

## Model Numbers

**SM 040 1 A E2 - K CD- N N V**

**Series**

**SM** Servo Motor Medium Inertia

**Frame Size**


**040** 40 mm  
**060** 60 mm  
**080** 80 mm

**Motor Length**

**1** 1 Stack All Frame Sizes  
**2** 2 Stacks All Frame Sizes  
**3** 3 Stacks 80mm only  
**4** 4 Stacks 80mm only

**Winding (See motor rating tables for available windings)**

Basic Bus Voltage  
**A** 320 VDC (230 VAC) Lower Current  
**B** 240 VDC  
**C** 160 VDC (115 VAC)  
**D** 120 VDC  
**E** 80 VDC  
**F** 60 VDC  
**G** 48 VDC  
**H** 36 VDC  
**J** 24 VDC Higher Current



**Feedback**

**E2** 2500 ppr Optical Encoder with Separate Commutation Signals  
**E4** 2500 ppr Optical Encoder with Shared Commutation Signals  
**MA** Absolute Multi Turn Tamagawa Encoder - **SM060 & SM080 Motors**  
**MB** Absolute Multi Turn Heidenhain EnDat 2.2 Encoder - **SM060 & SM080 Motors**

**Shaft**

**K** Standard Keyway

**Connections (Lead Style / Connector Style)**

**CD** 300mm (12") Shielded Cables with Non - Sealed Connectors - For Windings up to 6.5 Amps  
**CF** 300mm (12") Shielded Cables with Non - Sealed Connectors - For Windings 6.6 to 12.5 Amps  
**CM** 300mm (12") Shielded Cables with Sealed Metal Connectors

