SMARTMOTOR[™] PRODUCTS

Fully integrated and decentralized motion control, when performance really matters.



More Than "Just Motors"

The fully integrated SmartMotor[™] servos incorporate into one little black box: brushless DC motor with high power density, controller, amplifier, encoder and freely definable I/Os. There are no more extra feedback and control cables, PLCs, I/O blocks or cabinets necessary.

Using Moog Animatics technology, you significantly reduce:

- installation space
- complexity
- and development time

Why Moog Animatics?

Make use of our longstanding track record of motion control excellence and experience a trustful and consistent customer relationship with our well-trained experts.

It will make the difference through:

- reliable products and solutions
- economically effective project design
- and a competitive advantage, most likely for years

With Moog's typical hands-on mentality and the ambition to make the impossible possible in motion control, we are your partner of choice when performance really matters.



ADVANTAGES

- Maintenance-free brushless DC motors with a fully-featured and fully integrated motion controller
- Highly programmable systems with the ability to take over complex control tasks
- Free SMI (SmartMotor[™] Interface) software is included for programming the motors
- Extremely compact dimensions
- Close collaboration with our motion control experts
- High-end customization

APPLICATIONS

- Mobile robotics
- AGV (Automated Guided Vehicles)
- Medical and laboratory technology
- Stage equipment
- Agricultural engineering
- Dosing systems
- Labelling
- Material handling
- Building automation















		SM17205D	SM23165D	SM23165DT	SM34165D	SM34165DT
Continuous Torque	Nm	0.24	0.28	0.52	1.09	1.45
Nominal Continuous Power	Watts	145	181	204	235	615
Max. Continuous Current @ 48 V	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 @ 48 V	RPM	4,200	6,000	3,500	1,800	3,500
	Amps	4.69	4.43	5.73	6.38	23.86
No Load Speed @ 48 V	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	10 ⁻⁵ kg m ²	1.5324	0.6991	0.7060	9.8900	10.0310
Shaft Diameter	mm	5.00	6.35	6.35	9.53	12.70
Shaft, Radial Load	kg	3.18	3.18	3.18	6.80	13.61
Shaft, Axial Thrust Load	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
Weight	kg	0.55	0.45	0.59	2.27	2.49
PROFIBUS Option	-		Yes	Yes	Yes	Yes
CANopen Option	-	Yes	Yes	Yes	Yes	Yes
CDS7 Option	-		Yes	Yes	Yes	Yes
AEC3 Option	-		Yes	Yes	Yes	Yes
AD1 Option	-	Yes	Yes	Yes	Yes	Yes
BRK Option	-	Yes	Yes	Yes	Yes	Yes
IP65* Protection	-					

Basic configuration of all SmartMotor[™] servos listed: incremental optical encoder / communication: DMX, ModBus[®] capability, primary RS-232 communications port / 7 channels 5 V TTL non-isolated I/O (optional: 10 channels expanded 24 VDC isolated I/O), and a dedicated encoder out

*Shaft not sealed











		SM23165M -SCXx	SM23165MT -SCXx	SM34165M -SCXx	SM34165MT -SCXx
Continuous Torque	Nm	0.28	0.52	1.09	1.45
Nominal Continuous Power	Watts	181	204	235	615
Max. Continuous Current @ 48 V	RPM	6,500	3,800	2,400	4,500
	Amps	3.55	5.07	6.02	16.93
Peak Torque	Nm	0.43	0.84	1.60	3,39
Peak Current @ 48 V	RPM	6,000	3,500	1,800	3,500
	Amps	4.43	5.73	6.38	23.86
No Load Speed @ 48 V	RPM	10,400	5,200	3,100	5,100
Voltage Constant	V/krpm	4.45	9.08	14.98	8.90
Inductance	mH	0.83	1.31	1.72	0.32
Encoder Resolution	Counts/Rev	4,000	4,000	8,000	8,000
Rotor Inertia	10 ⁻⁵ kg m ²	0.6991	0.7060	9.8900	10.0310
Shaft Diameter	mm	6.35	6.35	9.53	12.70
Shaft, Radial Load	kg	3.18	3.18	6.80	13.61
Shaft, Axial Thrust Load	kg	1.36	1.36	1.36	1.36
Flange Size	mm	57.15	57.15	86.36	86.36
Motor Length	mm	59.40	59.40	96.20	96.20
Weight	kg	0.62	0.70	2.50	2.72
PROFIBUS Option	-				
CANopen Option	-	Yes	Yes	Yes	Yes
CDS7 Option	-				
AEC3 Option	-				
AD1 Option	-				
BRK Option		Yes	Yes	Yes	Yes
IP65* Protection	-	Yes	Yes	Yes	Yes

Basic configuration of all SmartMotor[™] servos listed: incremental optical encoder / communication: DMX, ModBus[®] capability, primary RS-232 communications port / 7 channels 5 V TTL non-isolated I/O (optional: 10 channels expanded 24 VDC isolated I/O), and a dedicated encoder out

*Shaft not sealed

The following illustration explains the SmartMotor[™] part numbering, including the most common options. Note that some options are mutually exclusive due to lack of space (e.g. AEC3 and BRK). To choose the right version for your application, please contact our motion control experts for your country.



