

# CLASS 5 S-STYLE SMARTMOTOR™

Affordable IP65\* protection, combined with the proven benefits of the SmartMotor™ series.

European Version



## SM23165Sx-x SM34165Sx-x

The fully-featured and integrated Class 5 S-Style SmartMotor™ with IP65\* protection is available in frame sizes NEMA 23 and 34. The SmartMotor™ products come equipped with industry-standard M connectors, as well as an optional brake.

The S-Style SmartMotor™ servos share many of the same components as the Class 5 D-style motors, which don't have IP protection. This significantly reduces production costs and sales prices, resulting in an excellent price-performance ratio.

The S-Style SmartMotor™ is suited for most applications where IP65\* sealing is required. Additionally, the positioning of the rear-mounted M connectors, located at the back of the aerodynamically shaped cap, opens up new assembly options in confined spaces.

### Features:

- IP65\* protection
- Fully integrated brushless DC motor
- Robust and industry standard metric connectors
- Extended installation options available
- Sizes NEMA 23 and 34 available
- Combitronic™ technology is available on some models
- DE is standard, allows separate power supplies for motor and controller

The Class 5 S-Style SmartMotor™ includes all the benefits of our fully-integrated Class 5 design along with IP65\* protection. It will efficiently solve your dust/wet-environment, motion-control applications and quickly get your products to market, providing high value for both you and your customers.

*\*The motor shaft is not sealed and must be mated to a sealed surface or mounted in a shaft-down orientation.*

### ADVANTAGES

- Fully integrated, compact motion system
- IP65\* sealing at an excellent price-performance ratio
- High noise immunity
- Low electrical noise emissions
- Very high tuning bandwidth (very stable)
- Full Class 5 controls with ability to handle complex applications

### APPLICATIONS

- Wet surroundings (e.g., food industry, papermaking, painting machines)
- High dust exposure (e.g., lumber industries, warehousing and logistics)
- Outdoors (e.g., sliding and access systems, vehicles, radar units)

# SPECIFICATIONS

## TECHNICAL DATA

Dimension	Unit	SM23165S-x	SM23165ST-x	SM34165S-x	SM34165ST-x
Continuous Torque	Nm	0.28	0.52	1.09	1.45
Nominal Continuous Power	W	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
Terminal Resistance	Ohm	1.00	0.70	0.60	0.06
Encoder Resolution*	Counts/rev	4,000	4,000	8,000	8,000
Rotor Inertia	10 <sup>-5</sup> kg m <sup>2</sup>	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
Weight	kg	0.62	0.70	2.50	2.72
Communication Protocol	-	CANopen			

The specifications of the S-Style SmartMotor™ differ depending on the winding type:

\*Encoder type: incremental optical

SM23165S-x / SM34165S-x: standard winding, optimized for 48 V

SM23165ST-x / SM34165ST-x: winding for maximum torque and optimized for 48 V

SM23165SH-x / SM34165SH-x: standard winding, optimized for 24 V (upon request)

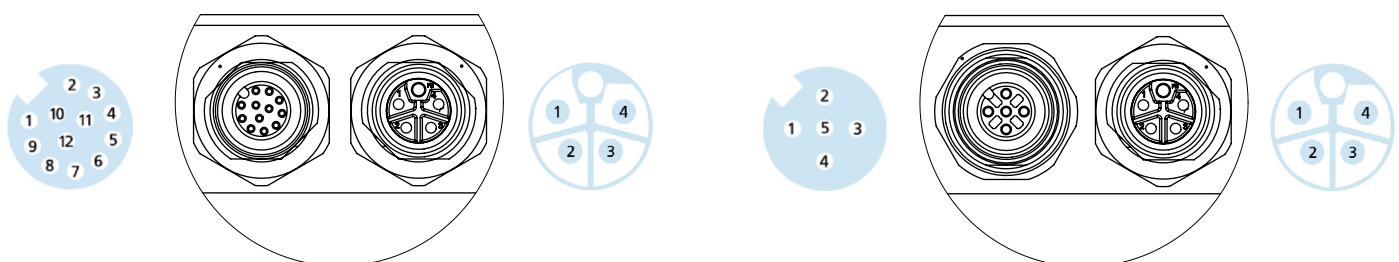
SM23165SHT-x / SM34165SHT: winding for maximum torque and optimized for 24 V (upon request)

