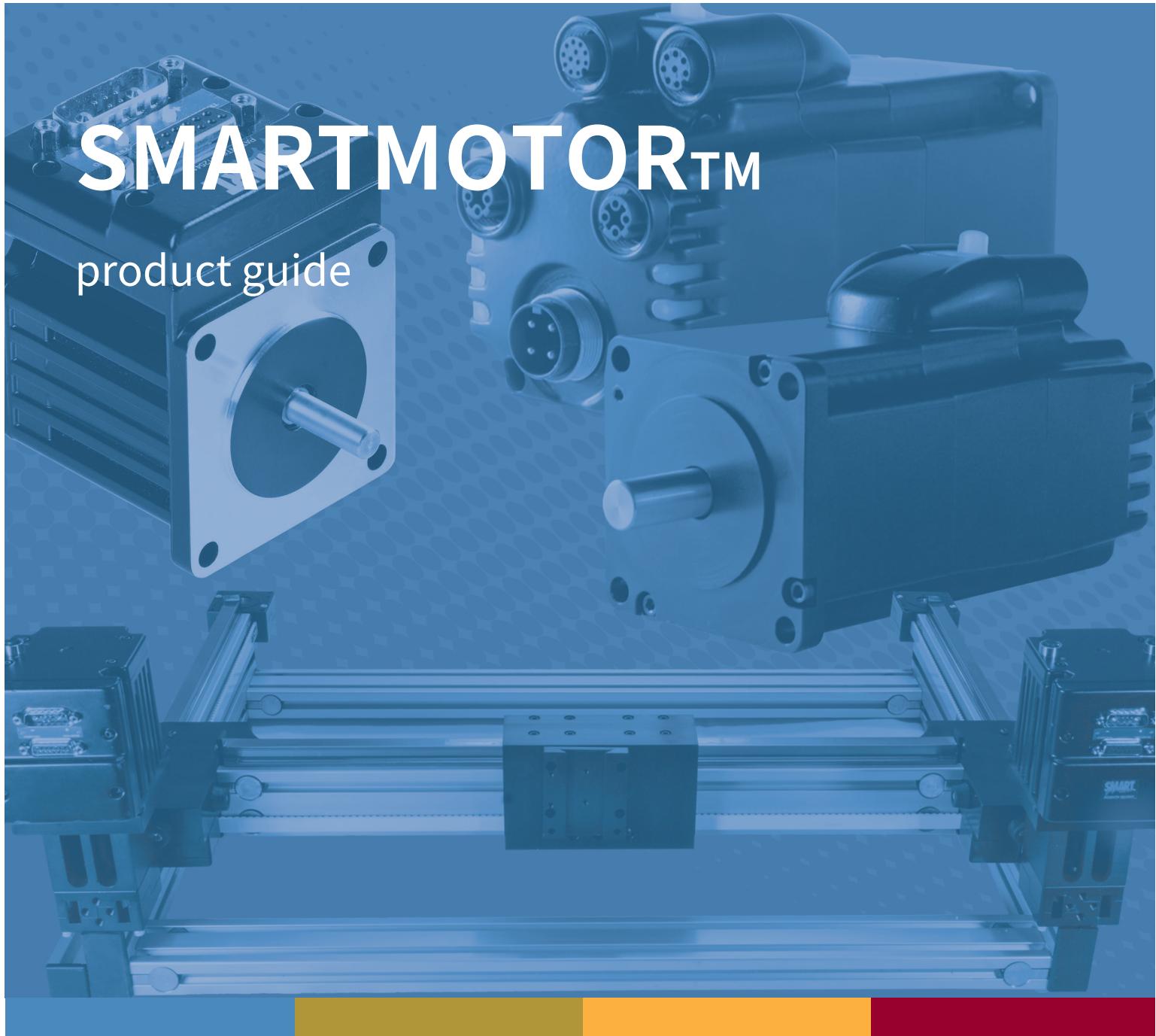


# SMARTMOTOR™

product guide



System integrated servo motor

WHEN PERFORMANCE REALLY MATTERS®

**MOOG**  
 **ANIMATICS**

**smart motor is** A servo motor with built-in controller, driver, encoder, input/output, and communication.

The control panel can be made compact due to space saving and wiring saving, and multi-axis control is possible.