* shaft not sealed



Create Multi-Axis Systems Fast to Stay Ahead

The Combitronic[™] protocol was developed by Moog Animatics and operates on the CAN bus. The ease of use and features provided by Combitronic[™] technology are not available from any other motor manufacturer in the industry! Up to 120 fully integrated SmartMotor[™] servos can be connected in each Combitronic[™] network and no dedicated master is required to operate them. This means that all participating motors are able to communicate simultaneously with all others.

With Combitronic[™] technology, any SmartMotor[™] can quickly read from, write to, and control others with no data collision or loss. **The result is a very flexible, fast and easy exchange of information, unrivaled in this form.**

Combine Combitronic[™] with our single-cable solution, CDS7. It covers both, power supply and communication, and simplifies the setup of your CAN bus network.

If there is a heavy axis, where you need more than 800 W power, you can also integrate stronger Moog motors into the network using the Moog DS2020 drive. The drive has been upgraded to process Combitronic[™] commands as a slave and supports Moog CD motors up to 12 kW.





The Moog DS2020 Combitronic™ drive integrates heavy axis into the Combitronic™ network.

Of course, a pure SmartMotor™ network does not need a separate drive at all. The Moog Extra Line Actuators are produced in Europe according to our high standards for use in many different applications. As a result, we can offer faster delivery times, while providing an excellent price-performance ratio.

TIMING BELT ACTUATORS - FAST MOVEMENTS AND LONG STROKES						
Available Features	Specifications					
 Protected with steel sealing strip for dirty environments Larger carriage to support higher moments of inertia Suitable for high loads in all directions Special design for handling heavier loads Low friction and low maintenance Belt actuators for vertical applications Rotary actuator 	Step/Turn No. of Guides Fx Max Payload V Max Accuracy Max Stroke	110, 120 or 200 mm 1-4 up to 10700 N up to 50 kg up to 5000 mm/s 0.05 (by 300 mm) 5000 mm				

BALL SCREW ACTUATORS - HIGH PRECISION						
Available Features	Specifications					
 Protected with steel sealing strip for dirty environments Specially designed for many cycles Design for high load and precision Many different profiles Motor mounted coaxial (in line) or parallel (pulley offset) to the axis 	Step/Turn 5-10-16 5-10-20 5-10-25 5-10-32 5-10-32 No. of Guides 2-4 Fx Max up to 16 Payload up to 50 V Max up to 20 Accuracy 0.05 (by Max Stroke 5000 mr	5-10-16 mm 5-10-20 mm 5-10-25 mm 5-10-32 mm 2-4 up to 16700 N up to 50 kg up to 2000 mm/s 0.05 (by 300 mm) 5000 mm				

Power Supplies and Shunts

Order power supplies directly from Moog Animatics. Our products are perfectly suited for all SmartMotor[™] applications, and we also offer shunts to protect your electrical system.

Always install shunts, even if overvoltages are unlikely. Shunts work as a surge protector for the motor and power supply, similar to a circuit breaker. When voltage exceeds the trigger level, the shunts automatically add an additional load to the DC bus by connecting large load resistors across the bus. This discharges the excess energy as heat.

Gearboxes

A wide range of gearboxes is available, from economic models to high-end products. Whether you need angular or planetary, worm or hollow-shaft gearboxes, we can provide the gearbox that meets your requirements.

Cables

SmartMotor[™] systems always reduce the need for cabling, but the CDS7 option provides even greater benefits.

With the CDS7 Add-A-Motor[™] cable, you get a convenient onecable solution for power and communication connections. At the same time, it provides room for an additional option at the back (AEC3 or BRK).

To minimize wiring costs and maximize performance, always contact our motion control experts who will recommend, based on your application, the best choice of flying leads, extensions, splitters, terminators and more.



Shunt (left) and power supply (right) on a DIN rail



CDS7 - Power, RS-232 and CAN Bus in one cable!

Moog has offices around the world. For more information or the office nearest you, do not hesitate to contact us:

info.mm@moog.com +49 (0) 8331 98480-0

For product and service information, visit **www.moog-memmingen.com**

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