

SM17205D		
Continuous Torque	2.08	in-lb
	33	oz-in
	0.24	N-m
Peak Torque	3.82	in-lb
	61	oz-in
	0.43	N-m
Nominal Continuous Power	145	Watt
No Load Speed	7,900	RPM
Max. Continuous Current* @ 6000 RPM	3.81	Amps
Peak Power @ 4200 RPM	185	Watts
Voltage Constant	6.506	V/kRPM
Inductance	1.4	mH
Encoder Resolution	4,000	Counts/Rev
Rotor Inertia	0.00217	oz-in-sec ²
	1.5325	10 ⁻⁵ Kg-m ²
Weight	1.2	lb
	0.55	kg
Shaft Diameter	0.197	in
	5.00	mm
Shaft, Radial Load	7	lb
	3.18	kg
Shaft, Axial Thrust Load	3	lb
	1.36	kg
DeviceNet Available	Yes	
PROFIBUS Available		
CANopen Available	Yes	

*Default voltage is 48V. See graphs for additional voltages.

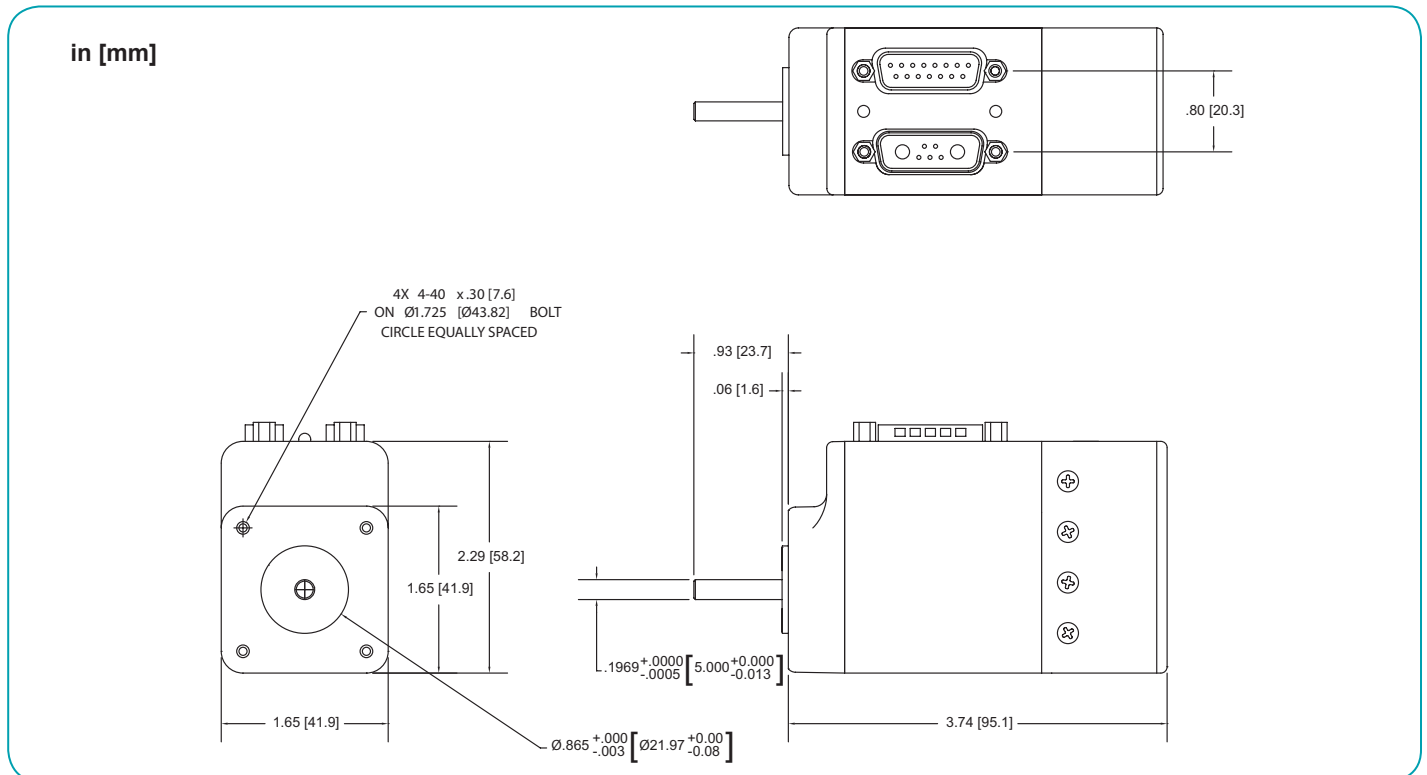


Operating temperature range: 0°C–85°C
Storage temperature range: -10°C–85°C, noncondensing

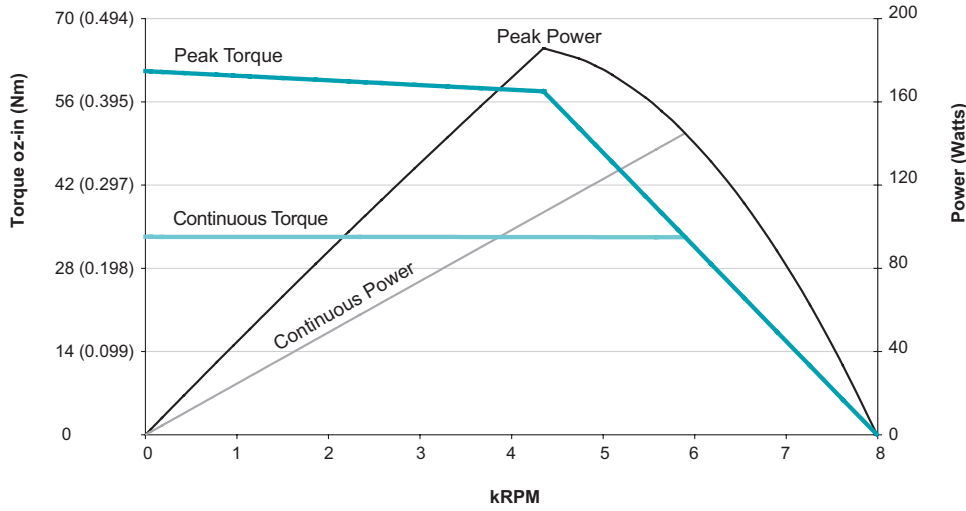
NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.



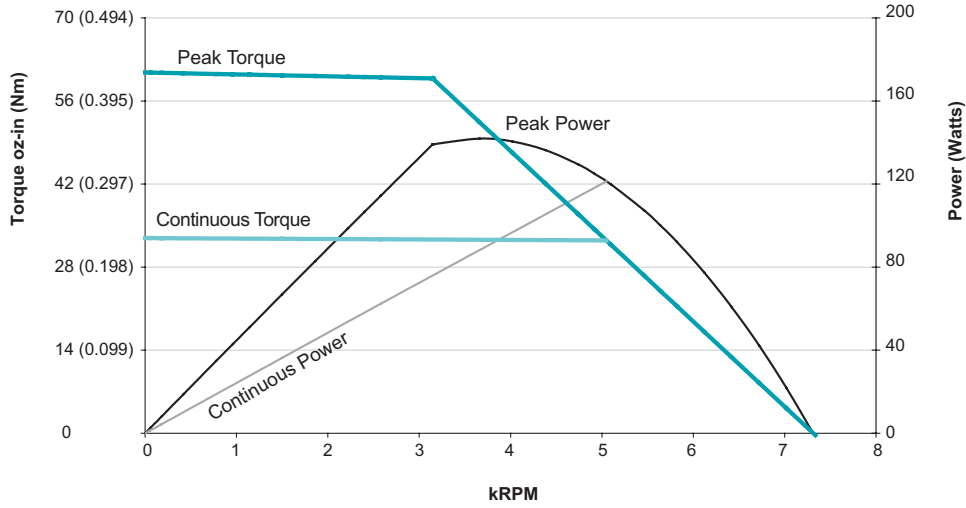
Moog Animatics SmartMotor™ SM17205D (No Options) CAD Drawing



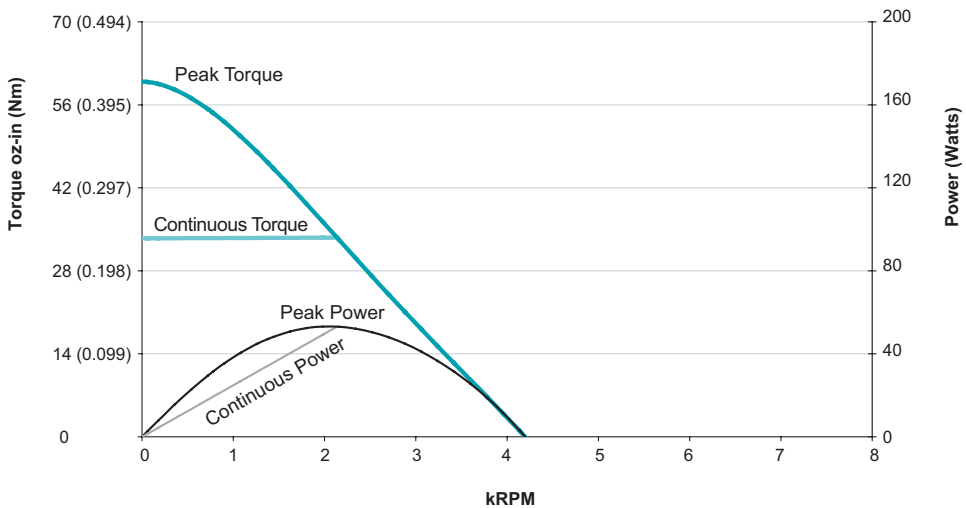
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**SM17205D
at 48 VDC
at rise to 85°C**



**SM17205D
at 42 VDC
at rise to 85°C**



**SM17205D
at 24 VDC
at rise to 85°C**

All torque curves based on 25°C ambient. Motors were operated using MDT (Trapezoidal Drive Mode) Commutation. For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

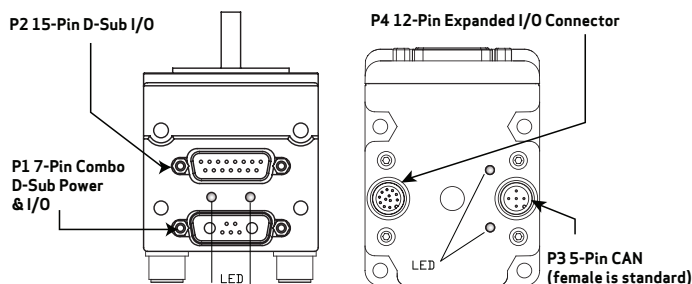
Class 5 D-Style Connector Pinouts

This table shows the pinouts for the connectors on the Class 5 D-style SmartMotors.

PIN	MAIN POWER	Specifications:	Notes:	P1
1	I/O - 6 GP, Index Input or "G" Command; For -CDS7, CAN-L only	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	Redundant connection on I/O connector	<p>7W2 Combo D-Sub Connector</p>
2	+5 VDC Out; For -CDS7, CAN-H only	50 mAmps Max (total)		
3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
5	Common Ground (typ. SIG Ground)			
A1	Main Power	+24-48 VDC	See NOTE	
A2	Common Ground (req'd. POWER Ground)		Must be Main Power Ground	
PIN	I/O CONNECTOR (5V TTL I/O)	Specifications:	Notes:	P2
1	I/O - 0 GP or Encoder A or Step Input	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	1.5 MHz Max as Encoder or Step Input	<p>P2 DB-15 D-Sub Connector</p>
2	I/O - 1 GP or Encoder B or Direction Input		1.5 MHz Max as Encoder or Direction Input	
3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP			
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)	115.2 KBaud Max		
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
9	Phase B Encoder Output			
10	RS-232 Transmit; For -CDS/7, CAN-L only	Com ch. 0	115.2 KBaud Max	
11	RS-232 Receive; For -CDS/7, CAN-H only			
12	+5 VDC Out	50 mAmp Max (total)		
13	Common Ground (typ. SIG Ground)			
14	Common Ground			
15	Main Power: +20-48 VDC	If DE Option, Control Power separate from Main Power		
NOTE: I/O ports input impedance = 5 kohm (5 kohm pull-up resistor)				
PIN	CAN bus	Connection:	Notes:	P3
1	NC	NC		<p>M12 5-Pin Female</p>
2	+V	NC except DeviceNet	Input current < 10 mA	
3	-V (ground, not common)	CAN Ground	Isolated	
4	CAN-H	1 MBaud Max		
5	CAN-L	1 MBaud Max		
PIN	Isolated 24 VDC I/O Connector	Max Load (sourcing)	Notes:	P4
1	I/O - 16 GP	150 mAmps	These I/O ports also support analog input	<p>M12 12-Pin Female End View</p>
2	I/O - 17 GP			
3	I/O - 18 GP			
4	I/O - 19 GP			
5	I/O - 20 GP			
6	I/O - 21 GP			
7	I/O - 22 GP	300 mAmps		
8	I/O - 23 GP			
9	I/O - 24 GP			
10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
12	Ground-I/O (not common)		Isolated	

NOTE: These motors can operate on power down to +20 VDC, but it is not recommended due to greatly reduced performance — optimum performance is achieved at 48 VDC.

NOTE: All specifications are subject to change without notice. Consult the factory for the latest information.

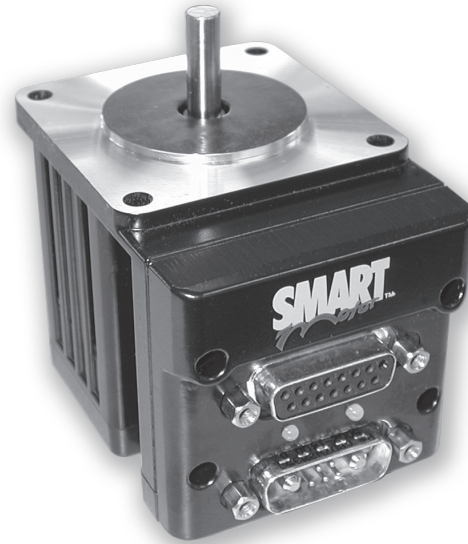


CAUTION: Pins 14 and 15 are intended for use with DE series motors for control power only. Attempting to power a non-DE motor through those pins, as main servo-drive power, may result in immediate damage to the electronics, which will void the warranty.

CAUTION: Connectors P3 and P4 must be finger tightened only! DO NOT use a tool. Doing so can cause overtightening of the connection, which may damage the connector and will void the warranty.

SM23165D		
Continuous Torque	2.50	in-lb
	40	oz-in
	0.28	N-m
Peak Torque	4.00	in-lb
	64	oz-in
	0.45	N-m
Nominal Continuous Power	181	Watt
No Load Speed	10,400	RPM
Max. Continuous Current* @ 6500 RPM	4.70	Amps
Peak Power @ 6100 RPM	183	Watts
Voltage Constant	4.45	V/kRPM
Inductance	0.829	mH
Encoder Resolution	4,000	Counts/Rev
Rotor Inertia	0.00099	oz-in-sec ²
	0.6991	10 ⁻⁵ Kg-m ²
Weight	1.0	lb
	0.45	kg
Shaft Diameter	0.250	in
	6.35	mm
Shaft, Radial Load	7	lb
	3.18	kg
Shaft, Axial Thrust Load	3	lb
	1.36	kg
DeviceNet Available	Yes	
PROFIBUS Available	Yes	
CANopen Available	Yes	

*Default voltage is 48V. See graphs for additional voltages.



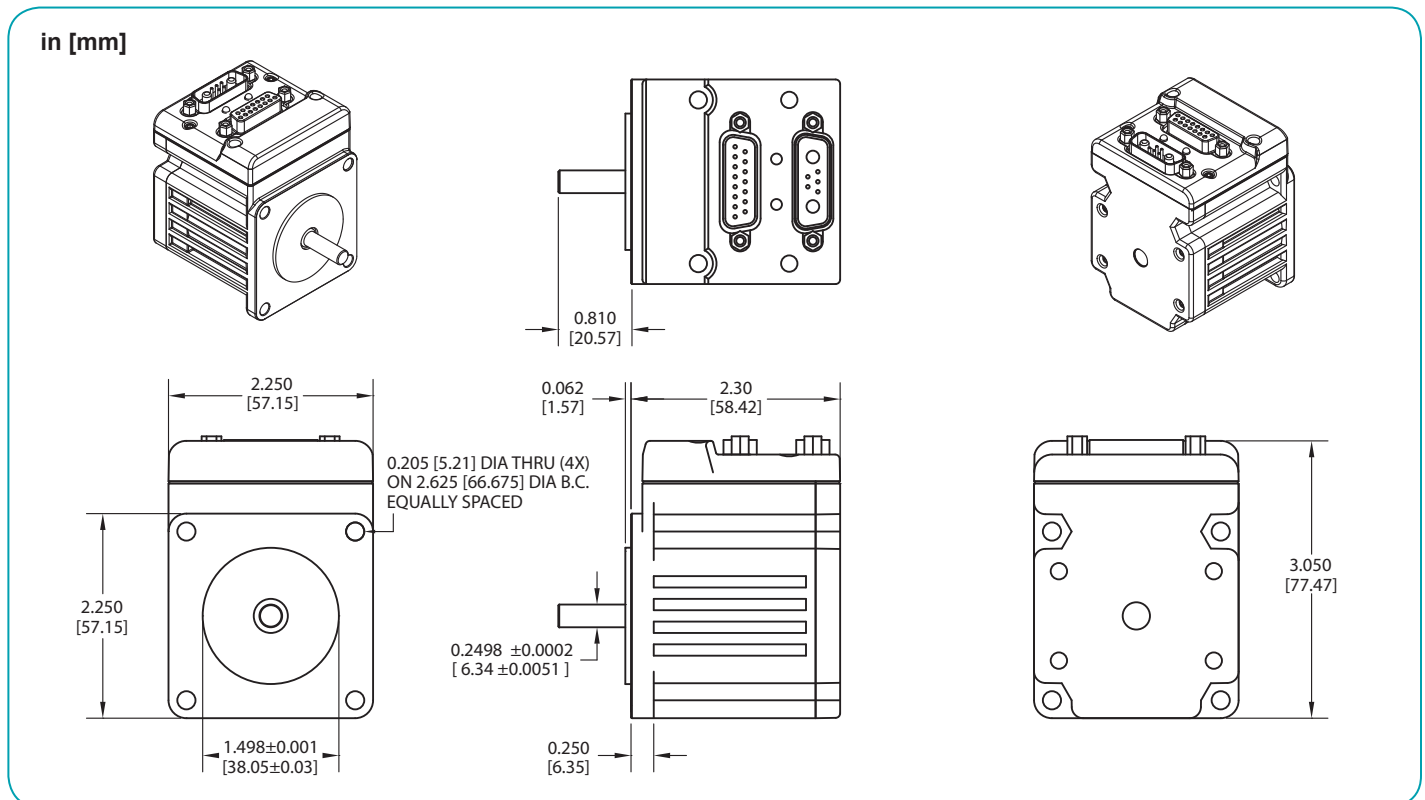
Operating temperature range: 0°C–85°C

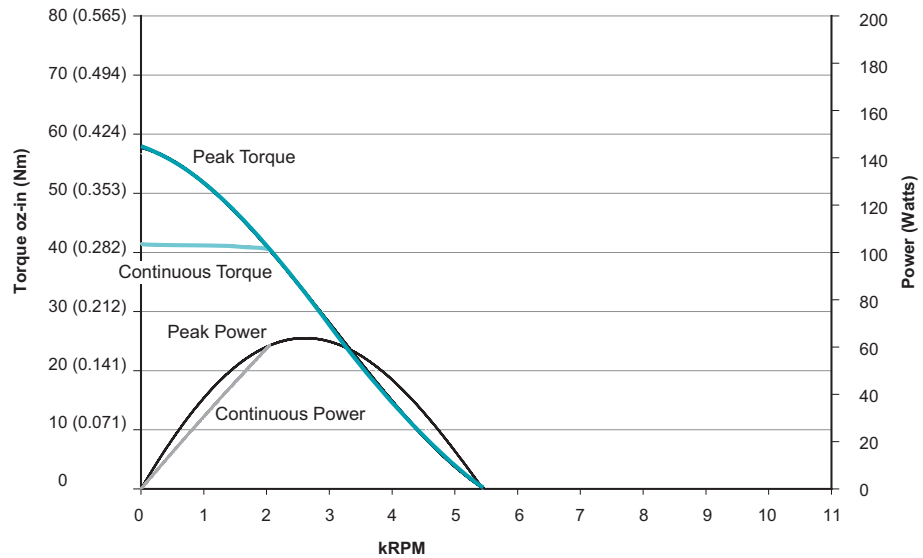
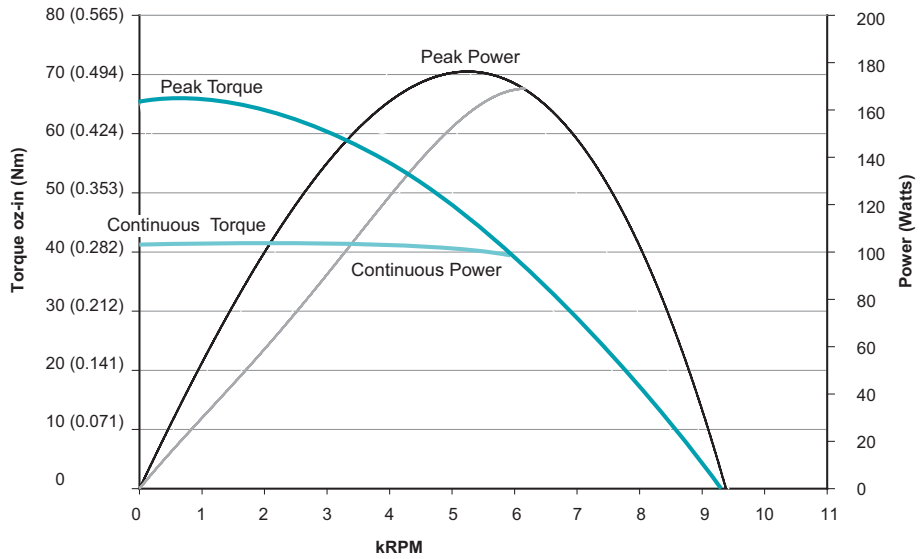
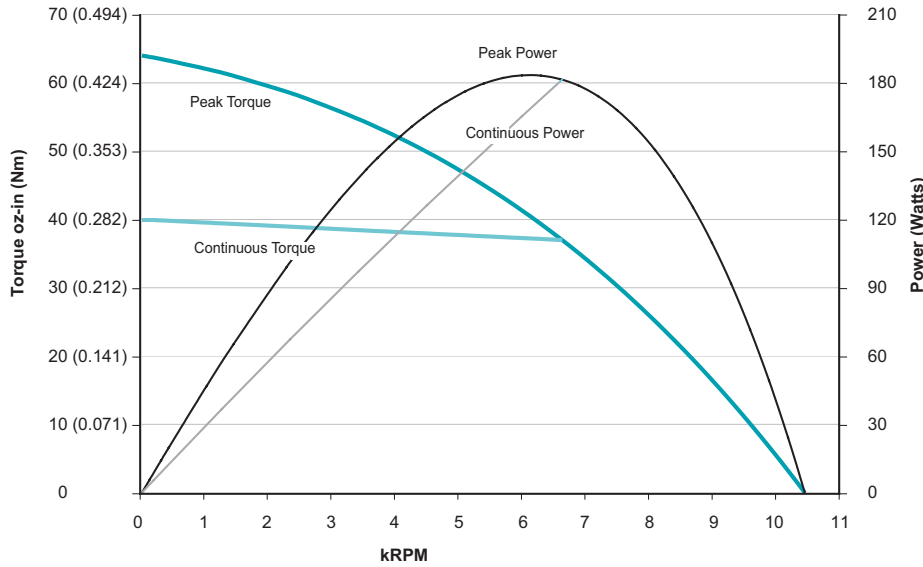
Storage temperature range: -10°C–85°C, noncondensing

NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.



