

Brushless DC Motors with Integral Drive

KinetiMax 24 EB Series

24 mm diameter, 6 mNm max. torque, up to 2.7 W output power

The KinetiMax 24 EB is an extremely compact brushless DC motor with integrated drive electronics. This motor is an outer-rotor motor with a robust bearing system capable of handling high side loads.

The KinetiMax 24 EB employs an external rotor and iron core stator to maximize torque production.

High quality components ensure a minimum operating life of 20,000 hours. The KinetiMax 24 EB is a good choice for many types of small pumps, laser scanners, small high performance fans, blowers and medical equipment.

Options & Accessories

- Customized shaft
- Customized mounting flange
- Custom leads and connector configurations
- Special winding configurations
- Gearbox



Features & Benefits

- Outer-rotor, precision 24 mm diameter brushless DC motors with integrated drive electronics
- Rated up to 2.7W power output at 4300 RPM nominal speed
- 6, 12 or 24 VDC winding choice
- 2-wire version is as simple to control as a DC motor, needing only a DC voltage to operate
- Protection against voltage reversal
- Low EMI – complies with EN 55014-1/2, 61000-6-1/3
- IP30 level protection sealing
- 5-wire speed control version
- Integrated electronics with control input
- Tachometer output (18 pulses per rev) for speed monitoring
- Input to enable direction reversal

KinetiMax 24 EB – Specifications

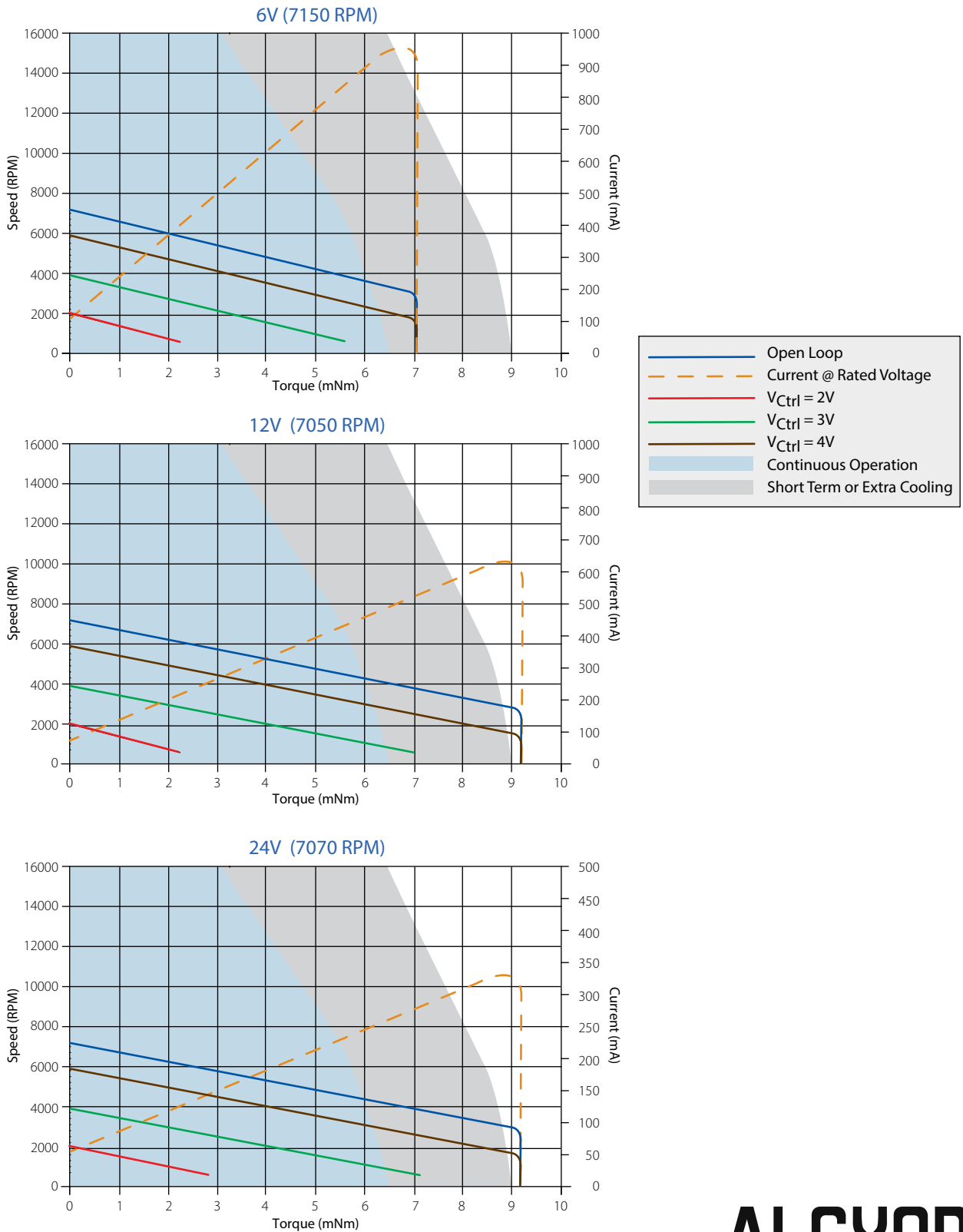
Model	2-wire CW Rotation	KMX-01621492	KMX-01621512	KMX-01621532
	2-Wire CCW Rotation	KMX-01621502	KMX-01621522	KMX-01621542
	5-Wire	KMX-01621513	KMX-01621523	KMX-01621533
Voltage VDC	Nominal	6	12	24
	Range ¹	5.5 – 9	7 – 17	10 – 28
Rated Output Power	W	2.2	2.7	2.7
Torque mNm (oz.in.)	Rated	5 (0.70)	6 (0.85)	6 (0.85)
	Max	7 (0.99)	9 (1.27)	9 (1.27)
Torque Constant	mNm/A (oz.in./A)	7.6 (1.07)	15.7 (2.16)	31.4 (4.45)
Speed RPM	Rated	4200	4250	4300
	No-load	7150	7050	7070
Current mA	Rated	750	445	230
	Max	950	630	330
	No-load	105	62	40
Rotor Inertia	kgm ² (oz.in.s ²)	0.77 E-6 (1.09 E-4)		
Mechanical Time Constant	ms	47	35	35
Thermal Resistance	°C/W Housing-Ambient	25.5		
Weight	g (oz)	30 (1.06)		
Protection Level		IP30		
Control Input ² V	Range	0 - 5		
	Threshold	1		
Direction Input V	CW	High ≥3.5		
	CCW	Low ≤1.5		
Speed Output Signal ²	PPR	18		
Operating Temperature Range	°C (°F)	0 – 90 (32 – 194)		
Thermal Limit Protection	°C	N/A (Maintain maximum motor housing temperature ≤ 90 °C)		

Values valid for nominal voltage and $T_{amb} = 22\text{ °C}$

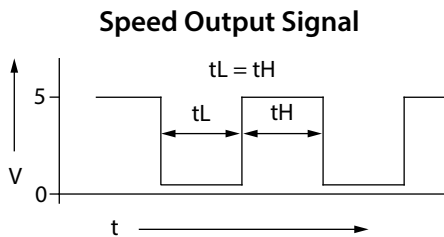
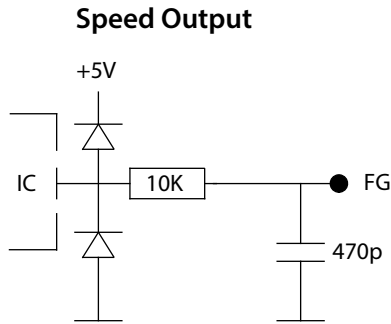
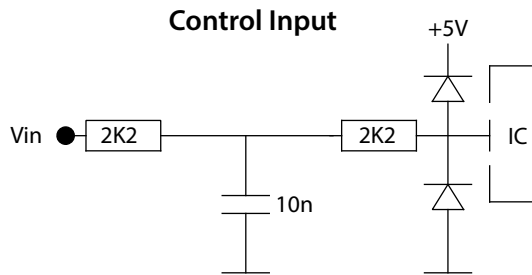
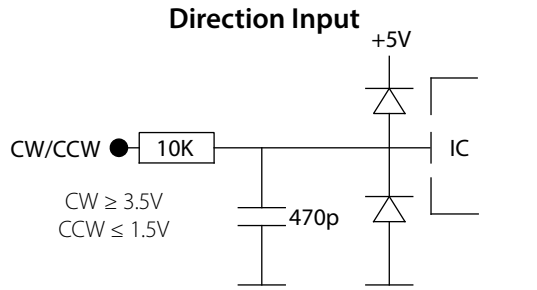
¹ Power supply provided with appropriate 68 μF buffer capacitor between supply voltage and common to comply with EN 55014-1/2