## High-performance programmable controller

Smart motors are equipped with high-performance programmable controls.

Built-in rollers.

This highly functional program

Programmable controller as main controller

Use or Use as a slave for distributed control

This can reduce the load processing on the host PLC.

MASUSmart motor has dual trajectory synthesis function

We are equipped with 3D spline interpolation or simple PTP

Operation is possible.

## Input/output (I/O)

The smart motor is equipped with 7 5V I/O points as standard,

and 10 isolated 24V I/O points can be added as an option. de

Digital and analog signals can be read up to

300mA, so PLCs, solenoid valves, potentiometer etc.

Can be used with devices.

## servo driver

Closed loop servo driver

It is integrated with the data. Because it is an integrated type, it is not affected by electrical noise.

At the same time, the electrical noise emitted to the outside is extremely low.

## communication

Class 5 smart motors are compatible with RS232

Equipped with RS485 as standard, CANopen, device net, Profibus is open available in the section.

\*EtherCAT can be selected as an option for Class 6.

## brushless dc servo motor

Uses high-performance brushless DC servo motors with frame sizes NEMA17, 23, and 34.

Depending on the model, the maximum speed is

3100RPM to 10,400RPM, The peak torque is

We have models ranging from 0.4N · m to

5.4N · m.

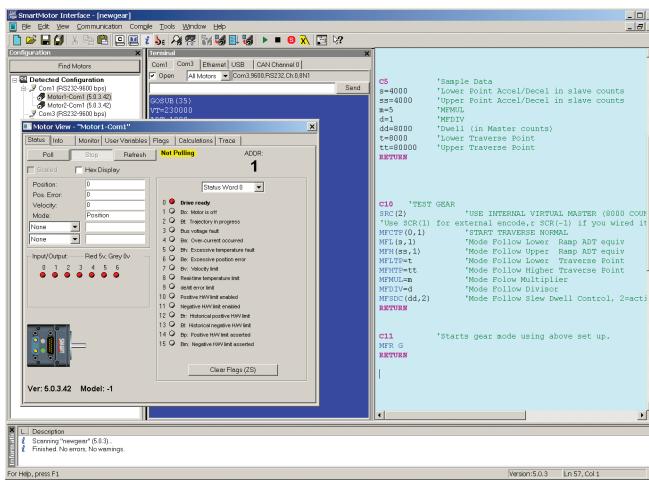
## encoder (incremental method)

Encoder for all Class 5 smart motors depends on the model, incremental. The resolution is 4000 counts/rev or 8000 counts/rev.



## SMI (Smart Motor Interface) Software

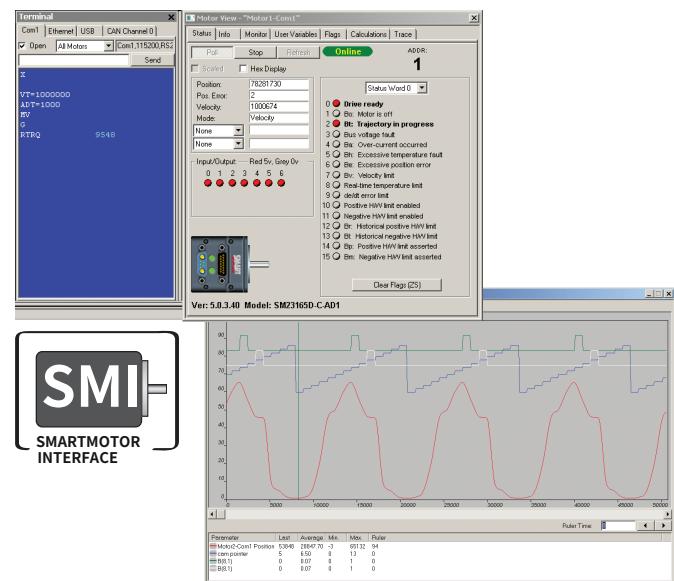
SMI™ is Microsoft Windows compatible interface software. Using SMI, you can configure smart motors from 1 to 100 axes. SMI is a terminal program, program editor, saw It has a level debugger. Standard SMI features include PID tuning parameters, Step response display, Motor information/dynamic status tracking, and online help and documentation features. There is a tool menu with tools. To create a program, Specify the address for the number of motors, Upload program from motor



can be coded.