Moog Animatics SmartMotor™ SM23165D (No Options) CAD Drawing





All torque curves based on 25°C ambient. Motors were operated using MDT (Trapezoidal Drive Mode) Commutation. For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

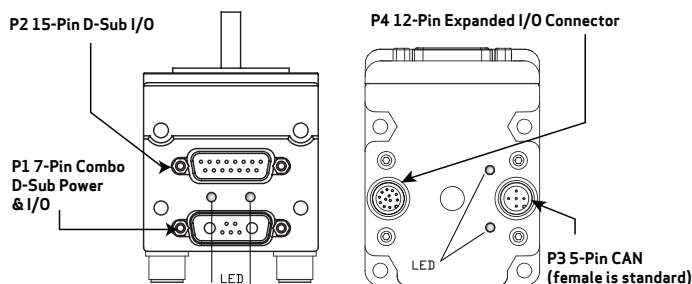
Class 5 D-Style Connector Pinouts

This table shows the pinouts for the connectors on the Class 5 D-style SmartMotors.

PIN	MAIN POWER	Specifications:	Notes:	P1
1	I/O - 6 GP, Index Input or "G" Command; For -CDS7, CAN-L only	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	Redundant connection on I/O connector	<p>7W2 Combo D-Sub Connector</p>
2	+5 VDC Out; For -CDS7, CAN-H only	50 mAmps Max (total)		
3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
5	Common Ground (typ. SIG Ground)			
A1	Main Power	+24-48 VDC	See NOTE	
A2	Common Ground (req'd. POWER Ground)		Must be Main Power Ground	
PIN	I/O CONNECTOR (5V TTL I/O)	Specifications:	Notes:	P2
1	I/O - 0 GP or Encoder A or Step Input		1.5 MHz Max as Encoder or Step Input	<p>P2 DB-15 D-Sub Connector</p>
2	I/O - 1 GP or Encoder B or Direction Input		1.5 MHz Max as Encoder or Direction Input	
3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D		
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)		115.2 KBaud Max	
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
9	Phase B Encoder Output			
10	RS-232 Transmit; For -CDS/7, CAN-L only	Com ch. 0	115.2 KBaud Max	
11	RS-232 Receive; For -CDS/7, CAN-H only			
12	+5 VDC Out	50 mAmp Max (total)		
13	Common Ground (typ. SIG Ground)			
14	Common Ground			
15	Main Power: +20-48 VDC	If DE Option, Control Power separate from Main Power		
NOTE: I/O ports input impedance = 5 kohm (5 kohm pull-up resistor)				
PIN	CAN bus	Connection:	Notes:	P3
1	NC	NC		<p>M12 5-Pin Female</p>
2	+V	NC except DeviceNet	Input current < 10 mA	
3	-V (ground, not common)	CAN Ground	Isolated	
4	CAN-H	1 MBaud Max		
5	CAN-L	1 MBaud Max		
PIN	Isolated 24 VDC I/O Connector	Max Load (sourcing)	Notes:	P4
1	I/O - 16 GP		These I/O ports also support analog input	<p>M12 12-Pin Female End View</p>
2	I/O - 17 GP	150 mAmps		
3	I/O - 18 GP			
4	I/O - 19 GP			
5	I/O - 20 GP			
6	I/O - 21 GP			
7	I/O - 22 GP	300 mAmps		
8	I/O - 23 GP			
9	I/O - 24 GP			
10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
12	Ground-I/O (not common)		Isolated	

NOTE: These motors can operate on power down to +20 VDC, but it is not recommended due to greatly reduced performance — optimum performance is achieved at 48 VDC.

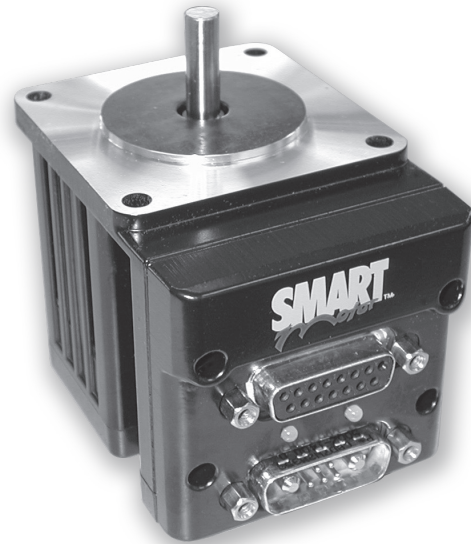
NOTE: All specifications are subject to change without notice. Consult the factory for the latest information.



CAUTION: Pins 14 and 15 are intended for use with DE series motors for control power only. Attempting to power a non-DE motor through those pins, as main servo-drive power, may result in immediate damage to the electronics, which will void the warranty.

CAUTION: Connectors P3 and P4 must be finger tightened only! DO NOT use a tool. Doing so can cause overtightening of the connection, which may damage the connector and will void the warranty.

SM23165DT		
Continuous Torque	4.61	in-lb
	74	oz-in
	0.52	N-m
Peak Torque	7.40	in-lb
	118	oz-in
	0.84	N-m
Nominal Continuous Power	204	Watt
No Load Speed	5,200	RPM
Max. Continuous Current* @ 3800 RPM	5.074	Amps
Peak Power @ 3400 RPM	210	Watts
Voltage Constant	9.08	V/kRPM
Inductance	1.31	mH
Encoder Resolution	4,000	Counts/Rev
Rotor Inertia	0.001	oz-in-sec ²
	0.706	10 ⁻⁵ Kg-m ²
Weight	1.3	lb
	0.59	kg
Shaft Diameter	0.250	in
	6.35	mm
Shaft, Radial Load	7	lb
	3.18	kg
Shaft, Axial Thrust Load	3	lb
	1.36	kg
DeviceNet Available	Yes	
PROFIBUS Available	Yes	
CANopen Available	Yes	



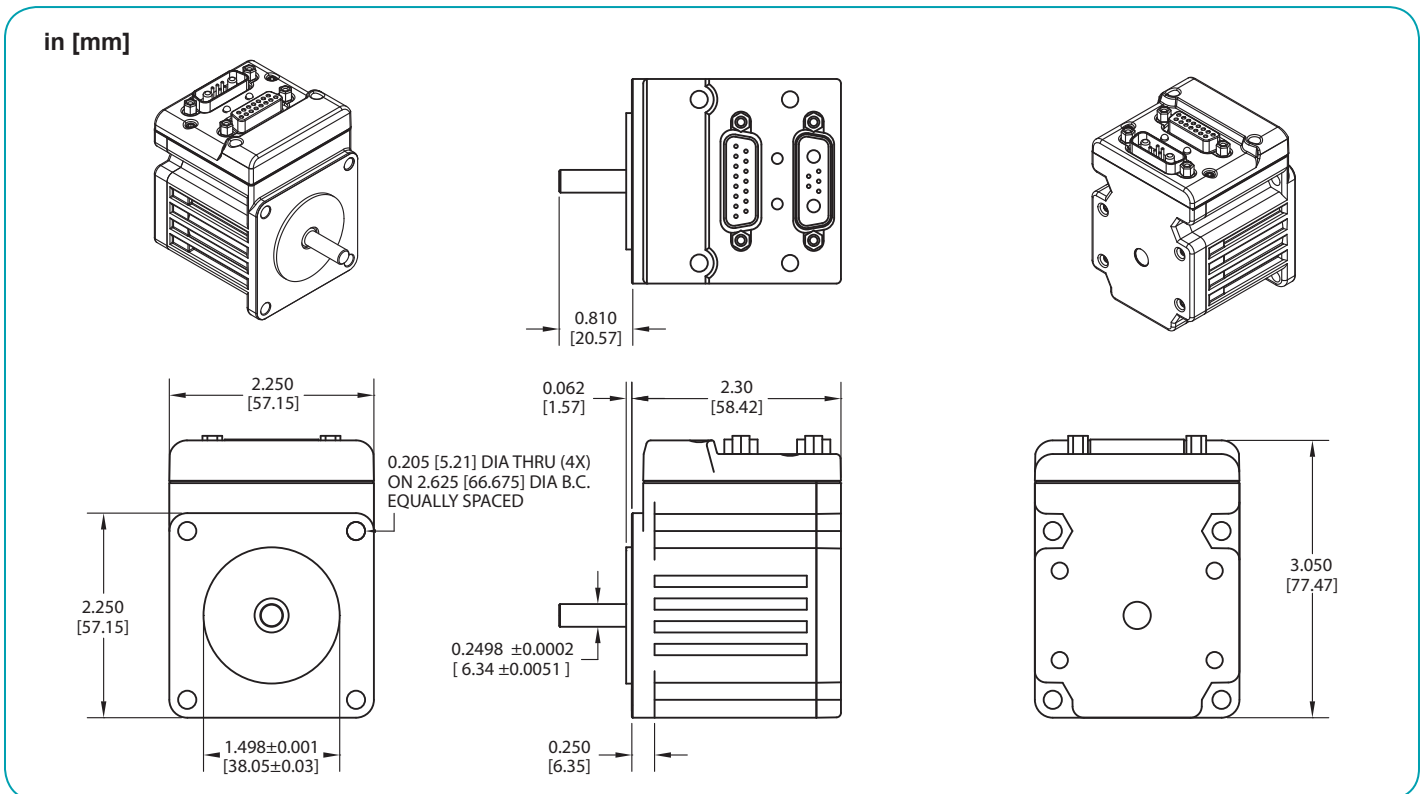
Operating temperature range: 0°C–85°C
Storage temperature range: -10°C–85°C, noncondensing

NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.

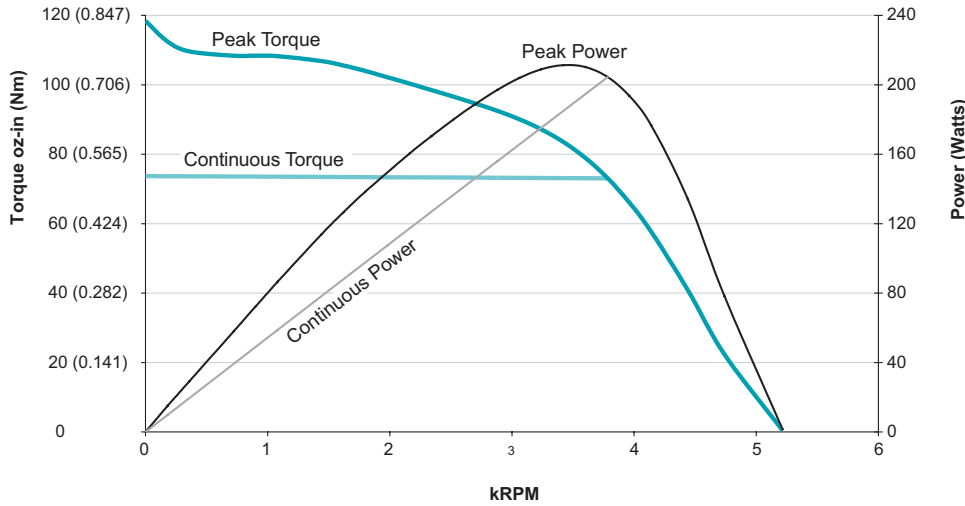


*Default voltage is 48V. See graphs for additional voltages.

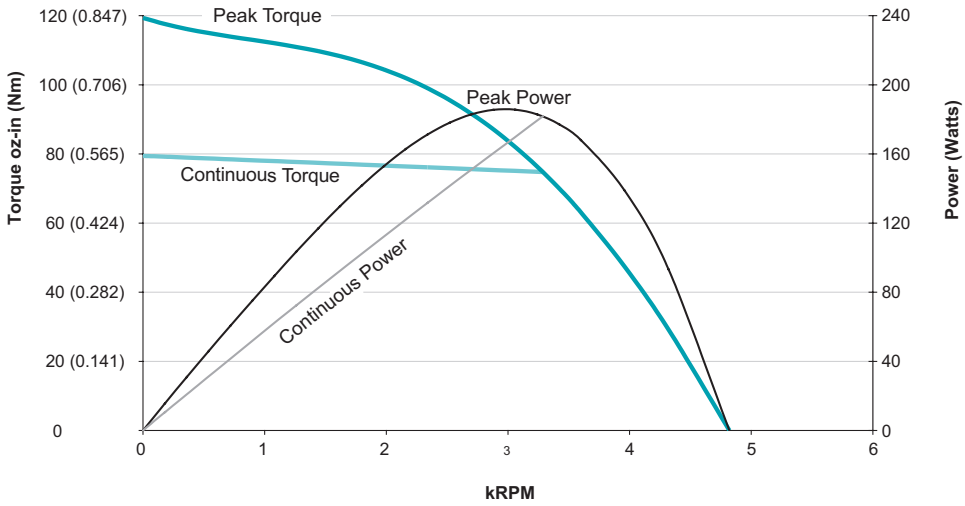
Moog Animatics SmartMotor™ SM23165DT (No Options) CAD Drawing



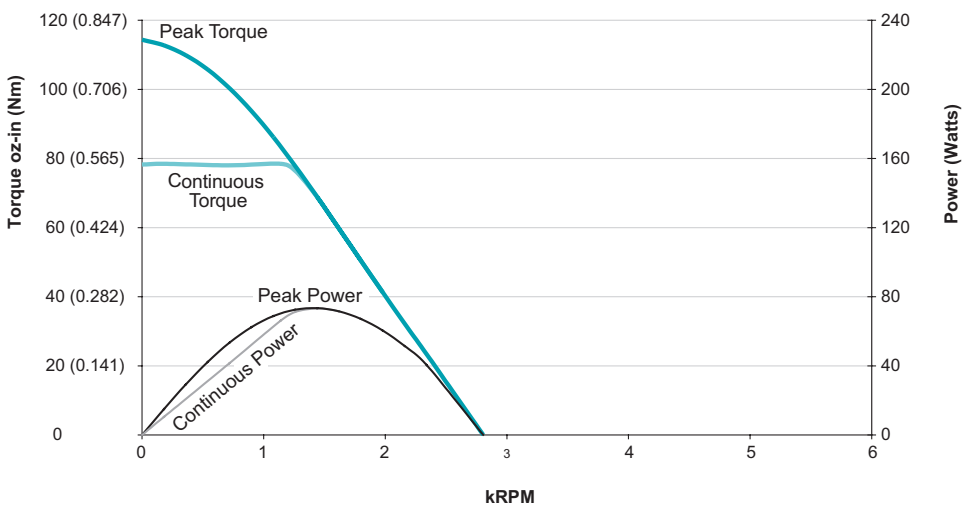
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SM23165DT
at 48 VDC
at rise to 85°C



SM23165DT
at 42 VDC
at rise to 85°C


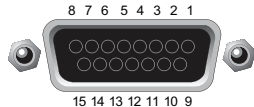
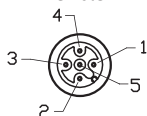
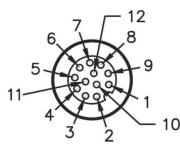


SM23165DT
at 24 VDC
at rise to 85°C

All torque curves based on 25°C ambient.
Motors were operated using MDT (Trapezoidal Drive Mode) Commutation.
For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

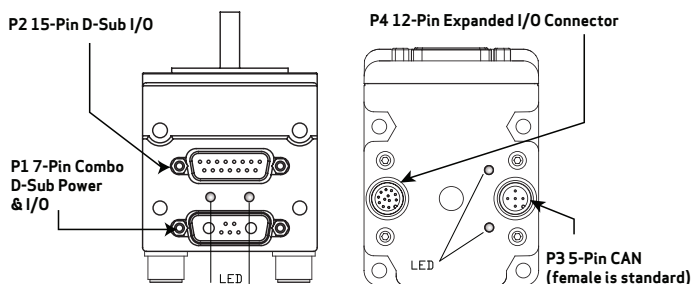
Class 5 D-Style Connector Pinouts

This table shows the pinouts for the connectors on the Class 5 D-style SmartMotors.

PIN	MAIN POWER	Specifications:	Notes:	P1
1	I/O - 6 GP, Index Input or "G" Command; For -CDS7, CAN-L only	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	Redundant connection on I/O connector	 <p>7W2 Combo D-Sub Connector</p>
2	+5 VDC Out; For -CDS7, CAN-H only	50 mAmps Max (total)		
3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
5	Common Ground (typ. SIG Ground)			
A1	Main Power	+24-48 VDC	See NOTE	
A2	Common Ground (req'd. POWER Ground)		Must be Main Power Ground	
PIN	I/O CONNECTOR (5V TTL I/O)	Specifications:	Notes:	P2
1	I/O - 0 GP or Encoder A or Step Input		1.5 MHz Max as Encoder or Step Input	 <p>P2 DB-15 D-Sub Connector</p>
2	I/O - 1 GP or Encoder B or Direction Input		1.5 MHz Max as Encoder or Direction Input	
3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D		
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)		115.2 KBaud Max	
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
9	Phase B Encoder Output			
10	RS-232 Transmit; For -CDS/7, CAN-L only	Com ch. 0	115.2 KBaud Max	
11	RS-232 Receive; For -CDS/7, CAN-H only			
12	+5 VDC Out	50 mAmp Max (total)		
13	Common Ground (typ. SIG Ground)			
14	Common Ground			
15	Main Power: +20-48 VDC	If DE Option, Control Power separate from Main Power		
NOTE: I/O ports input impedance = 5 kohm (5 kohm pull-up resistor)				
PIN	CAN bus	Connection:	Notes:	P3
1	NC	NC		 <p>M12 5-Pin Female</p>
2	+V	NC except DeviceNet	Input current < 10 mA	
3	-V (ground, not common)	CAN Ground	Isolated	
4	CAN-H	1 MBaud Max		
5	CAN-L	1 MBaud Max		
PIN	Isolated 24 VDC I/O Connector	Max Load (sourcing)	Notes:	P4
1	I/O - 16 GP		These I/O ports also support analog input	 <p>M12 12-Pin Female End View</p>
2	I/O - 17 GP	150 mAmps		
3	I/O - 18 GP			
4	I/O - 19 GP			
5	I/O - 20 GP			
6	I/O - 21 GP			
7	I/O - 22 GP	300 mAmps		
8	I/O - 23 GP			
9	I/O - 24 GP			
10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
12	Ground-I/O (not common)		Isolated	

NOTE: These motors can operate on power down to +20 VDC, but it is not recommended due to greatly reduced performance — optimum performance is achieved at 48 VDC.

NOTE: All specifications are subject to change without notice. Consult the factory for the latest information.



CAUTION: Pins 14 and 15 are intended for use with DE series motors for control power only. Attempting to power a non-DE motor through those pins, as main servo-drive power, may result in immediate damage to the electronics, which will void the warranty.

CAUTION: Connectors P3 and P4 must be finger tightened only! DO NOT use a tool. Doing so can cause overtightening of the connection, which may damage the connector and will void the warranty.

