Brushless DC Motor

FL22RBL SERIES

● INDICATIONS OF THE MODELS

FL 22 RBL 45 — 24V — 46 04 A

- FL — Fulling
- 22 — Motor frame size: Metric (mm) 22mm
- RBL — Round Brushless motor
- 45 — Body length:45mm
- 24V — Rated voltage :24VDC
- 46 — Rated speed/100 :4600rpm
- 04 — Output power : 04W
- A — Single shaft (B:double shaft)

● GENERAL SPECIFICATIONS

Winding type	Star
Hall effect angle	120 degree electrical angle
Shaft run out	0.025mm
Radial play	0.02mm@450g
End play	0.08mm@450g
Max. radial force	10N @ 10mm from the flange
Max. axial force	2N
Insulation class	Class B
Dielectric strength	360VAC @ 1 S
Insulation resistance	100MΩMin, 500VDC

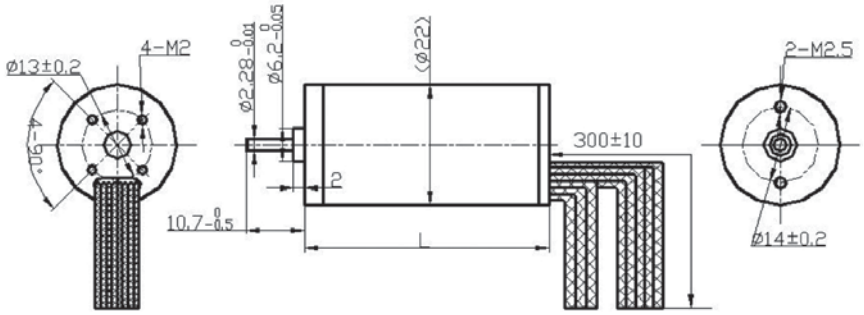
● ELECTRIC CONNECTION

Lead No.	Lead Color	Lead Gauge	FUNCTION	DESCRIPTION
1	Blue	UL1007 28AWG	Vcc	Power supply positive of Hall:+5VDC—+24VDC
2	Red		Hall A	
3	Yellow		Hall B	
4	Brown		Hall C	
5	Green		GND	Power supply negative of Hall
6	Red	UL1007 26AWG	Phase U	
7	Brown		Phase V	
8	Black		Phase W	

● ELECTRICAL SPECIFICATIONS

Model		FL22RBL45–24V–4604A	FL22RBL70–24V–3515A
Number of poles		8	8
Number of phase		3	3
Rated voltage	VDC	24	24
Rated speed	RPM	4600	3800
Continuous stall torque	mN.m	9.6	24
Rated torque	mN.m	8.0	20
Rated power	W	3.8	8
Peak torque	mN.m	24	60
Peak current	A	1.1	2
Resistance	ohms	23	11.6
Inductance	mH	6.2	4.3
Torque constant	mNm/A	29.7	35.8
Back EMF	Vrms/Krpm	2.2	2.65
Rotor inertia	$g.cm^2$	0.66	1.32
Body length	mm	45	68
Mass	Kg	0.07	0.12

● DIMENSIONS



*This motor can be designed & manufactured with customized request.

Brushless DC Motor

FL28BL SERIES

● INDICATIONS OF THE MODELS

FL 28 BL 38 – 24V – 3007 A

- FL: Fulling
- 28: Motor frame size: Metric (mm) 28mm
- BL: Brushless motor
- 38: Body length 38mm
- 24V: Rated voltage:24VDC
- 30: Rated speed/100:3000rpm
- 07: Output power : 07 W
- A: Single shaft (B:double shaft)

● GENERAL SPECIFICATIONS

Winding type	Star
Hall effect angle	120 degree electrical angle
Shaft run out	0.025mm
Radial play	0.02mm@450g
End play	0.08mm@450g
Max. radial force	10N @ 10mm from the flange
Max. axial force	2N
Insulation class	Class B
Dielectric strength	360VAC @ 1S
Insulation resistance	100MΩMin, 500VDC