Create programs and smartly placed  
Download to motor. Then, just by restarting the motor,  
Start.

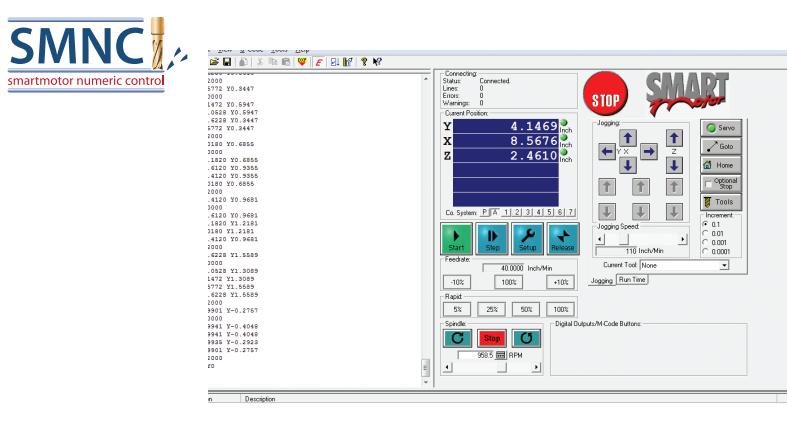
The latest version of SMI has added features including user interface enhancements and new features. application development, Useful for testing and operation.



## SMNC software for CNC applications

SMNC™ is a G-code-based servo control software that numerically controls multi-axis interpolation using smart motors. Including similarities to typical CNC equipment interface screens. every It has features comparable to CNC equipment. For details on SMNC Please check the G/M code table.

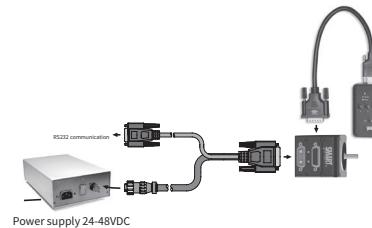
SMNC is RS-232, Smart module using RS-485 and CANopen communicate with the data.



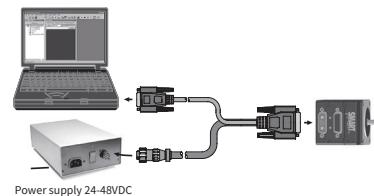
Smart motors are equipped with a master control function as standard, so Motion system even without a separate controller It is possible to build a system. If you need a host controller such as a PC or PLC, Used for command instructions and BCD input You can also.

[Class 5 single axis connection](#)

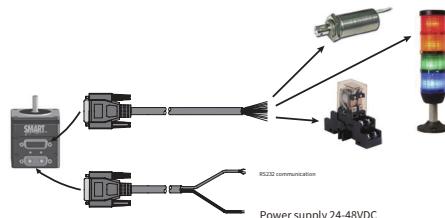
System example using I/O (using SmartBox BCD)