## OPTIONS

In addition to the winding options, all S-style motors can be configured:

1. With or without brake (see outline drawings)
2. With 12- or 5-pole sockets, depending on desired communication/control options

For details, see Ordering Code on page 7.



left side: 12-pole female socket - communication & I/O  
right side: 4-PIN male connector - power

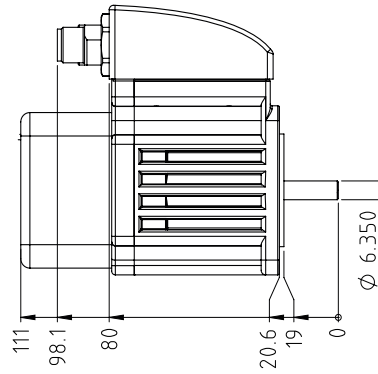
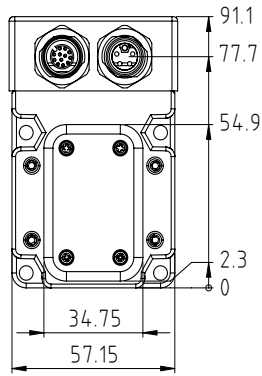
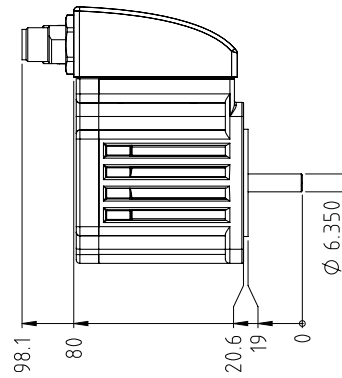
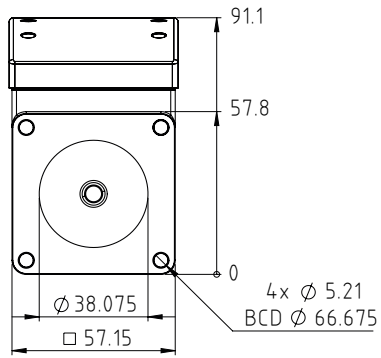
left side: 5-pole female socket - CAN Bus  
right side: 4-PIN male connector - power

# SPECIFICATIONS

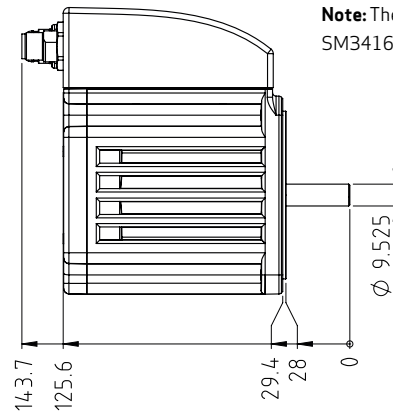
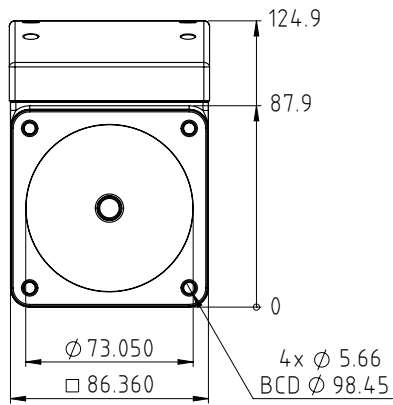
## OUTLINE DRAWINGS

(All dimensions in mm)

