SIMOTICS T-1FW6 Torque Motors
The right turn for your machine
SIMOTICS Motors for Motion Control Tasks
The right motor for any motion control task

The requirements on a SIMOTICS T built-in torque motor

With the SIMOTICS T-1FW6 torque motors, Siemens offers a range of motors specially designed for the requirements of motion control applications. These are optimally harmonized to the SINAMICS S120 drive system.

Built-in torque motors are multi-pole permanent magnet AC synchronous motors. The stator and rotor are supplied as components and can be integrated directly in the machine.

SIMOTICS T-1FW6 highlights
• Static torque up to 6,030 Nm
• Maximum torque up to 10,900 Nm
• Rated speeds up to 1,200 rpm
• Torque ripple < 1.5%
• Outer diameter 159 to 730 mm (9 sizes)
• Can be integrated directly into the machine
• Wear-free
• Highest precision, performance, and dynamics
• High control rigidity, since there are no elasticities in the drive train
• Mechanical transmission elements are eliminated
• Highest torques at low speeds thanks to multi-pole winding

Overview of the entire SIMOTICS motor portfolio

SIMOTICS – The broadest motor portfolio worldwide. From low-voltage motors, through motors for motion control tasks, all the way to DC and high-voltage motors. With a wide range of performance categories and sizes, you are certain to find the right answer for your specific requirements.
SIMOTICS T-1FW6 Torque Motors
Smoothly to more dynamics

Less is more

SIMOTICS T-1FW6 torque motors manage without any sort of mechanical transmission elements, such as a coupling or gear unit. They therefore require considerably less space. But that is by no means the only advantage to their compact structure: the low quantity of individual components reduces the number of interfaces, maintenance costs, and stocks of spare parts. In turn, this reduces machine breakdowns and increases availability.

The most precise processing

The principle of torque motors does not permit any mechanical transmission errors. Furthermore, the direct integration within the machine structure prevents unnecessary elasticities and transmission problems. The advantage is clear: the highest precision.

Reduced auxiliary processing times

Because power is transmitted without mechanical transmission elements in torque motors, overall mass and friction forces are minimized. This in turn leads in particular to a reduction in auxiliary processing times, with the benefit of increased dynamics.

No backlash

With the gear unit, the proverbial backlash is also eliminated in torque motors. This increases the contour accuracy when there is a change in the direction of motion. At the same time, the repeat accuracy improves when a position is approached again.
SIMOTICS T-1FW6 Torque Motors

The proven standard for motion control tasks

Motor features

Our permanent-magnet excited SIMOTICS T-1FW6 torque motors are available with a wide range of features based on frame size and thus always provide the fitting solution to your requirements:

- **SIMOTICS T-1FW6 natural cooling torque motors:** with this feature torque motors are supplied that can explicitly be used in applications for which water cooling is not desired or necessary.
- **SIMOTICS T-1FW6 torque motors with cooling jacket** are distinguished by their extremely compact design and are used in applications with very high requirements in terms of dynamics.
- **SIMOTICS T-1FW6 torque motors with integrated cooling** are characterized by their precise temperature control according to the Thermo-Sandwich® concept (for dual-circuit cooling). The cooling water connection is made through standard connections. The motor does not require any precise counter fit.

Scope of application

So-called torque motors operating according to the principles of a servo motor are best suited for use in

- Rotary indexing machines
- Rotary tables and dividing heads
- Rotary axes
  (A, B, C axis in 5-axis machine tools)
- Turret indexing and cylinder indexing for single-spindle and multi-spindle machines
- Workpiece spindles
- Roller and cylinder drives
- Infeed and handling axes
- Tablet presses
- Medical Application
- Measuring machines
Our product range – what we have to offer

<table>
<thead>
<tr>
<th>Rated torque range</th>
<th>Maximum torque range</th>
<th>Speed rated torque</th>
<th>Motor type</th>
<th>Stator outer diameter</th>
<th>Rotor inner diameter</th>
<th>Stator length</th>
<th>Type of cooling</th>
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<tbody>
<tr>
<td>$M_n$ Nm</td>
<td>$M_{max}$ Nm</td>
<td>$n_{max}$ at $M_{rated}$ rpm</td>
<td>1FW6053</td>
<td>184</td>
<td>64</td>
<td>89 to 209</td>
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<td>10.1 to 29.3</td>
<td>34.4 to 174</td>
<td>up to 1,200</td>
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<td>92</td>
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<td>13.9 to 45.5</td>
<td>64.5 to 332</td>
<td>up to 860</td>
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Water cooling

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<th>Rotor inner diameter</th>
<th>Stator length</th>
<th>Type of cooling</th>
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<td>89 to 209</td>
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Application and mechatronic support for motors: faster to the machine – faster to the market

The use of torque motors presents great potential for increasing machine performance. However, only the direct drive-compatible integration of built-in motors in the machine design ensures a high performance capability of the machine. With application and mechatronic support for motors, Siemens supports the development of new machines from the design stage through to machine acceptance tests with the following services:

- Optimum selection and dimensioning of all motor and control loop components
- Mechatronic analysis and simulation of machine designs
- Computer-assisted (finite-elemente-method) analysis and optimization of machine structures
- Commissioning and control loop optimization

Siemens has acquired many years of experience and specific expertise in employing direct drives in tool and production machinery. On this basis, we look forward to making our contribution to the quick and secure implementation of your development objectives, too. Please get in touch with us:

motor.support.motioncontrol@siemens.com
Discover in detail how integrated drive systems boost your competitive edge and reduce your time to profit.

For more on integrated drive systems, visit our mobile website.

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www.siemens.com/ids

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www.youtube.com/siemens

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