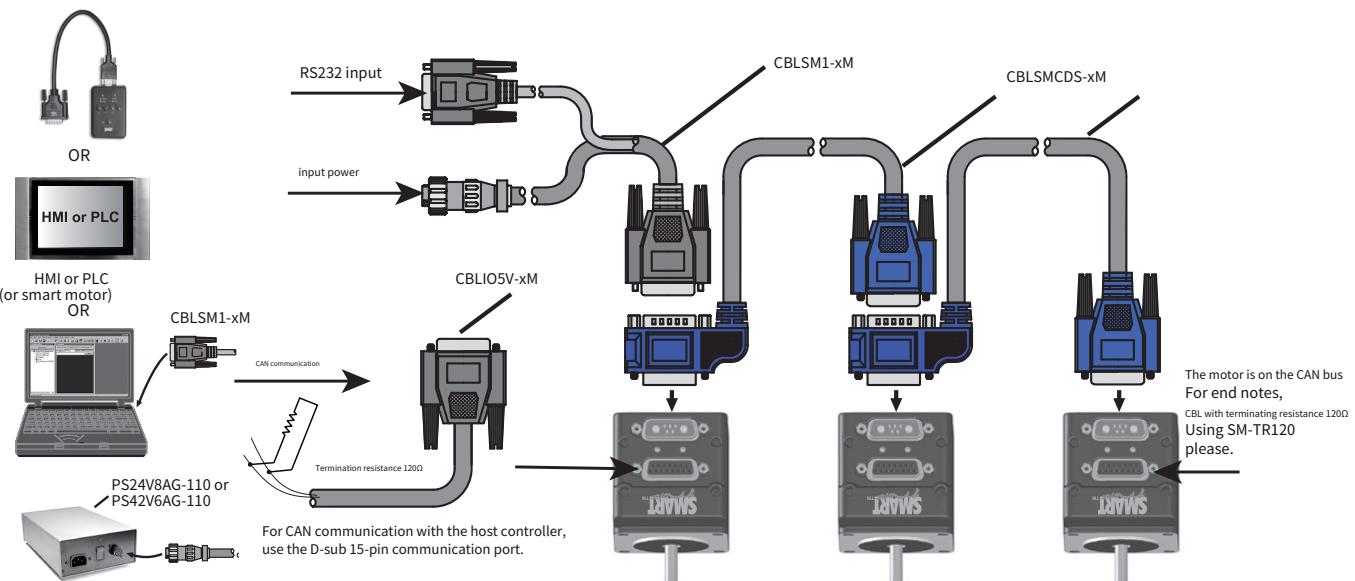
Example of a system using commands from a PC



Device connection example using I/O as an interface



[Class 5 multi-axis connection](#)



Note: Termination resistors are required at both ends of the CAN bus. The bus requires a multi-drop connection as shown, not a star connection.

The motor does not require 24V CAN bus power.

: Example of using CDS7 option.

## transportation



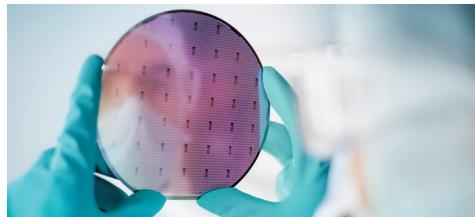
- AGV
- belt conveyor
- Pick and place

## medical care



- CT/MRI equipment
- Catheter manufacturing & winding
- Drug testing
- Centrifuge

## semiconductor



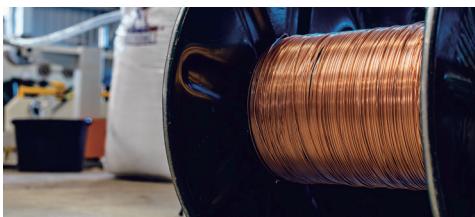
- Plasma coating
- Opening/closing the chamber gate
- Wafer transport

## Monitoring system



- Panhead
- Satellite position control
- Radar

## winding wire



- Optical fiber
- paper, film & foil
- Voice coil, transformer coil, induction coil
- Carbon fiber

## packaging



- Capper
- Labeling
- Blister pack
- Feed & Sealing

## other industries

- |                      |                |                 |                |                  |
|----------------------|----------------|-----------------|----------------|------------------|
| • Measurement        | • Defense      | • Agriculture   | • Woodworking  | • Marine science |
| • Metals & Materials | • self-driving | • Biology       | • Architecture | • Pharmaceutical |
| • entertainment      | • car          | • Biotechnology | • Education    |                  |