**Brake**

**N** No Brake  
**B** 24 VDC Brake

**Temperature Sensor**

**N** No Sensor

**Shaft Seal**

**V** Shaft seal shipped with motor, but not placed on shaft

## SM040 Series: 40mm, 60-100 Watts

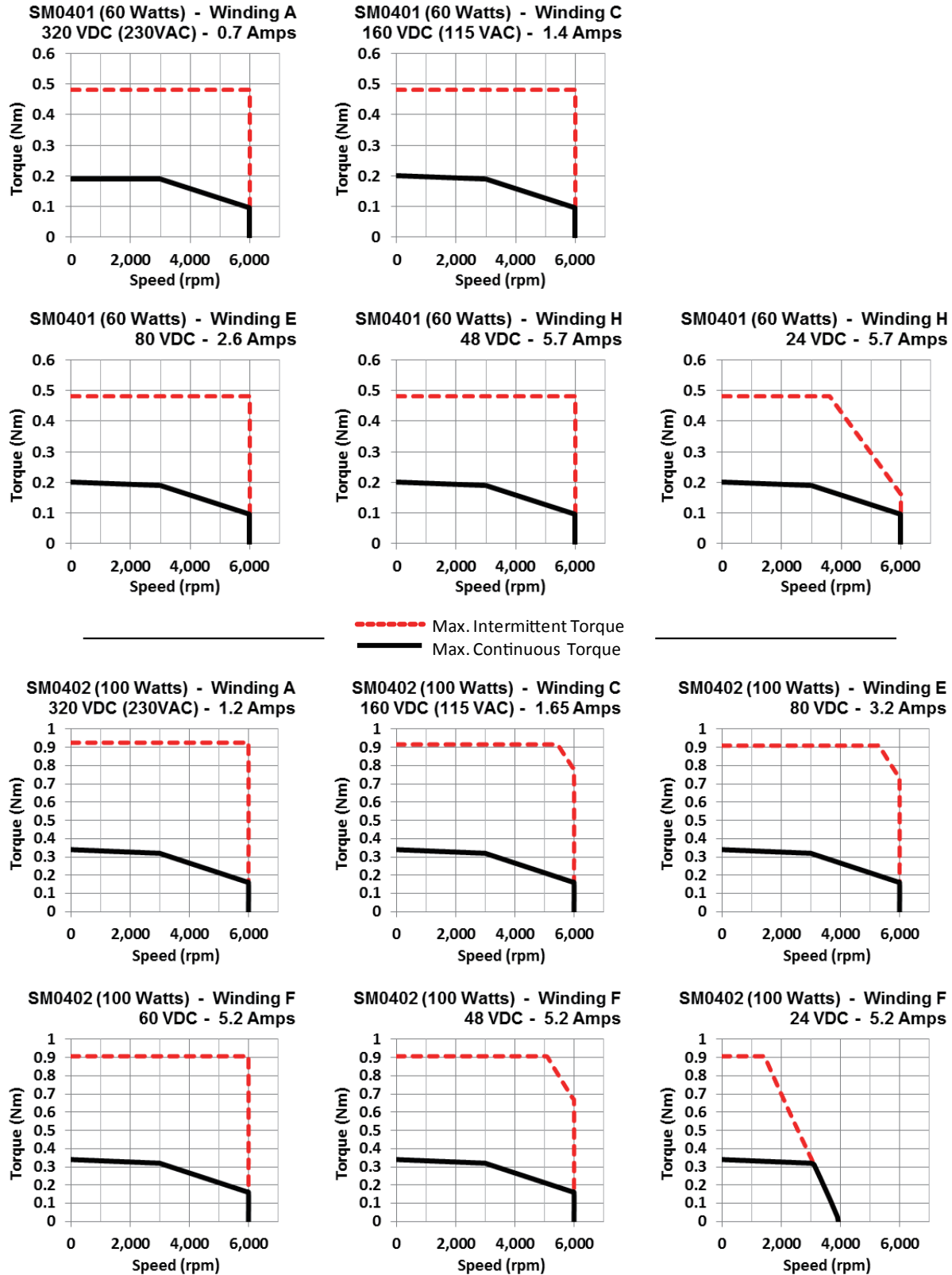


UL File Number	E465363
Insulation Class	B (130°C)
IP rating	IP65 (except shaft without seal and non-sealed connectors)
Installation location	Indoors, free from corrosive gas, inflammable gas
Ambient temperature	Operating 0 to 40°C, Storage -20 to 80°C
Ambient humidity	85%RH or lower (free from condensing)
Altitude (maximum)	Operating 1,000m
Vibration Resistance	49 m/s <sup>2</sup>
Rotor Poles	8

Series		SM0401 - 60 Watt				SM0402 - 100 Watt			
Preferred Model & Winding Letter		^ A	^ C	E	^ H	^ A	^ C	E	^ F
Base Model Number (with 2500 PPR incremental encoder non-sealed plastic connectors, no brake)		SM0401 AE2-KCD- NNV	SM0401 CE2-KCD- NNV	SM0401 EE2-KCD- NNV	SM0401 HE2-KCD- NNV	SM0402 AE2-KCD- NNV	SM0402 CE2-KCD- NNV	SM0402 EE2-KCD- NNV	SM0402 FE2-KCD- NNV
Typical Supply Voltages		208-240 VAC	120 VAC	60-90 VDC	24-48 VDC	208-240 VAC	120 VAC	60-90 VDC	24-80 VDC
Basic DC Bus Voltage	V (dc)	320	160	80	36	320	160	80	60
Rated Output Power	watts	60	60	60	60	100	100	100	100
Rated Speed	rpm	3000	3000	3000	3000	3000	3000	3000	3000
Max. Mechanical Speed	rpm	6000	6000	6000	6000	6000	6000	6000	6000
Rated Torque	Nm	0.19	0.19	0.19	0.19	0.32	0.32	0.32	0.32
Continuous Stall Torque	Nm	0.19	0.2	0.2	0.2	0.34	0.34	0.34	0.34
Peak Torque	Nm	0.48	0.48	0.48	0.48	0.93	0.92	0.91	0.91
Rated Current	A (rms)	0.7	1.4	2.6	5.7	1.2	1.65	3.2	5.2
Continuous Stall Current	A (rms)	0.7	1.5	2.8	6	1.27	1.8	3.4	5.6
Peak Current	A (rms)	1.75	3.5	6.5	14.3	3.6	4.95	9.6	15.6
Voltage Constant ±5%	V (rms) / K rpm	17	8.6	4.6	2.1	16.6	12	6.1	3.8
Torque Constant ±5%	Nm / A (rms)	0.283	0.143	0.077	0.035	0.271	0.195	0.1	0.061
Winding Resistance (Line-Line)	Ohm ±10% @25°C	27	6	1.67	0.36	9.7	4.9	1.23	0.48
Winding Inductance (Line-Line)	mH (typ.)	26	6.6	1.88	0.39	11.5	5.9	1.56	0.58
Inertia (with encoder)	kg m <sup>2</sup>	0.0232 X 10 <sup>-4</sup>				0.0428 X 10 <sup>-4</sup>			
Inertia - With Brake Option	kg m <sup>2</sup>	0.0298 X 10 <sup>-4</sup>				0.0494 X 10 <sup>-4</sup>			
Thermal Resistance (mounted)	°C / W	2.9				2.4			
Thermal Time Constant	Minutes	12				14.5			
Heat Sink Size	mm	120 x 120 x 5 Aluminum				120 x 120 x 5 Aluminum			
Shaft Load - Axial	(max.)	50 N / 11 Lb				50 N / 11 Lb			
Shaft Load - Radial (End of Shaft)	(max.)	50 N / 11 Lb				60 N / 13.5 Lb			
Weight (with std. encoder)		0.4 kg / 0.9 Lb				0.55 kg / 1.2 Lb			
Weight - With Brake Option		0.65 kg / 1.4 lb				0.8 kg / 1.8 lb			