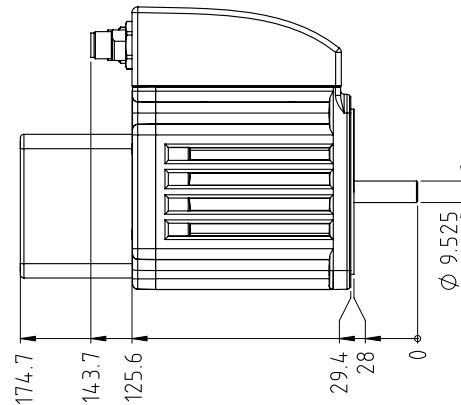
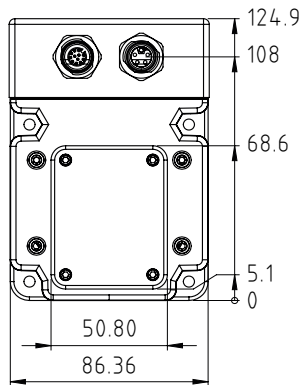
### SM23165Sx-x



### SM34165Sx-x



**Note:** The shaft diameter of the SM34165ST-x is 12.70 mm.

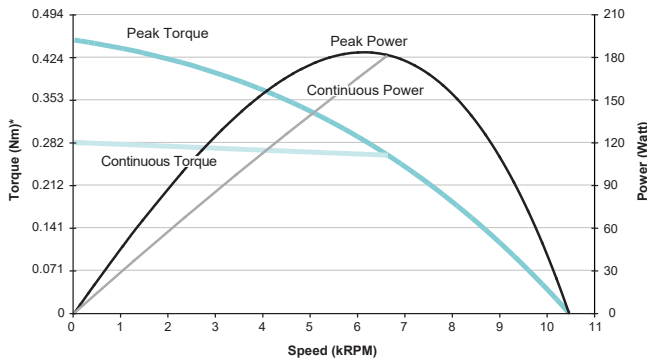


# SPECIFICATIONS

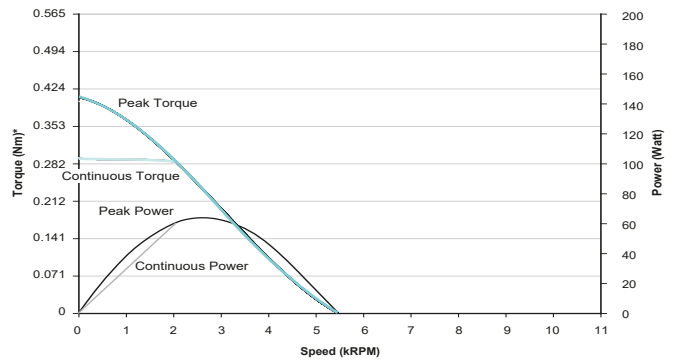
## PERFORMANCE TORQUE AND POWER CURVES

SM23165 S-x

Standard Winding for 48 V, Operating With 48 V

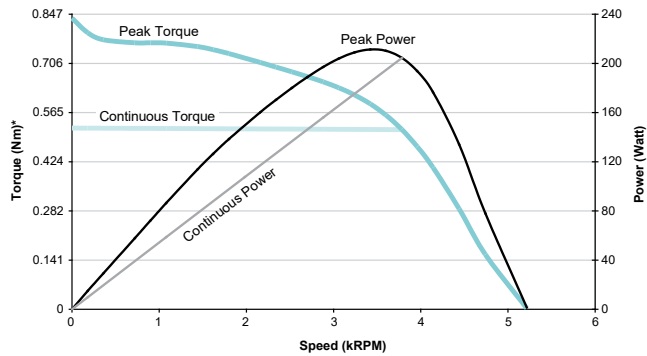


Standard Winding for 48 V, Operating With 24 V

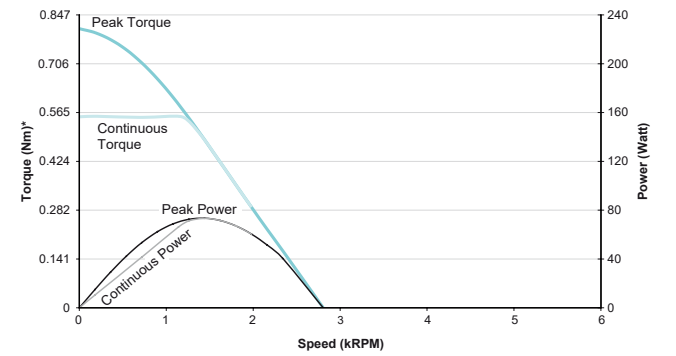


SM23165ST-x

Winding for Max. Torque and 48 V, Operating with 48 V