		<b>SM17205D</b>	<b>SM23165D</b>	<b>SM23165DT</b>	<b>SM34165D</b>	<b>SM34165DT</b>
continuous torque	Nm	0.24	0.28	0.52	1.09	1.45
Maximum continuous output	Watts	145	181	204	235	615
Maximum continuous current (48V)	RPM	6,000	6,500	3,800	2,400	4,500
	Amps	3.81	3.55	5.07	6.02	16.93
peak torque	Nm	0.43	0.45	0.84	1.60	3.39
Peak current (48V)	RPM	4,200	6,000	3,500	1,800	3,500
	Amps	4.69	4.43	5.73	6.38	23.86
Maximum speed without load (48V)	RPM	7,900	10,400	5,200	3,100	5,100
voltage constant	V/krpm	6.51	4.45	9.08	14.98	8.90
inductance	mH	1.40	0.83	1.31	1.72	0.32
Encoder resolution	Counts/Rev	4,000	4,000	4,000	8,000	8,000
rotor inertia	Ten-Fivekg m <sub>2</sub>	1.5324	0.6991	0.7060	9.8900	10.0310
Shaft diameter	mm	5.00	6.35	6.35	9.53	12.70
Radial load (axis)	kg	3.18	3.18	3.18	6.80	13.61
Axial load (axis)	kg	1.36	1.36	1.36	1.36	1.36
flange size	mm	41.90	57.15	57.15	86.36	86.36
motor length	mm	95.10	58.42	58.42	95.12	95.12
mass	kg	0.55	0.45	0.59	2.27	2.49
PROFIBUS options	-	○	○	○	○	○
CANopen options	-	○	○	○	○	○
CDS7 options	-	○	○	○	○	○
AD1 option	-	○	○	○	○	○
BRK option	-	○	○	○	○	○
IP65* Protection class	-					

- All D-style smart motors come standard with RS232 as the primary communication port.
- All D style smart motors come standard with 7 channels 5VDC TTL non-isolated 5V/I/O
- Optionally add 10 channels of 24VDC isolated I/O
- Encoder signal output pin available



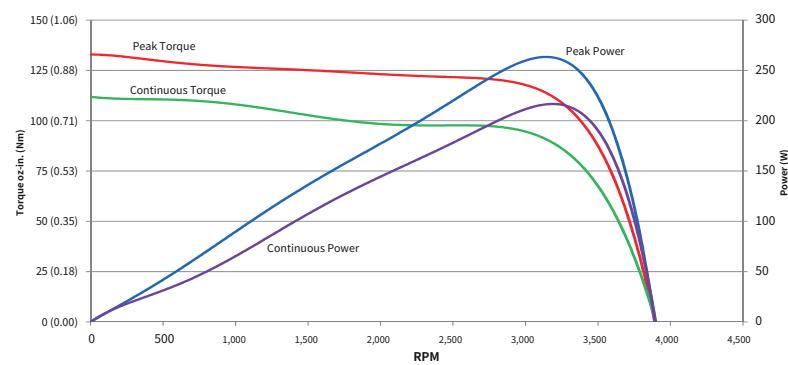
<b>SM23165S</b>	<b>SM23165ST</b>	<b>SM34165S</b>	<b>SM34165ST</b>		
0.28	0.52	1.09	1.45	Nm	continuous torque
181	204	235	615	Watts	Maximum continuous output
6,500	3,800	2,400	4,500	RPM	
3.55	5.07	6.02	16.93	Amps	Maximum continuous current (48V)
0.43	0.84	1.60	3,39	Nm	peak torque
6,000	3,500	1,800	3,500	RPM	
4.43	5.73	6.38	23.86	Amps	Peak current (48V)
10,400	5,200	3,100	5,100	RPM	Maximum speed without load (48V)
4.45	9.08	14.98	8.90	V/krpm	voltage constant
0.83	1.31	1.72	0.32	mH	inductance
4,000	4,000	8,000	8,000	Counts/Rev	Encoder resolution
0.6991	0.7060	9.8900	10.0310	Ten-Fivekg m <sup>2</sup>	rotor inertia
6.35	6.35	9.53	12.70	mm	Shaft diameter
3.18	3.18	6.80	13.61	kg	Radial load (axis)
1.36	1.36	1.36	1.36	kg	Axial load (axis)
57.15	57.15	86.36	86.36	mm	flange size
59.40	59.40	96.20	96.20	mm	motor length
0.62	0.70	2.50	2.72	kg	mass
				-	PROFIBUS options
○	○	○	○	-	CANopen options
				-	CDS7 options
				-	AD1 option
○	○	○	○	-	BRK option
○	○	○	○	-	IP65* Protection class

\*The shaft is not sealed.

Class 6 MT2 supports Ethernet communication and protection class IP67.