² Applicable for 5 wire versions only

KinetiMax 24 EB – Performance

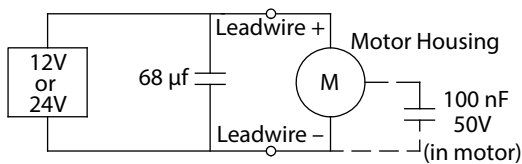


KinetiMax 24 EB – I/O Schematics



EMC

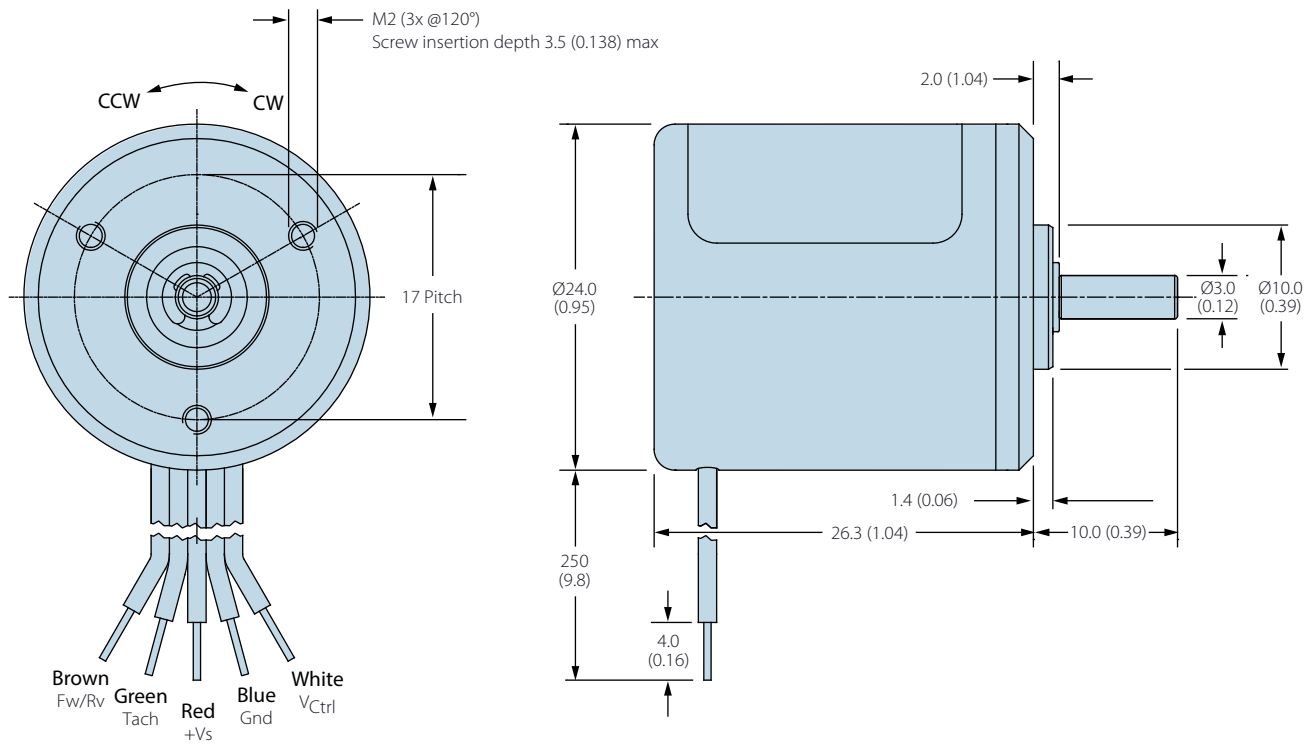
To meet EMC directive EN 55014, the power supply must be provided with a capacitor 68 μ F, 35V at the output:



KinetiMax 24 EB – Electrical Connections

Version	Description	Wire Color (AWG 26)
2-Wire (CW & CCW)	Supply Voltage (+Vs)	Red
	Common (GND, ground)	Blue
5-Wire	Supply Voltage (+Vs)	Red
	Common (GND, ground)	Blue
	Control input (V_{Ctrl} , V)	White
	Speed output (Tach, FG)	Green
	Direction input (CW/CCW)	Brown

KinetiMax 24 EB Dimensions — mm (in)



Brushless DC Motors with Integral Drive

KinetiMax 32 EB Series

*32 mm diameter, 32 mNm max. torque, up to 16 W output power
single or dual shaft configurations*

The KinetiMax 32 EB is an extremely compact brushless DC motor with integrated drive electronics. The outer-rotor design features a robust bearing system capable of handling high side loads. Models are available with 12 or 24 VDC windings, with either single or dual output shafts, for either clockwise or counterclockwise rotation. The series is offered in 2-wire and multi-wire versions for speed monitoring and direction control.

High quality components ensure a minimum operating life of 20,000 hours. The continuous output torque of 32 mNm at a constant speed of 4750 RPM makes this motor ideal for small membrane and peristaltic pumps, laser scanners, blower-fan and medical applications.

Options & Accessories

- Customized shaft
- Customized mounting flange
- Custom leads and connector configurations
- Special winding configurations
- Encoder and/or gearbox



Features & Benefits

- Small precision 32 mm dia., outer rotor, brushless DC motor with integrated drive
- Rated 32 mNm (4.5 oz-in) and 16 W output at 4750 RPM
- 12 or 24 VDC winding choice
- Integrated speed control loop with a speed set input to adjust motor speed from 250 to 6000 RPM
- Two-wire version is as simple to control as a DC motor, needing only a DC voltage to operate
- Four-wire version with tachometer output (18 pulses per rev) for speed monitoring
- Five-wire version with tachometer output (18 pulses per rev) for speed monitoring and direction input
- IP54 level protection sealing
- Thermal overload protection with automatic recovery
- Reverse supply voltage protection
- Low EMI – complies with EN 55014-1/2, 61000-6-1/3

KinetiMax 32 EB – Specifications

		2-Wire		4-Wire		5-Wire		
Single Shaft Models	CW Rotation	4322 016 30421	4322 016 30423	KMX-01630425	KMX-01630427	4322 016 30429	4322 016 30430	
	CCW Rotation	4322 016 30422	4322 016 30424	KMX-01630426	KMX-01630428			
Double Shaft Models	CW Rotation	4322 016 30431	4322 016 30433	KMX-01630435	KMX-01630437	—	—	
	CCW Rotation	4322 016 30432	4322 016 30434	KMX-01630436	KMX-01630438	—	—	
Voltage VDC	Nominal	12	24	12	24	12	24	
	Range ¹	10 - 18	10 - 28	10 - 18	10 - 28	10 - 18	10 - 28	
Rated Output Power	W	12	16	12	16	12	16	
Torque mNm (oz.in.)	Rated	32 (4.67)						
	Max	40 (5.66)	50 (7.08)	40 (5.66)	50 (7.08)	40 (5.66)	50 (7.08)	
Torque Constant ²	mNm/A (oz.in./A)	26 (3.68)	41 (5.81)	N/A	N/A	N/A	N/A	
Speed RPM	Rated	3450	4750	3450	4750	3450	4750	
	No-load	4600	6000	4600	6000	4600	6000	
Current mA	Max	Rated	1420	920	1420	920	1420	920
		Sgl Shaft	1600	1300	1600	1300	1600	1300
	Dbl Shaft	1600	1300	1600	1300	—	—	
	No-load	Sgl Shaft	160	130	160	130	160	130
Dbl Shaft		170	140	170	140	—	—	
Rotor Inertia	kgm ² (oz.in.s ²)	4.7 E-6 (7 E-4)						
Mechanical Time Constant	ms	12	9	12	9	12	9	
Thermal Resistance	°C/W Housing-Ambient	13						
Weight	g (oz)	Single Shaft: 113 (4.0)		Double Shaft: 125 (4.4)		113 (4.0)		
Protection Level		IP54						
Direction Input V	CW	Low < 1						
	CCW	High > 4						
Speed Command	Ratio ³	RPM/V	N/A		1000		1000	
	Range ^{3,4}	V	N/A		0 - 7		0 - 7	
	Threshold ³	V	N/A		0.2		0.2	
Speed Output Signal ³	PPR	N/A		18		18		
	Low Time	µsec	N/A		18		18	
Operating Temperature Range	°C (°F)	0 – 90 (32 – 194)						
Thermal Limit Protection	°C (°F)	90 (194) flange temp. / 80 (176) restart						

Values valid for nominal voltage and $T_{amb} = 22^{\circ}\text{C}$

¹ Power supply provided with appropriate 1000 µF buffer capacitor between supply voltage and common to comply with EN 55014-1/2; protection against wrong connection up to ±28 volt