SM23305D		
Continuous Torque	3.98	in-lb
	64	oz-in
	0.45	N-m
Peak Torque	6.86	in-lb
	110	oz-in
	0.77	N-m
Nominal Continuous Power	220	Watt
No Load Speed	5,600	RPM
Max. Continuous Current* @ 4750 RPM	5.57	Amps
Peak Power @ 4100 RPM	325	Watts
Voltage Constant	8.873	V/kRPM
Inductance	0.61	mH
Encoder Resolution	4,000	Counts/Rev
Rotor Inertia	0.00332	oz-in-sec ²
	2.344	10 ⁻⁵ Kg-m ²
Weight	2.3	lb
	1.03	kg
Shaft Diameter	0.250	in
	6.35	mm
Shaft, Radial Load	7	lb
	3.18	kg
Shaft, Axial Thrust Load	3	lb
	1.36	kg
DeviceNet Available	Yes	
PROFIBUS Available		
CANopen Available	Yes	

*Default voltage is 48V. See graphs for additional voltages.

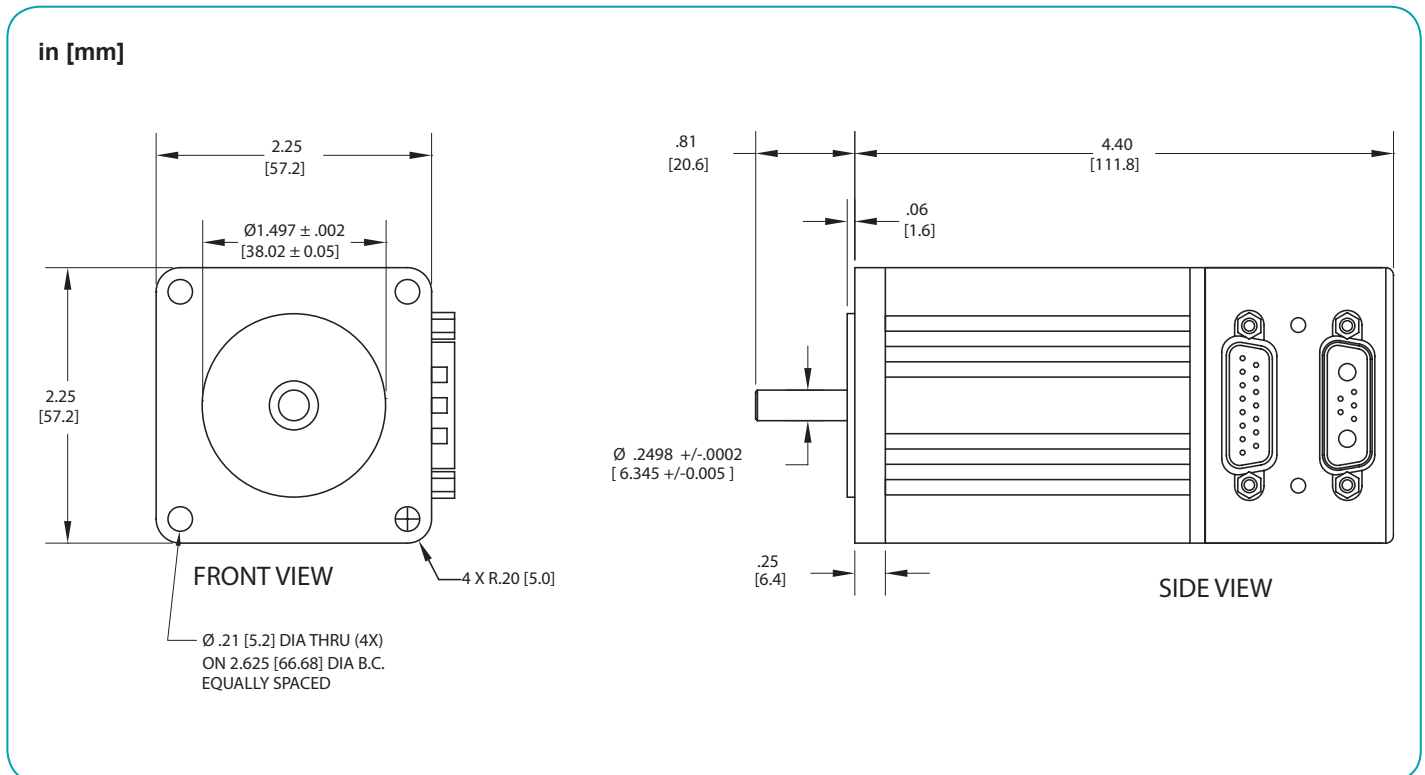


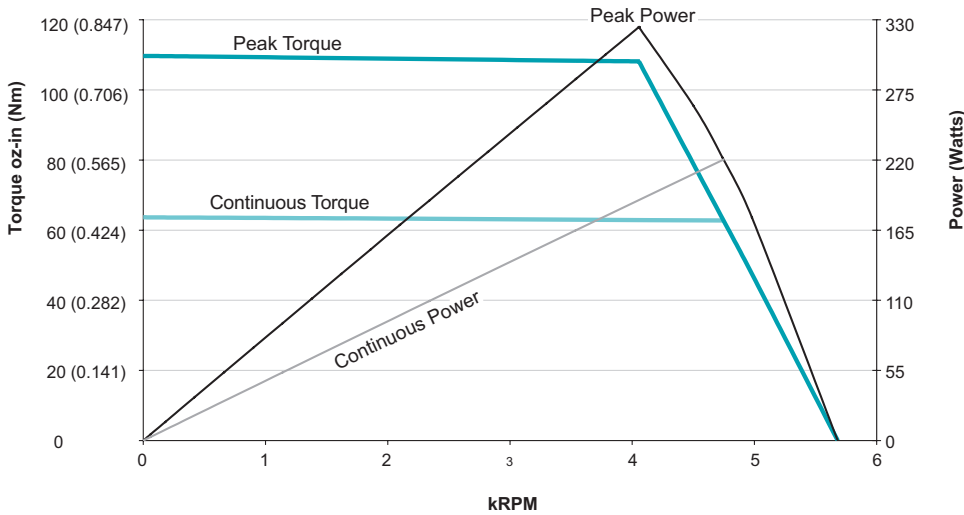
Operating temperature range: 0°C–85°C
Storage temperature range: -10°C–85°C, noncondensing

NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.

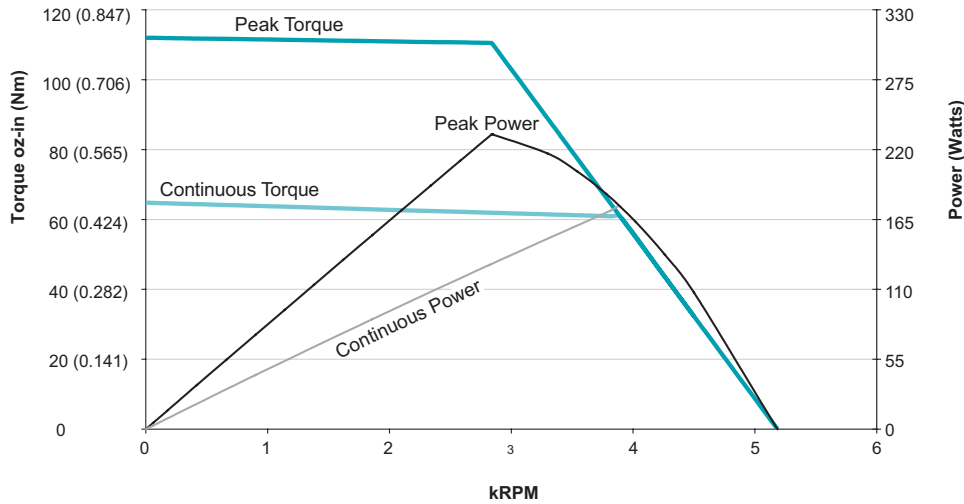


Moog Animatics SmartMotor SM23305D (No Options) CAD Drawing

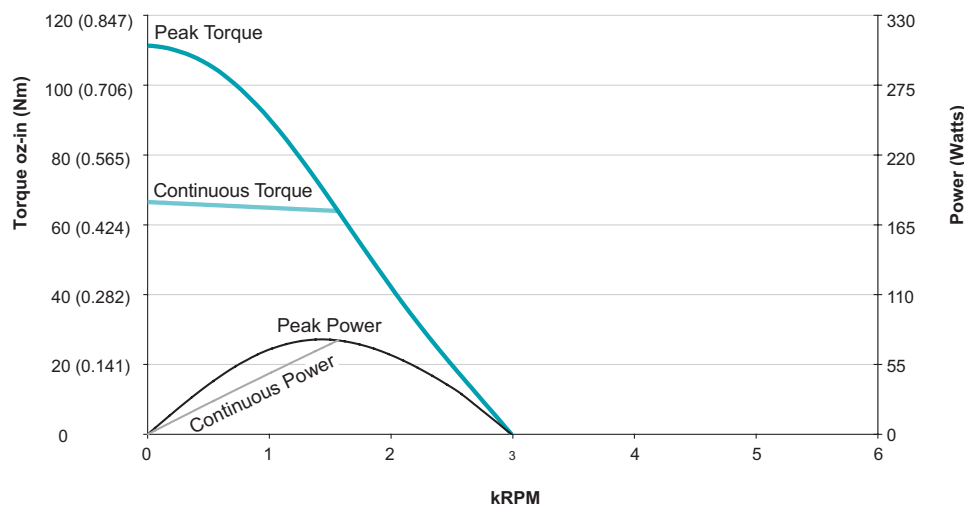




**SM23305D
at 48 VDC
at rise to 85°C**



**SM23305D
at 42 VDC
at rise to 85°C**



**SM23305D
at 24 VDC
at rise to 85°C**

All torque curves based on 25°C ambient. Motors were operated using MDT (Trapezoidal Drive Mode) Commutation. For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

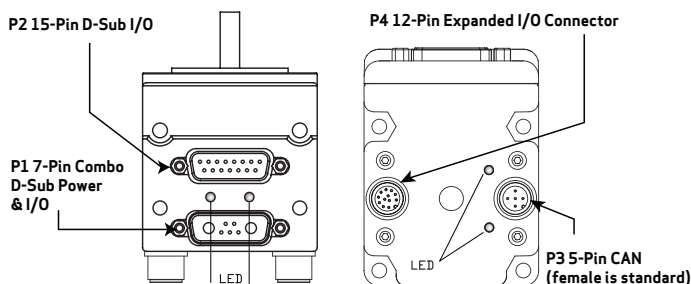
Class 5 D-Style Connector Pinouts

This table shows the pinouts for the connectors on the Class 5 D-style SmartMotors.

PIN	MAIN POWER	Specifications:	Notes:	P1
1	I/O - 6 GP, Index Input or "G" Command; For -CDS7, CAN-L only	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	Redundant connection on I/O connector	<p>7W2 Combo D-Sub Connector</p>
2	+5 VDC Out; For -CDS7, CAN-H only	50 mAmps Max (total)		
3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
5	Common Ground (typ. SIG Ground)			
A1	Main Power	+24-48 VDC	See NOTE	
A2	Common Ground (req'd. POWER Ground)		Must be Main Power Ground	
PIN	I/O CONNECTOR (5V TTL I/O)	Specifications:	Notes:	P2
1	I/O - 0 GP or Encoder A or Step Input	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	1.5 MHz Max as Encoder or Step Input	<p>P2 DB-15 D-Sub Connector</p>
2	I/O - 1 GP or Encoder B or Direction Input		1.5 MHz Max as Encoder or Direction Input	
3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP			
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)	115.2 KBaud Max		
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
9	Phase B Encoder Output			
10	RS-232 Transmit; For -CDS/7, CAN-L only	Com ch. 0	115.2 KBaud Max	
11	RS-232 Receive; For -CDS/7, CAN-H only			
12	+5 VDC Out	50 mAmp Max (total)		
13	Common Ground (typ. SIG Ground)			
14	Common Ground			
15	Main Power: +20-48 VDC	If DE Option, Control Power separate from Main Power		
NOTE: I/O ports input impedance = 5 kohm (5 kohm pull-up resistor)				
PIN	CAN bus	Connection:	Notes:	P3
1	NC	NC		<p>M12 5-Pin Female</p>
2	+V	NC except DeviceNet	Input current < 10 mA	
3	-V (ground, not common)	CAN Ground	Isolated	
4	CAN-H	1 MBaud Max		
5	CAN-L	1 MBaud Max		
PIN	Isolated 24 VDC I/O Connector	Max Load (sourcing)	Notes:	P4
1	I/O - 16 GP	150 mAmps	These I/O ports also support analog input	<p>M12 12-Pin Female End View</p>
2	I/O - 17 GP			
3	I/O - 18 GP			
4	I/O - 19 GP			
5	I/O - 20 GP			
6	I/O - 21 GP			
7	I/O - 22 GP	300 mAmps		
8	I/O - 23 GP			
9	I/O - 24 GP			
10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
12	Ground-I/O (not common)		Isolated	

NOTE: These motors can operate on power down to +20 VDC, but it is not recommended due to greatly reduced performance — optimum performance is achieved at 48 VDC.

NOTE: All specifications are subject to change without notice. Consult the factory for the latest information.



CAUTION: Pins 14 and 15 are intended for use with DE series motors for control power only. Attempting to power a non-DE motor through those pins, as main servo-drive power, may result in immediate damage to the electronics, which will void the warranty.

CAUTION: Connectors P3 and P4 must be finger tightened only! DO NOT use a tool. Doing so can cause overtightening of the connection, which may damage the connector and will void the warranty.

SM23375D	
Continuous Torque	2.86 in-lb
	46 oz-in
	0.32 N-m
Peak Torque	5.00 in-lb
	80 oz-in
	0.57 N-m
Nominal Continuous Power	191 Watt
No Load Speed	8,000 RPM
Max. Continuous Current* @ 6000 RPM	5.072 Amps
Peak Power @ 4750 RPM	220 Watts
Voltage Constant	5.62 V/kRPM
Inductance	0.770 mH
Encoder Resolution	4,000 Counts/Rev
Rotor Inertia	0.0019 oz-in-sec ²
	1.342 10 ⁻⁵ Kg-m ²
Weight	2.1 lb
	0.95 kg
Shaft Diameter	0.250 in
	6.35 mm
Shaft, Radial Load	7 lb
	3.18 kg
Shaft, Axial Thrust Load	3 lb
	1.36 kg
DeviceNet Available	Yes
PROFIBUS Available	
CANopen Available	Yes

*Default voltage is 48V. See graphs for additional voltages.



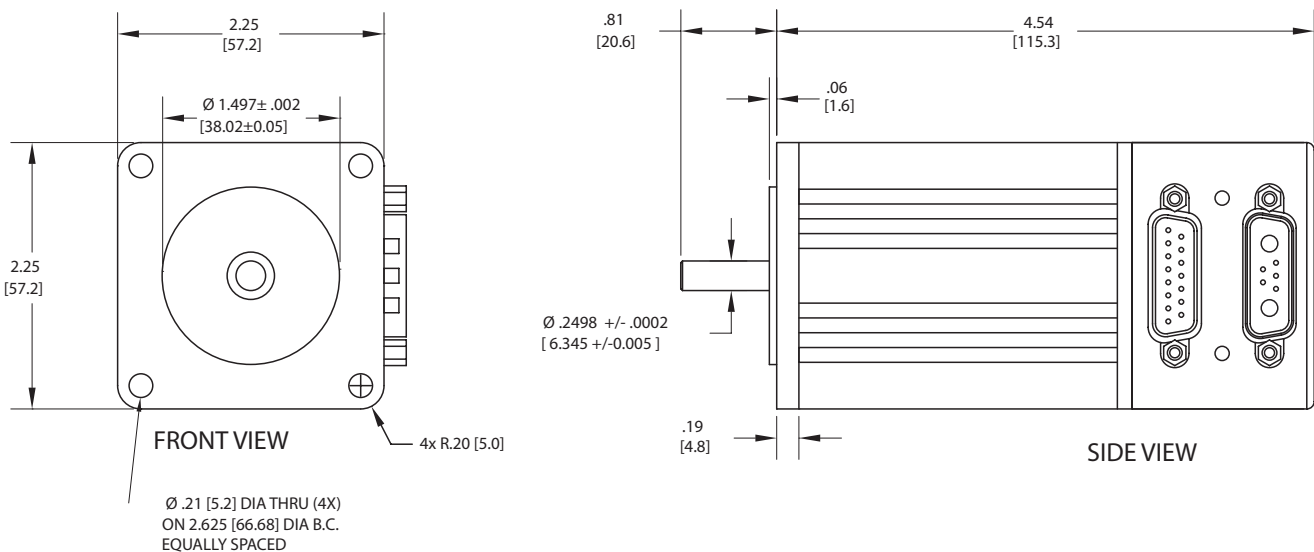
Operating temperature range: 0°C–85°C
Storage temperature range: -10°C–85°C, noncondensing

NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.

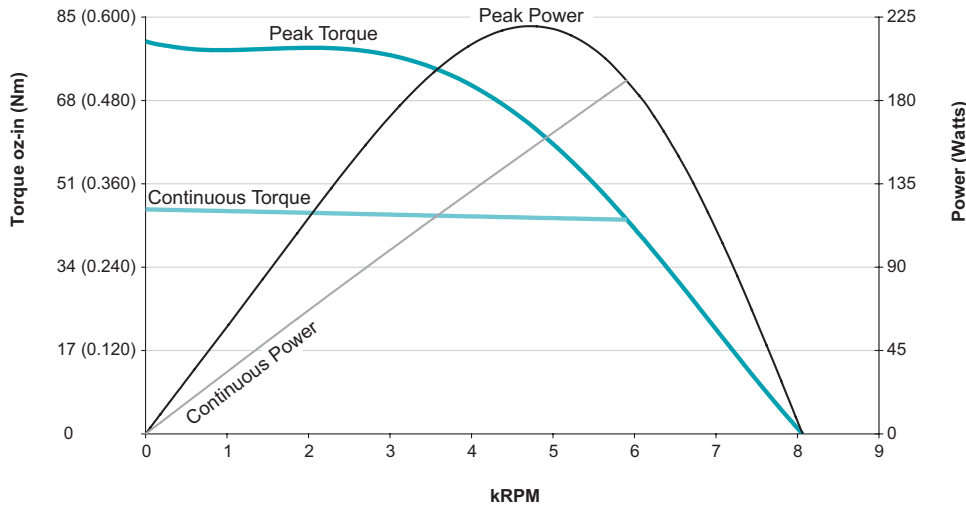


Moog Animatics SmartMotor SM23375D (No Options) CAD Drawing

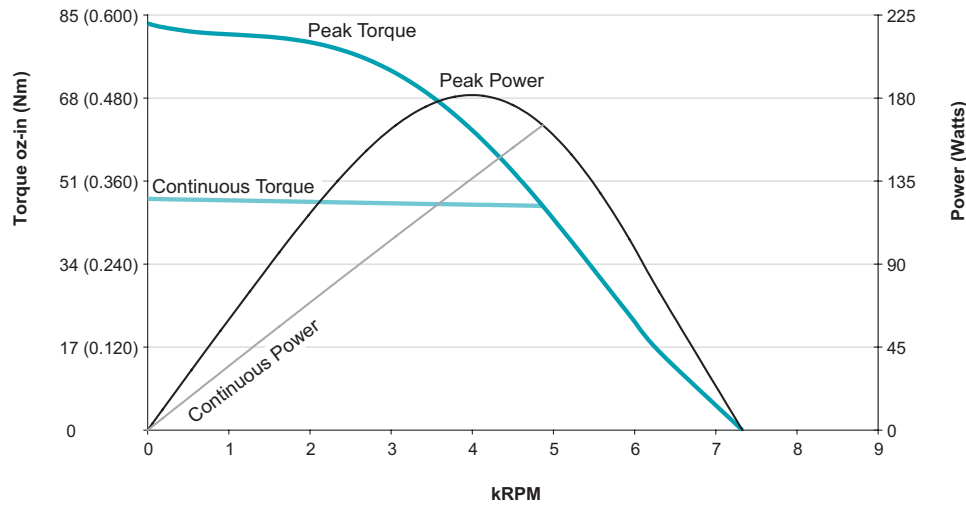
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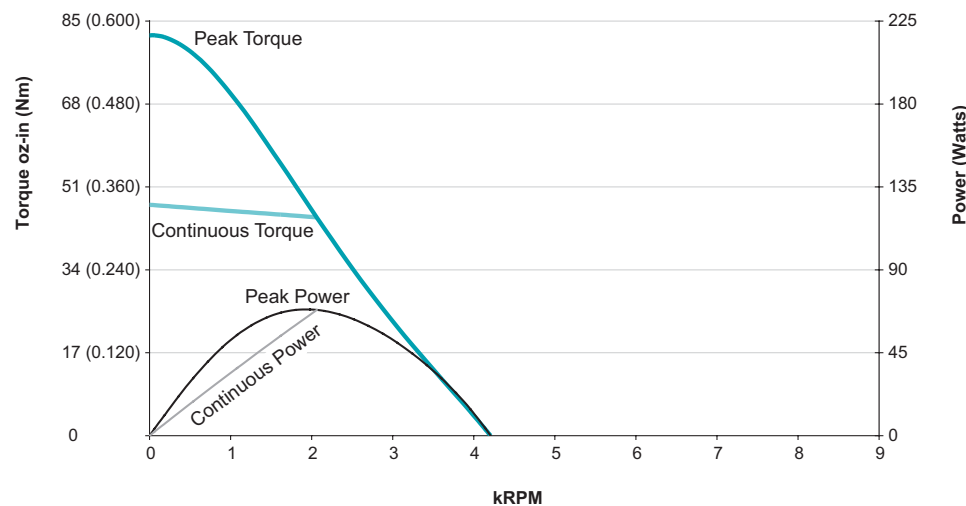
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**SM23375D
at 48 VDC
at rise to 85°C**



**SM23375D
at 42 VDC
at rise to 85°C**



**SM23375D
at 24 VDC
at rise to 85°C**

All torque curves based on 25°C ambient.
Motors were operated using MDT (Trapezoidal Drive Mode) Commutation.
For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

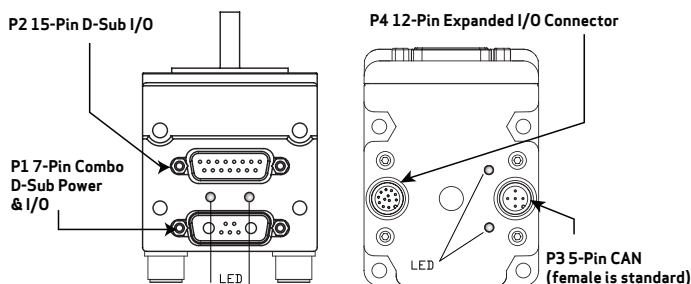
Class 5 D-Style Connector Pinouts

This table shows the pinouts for the connectors on the Class 5 D-style SmartMotors.