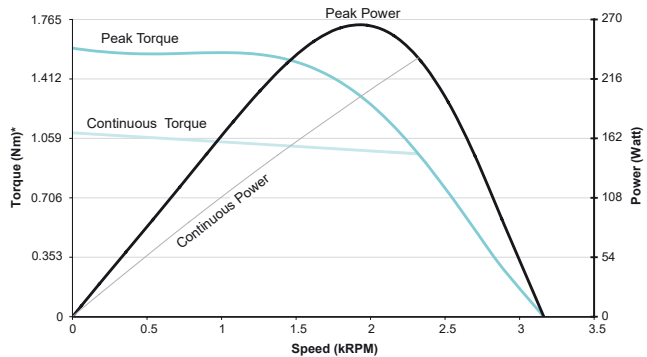


Winding for Max. Torque and 48 V, Operating with 24 V

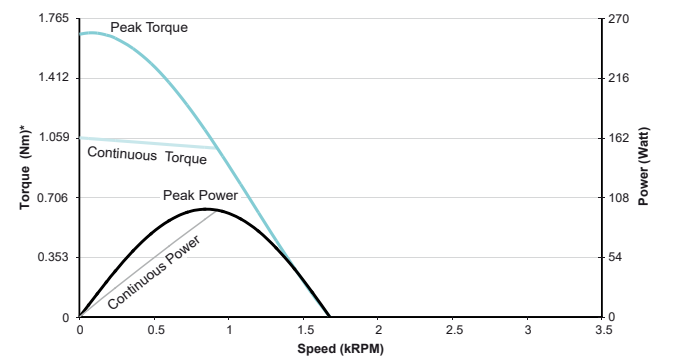


SM34165S-x

Standard Winding for 48 V, Operating With 48 V

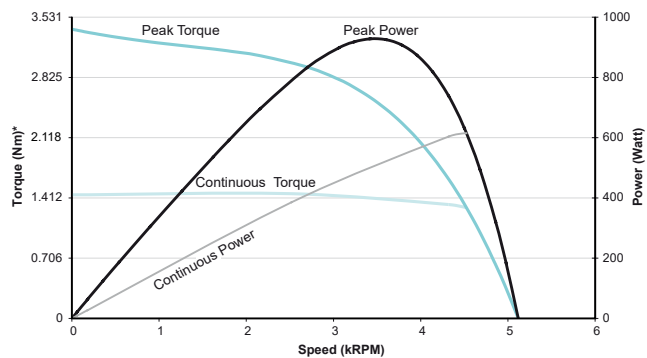


Standard Winding for 48 V, Operating With 24 V

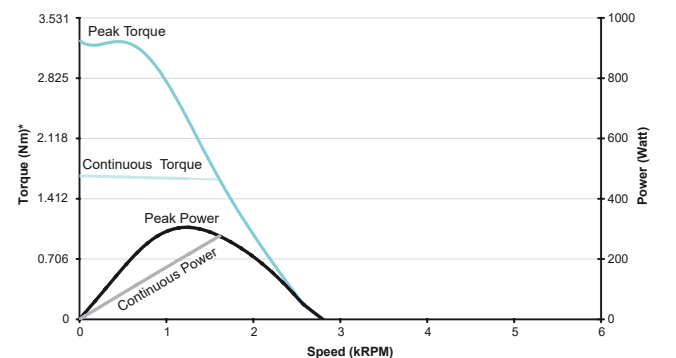


SM34165ST-x

Winding for Max. Torque and 48 V, Operating with 48 V



Winding for Max. Torque and 48 V, Operating with 24 V



\*The decimal numbers for the Nm data result from the conversion of the original in-oz data.