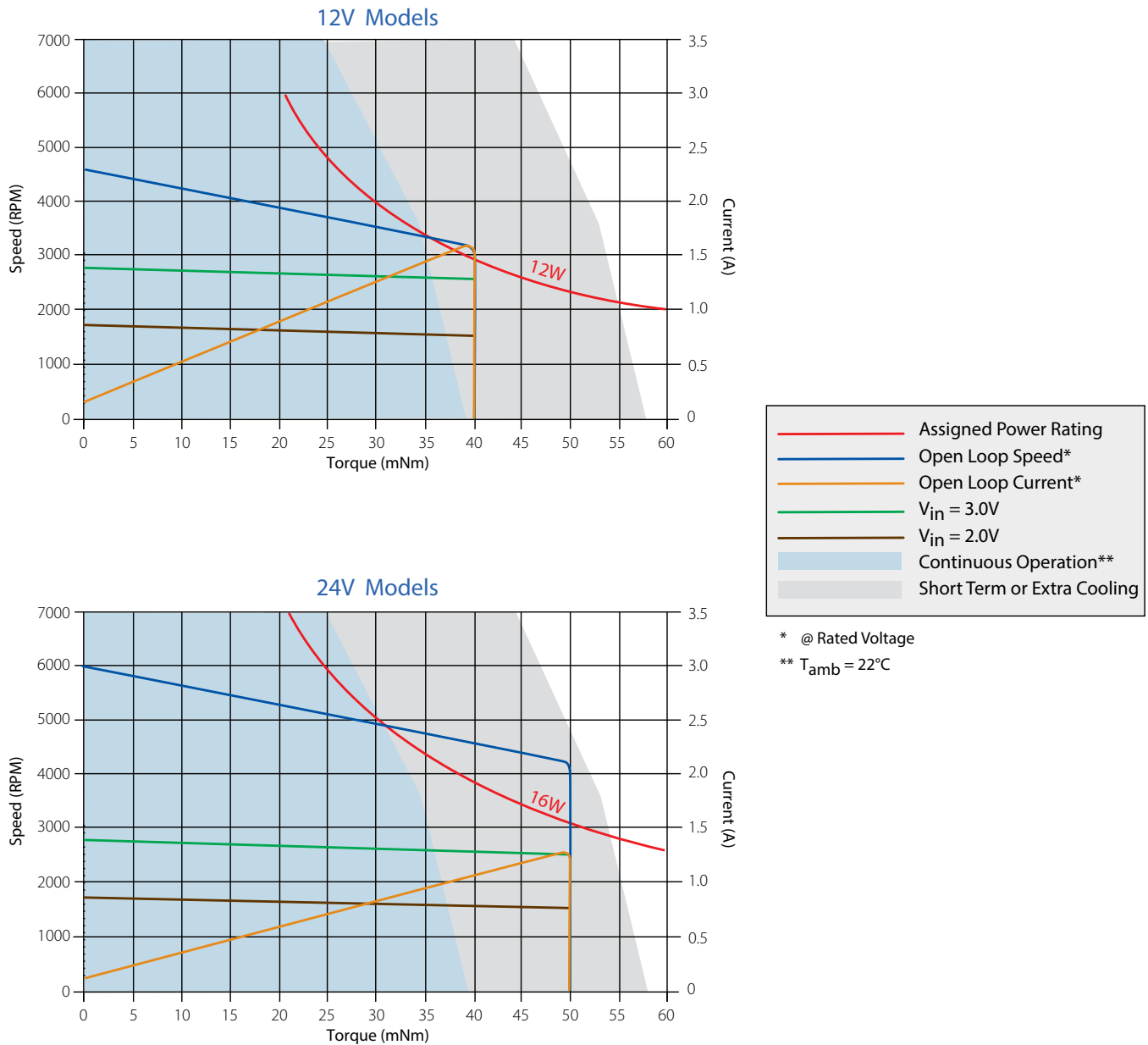
² Applicable for 2 wire version only

³ Applicable for 4 wire version only

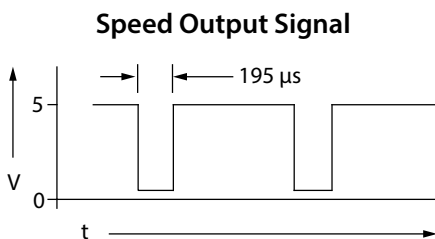
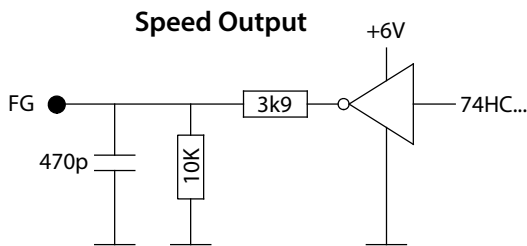
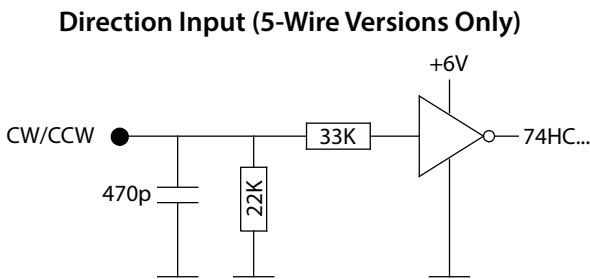
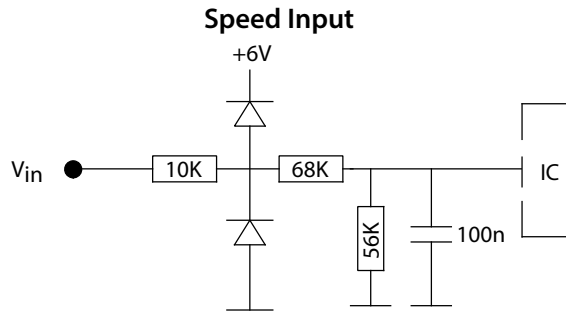
⁴ Also PWM input signal possible (applicable for 5 wire versions only), advised PWM carrier frequency range 6 to 20 kHz.

$V_{in} = \text{PWM amplitude} \times \text{PWM duty cycle}$.

KinetiMax 32 EB – Performance

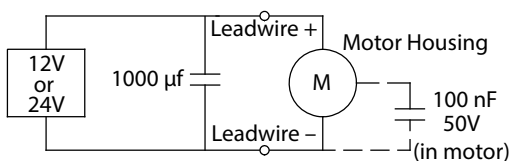


KinetiMax 32 EB – I/O Schematics



EMC

To meet EMC directive EN 55014, the power supply must be provided with a capacitor 1000 μ F, 35V at the output:

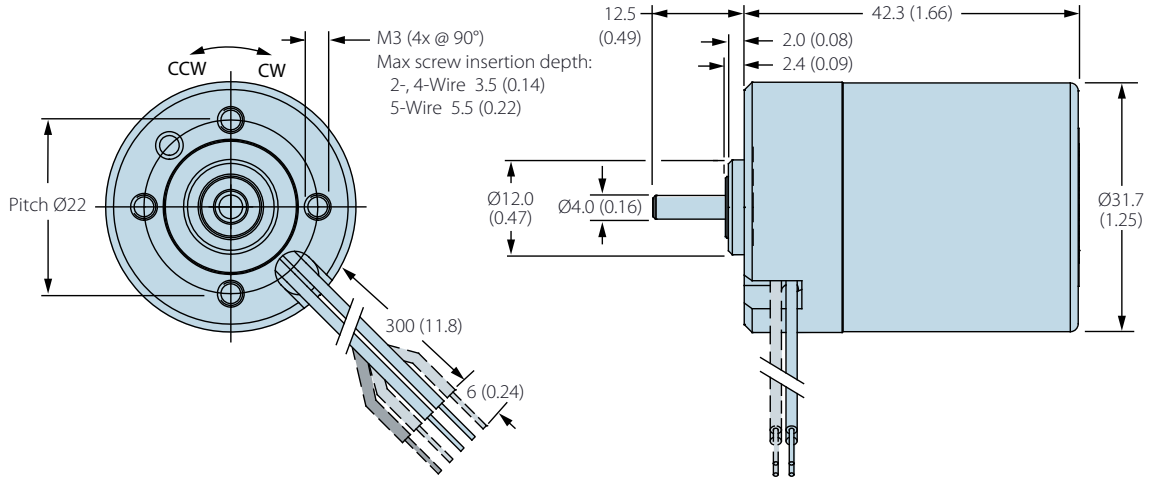


KinetiMax 32 EB – Electrical Connections

Version	Description	Wire Color (AWG 24)
2-Wire (CW & CCW)	Supply Voltage	Red
	Ground	Black
4-Wire	Supply Voltage	Red
	Ground	Black
	Speed Control Input (V_{in})	White
5-Wire	Tachometer Output (FG)	Green
	Supply Voltage	Red
	Ground	Black
	Speed Control Input (V_{in})	White
	Tachometer Output (FG)	Green
	Direction Input (CW/CCW)	Brown

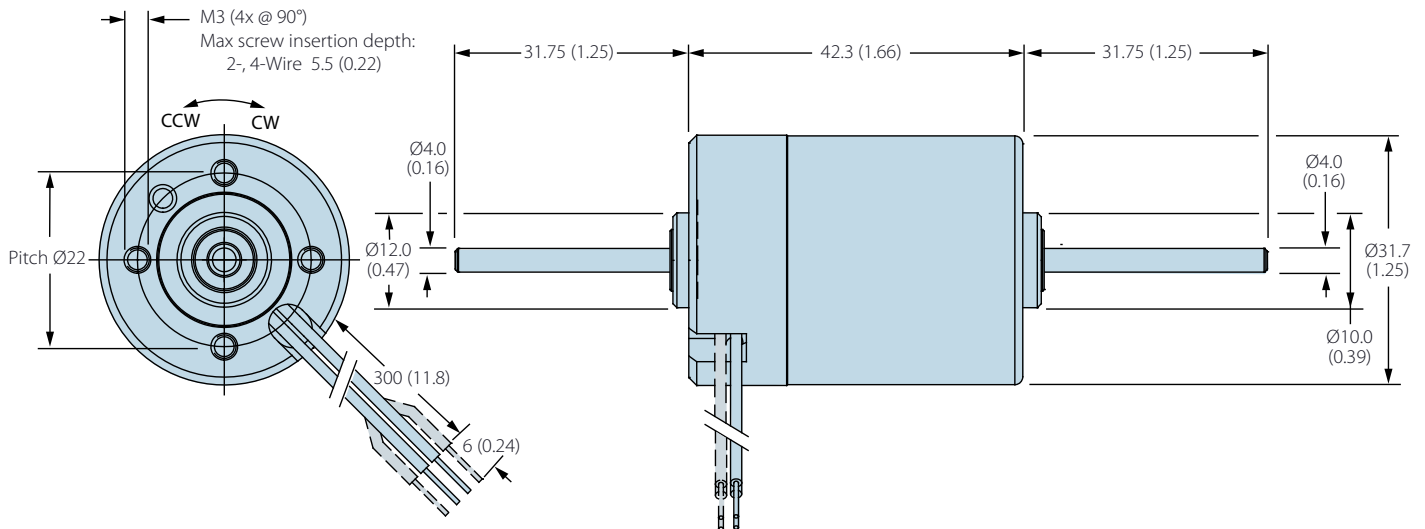
KinetiMax 32 EB – Dimensions — mm (in)

Single shaft models (2-, 4-, 5-Wire)



Double shaft models (2-, 4-Wire)

Mounting hole location and size
identical both ends of motor



Brushless DC Motors with Integral Drive

KinetiMax 42 EB Series

42 mm diameter, 70 mNm max. torque, up to 31 W output power

The KinetiMax 42 EB is an extremely compact brushless DC motor with integrated drive electronics. This motor is an outer rotor motor with a robust bearing system capable of handling high side loads.