PIN	MAIN POWER	Specifications:	Notes:	P1
1	I/O - 6 GP, Index Input or "G" Command; For -CDS7, CAN-L only	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	Redundant connection on I/O connector	<p>7W2 Combo D-Sub Connector</p>
2	+5 VDC Out; For -CDS7, CAN-H only	50 mAmps Max (total)		
3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
5	Common Ground (typ. SIG Ground)			
A1	Main Power	+24-48 VDC	See NOTE	
A2	Common Ground (req'd. POWER Ground)		Must be Main Power Ground	
PIN	I/O CONNECTOR (5V TTL I/O)	Specifications:	Notes:	P2
1	I/O - 0 GP or Encoder A or Step Input	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	1.5 MHz Max as Encoder or Step Input	<p>P2 DB-15 D-Sub Connector</p>
2	I/O - 1 GP or Encoder B or Direction Input		1.5 MHz Max as Encoder or Direction Input	
3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP			
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)	115.2 KBaud Max		
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
9	Phase B Encoder Output			
10	RS-232 Transmit; For -CDS/7, CAN-L only	Com ch. 0	115.2 KBaud Max	
11	RS-232 Receive; For -CDS/7, CAN-H only			
12	+5 VDC Out	50 mAmp Max (total)		
13	Common Ground (typ. SIG Ground)			
14	Common Ground			
15	Main Power: +20-48 VDC	If DE Option, Control Power separate from Main Power		
NOTE: I/O ports input impedance = 5 kohm (5 kohm pull-up resistor)				
PIN	CAN bus	Connection:	Notes:	P3
1	NC	NC		<p>M12 5-Pin Female</p>
2	+V	NC except DeviceNet	Input current < 10 mA	
3	-V (ground, not common)	CAN Ground	Isolated	
4	CAN-H	1 MBaud Max		
5	CAN-L	1 MBaud Max		
PIN	Isolated 24 VDC I/O Connector	Max Load (sourcing)	Notes:	P4
1	I/O - 16 GP	150 mAmps	These I/O ports also support analog input	<p>M12 12-Pin Female End View</p>
2	I/O - 17 GP			
3	I/O - 18 GP			
4	I/O - 19 GP			
5	I/O - 20 GP			
6	I/O - 21 GP			
7	I/O - 22 GP	300 mAmps		
8	I/O - 23 GP			
9	I/O - 24 GP			
10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
12	Ground-I/O (not common)		Isolated	

NOTE: These motors can operate on power down to +20 VDC, but it is not recommended due to greatly reduced performance — optimum performance is achieved at 48 VDC.

NOTE: All specifications are subject to change without notice. Consult the factory for the latest information.



CAUTION: Pins 14 and 15 are intended for use with DE series motors for control power only. Attempting to power a non-DE motor through those pins, as main servo-drive power, may result in immediate damage to the electronics, which will void the warranty.

CAUTION: Connectors P3 and P4 must be finger tightened only! DO NOT use a tool. Doing so can cause overtightening of the connection, which may damage the connector and will void the warranty.

SM23375DT	
Continuous Torque	5.18 in-lb
	83 oz-in
	0.59 N-m
Peak Torque	9.80 in-lb
	157 oz-in
	1.11 N-m
Nominal Continuous Power	186 Watt
No Load Speed	4,000 RPM
Max. Continuous Current* @ 3250 RPM	4.52 Amps
Peak Power @ 2450 RPM	235 Watts
Voltage Constant	10.95 V/kRPM
Inductance	0.906 mH
Encoder Resolution	4,000 Counts/Rev
Rotor Inertia	0.0019 oz-in-sec ²
	1.342 10 ⁻⁵ Kg-m ²
Weight	2.2 lb
	0.98 kg
Shaft Diameter	0.250 in
	6.35 mm
Shaft, Radial Load	7 lb
	3.18 kg
Shaft, Axial Thrust Load	3 lb
	1.36 kg
DeviceNet Available	Yes
PROFIBUS Available	
CANopen Available	Yes

*Default voltage is 48V. See graphs for additional voltages.



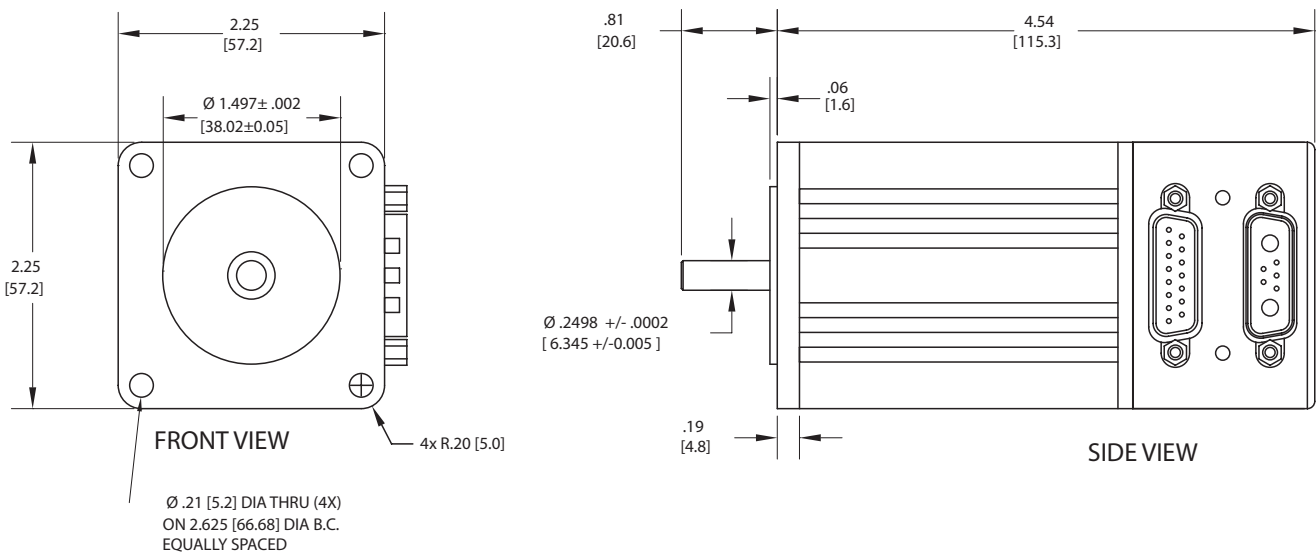
Operating temperature range: 0°C–85°C
Storage temperature range: -10°C–85°C, noncondensing

NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.

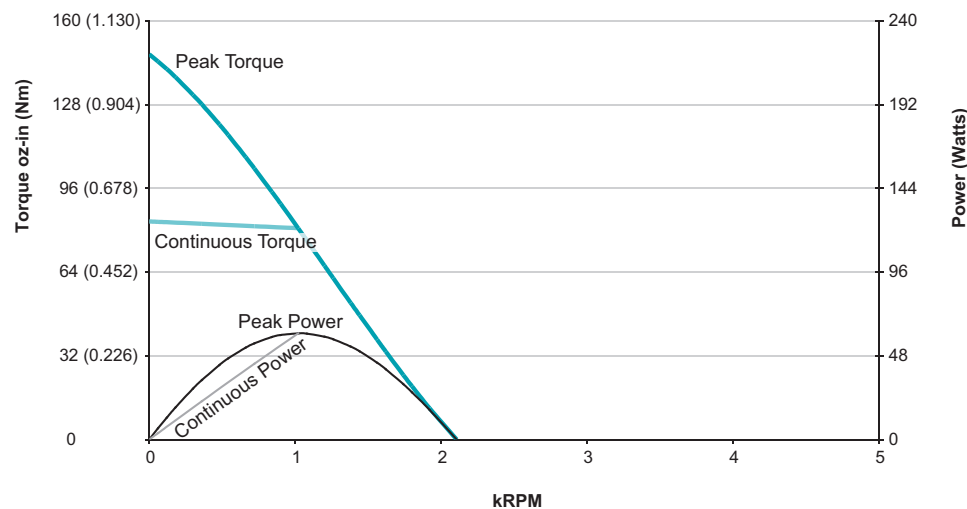
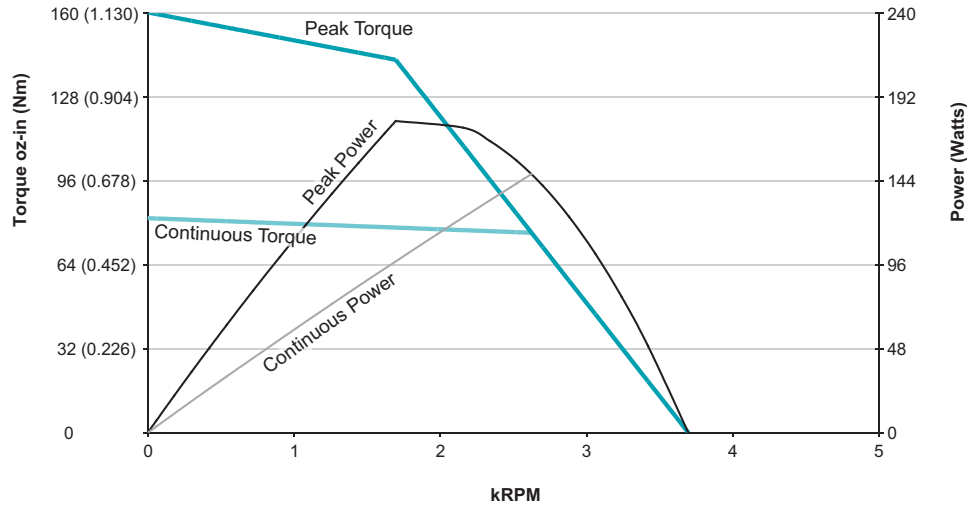
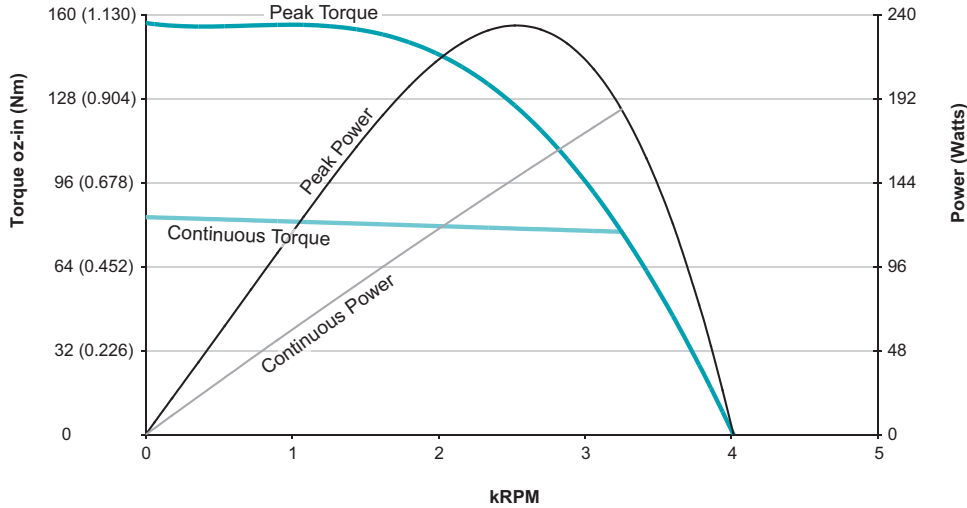


Moog Animatics SmartMotor SM23375DT (No Options) CAD Drawing

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APPENDIX GEAR HEADS POWER SUPPLIES & SHUNTS LINEAR SYSTEMS M-STYLE CONNECTIVITY M-STYLE MOTORS PERIPHERALS D-STYLE CONNECTIVITY D-STYLE MOTORS SOFTWARE OVERVIEW



All torque curves based on 25°C ambient. Motors were operated using MDT (Trapezoidal Drive Mode) Commutation. For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

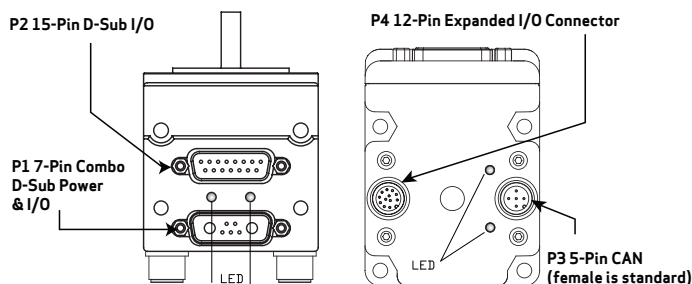
Class 5 D-Style Connector Pinouts

This table shows the pinouts for the connectors on the Class 5 D-style SmartMotors.

PIN	MAIN POWER	Specifications:	Notes:	P1
1	I/O - 6 GP, Index Input or "G" Command; For -CDS7, CAN-L only	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	Redundant connection on I/O connector	<p>7W2 Combo D-Sub Connector</p>
2	+5 VDC Out; For -CDS7, CAN-H only	50 mAmps Max (total)		
3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
5	Common Ground (typ. SIG Ground)			
A1	Main Power	+24-48 VDC	See NOTE	
A2	Common Ground (req'd. POWER Ground)		Must be Main Power Ground	
PIN	I/O CONNECTOR (5V TTL I/O)	Specifications:	Notes:	P2
1	I/O - 0 GP or Encoder A or Step Input	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	1.5 MHz Max as Encoder or Step Input	<p>P2 DB-15 D-Sub Connector</p>
2	I/O - 1 GP or Encoder B or Direction Input		1.5 MHz Max as Encoder or Direction Input	
3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP			
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)	115.2 KBaud Max		
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
9	Phase B Encoder Output			
10	RS-232 Transmit; For -CDS/7, CAN-L only	Com ch. 0	115.2 KBaud Max	
11	RS-232 Receive; For -CDS/7, CAN-H only			
12	+5 VDC Out	50 mAmp Max (total)		
13	Common Ground (typ. SIG Ground)			
14	Common Ground			
15	Main Power: +20-48 VDC	If DE Option, Control Power separate from Main Power		
NOTE: I/O ports input impedance = 5 kohm (5 kohm pull-up resistor)				
PIN	CAN bus	Connection:	Notes:	P3
1	NC	NC		<p>M12 5-Pin Female</p>
2	+V	NC except DeviceNet	Input current < 10 mA	
3	-V (ground, not common)	CAN Ground	Isolated	
4	CAN-H	1 MBaud Max		
5	CAN-L	1 MBaud Max		
PIN	Isolated 24 VDC I/O Connector	Max Load (sourcing)	Notes:	P4
1	I/O - 16 GP	150 mAmps	These I/O ports also support analog input	<p>M12 12-Pin Female End View</p>
2	I/O - 17 GP			
3	I/O - 18 GP			
4	I/O - 19 GP			
5	I/O - 20 GP			
6	I/O - 21 GP			
7	I/O - 22 GP	300 mAmps		
8	I/O - 23 GP			
9	I/O - 24 GP			
10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
12	Ground-I/O (not common)		Isolated	

NOTE: These motors can operate on power down to +20 VDC, but it is not recommended due to greatly reduced performance — optimum performance is achieved at 48 VDC.

NOTE: All specifications are subject to change without notice. Consult the factory for the latest information.



CAUTION: Pins 14 and 15 are intended for use with DE series motors for control power only. Attempting to power a non-DE motor through those pins, as main servo-drive power, may result in immediate damage to the electronics, which will void the warranty.

CAUTION: Connectors P3 and P4 must be finger tightened only! DO NOT use a tool. Doing so can cause overtightening of the connection, which may damage the connector and will void the warranty.

SM23405D	
Continuous Torque	4.88 in-lb
	78 oz-in
	0.55 N-m
Peak Torque	8.04 in-lb
	129 oz-in
	0.91 N-m
Nominal Continuous Power	253 Watt
No Load Speed	5,300 RPM
Max. Continuous Current* @ 4500 RPM	6.76 Amps
Peak Power @ 4000 RPM	345 Watts
Voltage Constant	9.612 V/kRPM
Inductance	0.49 mH
Encoder Resolution	4,000 Counts/Rev
Rotor Inertia	0.00439 oz-in-sec ²
	3.100 10 ⁻⁵ Kg-m ²
Weight	2.8 lb
	1.27 kg
Shaft Diameter	0.250 in
	6.35 mm
Shaft, Radial Load	7 lb
	3.18 kg
Shaft, Axial Thrust Load	3 lb
	1.36 kg
DeviceNet Available	Yes
PROFIBUS Available	
CANopen Available	Yes

*Default voltage is 48V. See graphs for additional voltages.

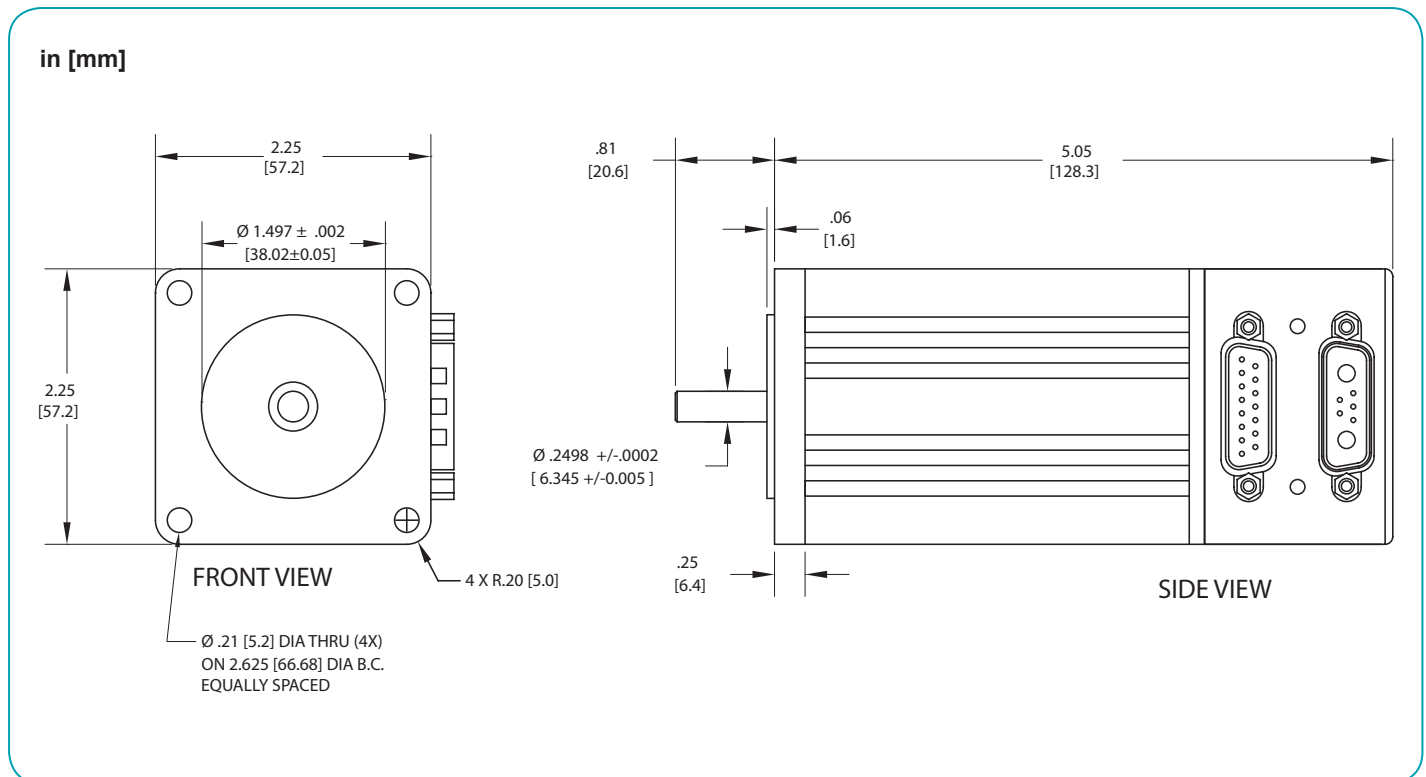


Operating temperature range: 0°C–85°C
Storage temperature range: -10°C–85°C, noncondensing

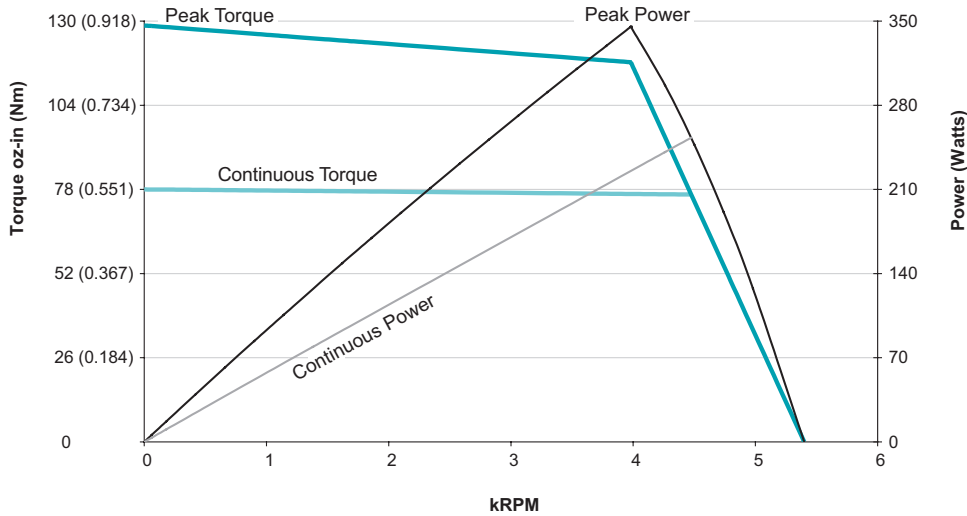
NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.