All torque curves based on 25°C ambient.  
 For ambient temperatures above 25°C, continuous torque must be linearly derated to 0% at 85°C.  
 Operating temperature range: from 0 to 85°C  
 Storage temperature range: from -10 to 85°C, non-condensing  
 Motors were operated using MDT (Trapezoidal Drive Mode) Commutation.

## CABLES

The following cable types only give you a first overview of our comprehensive offer. Just contact us and our sales team will be happy to help you choose the correct connections.

### Power Supply\*



CBLIP-S-GE-PWR-FL-xM  
Straight Flying Lead Cable  
Cable lengths: 2 m | 5 m | 10 m



CBLIP-S-GE-PWR-FL-xMR  
Angled Flying Lead Cable  
Cable lengths: 2 m | 5 m | 10 m



CBLIP-S-GE-PWR-EXT-xM  
Extension Cable  
(R-S|R-R|S-S|S-R)  
Cable lengths: 2 m | 5 m | 10 m



CBLIP-S-GE-PWR-h-FFM



CBLIP-S-GE-PWR-h-FFM



CBLIP-S-GE-PWR-H-FFFM

\* All power cables are L-coded.

### Legend

R	Angled
CAN	Controller Area Network
CBLIP	Cable IP
EXT	EXTension
FL	Flying Lead
IO	Input/Output
PWR	Power
S	Straight
xM	x meter - x is a placeholder for the length specification

### Communication & I/O



CBLIP-S-GE-IO-FL-xM  
Straight Flying Lead Cable  
Cable lengths: 2 m | 5 m | 10 m



CBLIP-S-GE-IO-FL-xMR  
Angled Flying Lead Cable  
Cable lengths: 2 m | 5 m | 10 m



CBLIP-S-GE-IO-EXT-xM  
Extension Cable  
(R-S|R-R|S-S|S-R)  
Cable lengths: 2 m | 5 m | 10 m

### CAN



CBLIP-S-GE-CAN-T-FMM



CBLIP-S-GE-CAN-FL-xM  
Straight Power Flying Lead Cable  
Cable lengths: 2 m | 5 m | 10 m



CBLIP-S-GE-CAN-FL-xMR  
Angled Power Flying Lead Cable  
Cable lengths: 2 m | 5 m | 10 m




CBLIP-S-GE-CAN-TRF  
CBLIP-S-GE-CAN-TRM

The exact specification for extension cables is defined at the end of the designation sequence - [socket][connector].

Example: CBLIP-S-GE-IO-EXT-1M-SR

It is therefore an IO connection cable with 1 meter length, straight socket and angled connector.

# PART NUMBERING GUIDELINE

<b>SM</b>	<b>23</b>	<b>16</b>	<b>5</b>	<b>S</b>	<b>T</b>	-	<b>BRK</b>	-	<b>I06</b>
	<b>NEMA Frame Size: 23 or 34</b>	<b>Motor: 16</b>	<b>Processor Class: 5</b>	<b>Connector Style: S</b> S = sloped cap and sealed All S-Style motors have IP65* protection and metric axial connectors DE is standard	<b>Winding Type:</b> - 48 V winding <b>T</b> 48 V winding High torque <b>x</b> 24 V winding (upon request) <b>xT</b> 24 V winding High torque (upon request)		<b>Break:</b> - <b>BRK</b>		<b>Configuration ID:</b> <b>I06</b> CAN In and 6xIO <b>C</b> Only CAN <b>EO</b> Encoder Out and 6xIO - CAN In and out and 4xIO

\* shaft not sealed



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

[info.mm@moog.com](mailto:info.mm@moog.com)  
+49 (0) 8331 98480-0

For product and service information, visit  
[www.moog-memmingen.com](http://www.moog-memmingen.com)

Moog is a registered trademark of Moog Inc. and its subsidiaries. All trademarks as indicated herein are the property of Moog Inc. and its subsidiaries. ©2022 Moog Inc. All rights reserved. All changes are reserved.

This technical data is based on current available information and is subject to change at any time. Specifications for specific systems or applications may vary.

Moog Animatics Class 5 S-Style SmartMotor™  
PIM/Rev. B, April 2022, CDL60079-en