High quality components ensure a minimum operating life of 20.000 hours. The continuous output torque of 70 mNm at a constant speed of 4300 RPM makes this motor ideal for small membrane and peristaltic pumps, blower fan and medical applications.



Options & Accessories

- Customized shaft
- Double shaft version, with front and back shaft
- Customized mounting flange
- Custom leads and connector configurations
- Special winding configurations
- Motor with Hall sensors on
- Encoder and/or gearbox

Features & Benefits

- 42 mm diameter outer rotor, brushless DC motor with integrated drive and robust bearing system
- Rated 70 mNm (9,9 oz-in) and 31 W output at 4300 RPM
- 12 or 24 VDC winding choice
- Integrated speed control loop with a speed set input to adjust motor speed from 150 to 5000 RPM
- 6-wire version with tachometer output (18 pulses per rev) for speed monitoring, speed input and direction input.
- IP54 level protection sealing
- Thermal overload protection with automatic recovery
- Reverse supply voltage protection
- Low EMI – complies with EN 55014-1/2, 61000-6-1/3

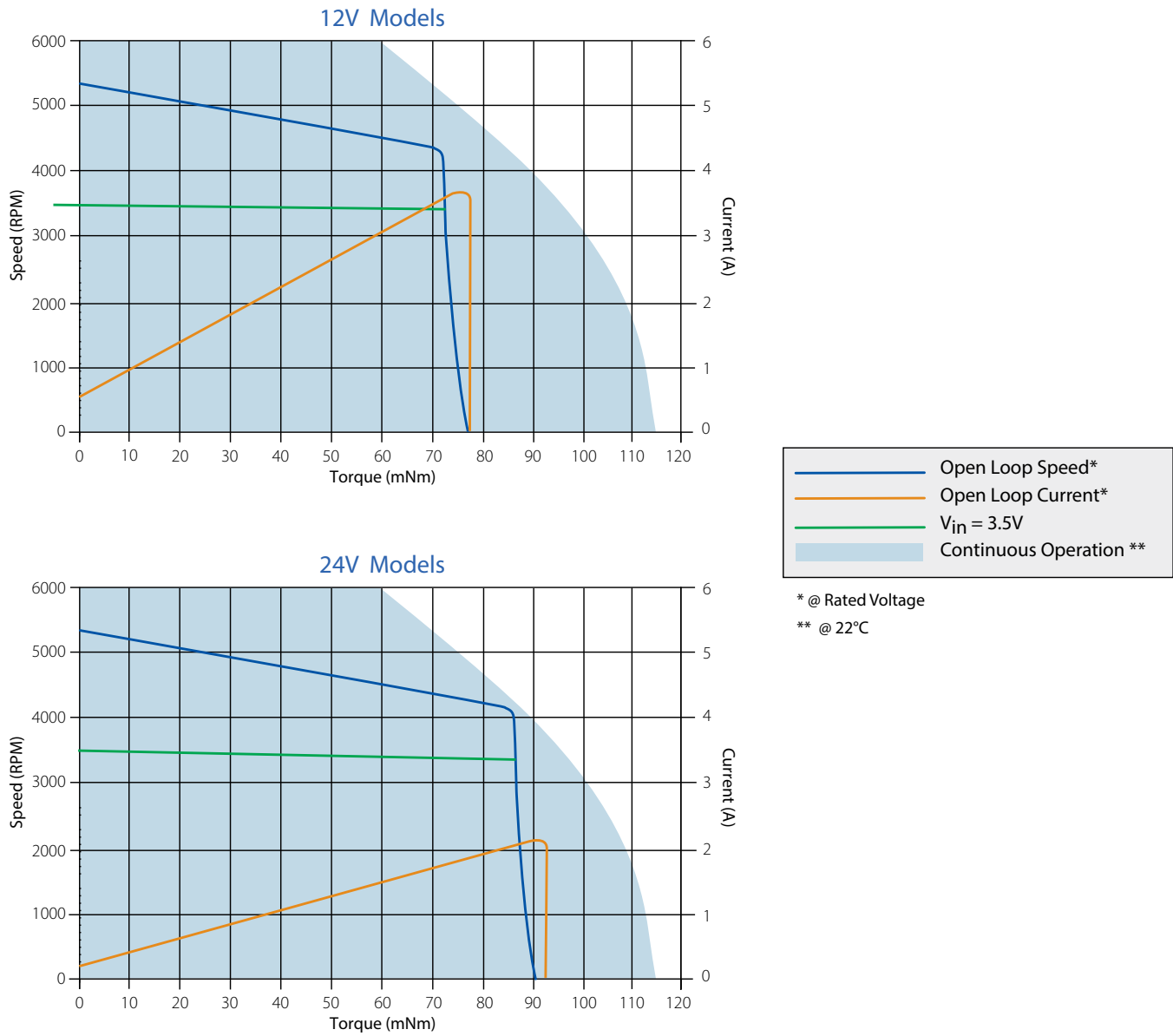
KinetiMax 42 EB – Specifications

Shaft Diameter	4 mm	4322-016-38002	4322-016-38007
	5 mm	4322-016-38003	4322-016-38008
	6 mm	4322-016-38004	4322-016-38009
Voltage VDC	Nominal	12	24
	Range ¹	10 – 18	10 – 28
Rated Output Power	W	29	32
Torque mNm (oz.in.)	Rated	70 (9.9)	
	Max	72 (10.2)	100 (14.2)
Speed RPM	Rated	4300	
	No-load	5200	5300
Current	Rated	A	3.5
	Max	A	3.6
	No-load	mA	460
Rotor Inertia kgm ² (oz.in.s ²)	17.5 E-6 (26 E-4)		
Thermal Resistance °C/W	Housing-Ambient	7.6	
Weight g (oz)	225 (4.0)		
Protection Level	IP54		
Speed Command	Ratio	RPM/V	1000
	Range	V	0 – 7
	Threshold	V	0.1
Direction Input V	CW	Low <1	
	CCW	High >4	
Speed Output	Pulse Rate	PPR	18
	Low Time	µsec	195
Operating Temperature Range °C (°F)			
Thermal Limit Protection	°C (°F)	90 (194) flange temp. / 80 (176) restart	

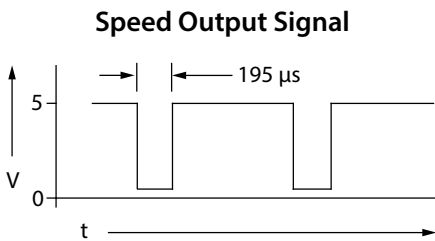
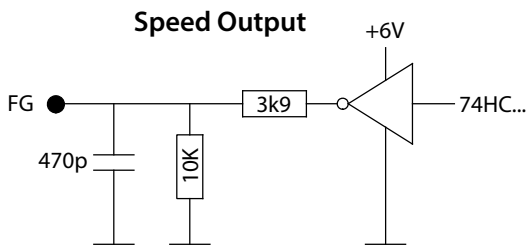
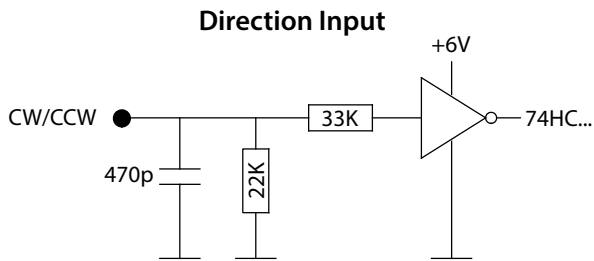
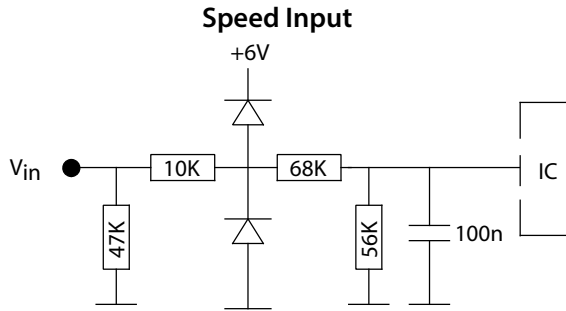
Values valid for nominal voltage and $T_{amb} = 22^{\circ}\text{C}$

¹ Power supply provided with appropriate 1000 µF buffer capacitor between supply voltage and common to comply with EN 55014-1/2; protection against wrong connection up to ±28 volt