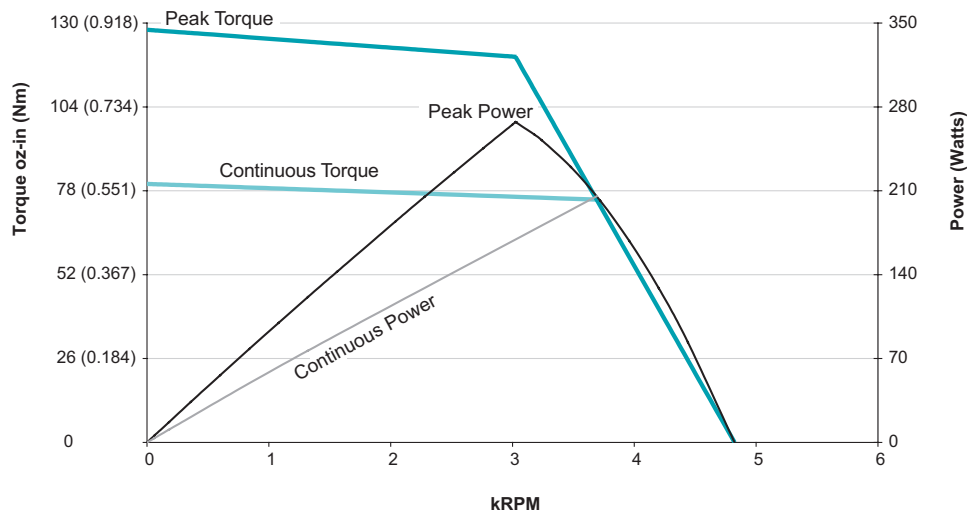
Moog Animatics SmartMotor SM23405D (No Options) CAD Drawing



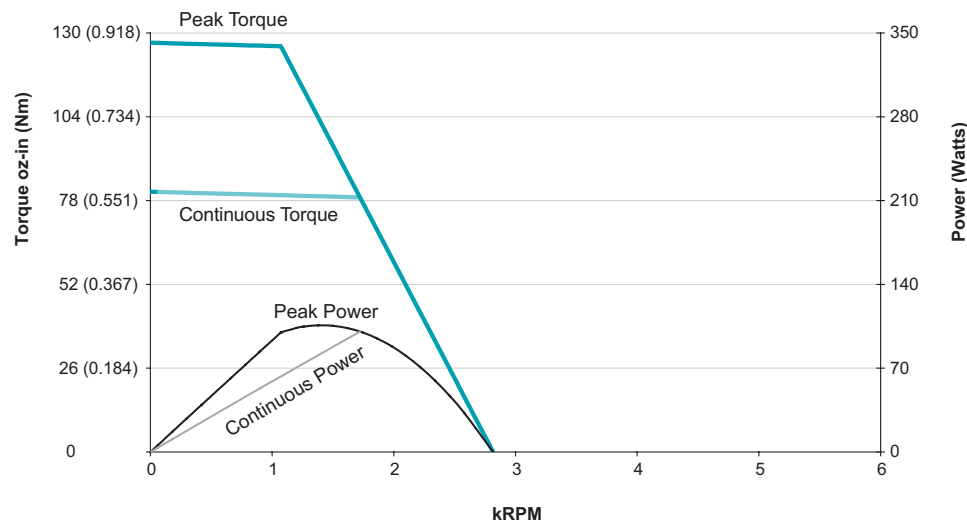
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SM23405D
at 48 VDC
at rise to 85°C



SM23405D
at 42 VDC
at rise to 85°C



SM23405D
at 24 VDC
at rise to 85°C

All torque curves based on 25°C ambient.
Motors were operated using MDT (Trapezoidal Drive Mode) Commutation.
For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

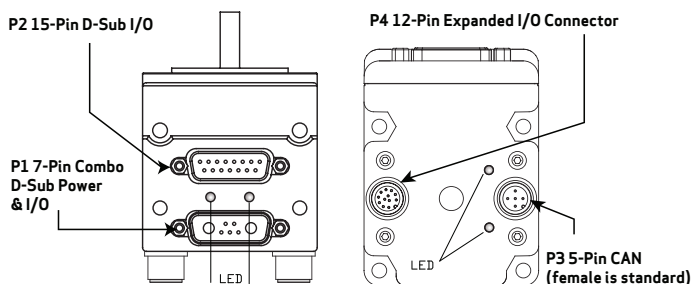
Class 5 D-Style Connector Pinouts

This table shows the pinouts for the connectors on the Class 5 D-style SmartMotors.

PIN	MAIN POWER	Specifications:	Notes:	P1
1	I/O - 6 GP, Index Input or "G" Command; For -CDS7, CAN-L only	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	Redundant connection on I/O connector	<p>7W2 Combo D-Sub Connector</p>
2	+5 VDC Out; For -CDS7, CAN-H only	50 mAmps Max (total)		
3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
5	Common Ground (typ. SIG Ground)			
A1	Main Power	+24-48 VDC	See NOTE	
A2	Common Ground (req'd. POWER Ground)		Must be Main Power Ground	
PIN	I/O CONNECTOR (5V TTL I/O)	Specifications:	Notes:	P2
1	I/O - 0 GP or Encoder A or Step Input	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	1.5 MHz Max as Encoder or Step Input	<p>P2 DB-15 D-Sub Connector</p>
2	I/O - 1 GP or Encoder B or Direction Input		1.5 MHz Max as Encoder or Direction Input	
3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP			
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)	115.2 KBaud Max		
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
9	Phase B Encoder Output			
10	RS-232 Transmit; For -CDS/7, CAN-L only	Com ch. 0	115.2 KBaud Max	
11	RS-232 Receive; For -CDS/7, CAN-H only			
12	+5 VDC Out	50 mAmp Max (total)		
13	Common Ground (typ. SIG Ground)			
14	Common Ground			
15	Main Power: +20-48 VDC	If DE Option, Control Power separate from Main Power		
NOTE: I/O ports input impedance = 5 kohm (5 kohm pull-up resistor)				
PIN	CAN bus	Connection:	Notes:	P3
1	NC	NC		<p>M12 5-Pin Female</p>
2	+V	NC except DeviceNet	Input current < 10 mA	
3	-V (ground, not common)	CAN Ground	Isolated	
4	CAN-H	1 MBaud Max		
5	CAN-L	1 MBaud Max		
PIN	Isolated 24 VDC I/O Connector	Max Load (sourcing)	Notes:	P4
1	I/O - 16 GP	150 mAmps	These I/O ports also support analog input	<p>M12 12-Pin Female End View</p>
2	I/O - 17 GP			
3	I/O - 18 GP			
4	I/O - 19 GP			
5	I/O - 20 GP			
6	I/O - 21 GP			
7	I/O - 22 GP	300 mAmps		
8	I/O - 23 GP			
9	I/O - 24 GP			
10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
12	Ground-I/O (not common)		Isolated	

NOTE: These motors can operate on power down to +20 VDC, but it is not recommended due to greatly reduced performance — optimum performance is achieved at 48 VDC.

NOTE: All specifications are subject to change without notice. Consult the factory for the latest information.



CAUTION: Pins 14 and 15 are intended for use with DE series motors for control power only. Attempting to power a non-DE motor through those pins, as main servo-drive power, may result in immediate damage to the electronics, which will void the warranty.

CAUTION: Connectors P3 and P4 must be finger tightened only! DO NOT use a tool. Doing so can cause overtightening of the connection, which may damage the connector and will void the warranty.

SM34165D	
Continuous Torque	9.67 in-lb
	155 oz-in
	1.09 N-m
Peak Torque	14.12 in-lb
	226 oz-in
	1.60 N-m
Nominal Continuous Power	235 Watt
No Load Speed	3,100 RPM
Max. Continuous Current* @ 2400 RPM	6.02 Amps
Peak Power @ 1900 RPM	265 Watts
Voltage Constant	14.98 V/kRPM
Inductance	1.72 mH
Encoder Resolution	8,000 Counts/Rev
Rotor Inertia	0.014 oz-in-sec ²
	9.890 10 ⁻⁵ Kg-m ²
Weight	5.0 lb
	2.27 kg
Shaft Diameter	0.375 in
	9.53 mm
Shaft, Radial Load	15 lb
	6.80 kg
Shaft, Axial Thrust Load	3 lb
	1.36 kg
DeviceNet Available	Yes
PROFIBUS Available	Yes
CANopen Available	Yes

*Default voltage is 48V. See graphs for additional voltages.



Operating temperature range: 0°C–85°C

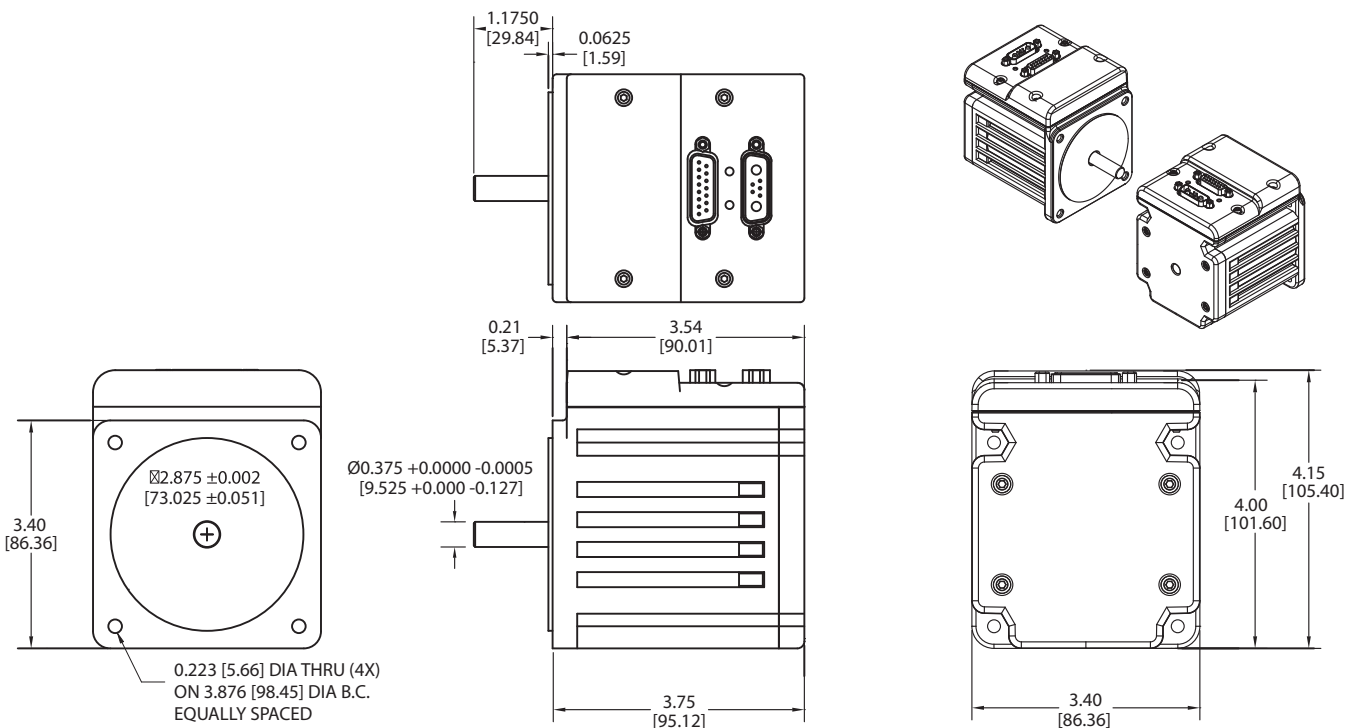
Storage temperature range: -10°C–85°C, noncondensing

NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.

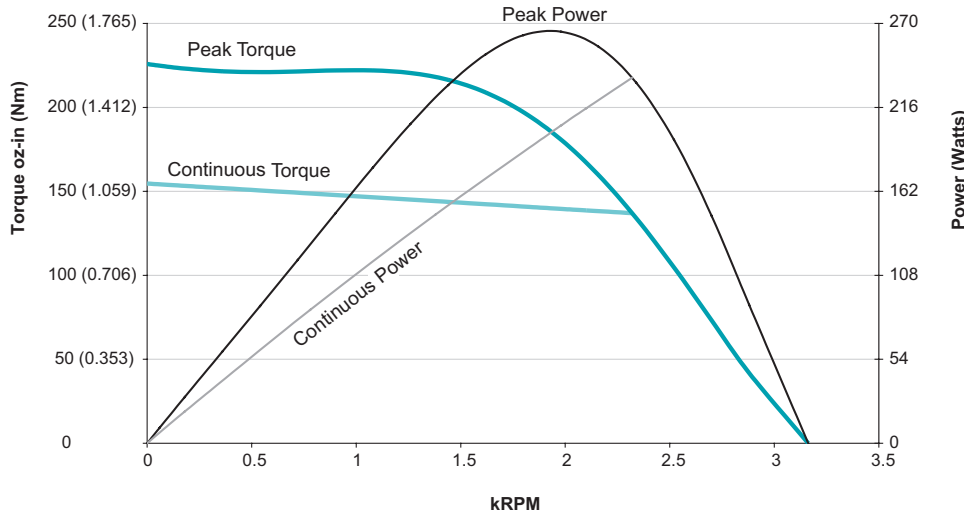


Moog Animatics SmartMotor™ SM34165D (No Options) CAD Drawing

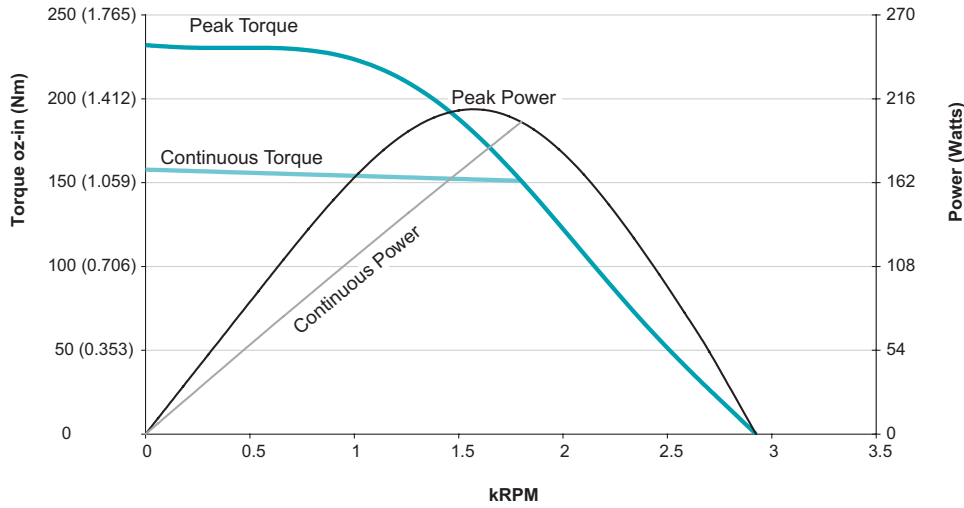
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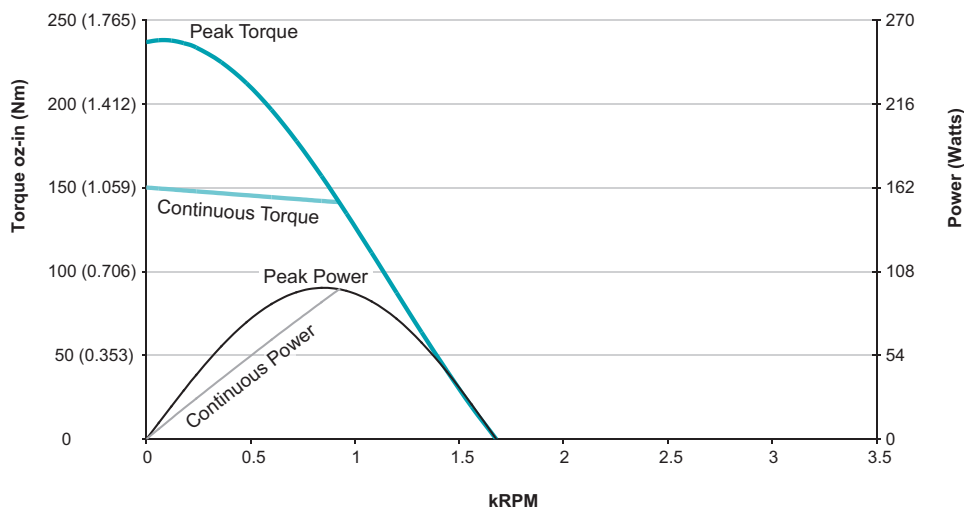
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SM34165D
at 48 VDC
at rise to 85°C



SM34165D
at 42 VDC
at rise to 85°C



SM34165D
at 24 VDC
at rise to 85°C

All torque curves based on 25°C ambient.
Motors were operated using MDT (Trapezoidal Drive Mode) Commutation.
For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

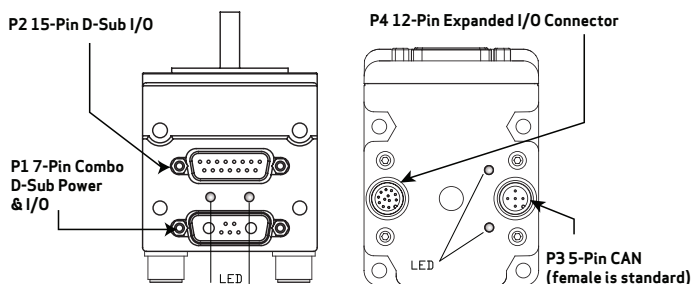
Class 5 D-Style Connector Pinouts

This table shows the pinouts for the connectors on the Class 5 D-style SmartMotors.

PIN	MAIN POWER	Specifications:	Notes:	P1
1	I/O - 6 GP, Index Input or "G" Command; For -CDS7, CAN-L only	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	Redundant connection on I/O connector	<p>7W2 Combo D-Sub Connector</p>
2	+5 VDC Out; For -CDS7, CAN-H only	50 mAmps Max (total)		
3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
5	Common Ground (typ. SIG Ground)			
A1	Main Power	+24-48 VDC	See NOTE	
A2	Common Ground (req'd. POWER Ground)		Must be Main Power Ground	
PIN	I/O CONNECTOR (5V TTL I/O)	Specifications:	Notes:	P2
1	I/O - 0 GP or Encoder A or Step Input	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	1.5 MHz Max as Encoder or Step Input	<p>P2 DB-15 D-Sub Connector</p>
2	I/O - 1 GP or Encoder B or Direction Input		1.5 MHz Max as Encoder or Direction Input	
3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP			
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)	115.2 KBaud Max		
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
9	Phase B Encoder Output			
10	RS-232 Transmit; For -CDS/7, CAN-L only	Com ch. 0	115.2 KBaud Max	
11	RS-232 Receive; For -CDS/7, CAN-H only			
12	+5 VDC Out	50 mAmp Max (total)		
13	Common Ground (typ. SIG Ground)			
14	Common Ground			
15	Main Power: +20-48 VDC	If DE Option, Control Power separate from Main Power		
NOTE: I/O ports input impedance = 5 kohm (5 kohm pull-up resistor)				
PIN	CAN bus	Connection:	Notes:	P3
1	NC	NC		<p>M12 5-Pin Female</p>
2	+V	NC except DeviceNet	Input current < 10 mA	
3	-V (ground, not common)	CAN Ground	Isolated	
4	CAN-H	1 MBaud Max		
5	CAN-L	1 MBaud Max		
PIN	Isolated 24 VDC I/O Connector	Max Load (sourcing)	Notes:	P4
1	I/O - 16 GP	150 mAmps	These I/O ports also support analog input	<p>M12 12-Pin Female End View</p>
2	I/O - 17 GP			
3	I/O - 18 GP			
4	I/O - 19 GP			
5	I/O - 20 GP			
6	I/O - 21 GP			
7	I/O - 22 GP	300 mAmps		
8	I/O - 23 GP			
9	I/O - 24 GP			
10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
12	Ground-I/O (not common)		Isolated	

NOTE: These motors can operate on power down to +20 VDC, but it is not recommended due to greatly reduced performance — optimum performance is achieved at 48 VDC.