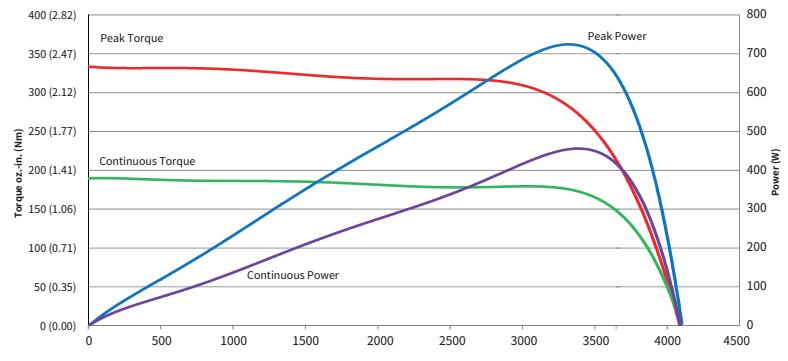
## SM23166MT2-EXX \*\*

Continuous torque @48V	0.80	Nm
peak torque	0.94	Nm
Maximum continuous output @3100rpm	210	watts
Peak power @ 3100 rpm	255	watts
Maximum speed without load	3,900	rpm
constant voltage	9.08	V/kRPM
Resistance between terminals	0.743	Ohms
Encoder resolution	4,000	counts/rev
rotor inertia	1.03	(oz-in-sec <sub>2</sub> )x10 <sub>-3</sub>
	7.20	Ten <sub>-6</sub> kg·m <sub>2</sub>
mass	1.00	kg
Shaft diameter	9.53	mm
Radial load (axis)	6.80	kg
Axial load (axis)	1.36	kg
EtherCAT® options*	Yes	
PROFINET® options*	Yes	
EtherNet/IP™ option*	Yes	



## SM34166MT2-EXX \*\*

Continuous torque @48V	1.34	Nm
peak torque	2.33	Nm
Maximum continuous output @3100rpm	460	watts
Peak power @ 3100 rpm	720	watts
Maximum speed without load	4,900	rpm
constant voltage	8.9	V/kRPM
Resistance between terminals	0.055	Ohms
Encoder resolution	4,000	counts/rev
rotor inertia	0.0142	oz-in-sec <sub>2</sub>
	10.027	Ten <sub>-5</sub> kg·m <sub>2</sub>
mass	3.4	kg
Shaft diameter	12.7	mm
Radial load (axis)	13.6	kg
Axial load (axis)	1.36	kg
EtherCAT® options*	Yes	
PROFINET® options*	Yes	
EtherNet/IP™ option*	Yes	



Maximum temperature: 85°C (board), 130°C (winding)

Recommended ambient temperature range: 0°C to 50°C.

Storage temperature range: -10°C to 85°C

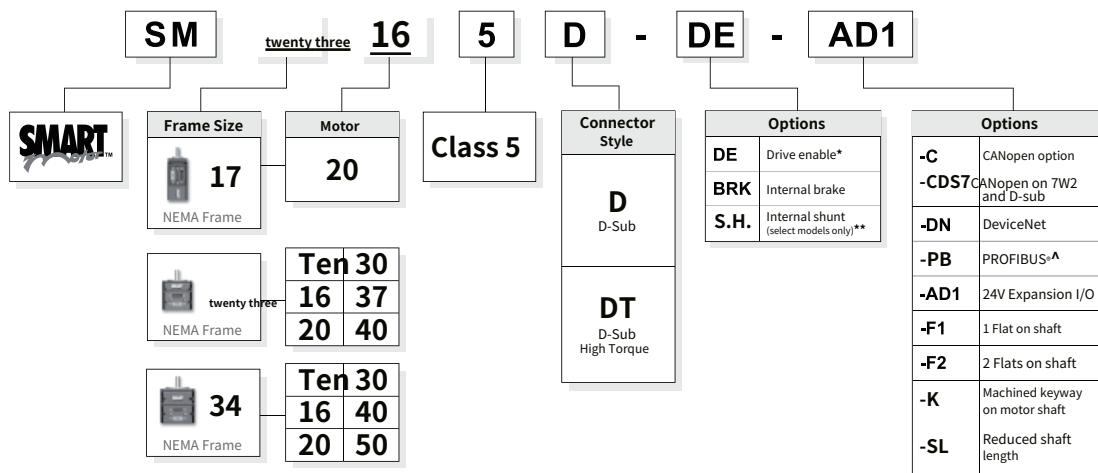
Relative humidity: up to 90% (no condensation)

These are the measurement results under the conditions of 48VDC power supply, MDC mode, and ambient temperature of 25°C. Characteristics may change depending on the power supply voltage and ambient temperature used.

