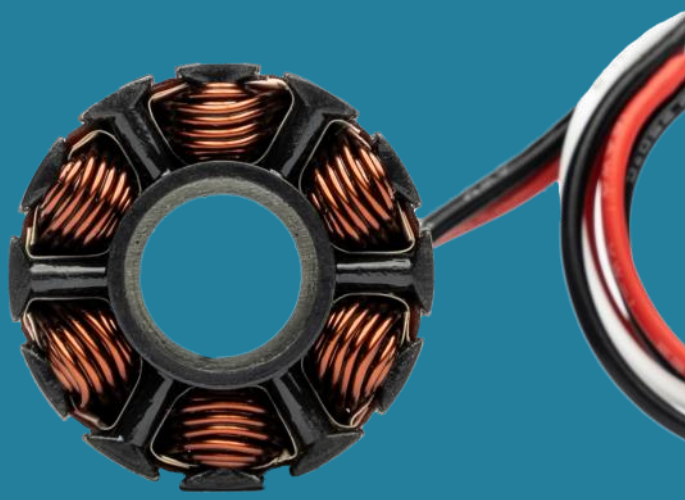
Embracing the power of customization allows you to tailor the motor to your exact requirements, ensuring seamless integration and maximizing efficiency.

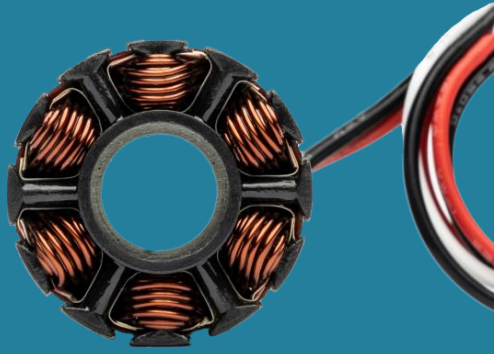
Parameters for a custom motor

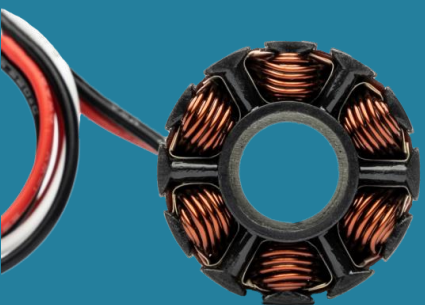
Achieving optimal performance requires precision and attention to detail. When it comes to selecting a motor for your project,
specifying certain parameters becomes crucial.

To start a custom project, the following parameters are necessary to specify:

- Torque requirements (peak and continuous)
- Duty Cycle (in case of a dynamic application)
- Size (limitations)
- Speed requirements
- Supply Voltage level
- Budget / Price target per motor







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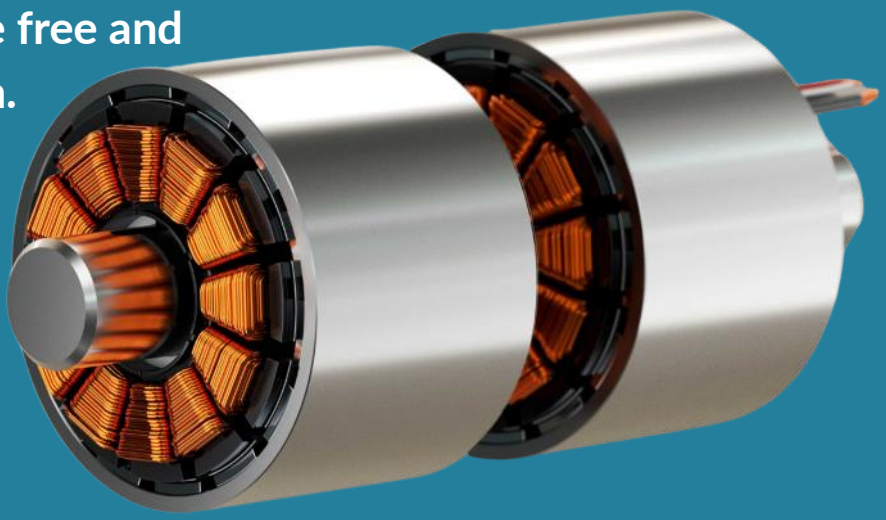
GO DIRECT DRIVE!

Choose a maintenance free and energy efficient design.



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