NOTE: All specifications are subject to change without notice. Consult the factory for the latest information.



CAUTION: Pins 14 and 15 are intended for use with DE series motors for control power only. Attempting to power a non-DE motor through those pins, as main servo-drive power, may result in immediate damage to the electronics, which will void the warranty.

CAUTION: Connectors P3 and P4 must be finger tightened only! DO NOT use a tool. Doing so can cause overtightening of the connection, which may damage the connector and will void the warranty.

SM34165DT		
Continuous Torque	12.83	in-lb
	205	oz-in
	1.45	N-m
Peak Torque	30.00	in-lb
	480	oz-in
	3.39	N-m
Nominal Continuous Power	615	Watt
No Load Speed	5,100	RPM
Max. Continuous Current* @ 4500 RPM	16.93	Amps
Peak Power @ 3400 RPM	930	Watts
Voltage Constant	8.9	V/kRPM
Inductance	0.32	mH
Encoder Resolution	8,000	Counts/Rev
Rotor Inertia	0.0142	oz-in-sec ²
	10.031	10 ⁻⁵ Kg-m ²
Weight	5.5	lb
	2.49	kg
Shaft Diameter	0.500	in
	12.70	mm
Shaft, Radial Load	30	lb
	13.61	kg
Shaft, Axial Thrust Load	3	lb
	1.36	kg
DeviceNet Available	Yes	
PROFIBUS Available	Yes	
CANopen Available	Yes	



Operating temperature range: 0°C–85°C

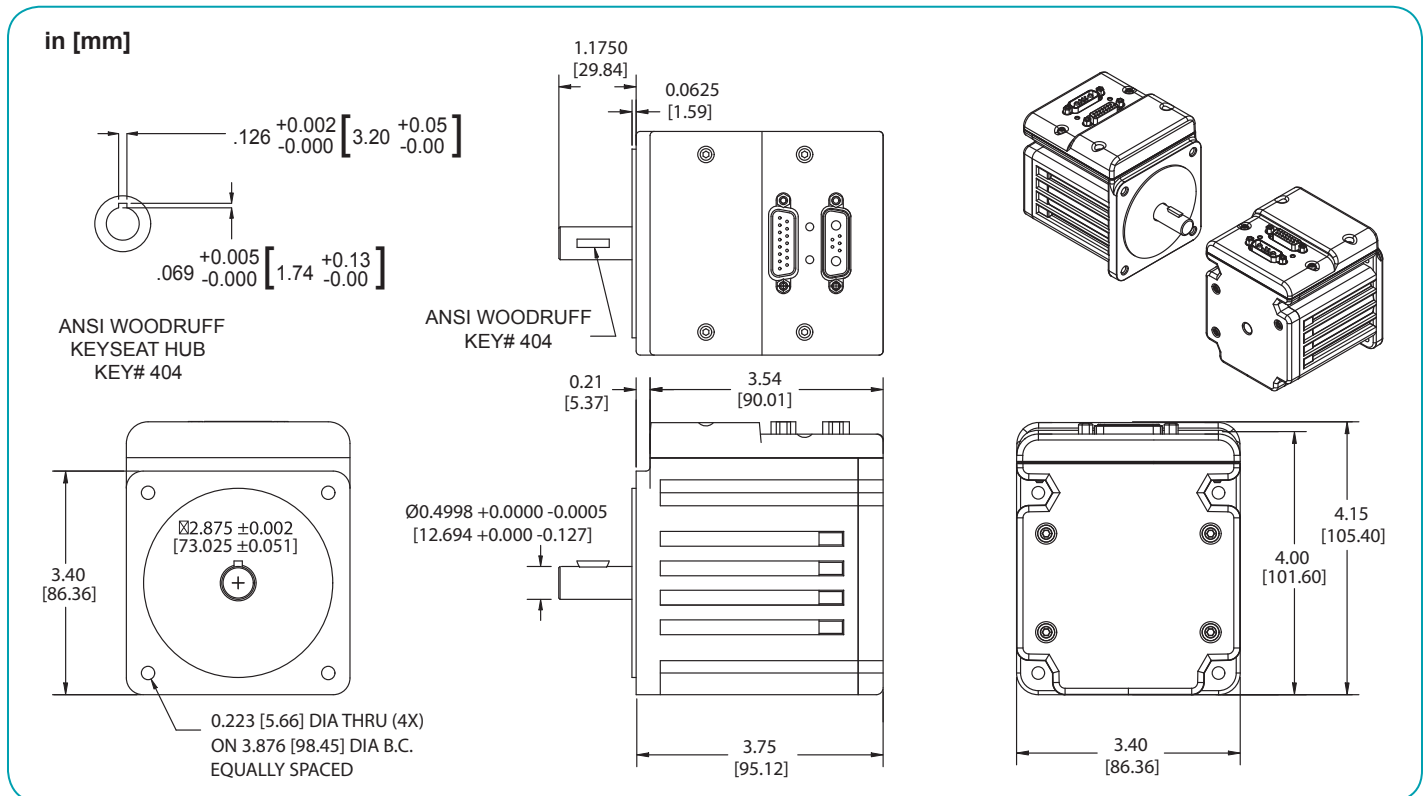
Storage temperature range: -10°C–85°C, noncondensing

NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.

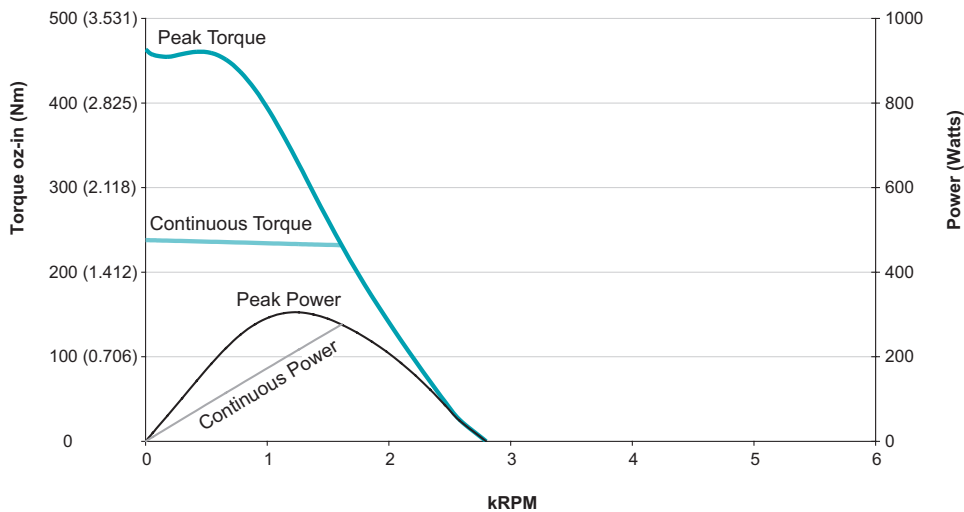
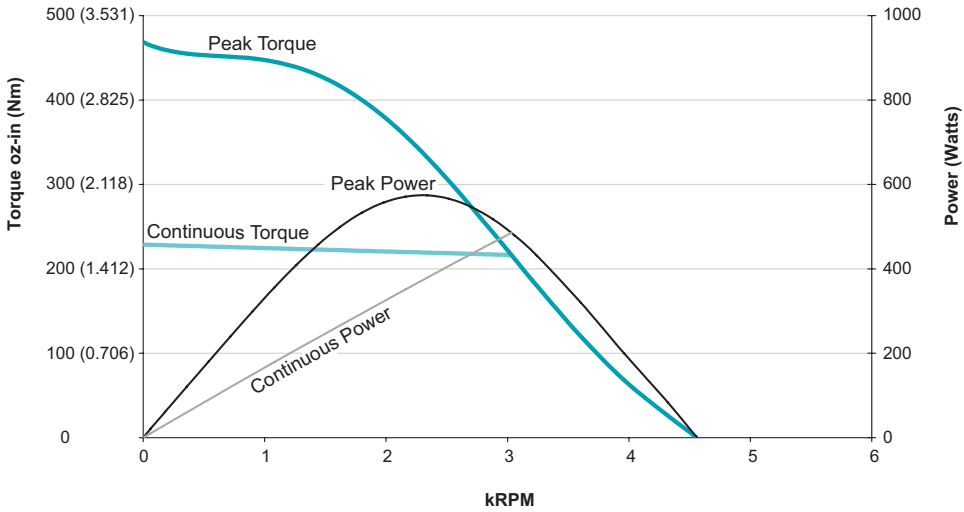
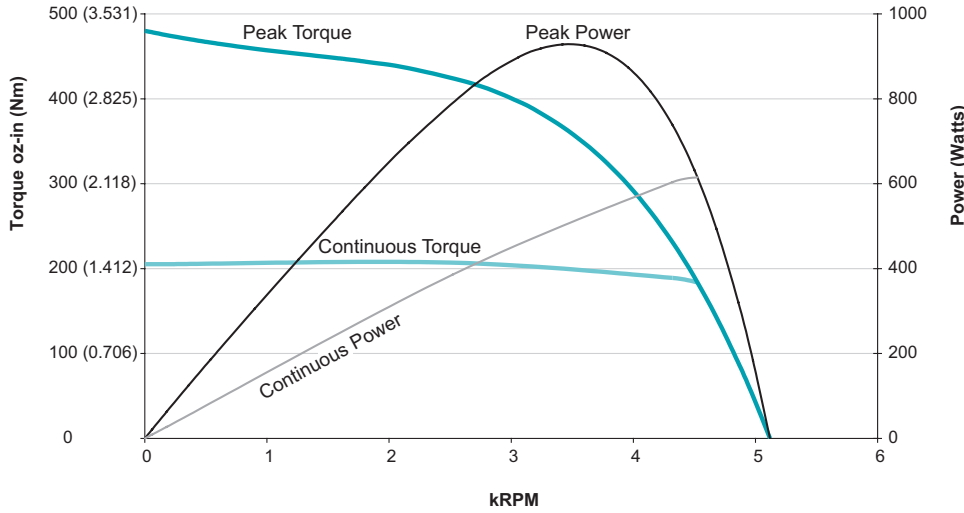


*Default voltage is 48V. See graphs for additional voltages.

Moog Animatics SmartMotor™ SM34165DT (No Options) CAD Drawing



- OVERVIEW
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- D-STYLE MOTORS
- D-STYLE CONNECTIVITY
- PERIPHERALS
- M-STYLE MOTORS
- M-STYLE CONNECTIVITY
- LINEAR SYSTEMS
- POWER SUPPLIES & SHUNTS
- GEAR HEADS
- APPENDIX



All torque curves based on 25°C ambient.
 Motors were operated using MDT (Trapezoidal Drive Mode) Commutation.
 For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

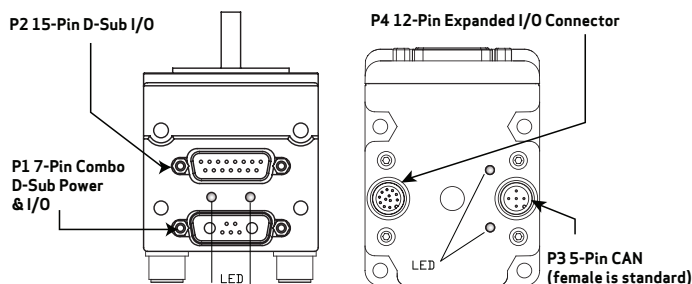
Class 5 D-Style Connector Pinouts

This table shows the pinouts for the connectors on the Class 5 D-style SmartMotors.

PIN	MAIN POWER	Specifications:	Notes:	P1
1	I/O - 6 GP, Index Input or "G" Command; For -CDS7, CAN-L only	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	Redundant connection on I/O connector	<p>7W2 Combo D-Sub Connector</p>
2	+5 VDC Out; For -CDS7, CAN-H only	50 mAmps Max (total)		
3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
5	Common Ground (typ. SIG Ground)			
A1	Main Power	+24-48 VDC	See NOTE	
A2	Common Ground (req'd. POWER Ground)		Must be Main Power Ground	
PIN	I/O CONNECTOR (5V TTL I/O)	Specifications:	Notes:	P2
1	I/O - 0 GP or Encoder A or Step Input	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	1.5 MHz Max as Encoder or Step Input	<p>P2 DB-15 D-Sub Connector</p>
2	I/O - 1 GP or Encoder B or Direction Input		1.5 MHz Max as Encoder or Direction Input	
3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP			
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)	115.2 KBaud Max		
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
9	Phase B Encoder Output			
10	RS-232 Transmit; For -CDS/7, CAN-L only	Com ch. 0	115.2 KBaud Max	
11	RS-232 Receive; For -CDS/7, CAN-H only			
12	+5 VDC Out	50 mAmp Max (total)		
13	Common Ground (typ. SIG Ground)			
14	Common Ground			
15	Main Power: +20-48 VDC	If DE Option, Control Power separate from Main Power		
NOTE: I/O ports input impedance = 5 kohm (5 kohm pull-up resistor)				
PIN	CAN bus	Connection:	Notes:	P3
1	NC	NC		<p>M12 5-Pin Female</p>
2	+V	NC except DeviceNet	Input current < 10 mA	
3	-V (ground, not common)	CAN Ground	Isolated	
4	CAN-H	1 MBaud Max		
5	CAN-L	1 MBaud Max		
PIN	Isolated 24 VDC I/O Connector	Max Load (sourcing)	Notes:	P4
1	I/O - 16 GP	150 mAmps	These I/O ports also support analog input	<p>M12 12-Pin Female End View</p>
2	I/O - 17 GP			
3	I/O - 18 GP			
4	I/O - 19 GP			
5	I/O - 20 GP			
6	I/O - 21 GP			
7	I/O - 22 GP	300 mAmps		
8	I/O - 23 GP			
9	I/O - 24 GP			
10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
12	Ground-I/O (not common)		Isolated	

NOTE: These motors can operate on power down to +20 VDC, but it is not recommended due to greatly reduced performance — optimum performance is achieved at 48 VDC.

NOTE: All specifications are subject to change without notice. Consult the factory for the latest information.



CAUTION: Pins 14 and 15 are intended for use with DE series motors for control power only. Attempting to power a non-DE motor through those pins, as main servo-drive power, may result in immediate damage to the electronics, which will void the warranty.

CAUTION: Connectors P3 and P4 must be finger tightened only! DO NOT use a tool. Doing so can cause overtightening of the connection, which may damage the connector and will void the warranty.

SM34205D		
Continuous Torque	7.91	in-lb
	126	oz-in
	0.89	N-m
Peak Torque	24.91	in-lb
	399	oz-in
	2.81	N-m
Nominal Continuous Power	324	Watt
No Load Speed	4,500	RPM
Max. Continuous Current* @ 3750 RPM	8.28	Amps
Peak Power @ 2250 RPM	455	Watts
Voltage Constant	10.8	V/kRPM
Inductance	0.596	mH
Encoder Resolution	8,000	Counts/Rev
Rotor Inertia	0.012	oz-in-sec ²
	8.448	10 ⁻⁵ Kg-m ²
Weight	3.5	lb
	1.59	kg
Shaft Diameter	0.375	in
	9.53	mm
Shaft, Radial Load	15	lb
	6.80	kg
Shaft, Axial Thrust Load	3	lb
	1.36	kg
DeviceNet Available	Yes	
PROFIBUS Available		
CANopen Available	Yes	

*Default voltage is 48V. See graphs for additional voltages.



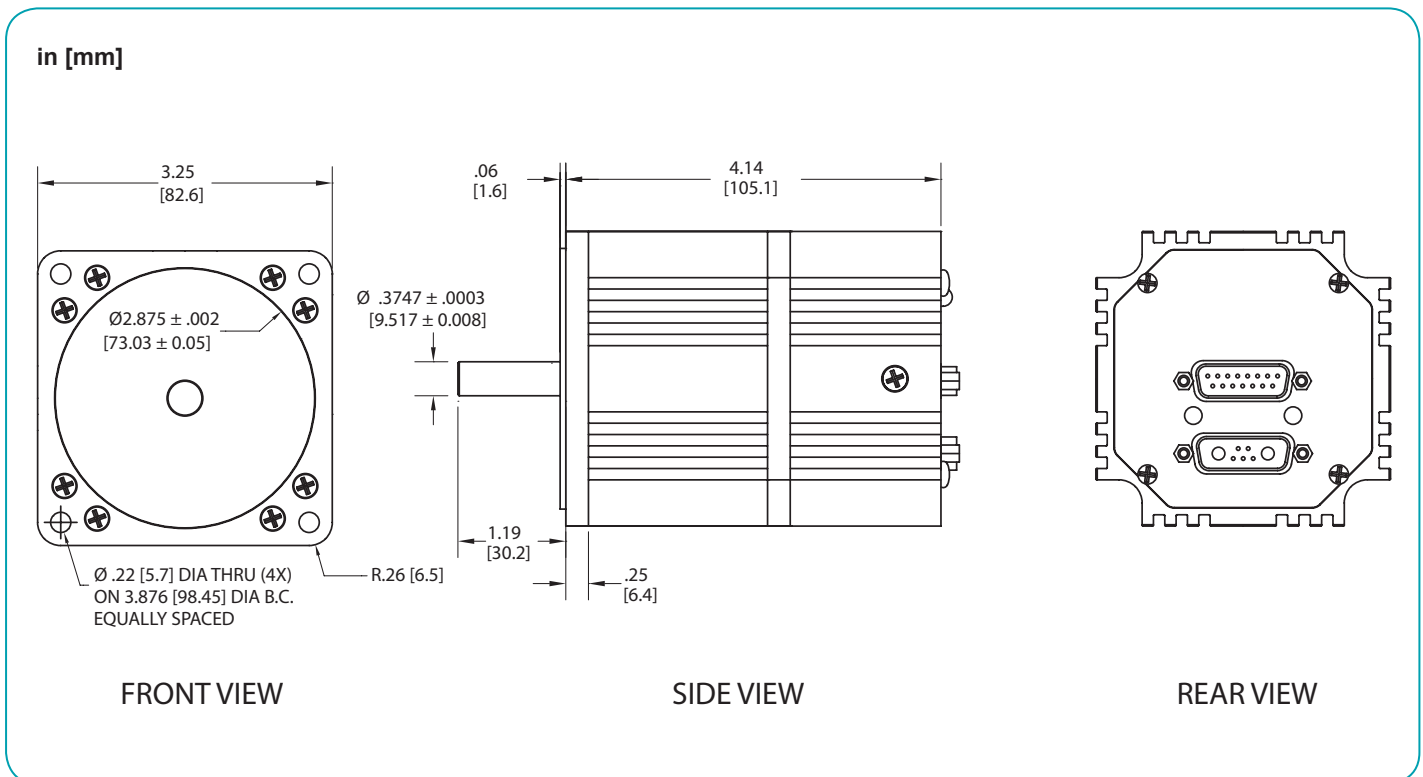
Operating temperature range: 0°C–85°C

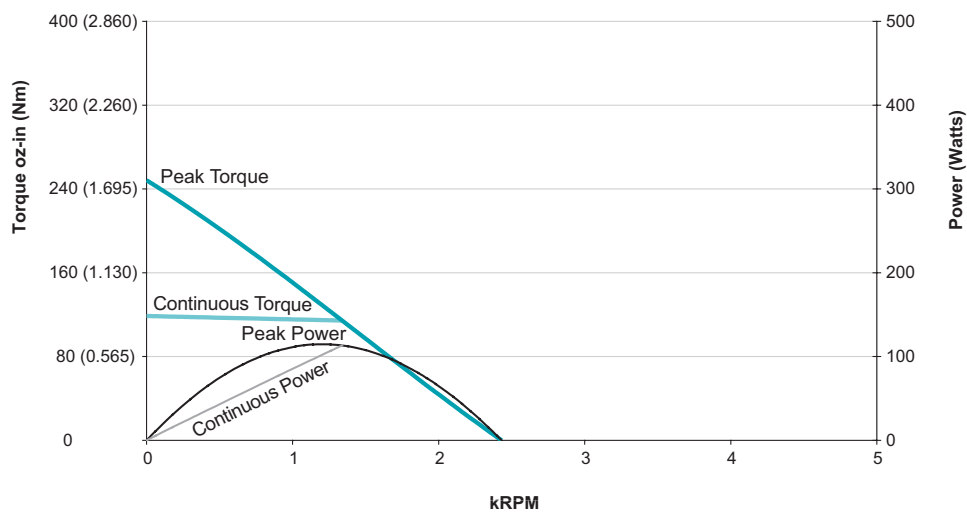
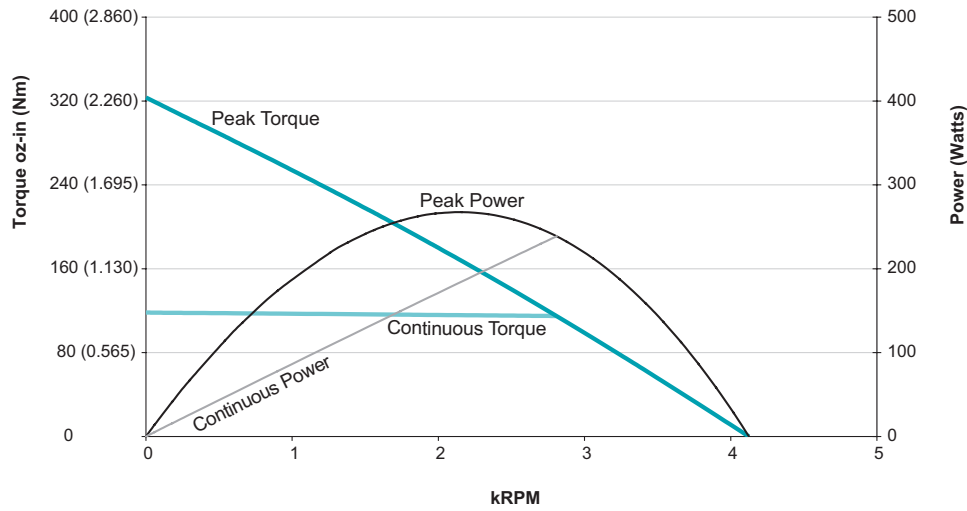
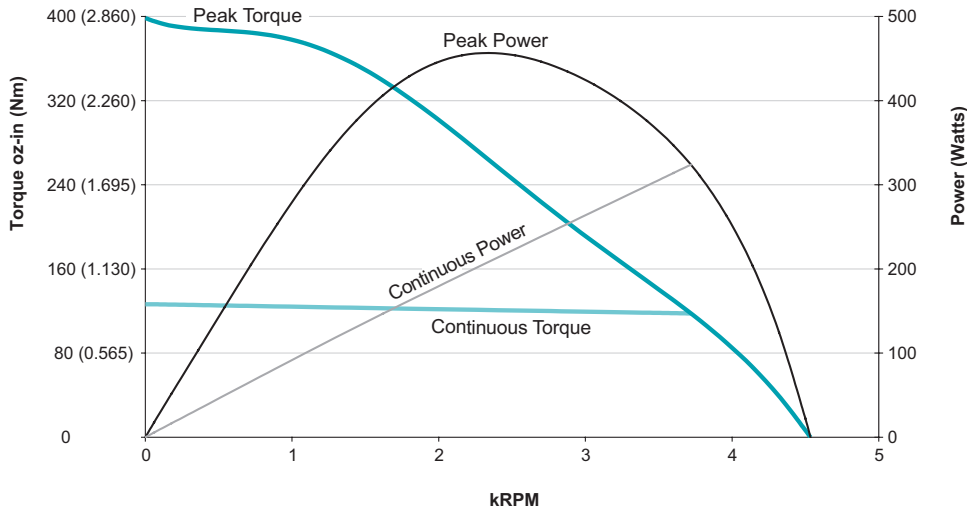
Storage temperature range: -10°C–85°C, noncondensing

NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.