KinetiMax 42 EB – Performance

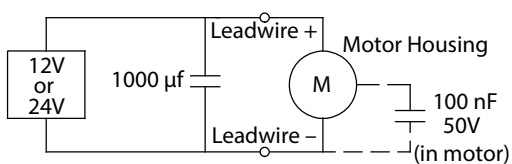


KinetiMax 42 EB – I/O Schematics



EMC

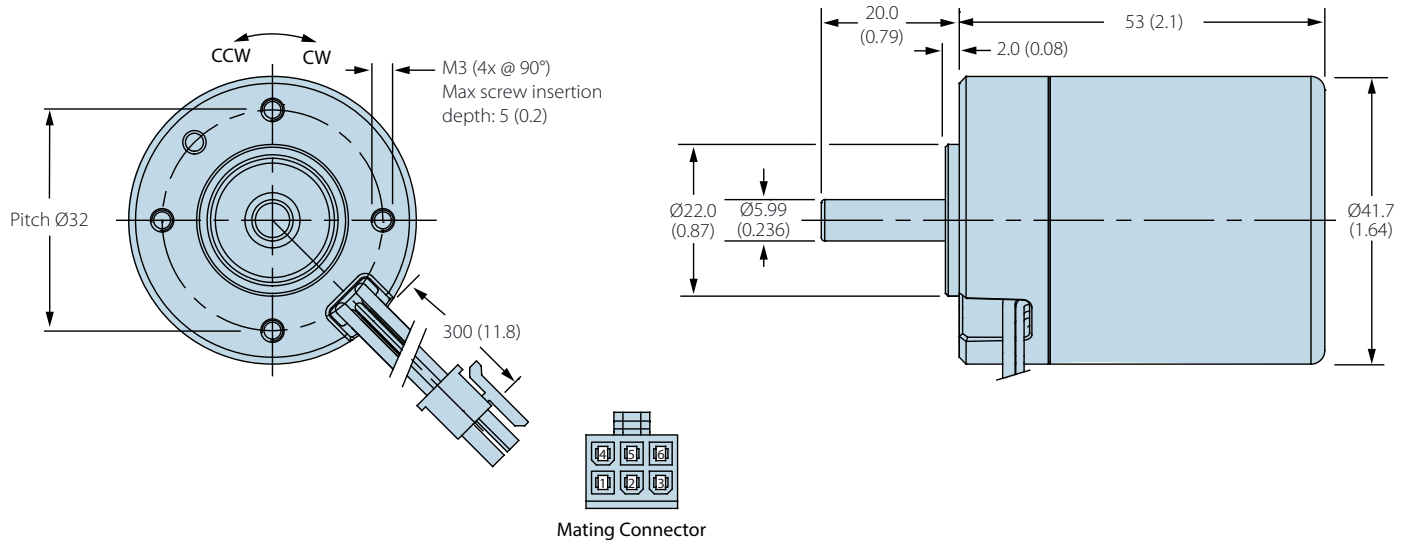
To meet EMC directive EN 55014, the power supply must be provided with a capacitor 1000 μ f, 35V at the output:



KinetiMax 42 EB – Electrical Connections

Version	Description	Wire Color (AWG 24)
6-Wire	1 Supply Voltage	Red
	2 Ground	Black
	3 Tachometer Output (FG)	Green
	4 Speed Control Input (V_{in})	White
	5 Direction Input (CW/CCW)	Brown
	6 Shield	Yellow

KinetiMax 42 EB – Dimensions — mm (in)



Brushless DC Motors with Integral Speed Drive

KinetiMax 54 EB Series

54 mm diameter, 30/40 mNm cont. torque, up to 16 W output power

The KinetiMax 54 EB brushless DC motor with integrated speed control drive is an outer rotor motor with a robust bearing system designed to handle high side loads. Two stack height models are available, 30 and 37 mm, with 30 and 40 mNm continuous torque rating, respectively.

High quality components ensure a minimum operating life of 20,000 hours. The outer rotor concept combined with the integrated drive makes this motor ideal for small membrane or peristaltic pumps, high performance fans and blowers, and various medical devices



Options & Accessories

- Custom shaft design
- Custom mounting interface
- Custom leads and/or connector
- IP 54 protection rating
- 500 V isolation capability
- Planetary or spur gearbox on request
- PWM input combined with integrated speed loop, resulting in a speed range from 100 to 4000 RPM

Features & Benefits

- 54 mm dia., outer rotor, brushless DC motor with integrated drive and robust bearing system
- Up to 40 mNm rated torque and 16 W rated output power
- 12 or 24 VDC winding selection
- Integrated speed control loop with a speed set input to adjust motor speed from 300 to 4000 RPM
- Thermal overload protection with automatic recovery
- Rotation direction input (CW/CCW)
- Speed output for speed sensing (36 pulses per rev)
- Reverse supply voltage protection
- Low EMI – complies with EN 55014-1/2, 61000-6-1/3

KinetiMax 54 EB – Specifications 30.4 mm (1.20 in) length units

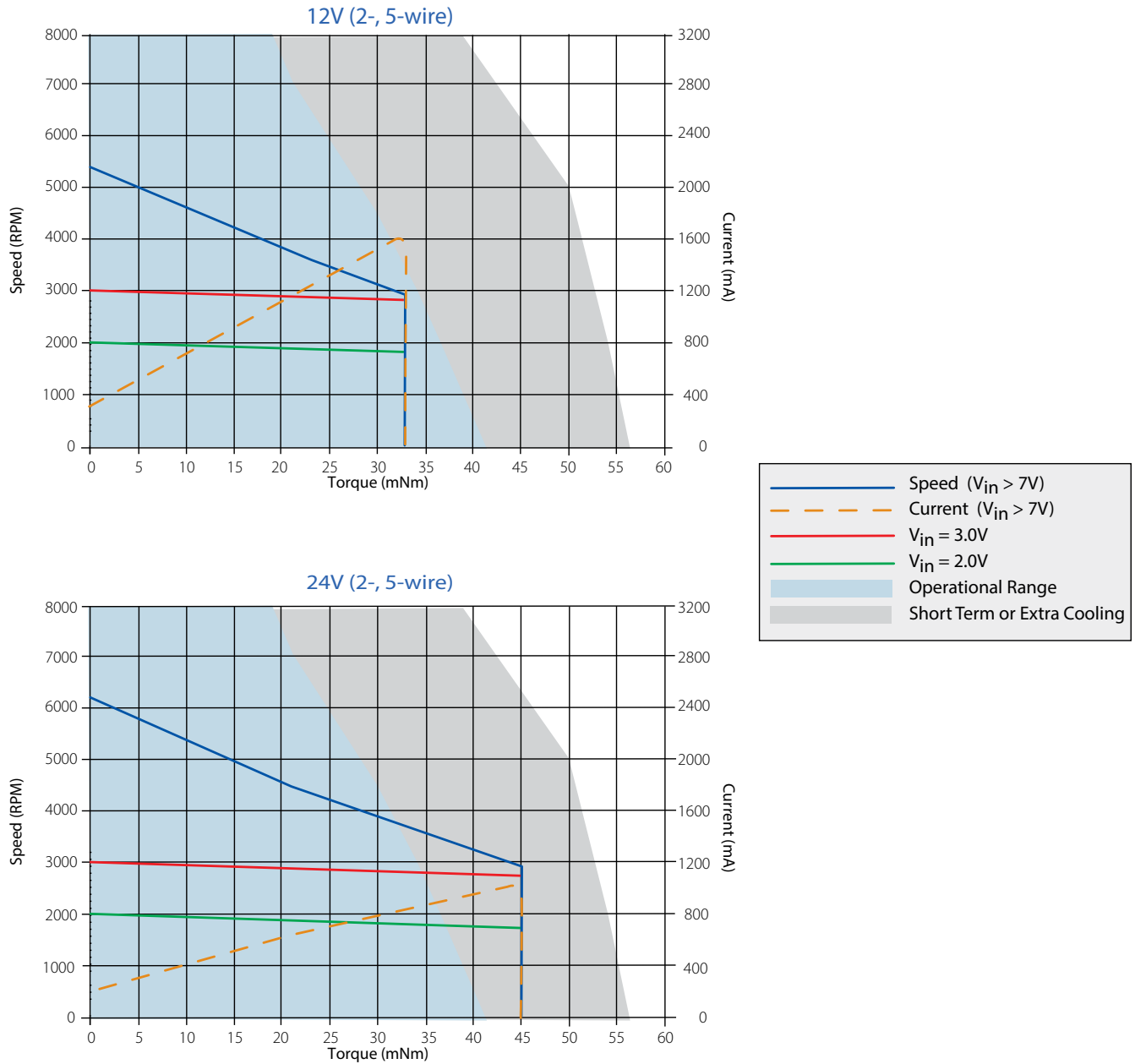
Model		KMX-01648621	KMX-01648622
Length mm (in)		30.4 (1.20)	
Voltage VDC	Nominal	12	24
	Range ¹	10 – 18	10 – 28
Rated Output Power	W	10	12
Torque mNm (oz.in.)	Rated	30 (4.25)	
	Max	33 (4.67)	45 (6.37)
Speed RPM	Rated	3200	3800
	No-load	5400	6200
Current mA	Rated	1450	800
	Max	1600	1100
	No-load	310	200
Rotor Inertia kgm ² (oz.in.s ²)		22 E-6 (3.1 E-3)	
Mechanical Time Constant ms		45	
Thermal Resistance Housing-Ambient °C/W		8.5	
Weight g (oz)		200 (7.04)	
Protection Level		IP30	
Gearbox (option)		On request	
Speed-Voltage Input Ratio	RPM/V	1000	
Speed Input V	Set Point	0 – 7	
	Threshold	0.11	
Direction Input V	CCW	< 1	
	CW	> 4	
Speed Output Signal	PPR	36	
	Low Time μsec	90	
Operating Temperature Range °C (°F)		0 – 90 (32 – 194)	
Thermal Limit Protection ² °C		90 (194) flange temp. / 80 (176) restart	

Values valid for nominal voltage and $T_{amb} = 22\text{ °C}$

¹ Power supply provided with appropriate 470 μF buffer capacitor between supply voltage and common to comply with EN 55014-1/2.
(See additional EMC information on page 4.)