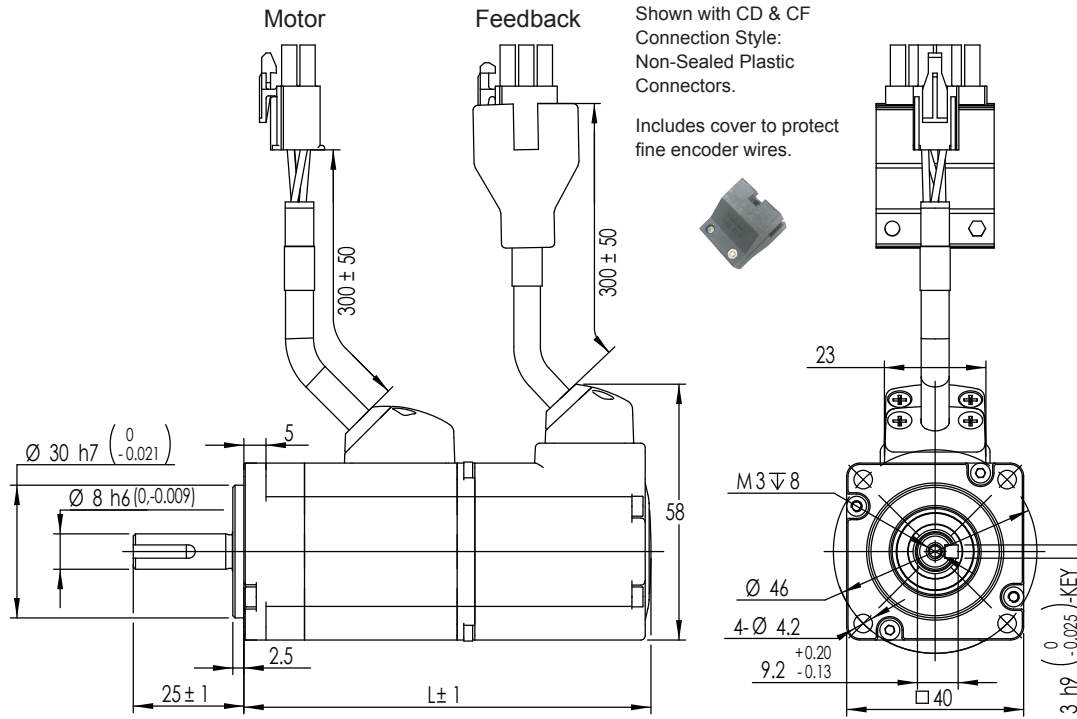
Shaft Load: (L<sub>10</sub> life, 20,000 hours, 2,000 RPM)