Moog Animatics SmartMotor SM34205D (No Options) CAD Drawing





All torque curves based on 25°C ambient. Motors were operated using MDT (Trapezoidal Drive Mode) Commutation. For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

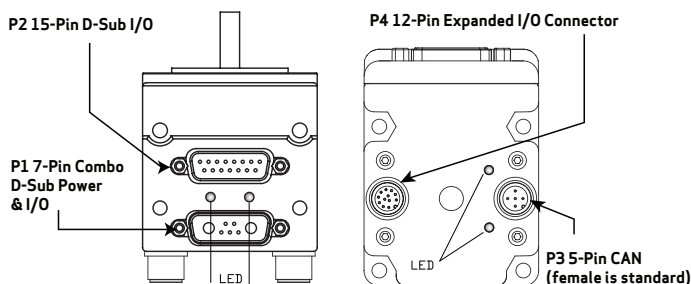
Class 5 D-Style Connector Pinouts

This table shows the pinouts for the connectors on the Class 5 D-style SmartMotors.

PIN	MAIN POWER	Specifications:	Notes:	P1
1	I/O - 6 GP, Index Input or "G" Command; For -CDS7, CAN-L only	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	Redundant connection on I/O connector	<p>7W2 Combo D-Sub Connector</p>
2	+5 VDC Out; For -CDS7, CAN-H only	50 mAmps Max (total)		
3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
5	Common Ground (typ. SIG Ground)			
A1	Main Power	+24-48 VDC	See NOTE	
A2	Common Ground (req'd. POWER Ground)		Must be Main Power Ground	
PIN	I/O CONNECTOR (5V TTL I/O)	Specifications:	Notes:	P2
1	I/O - 0 GP or Encoder A or Step Input	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	1.5 MHz Max as Encoder or Step Input	<p>P2 DB-15 D-Sub Connector</p>
2	I/O - 1 GP or Encoder B or Direction Input		1.5 MHz Max as Encoder or Direction Input	
3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP			
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)	115.2 KBaud Max		
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
9	Phase B Encoder Output			
10	RS-232 Transmit; For -CDS/7, CAN-L only	Com ch. 0	115.2 KBaud Max	
11	RS-232 Receive; For -CDS/7, CAN-H only			
12	+5 VDC Out	50 mAmp Max (total)		
13	Common Ground (typ. SIG Ground)			
14	Common Ground			
15	Main Power: +20-48 VDC	If DE Option, Control Power separate from Main Power		
NOTE: I/O ports input impedance = 5 kohm (5 kohm pull-up resistor)				
PIN	CAN bus	Connection:	Notes:	P3
1	NC	NC		<p>M12 5-Pin Female</p>
2	+V	NC except DeviceNet	Input current < 10 mA	
3	-V (ground, not common)	CAN Ground	Isolated	
4	CAN-H	1 MBaud Max		
5	CAN-L	1 MBaud Max		
PIN	Isolated 24 VDC I/O Connector	Max Load (sourcing)	Notes:	P4
1	I/O - 16 GP	150 mAmps	These I/O ports also support analog input	<p>M12 12-Pin Female End View</p>
2	I/O - 17 GP			
3	I/O - 18 GP			
4	I/O - 19 GP			
5	I/O - 20 GP			
6	I/O - 21 GP			
7	I/O - 22 GP	300 mAmps		
8	I/O - 23 GP			
9	I/O - 24 GP			
10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
12	Ground-I/O (not common)		Isolated	

NOTE: These motors can operate on power down to +20 VDC, but it is not recommended due to greatly reduced performance — optimum performance is achieved at 48 VDC.

NOTE: All specifications are subject to change without notice. Consult the factory for the latest information.



CAUTION: Pins 14 and 15 are intended for use with DE series motors for control power only. Attempting to power a non-DE motor through those pins, as main servo-drive power, may result in immediate damage to the electronics, which will void the warranty.

CAUTION: Connectors P3 and P4 must be finger tightened only! DO NOT use a tool. Doing so can cause overtightening of the connection, which may damage the connector and will void the warranty.

SM34305D		
Continuous Torque	10.87	in-lb
	174	oz-in
	1.23	N-m
Peak Torque	34.75	in-lb
	556	oz-in
	3.93	N-m
Nominal Continuous Power	400	Watt
No Load Speed	4,100	RPM
Max. Continuous Current* @ 3600 RPM	10.31	Amps
Peak Power @ 2500 RPM	725	Watts
Voltage Constant	12.1	V/kRPM
Inductance	0.490	mH
Encoder Resolution	8,000	Counts/Rev
Rotor Inertia	0.018	oz-in-sec ²
	12.56	10 ⁻⁵ Kg-m ²
Weight	4.5	lb
	2.04	kg
Shaft Diameter	0.375	in
	9.53	mm
Shaft, Radial Load	15	lb
	6.80	kg
Shaft, Axial Thrust Load	3	lb
	1.36	kg
DeviceNet Available	Yes	
PROFIBUS Available		
CANopen Available	Yes	

*Default voltage is 48V. See graphs for additional voltages.

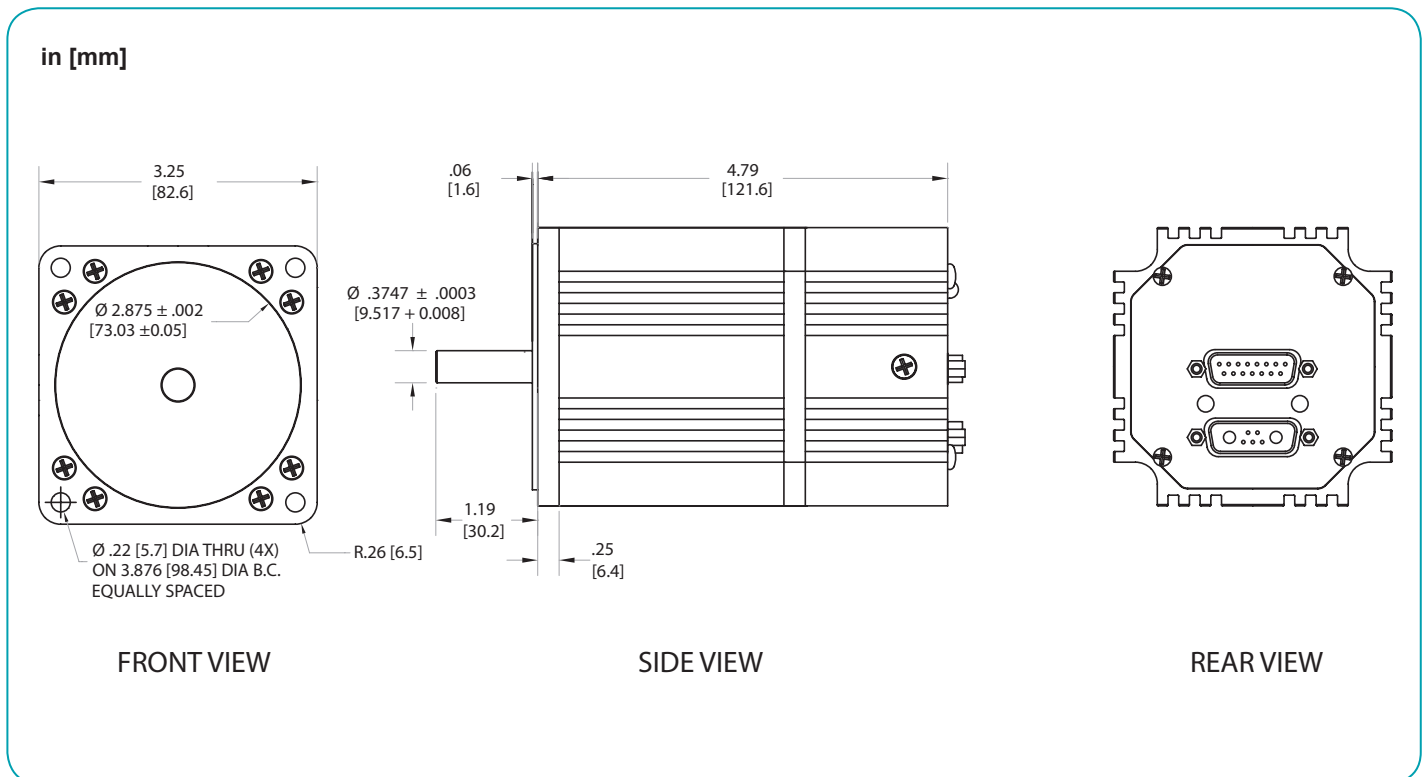


Operating temperature range: 0°C–85°C
Storage temperature range: -10°C–85°C, noncondensing

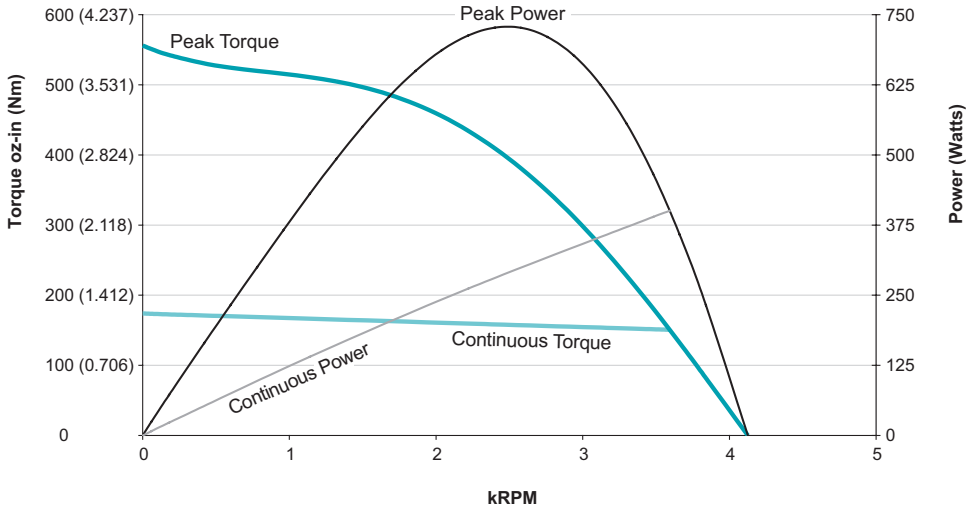
NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.



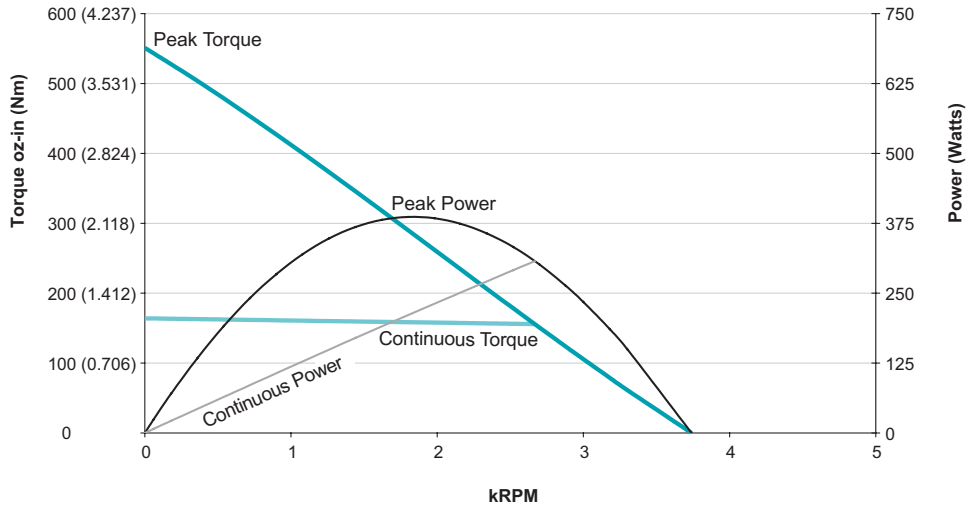
Moog Animatics SmartMotor SM34305D (No Options) CAD Drawing



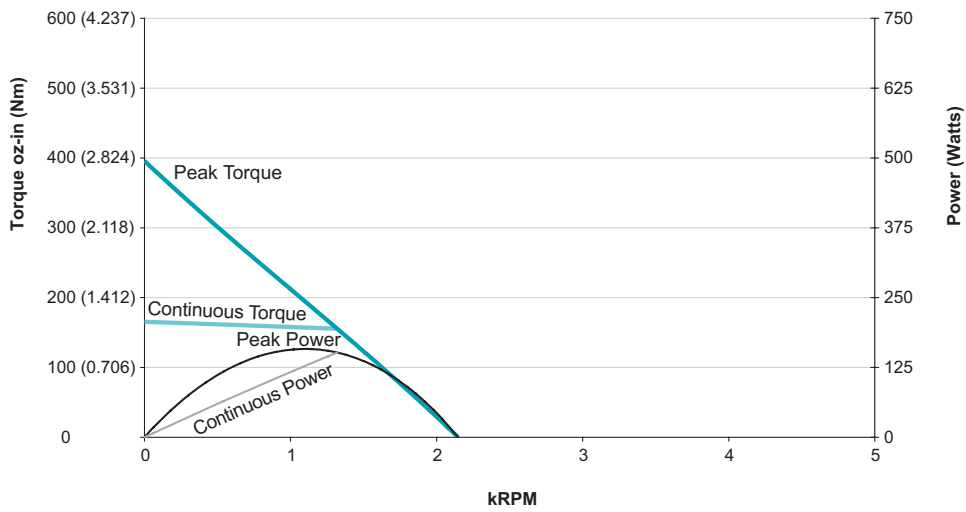
OVERVIEW
SOFTWARE
D-STYLE MOTORS
D-STYLE CONNECTIVITY
PERIPHERALS
M-STYLE MOTORS
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LINEAR SYSTEMS
POWER SUPPLIES & SHUNTS
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APPENDIX



**SM34305D
at 48 VDC
at rise to 85°C**



**SM34305D
at 42 VDC
at rise to 85°C**



**SM34305D
at 24 VDC
at rise to 85°C**

All torque curves based on 25°C ambient.
Motors were operated using MDT (Trapezoidal Drive Mode) Commutation.
For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

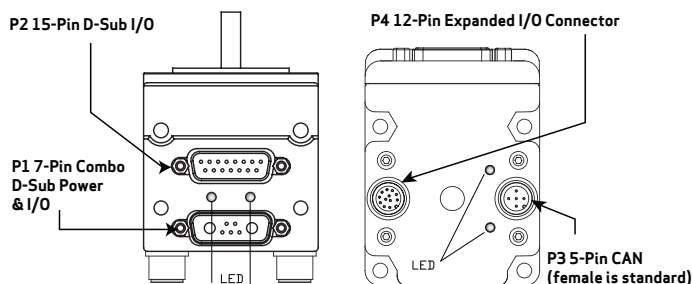
Class 5 D-Style Connector Pinouts

This table shows the pinouts for the connectors on the Class 5 D-style SmartMotors.

PIN	MAIN POWER	Specifications:	Notes:	P1
1	I/O - 6 GP, Index Input or "G" Command; For -CDS7, CAN-L only	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	Redundant connection on I/O connector	<p>7W2 Combo D-Sub Connector</p>
2	+5 VDC Out; For -CDS7, CAN-H only	50 mAmps Max (total)		
3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
5	Common Ground (typ. SIG Ground)			
A1	Main Power	+24-48 VDC	See NOTE	
A2	Common Ground (req'd. POWER Ground)		Must be Main Power Ground	
PIN	I/O CONNECTOR (5V TTL I/O)	Specifications:	Notes:	P2
1	I/O - 0 GP or Encoder A or Step Input	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	1.5 MHz Max as Encoder or Step Input	<p>P2 DB-15 D-Sub Connector</p>
2	I/O - 1 GP or Encoder B or Direction Input		1.5 MHz Max as Encoder or Direction Input	
3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP			
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)	115.2 KBaud Max		
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
9	Phase B Encoder Output			
10	RS-232 Transmit; For -CDS/7, CAN-L only	Com ch. 0	115.2 KBaud Max	
11	RS-232 Receive; For -CDS/7, CAN-H only			
12	+5 VDC Out	50 mAmp Max (total)		
13	Common Ground (typ. SIG Ground)			
14	Common Ground			
15	Main Power: +20-48 VDC	If DE Option, Control Power separate from Main Power		
NOTE: I/O ports input impedance = 5 kohm (5 kohm pull-up resistor)				
PIN	CAN bus	Connection:	Notes:	P3
1	NC	NC		<p>M12 5-Pin Female</p>
2	+V	NC except DeviceNet	Input current < 10 mA	
3	-V (ground, not common)	CAN Ground	Isolated	
4	CAN-H	1 MBaud Max		
5	CAN-L	1 MBaud Max		
PIN	Isolated 24 VDC I/O Connector	Max Load (sourcing)	Notes:	P4
1	I/O - 16 GP	150 mAmps	These I/O ports also support analog input	<p>M12 12-Pin Female End View</p>
2	I/O - 17 GP			
3	I/O - 18 GP			
4	I/O - 19 GP			
5	I/O - 20 GP			
6	I/O - 21 GP			
7	I/O - 22 GP	300 mAmps		
8	I/O - 23 GP			
9	I/O - 24 GP			
10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
12	Ground-I/O (not common)		Isolated	

NOTE: These motors can operate on power down to +20 VDC, but it is not recommended due to greatly reduced performance — optimum performance is achieved at 48 VDC.

NOTE: All specifications are subject to change without notice. Consult the factory for the latest information.



CAUTION: Pins 14 and 15 are intended for use with DE series motors for control power only. Attempting to power a non-DE motor through those pins, as main servo-drive power, may result in immediate damage to the electronics, which will void the warranty.

CAUTION: Connectors P3 and P4 must be finger tightened only! DO NOT use a tool. Doing so can cause overtightening of the connection, which may damage the connector and will void the warranty.

SM34405D		
Continuous Torque	12.94	in-lb
	207	oz-in
	1.46	N-m
Peak Torque	40.38	in-lb
	646	oz-in
	4.56	N-m
Nominal Continuous Power	438	Watt
No Load Speed	3,800	RPM
Max. Continuous Current* @ 3300 RPM	11.69	Amps
Peak Power @ 2350 RPM	820	Watts
Voltage Constant	12.9	V/kRPM
Inductance	0.913	mH
Encoder Resolution	8,000	Counts/Rev
Rotor Inertia	0.024	oz-in-sec ²
	17.020	10 ⁻⁵ Kg-m ²
Weight	5.5	lb
	2.49	kg
Shaft Diameter	0.375	in
	9.53	mm
Shaft, Radial Load	15	lb
	6.80	kg
Shaft, Axial Thrust Load	3	lb
	1.36	kg
DeviceNet Available	Yes	
PROFIBUS Available		
CANopen Available	Yes	

*Default voltage is 48V. See graphs for additional voltages.