² Motor temperature measured at aluminum bearing support

KinetiMax 54 EB – Performance 30.4 mm (1.20 in) length units



KinetiMax 54 EB – Specifications 37.25 mm (1.47 in) length units

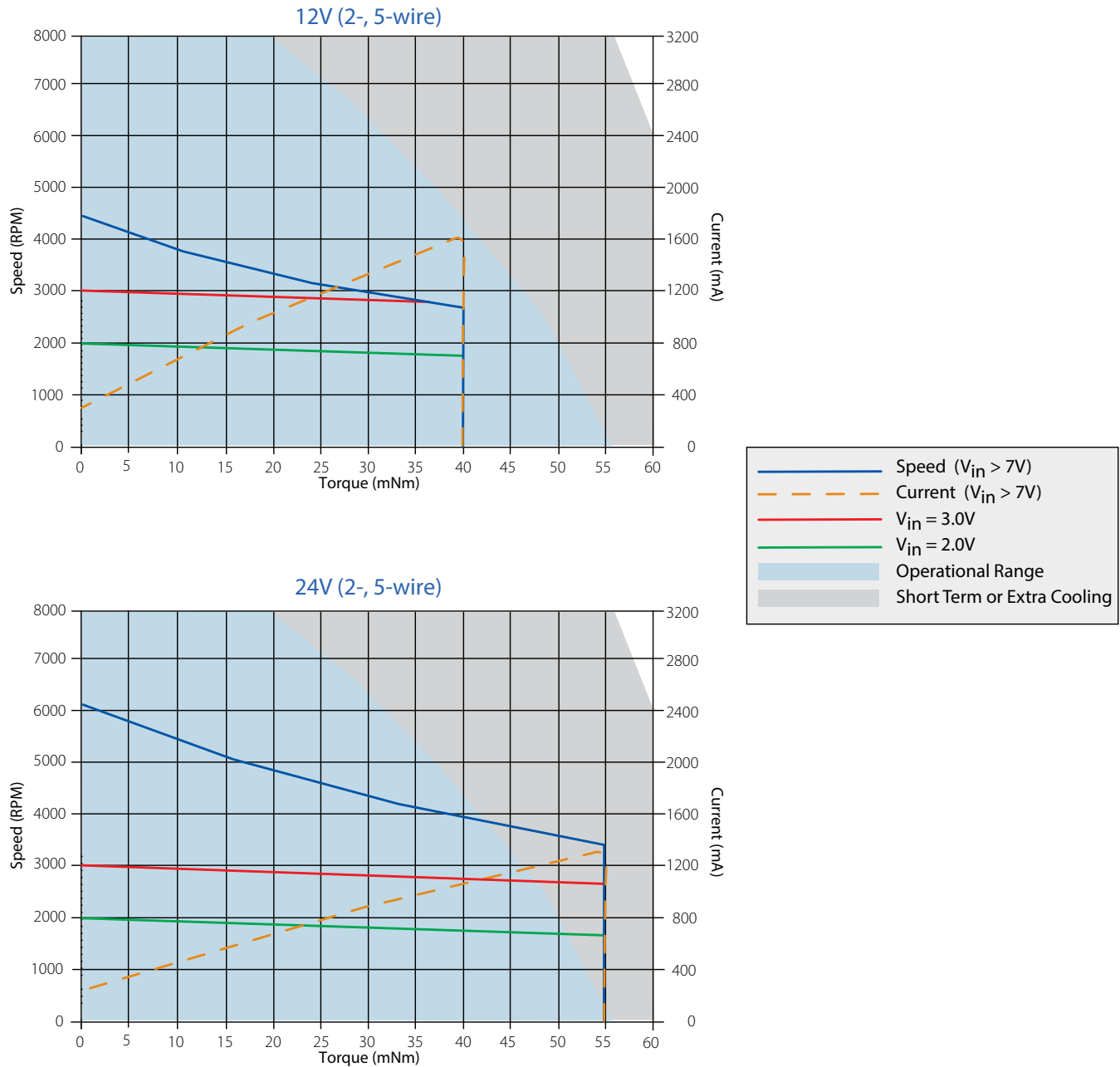
Model		KMX-01648623	KMX-01648624
Length	mm (in)	37.25 (1.47)	
Voltage	Nominal	12	24
	Range ¹	10 – 18	10 – 28
Rated Output Power	W	12	16
Torque	Rated	40 (5.66)	
	Max	40 (5.66)	55 (7.79)
Speed	Rated	2700	3900
	No-load	4450	6100
Current	Rated	1600	1050
	Max	1600	1300
	No-load	300	240
	Rotor Inertia	31 E-6 (4.4 E-3)	
Mechanical Time Constant	ms	45	
Thermal Resistance Housing-Ambient	°C/W	7.5	
Weight	g (oz)	250 (8.80)	
Protection Level		IP30	
Gearbox (option)		On request	
Speed-Voltage Input Ratio	RPM/V	1000	
Speed Input	Set Point	0 – 7	
	Threshold	0.11	
Direction Input	CCW	< 1	
	CW	> 4	
Speed Output Signal	PPR	36	
	Low Time	90 μsec	
Operating Temperature Range	°C (°F)	0 – 90 (32 – 194)	
Thermal Limit Protection ²	°C	90 (194) flange temp. / 80 (176) restart	

Values valid for nominal voltage and $T_{amb} = 22\text{ °C}$

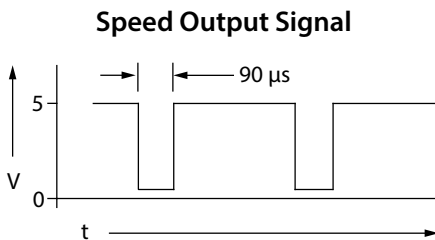
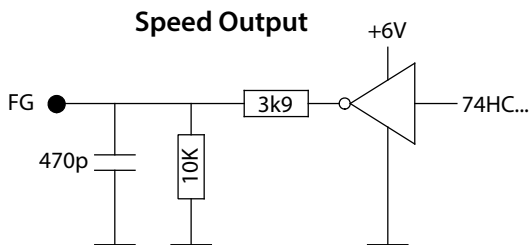
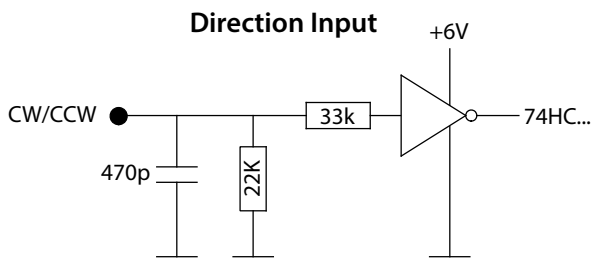
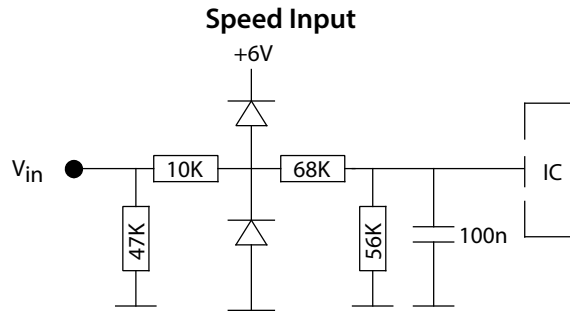
¹ Power supply provided with appropriate 470 μF buffer capacitor between supply voltage and common to comply with EN 55014-1/2.
(See additional EMC information on page 4.)

² Motor temperature measured at aluminum bearing support

KinetiMax 54 EB – Performance 37.25 mm (1.47 in) length units

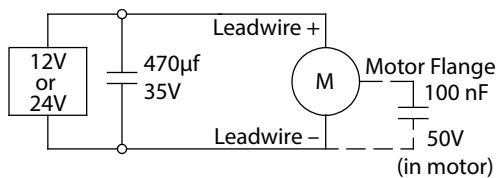


KinetiMax 54 EB – I/O Schematics



EMC

To meet EMC directive EN 55014, the power supply must be provided with a capacitor 470μF, 35V at the output:

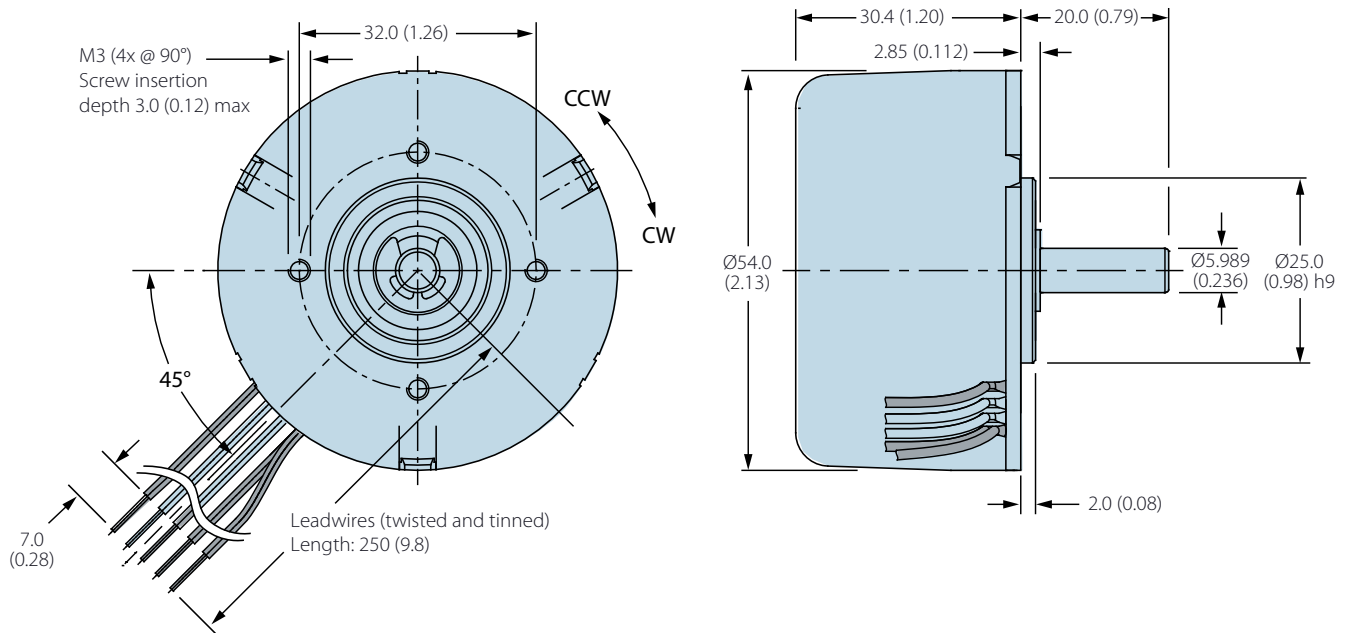


KinetiMax 54 EB – Electrical Connections

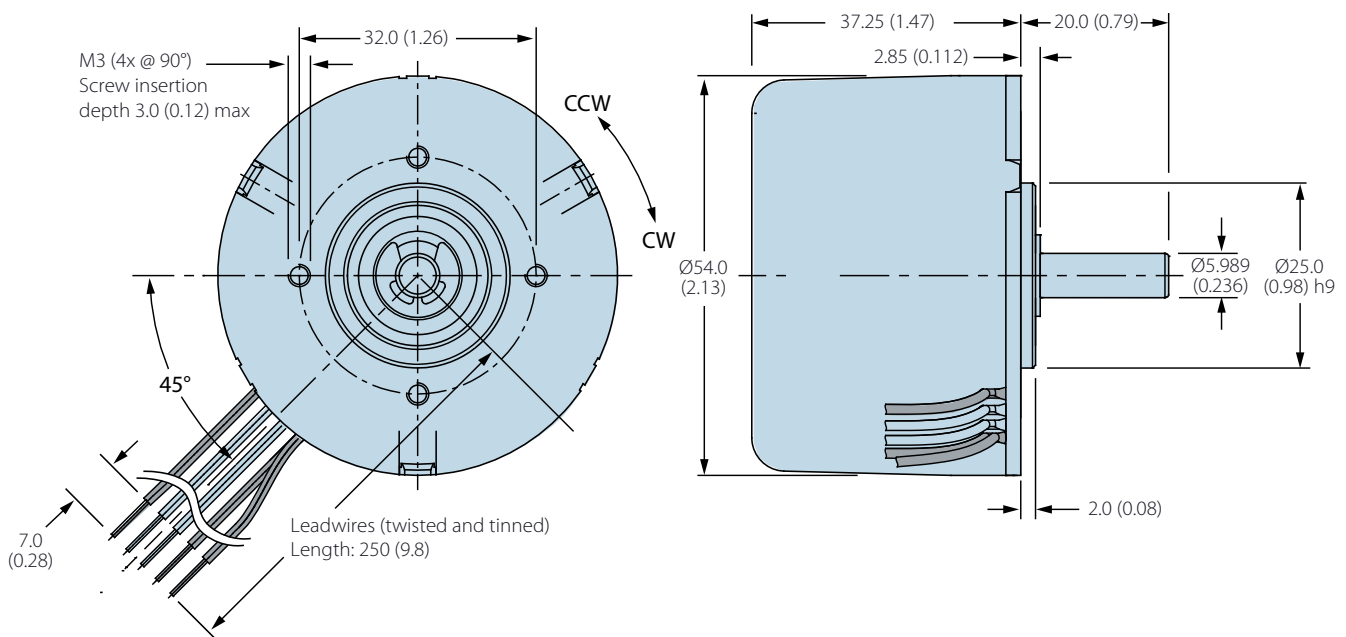
Version	Description	Wire Color (AWG 26)
2-Wire (CW & CCW)	Supply Voltage (+Vs)	Red
	Ground	Blue
5-Wire	Supply Voltage (+Vs)	Red
	Ground	Blue
	Control input (V_{Ctrl} , V)	White
	Speed output (Tach, FG)	Green
	Direction input (CW/CCW)	Brown

KinetiMax 54 EB Dimensions — mm (in)

30.4 mm (1.20 in) length models (2-, 5-Wire)



37.25 mm (1.47 in) length models (2-, 5-Wire)



Brushless DC Motors with Integral Speed Drive

KinetiMax 68 EB Series

68 mm diameter, up to 170 mNm cont. torque, up to 50 W output power

The KinetiMax 68 EB series of brushless DC motors with integrated drive electronics are compact yet powerful outer-rotor motors. The external rotor and iron core stator minimize cogging and maximize output torque. The KinetiMax 68 motors are designed with a bearing system capable of handling high side loads.

High quality components ensure the KinetiMax 68 motor life exceeds 20,000 hours. The output torque range of this family has a maximum of 170 mNm, and the speed range extends to 6000 RPM.

Typical applications for the KinetiMax 68 include many types of gear pumps and peristaltic pumps, high-end fans and blowers, and laboratory equipment.

Options & Accessories

- Special shaft diameter and machining
- Customized mounting flange
- Custom leads and connector configurations
- Special winding configurations
- Provisions for gearbox mounting
- IP 55 rating
- PWM or frequency speed set in place of analog input



Features & Benefits

- Outer-rotor precision 68 mm dia. brushless DC motor with integrated drive electronics
- Models rated at 35 and 50 W output power, rated torque up to 170 mNm, no-load speed up to 6000 RPM
- Adjustable speed and direction selection
- Thermal overload protection with automatic recovery
- Low EMI – complies with EN 55014-1/2, EN 61000-6-1/3
- Standard IP43 protection level
- Model 01658033 includes integral electrical brake