## SM040 Series: 40mm, 60-100 Watts



## SM040 Series: 40mm, 60-100 Watts

### Motor Dimensions – No Brake: mm



Motor Length-Without Brake

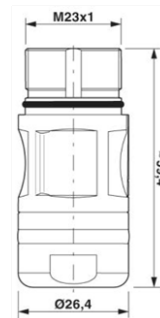
Motor Series	L (mm)
SM0401, 60 Watt	92
SM0402, 100 Watt	109

### Optional CM Connection Style: Sealed Metal Connectors

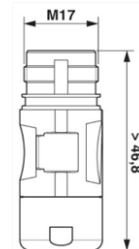
These rugged connectors provide more protection

- IP65 sealed
- Better protection from EMI / RFI noise, for use over longer distances
- Metal housings provide more mechanical protection
- Metal housings form a continuous electrical shield
- Cable shields are connected to the connector housings

Motor Connector  
(Includes Optional Brake)



Feedback Connector



## SM040 Series: 40mm, 60-100 Watts

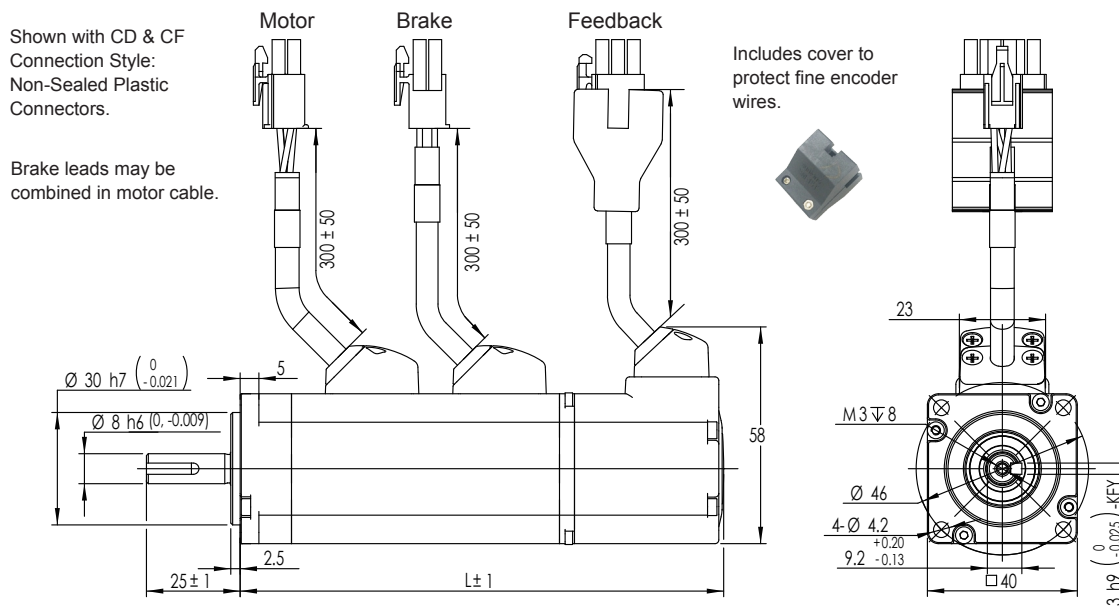
### Brake Specifications:

This is a holding brake. Brake Releases when energized. Do NOT engage when motor is rotating.

Brake power is not polarity sensitive.

Static Friction Torque	0.35 Nm
Rated Voltage	24 VDC
Rated Current	0.25 A
Engage Time	At nominal air gap @20°C - < 25ms (As brakes are out of box)
Release Time	Without diode - < 25 ms (During E-stop condition)
Release Voltage	18.5 VDC max (at 20°C)

### Brake Motor Dimensions: mm



### Motor Length-With Brake

Motor Series	L (mm)
SM0401, 60 Watt	129
SM0402, 100 Watt	147