Operating temperature range: 0°C–85°C

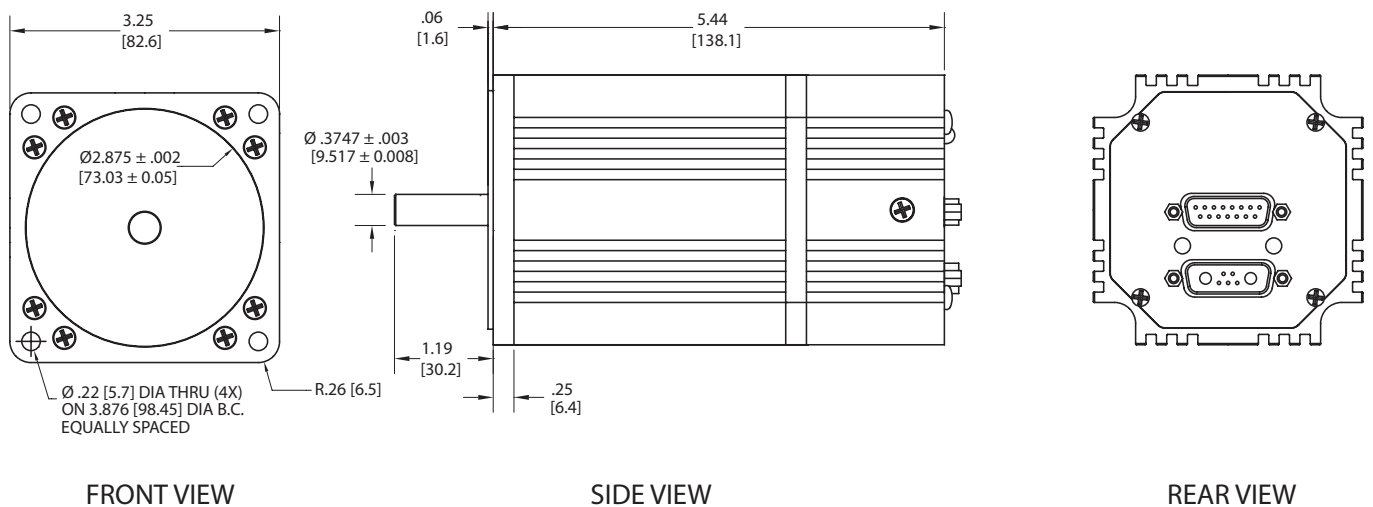
Storage temperature range: -10°C–85°C, noncondensing

NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.

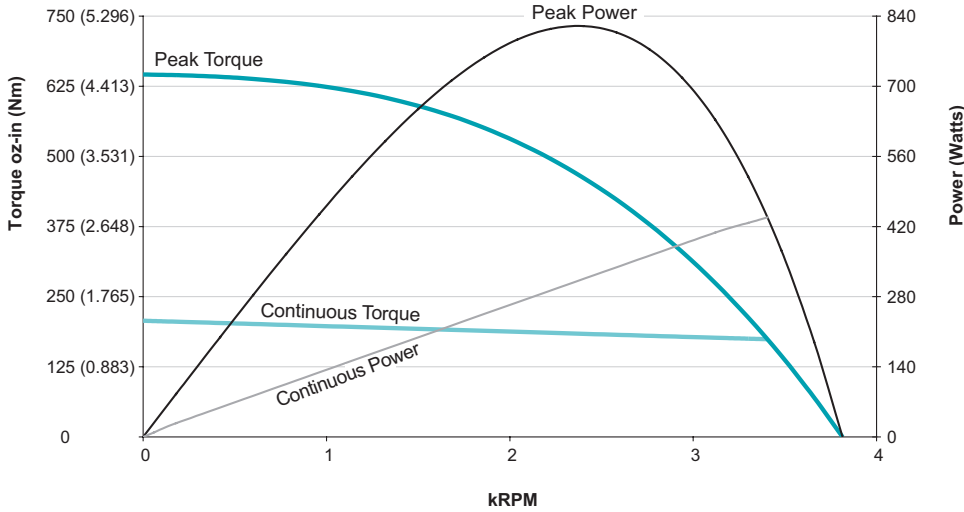


Moog Animatics SmartMotor SM34405D (No Options) CAD Drawing

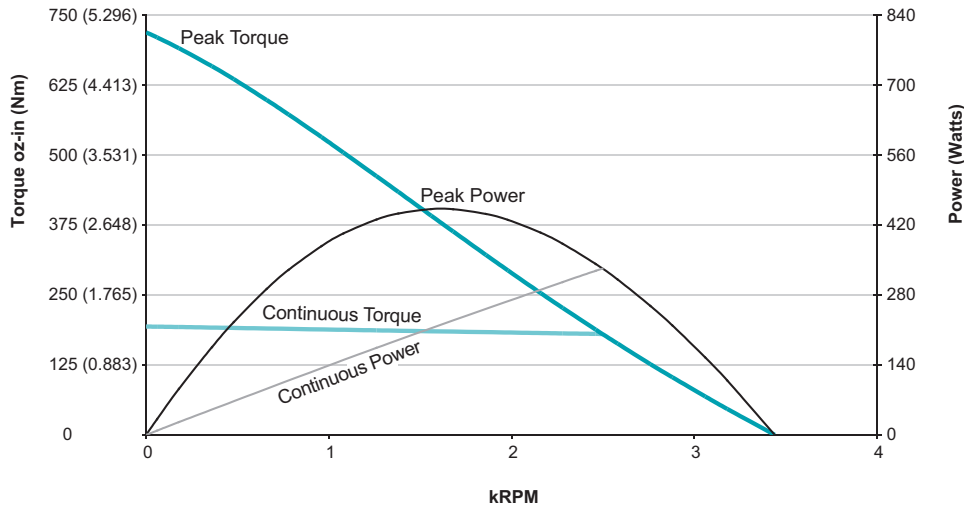
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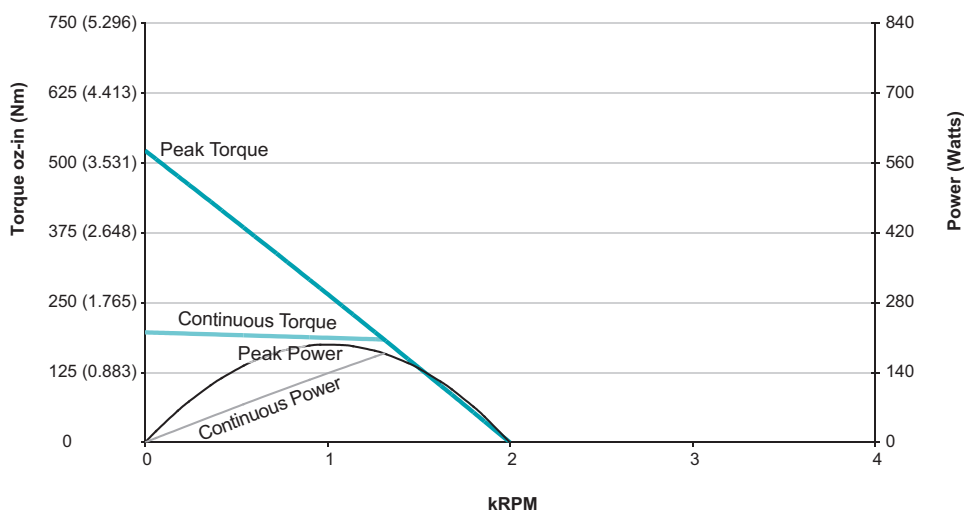
OVERVIEW
SOFTWARE
D-STYLE MOTORS
D-STYLE CONNECTIVITY
PERIPHERALS
M-STYLE MOTORS
M-STYLE CONNECTIVITY
LINEAR SYSTEMS
POWER SUPPLIES & SHUNTS
GEAR HEADS
APPENDIX



**SM34405D
at 48 VDC
at rise to 85°C**



**SM34405D
at 42 VDC
at rise to 85°C**


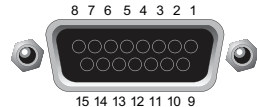
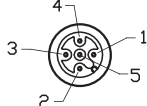
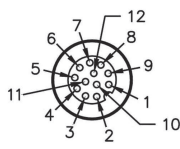


**SM34405D
at 24 VDC
at rise to 85°C**

All torque curves based on 25°C ambient.
Motors were operated using MDT (Trapezoidal Drive Mode) Commutation.
For ambient temperatures above 25°C, Continuous Torque must be linearly derated to 0% at 85°C.

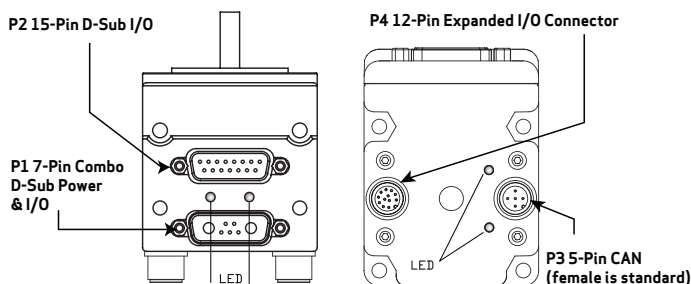
Class 5 D-Style Connector Pinouts

This table shows the pinouts for the connectors on the Class 5 D-style SmartMotors.

PIN	MAIN POWER	Specifications:	Notes:	P1
1	I/O - 6 GP, Index Input or "G" Command; For -CDS7, CAN-L only	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D	Redundant connection on I/O connector	 <p>7W2 Combo D-Sub Connector</p>
2	+5 VDC Out; For -CDS7, CAN-H only	50 mAmps Max (total)		
3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
5	Common Ground (typ. SIG Ground)			
A1	Main Power	+24-48 VDC	See NOTE	
A2	Common Ground (req'd. POWER Ground)		Must be Main Power Ground	
PIN	I/O CONNECTOR (5V TTL I/O)	Specifications:	Notes:	P2
1	I/O - 0 GP or Encoder A or Step Input		1.5 MHz Max as Encoder or Step Input	 <p>P2 DB-15 D-Sub Connector</p>
2	I/O - 1 GP or Encoder B or Direction Input		1.5 MHz Max as Encoder or Direction Input	
3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D		
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)		115.2 KBaud Max	
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
9	Phase B Encoder Output			
10	RS-232 Transmit; For -CDS/7, CAN-L only	Com ch. 0	115.2 KBaud Max	
11	RS-232 Receive; For -CDS/7, CAN-H only			
12	+5 VDC Out	50 mAmp Max (total)		
13	Common Ground (typ. SIG Ground)			
14	Common Ground			
15	Main Power: +20-48 VDC	If DE Option, Control Power separate from Main Power		
NOTE: I/O ports input impedance = 5 kohm (5 kohm pull-up resistor)				
PIN	CAN bus	Connection:	Notes:	P3
1	NC	NC		 <p>M12 5-Pin Female</p>
2	+V	NC except DeviceNet	Input current < 10 mA	
3	-V (ground, not common)	CAN Ground	Isolated	
4	CAN-H	1 MBaud Max		
5	CAN-L	1 MBaud Max		
PIN	Isolated 24 VDC I/O Connector	Max Load (sourcing)	Notes:	P4
1	I/O - 16 GP		These I/O ports also support analog input	 <p>M12 12-Pin Female End View</p>
2	I/O - 17 GP	150 mAmps		
3	I/O - 18 GP			
4	I/O - 19 GP			
5	I/O - 20 GP			
6	I/O - 21 GP			
7	I/O - 22 GP	300 mAmps		
8	I/O - 23 GP			
9	I/O - 24 GP			
10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
12	Ground-I/O (not common)		Isolated	

NOTE: These motors can operate on power down to +20 VDC, but it is not recommended due to greatly reduced performance — optimum performance is achieved at 48 VDC.

NOTE: All specifications are subject to change without notice. Consult the factory for the latest information.



CAUTION: Pins 14 and 15 are intended for use with DE series motors for control power only. Attempting to power a non-DE motor through those pins, as main servo-drive power, may result in immediate damage to the electronics, which will void the warranty.

CAUTION: Connectors P3 and P4 must be finger tightened only! DO NOT use a tool. Doing so can cause overtightening of the connection, which may damage the connector and will void the warranty.

SM34505D		
Continuous Torque	16.34	in-lb
	261	oz-in
	1.85	N-m
Peak Torque	48.19	in-lb
	771	oz-in
	5.44	N-m
Nominal Continuous Power	527	Watt
No Load Speed	3,300	RPM
Max. Continuous Current* @ 3100 RPM	14.37	Amps
Peak Power @ 2250 RPM	925	Watts
Voltage Constant	14.049	V/kRPM
Inductance	0.871	mH
Encoder Resolution	8,000	Counts/Rev
Rotor Inertia	0.03	oz-in-sec ²
	20.92	10 ⁻⁵ Kg-m ²
Weight	6.5	lb
	2.95	kg
Shaft Diameter	0.375	in
	9.53	mm
Shaft, Radial Load	15	lb
	6.80	kg
Shaft, Axial Thrust Load	3	lb
	1.36	kg
DeviceNet Available	Yes	
PROFIBUS Available		
CANopen Available	Yes	

*Default voltage is 48V. See graphs for additional voltages.



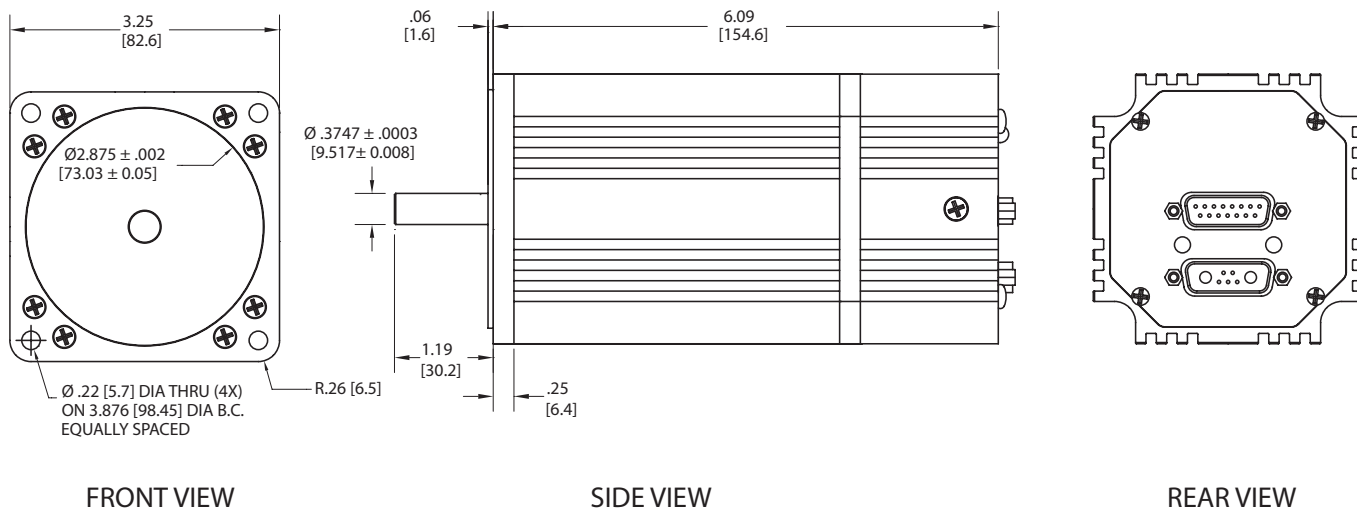
Operating temperature range: 0°C–85°C
Storage temperature range: -10°C–85°C, noncondensing

NOTE: Motor specifications are subject to changes without notice. Consult website and factory for latest data.

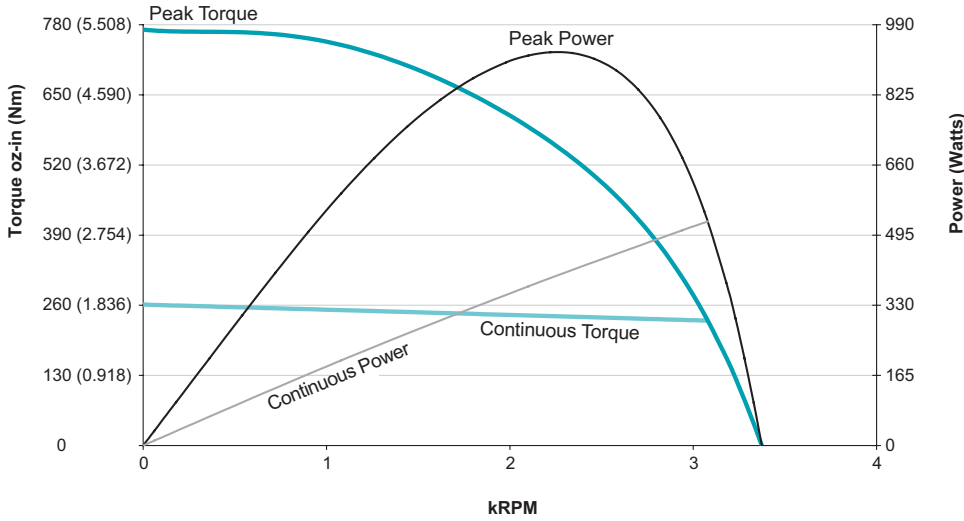


Moog Animatics SmartMotor SM34505D (No Options) CAD Drawing

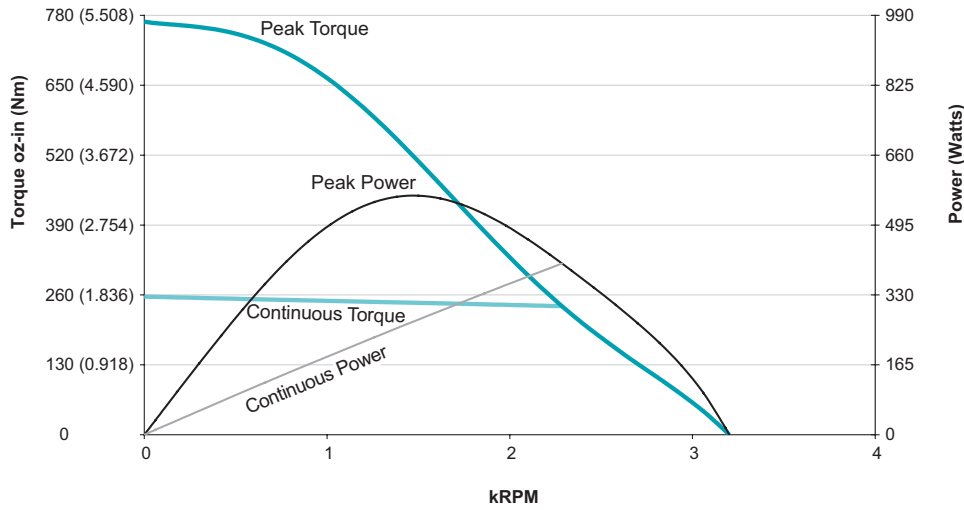
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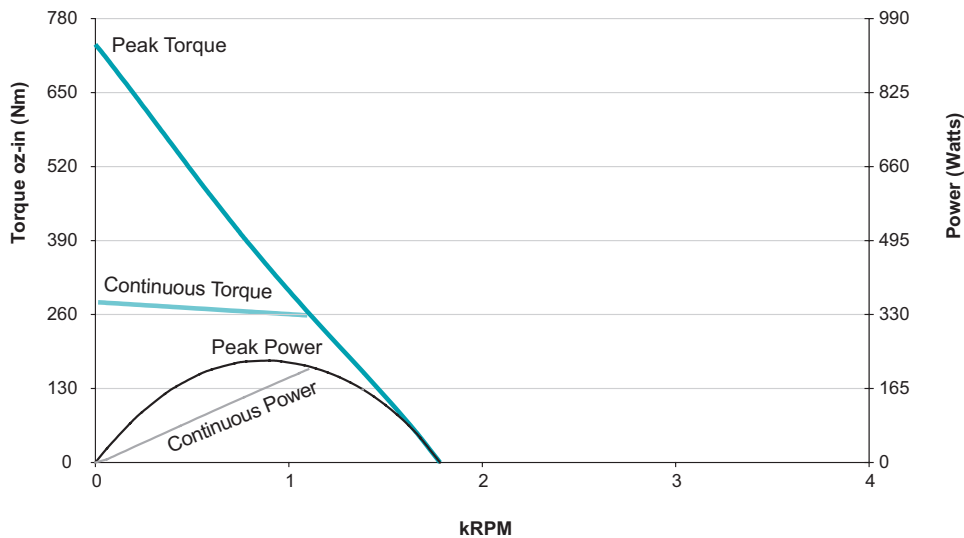
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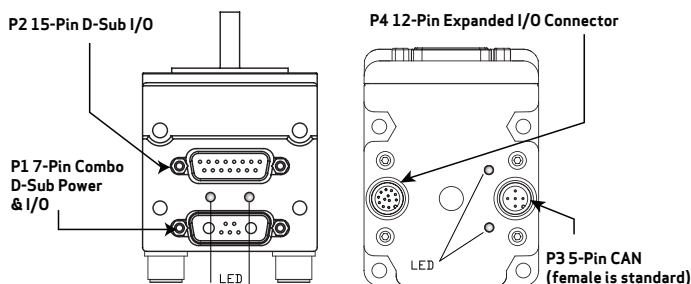
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3	RS-232 Transmit	Com ch. 0	115.2 KBaud Max	
4	RS-232 Receive			
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3	I/O - 2 Positive Over Travel or GP			
4	I/O - 3 Negative Over Travel or GP	25 mAmp Sink or Source 10 Bit 0-5 VDC A/D		
5	I/O - 4 GP, IIC (SDA) or RS-485 A (Com ch. 1)		115.2 KBaud Max	
6	I/O - 5 GP, IIC (SCL) or RS-485 B (Com ch.1)			
7	I/O - 6 GP, Index Input or "G" Command		Redundant connection on Main Power Connector	
8	Phase A Encoder Output	24 mAmp Sink or Source		
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10	I/O - 25 GP			
11	+24 Volts Input	18-32 VDC		
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