KinetiMax 68 EB – Specifications

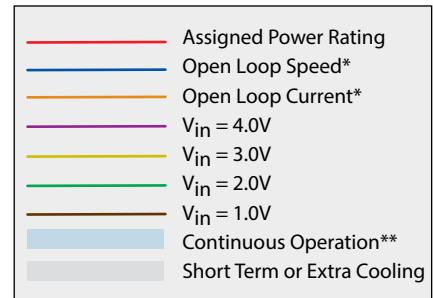
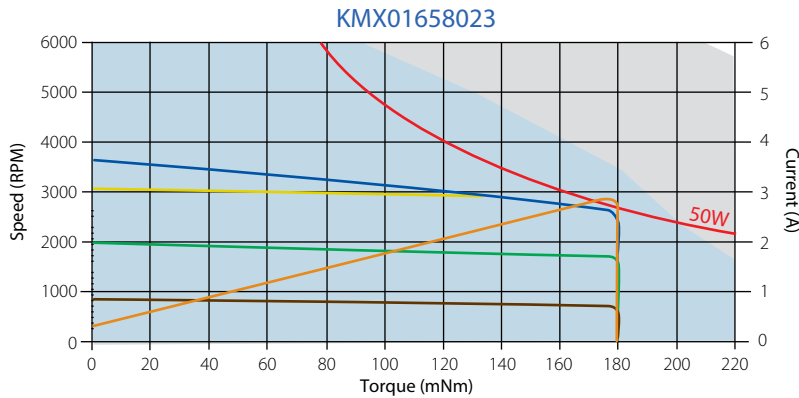
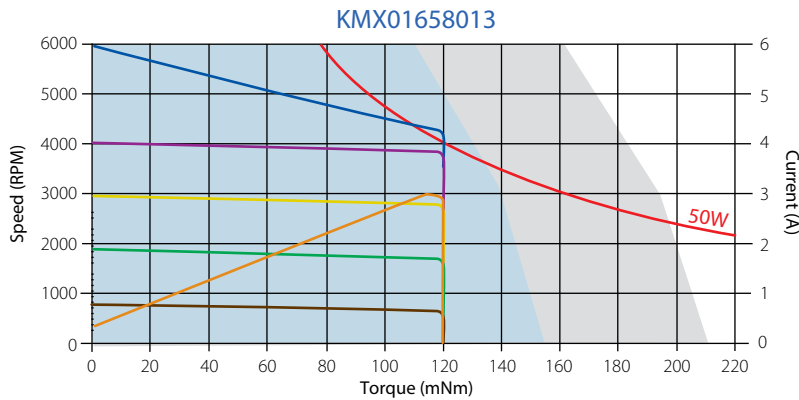
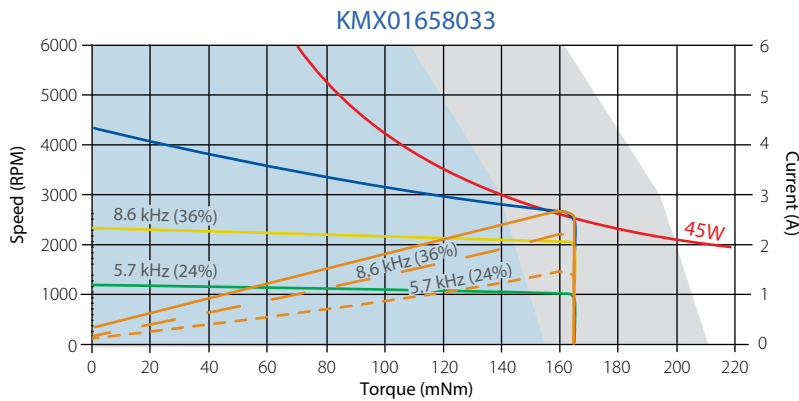
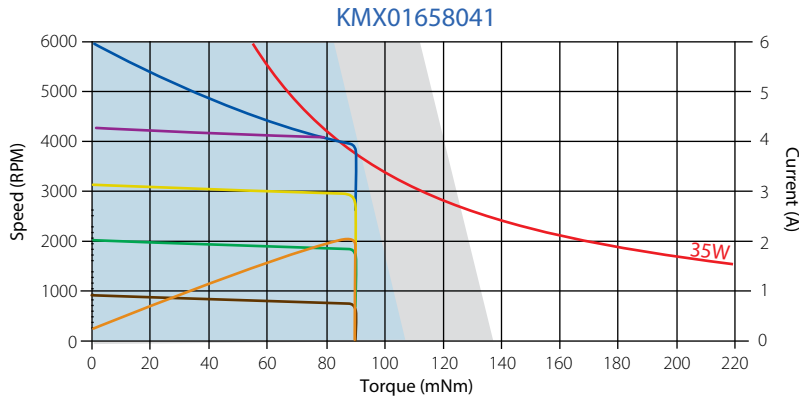
Model		KMX-01658041	KMX-01658033	KMX-01658013	KMX-01658023
Length		49.1 (1.93)	62.1 (2.44)		
Voltage VDC	Nominal	24			
	Range ¹	14 – 30			
Rated Output Power	W	35		50	
Torque mNm (oz.in.)	Rated	70 (9.9)	110 (15.6)		170 (24.0)
	Max	90 (12.7)	150 (21.2)	120 (17.0)	180 (25.5)
Speed RPM	Rated	3650	2500	3750	2400
	No-load	6000	4330	6000	3650
Current A	Rated – A	2		3	
	Max – A	2.3	3.4		
	No-load – mA	215	180	260	265
Rotor Inertia kgm ² (oz.in.s ²)		0.75 E-4 (0.0106)	1.2 E-4 (0.017)		
Mechanical Time Constant ms		30	40	25	
Thermal Resistance Housing-Ambient °C/W		4.2	3.7		
Weight g (oz)		450 (15.9)	550 (19.4)		
Protection Level		IP43			
Gearbox (option)		On request			
Speed-Voltage Input Ratio	RPM/V	1000	1100	1000	
	Set Point	0 - 6			
Speed Input V	Threshold	0.25	N/A	0.25	
	Brake Active	N/A	0 to 0.4	N/A	
	Motor Disable	N/A	0.4 to 0.7..1.05	N/A	
	Direction Input V	CCW	< 1		
	CW	> 4			
Speed Output Signal	PPR	36			
	Low Time μsec	168			
Operating Temperature Range °C (°F)		0 – 70 (32 – 158)			
Thermal Limit Protection ² °C		90 (194) flange temp. / 80 (176) restart			

Values valid for nominal voltage and $T_{amb} = 22\text{ °C}$

¹ Power supply provided with appropriate 1000 μF buffer capacitor between supply voltage and common to comply with EN 55014-1/2.
(See additional EMC information on page 4.)

² Motor temperature measured at aluminum bearing support

KinetiMax 68 EB – Performance

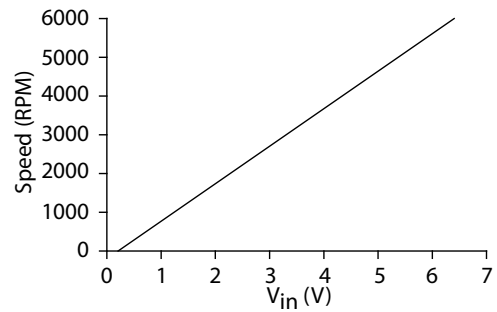
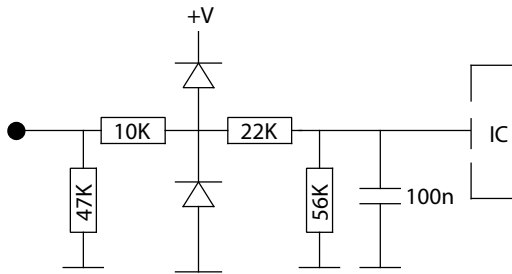


* @ Rated Voltage

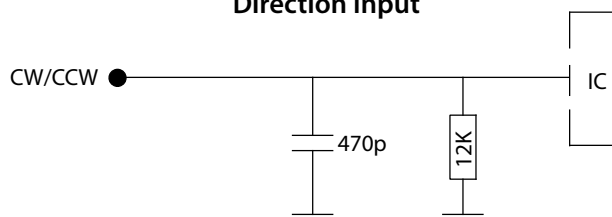
** T_{amb} = 22°C

KinetiMax 68 EB – I/O Schematics

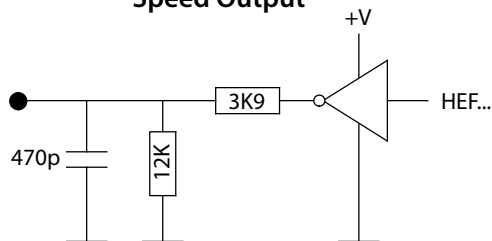
Speed Input



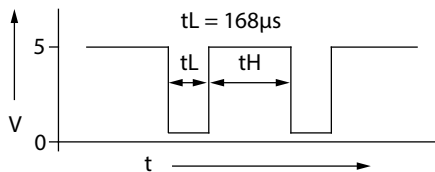
Direction Input



Speed Output

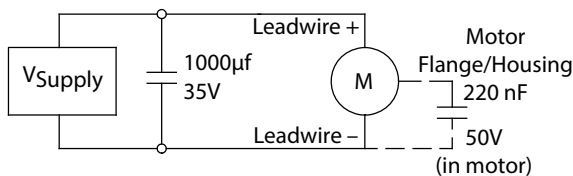


Speed Output Signal



EMC

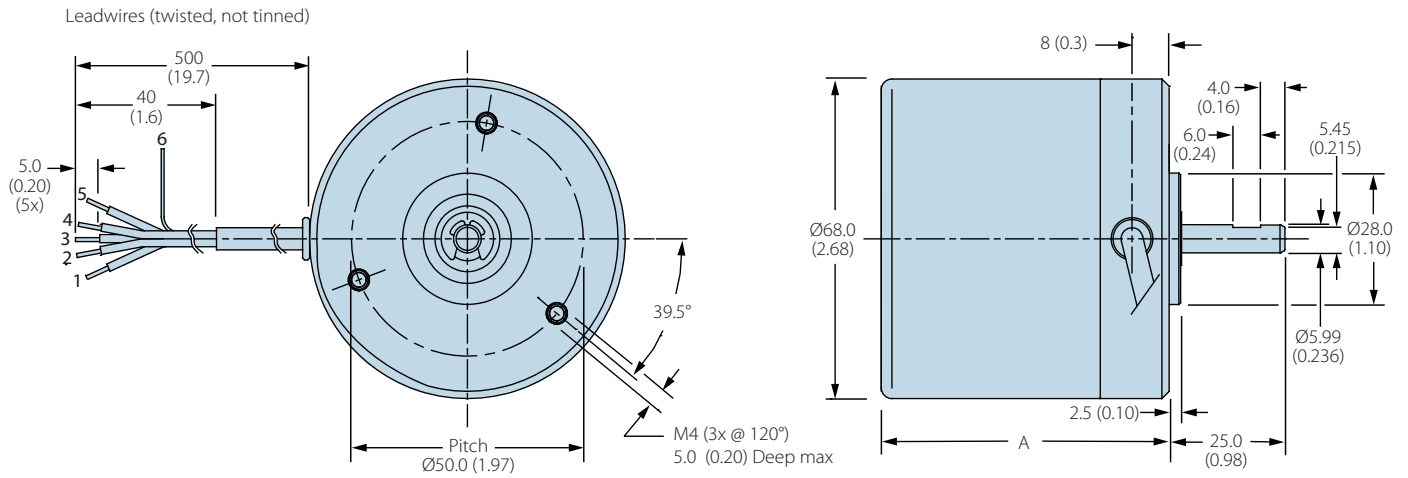
To meet EMC directive EN 55014, the power supply must be provided with a capacitor 1000µf, 35V at the output:



KinetiMax 68 EB – Electrical Connections

Version	Description	Wire Color (AWG 24)
5-Wire	1 Supply voltage (+24V)	Red
	2 Ground	Black
	3 Speed control (V _{in}) 0 – 5V (1V/1000 RPM)	White
	4 Speed output (FG) 36 pulses/rev tachometer	Green
	5 Direction input (Fw/Rv) CCW/CW	Brown
	6 Shield/ground to motor housing	—

KinetiMax 68 EB Dimensions — mm (in)



	Length A
KMX-01658041	49.1 (1.93)
KMX-01658033	
KMX-01658013	62.1 (2.44)
KMX-01658023	