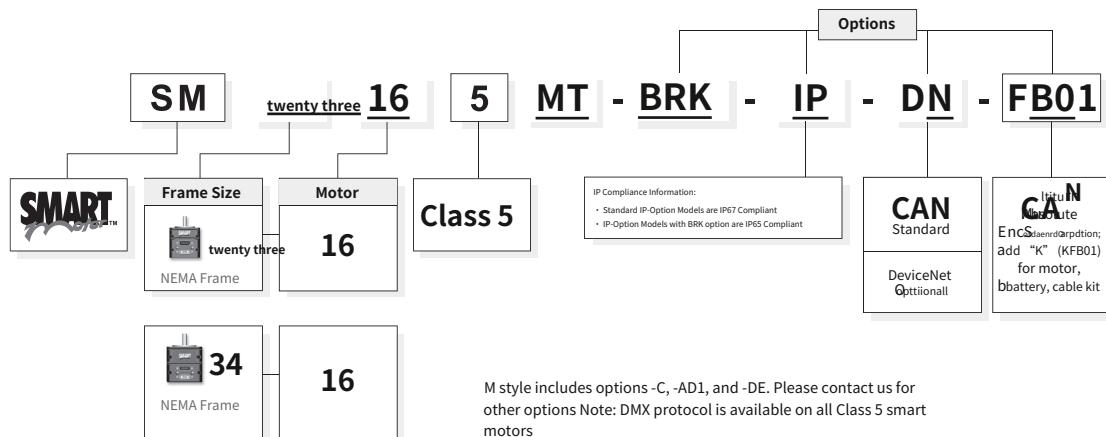
\* EtherCAT® (EEC option), PROFINET® (EPN option), and EtherNet/IP™ (EIP option) version

\*\* The XX part of the model number contains an option symbol. Details on next page (Order code) Please refer to the Class 6 M style.

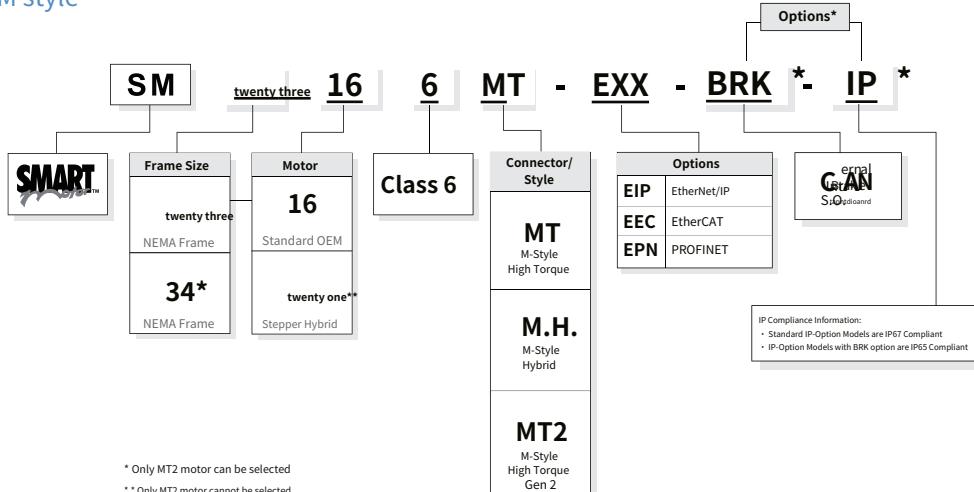
## Class 5 D style



## Class 5 M style



## Class 6 M style



## Click here for more information

Moog Animatics, a sub-brand of Moog Inc., has been a global leader in integrated automation solutions since 2011. With over 30 years of experience in the motion control industry, the company is headquartered in the United States and provides automation solutions worldwide.

There is a network of online providers.

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