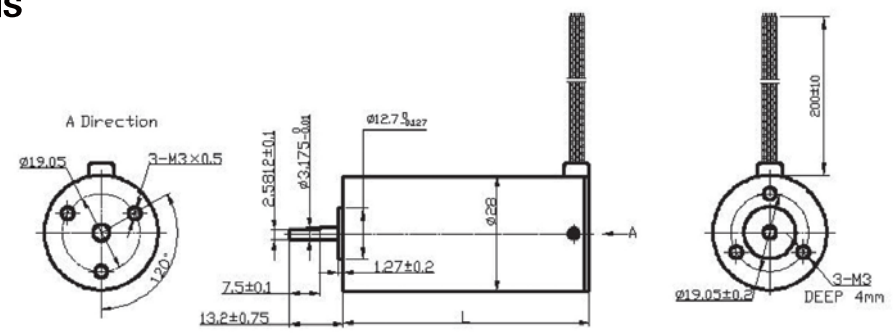
● ELECTRIC CONNECTION

Lead No.	Lead Color	Lead Gauge	FUNCTION	DESCRIPTION
1	Yellow	UL1007 26AWG	Vcc	Power supply positive of Hall:+5VDC—+24VDC
2	Blue		Hall A	
3	Orange		Hall B	
4	Brown		Hall C	
5	White		GND	Power supply negative of Hall
6	Green		Phase U	
7	Red		Phase V	
8	Black		Phase W	

● ELECTRICAL SPECIFICATIONS

Model		FL28BL26–15V–8006AF	FL28BL38	FL28BL77–24V–3116AF
Number of poles		4	4	4
Number of phase		3	3	3
Rated voltage	VDC	15	24	24
Rated speed	RPM	8000	10000	4000
Continuous stall torque	mN.m	6	17	60
Rated torque	mN.m	5	14	50
Rated power	W	4	14.78	16
Peak torque	mN.m	15	42	150
Peak current	A	1.3	2.7	4.2
Resistance	ohms	8.2	4.2	4.2
Inductance	mH	2.3	1.69	2.3
Torque constant	mNm/A	14.3	16.9	37.4
Back EMF	Vrms/Krpm	1.06	1.25	2.77
Rotor inertia	$g.cm^2$	2.35	3.69	10.98
Body length	mm	26	38	77
Mass	Kg	0.060	0.082	0.280

● DIMENSIONS



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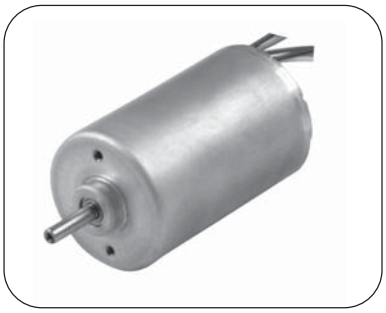
Brushless DC Motor

FL36CBL SERIES



● INDICATIONS OF THE MODELS

FL 36 CBL 57— 24V—45 33 A

- FL — Fulling
- 36 — Motor frame size：36mm
- CBL — Round Brushless motor，low cost
- 57 — Body length：57mm
- 24V — Rated voltage：24V
- 45 — Rated speed 1%：4500rpm
- 33 — Rated power：33W
- A — Single output shaft (A)
  Double output shaft (B)

● GENERAL SPECIFICATIONS

Winding type	star
Hall effect angle	120degree electrical angle
Shaft run out	0.025mm
Radial play	0.02mm@450g
End play	0.08mm@450g
Max. radial force	15N @ 10mm from the flange
Max. axial force	10N
Insulation class	Class B/F
Dielectric strength	500VAC,1min.
Insulation resistance	100MΩ, 500VDC

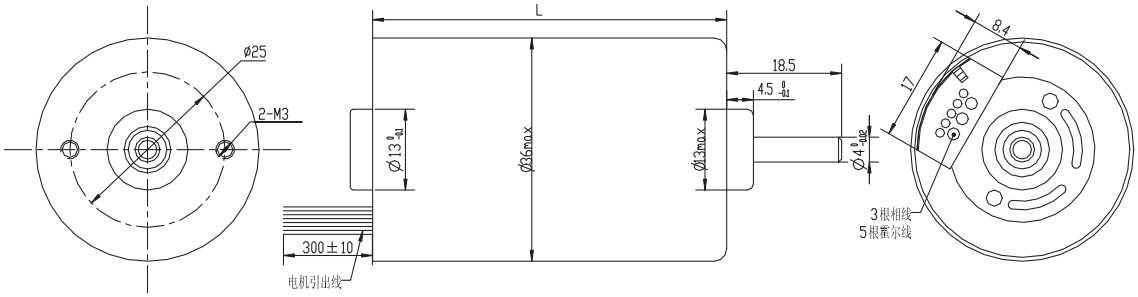
● ELECTRIC CONNECTION

Lead No.	Lead Color	Lead Gauge	FUNCTION	DESCRIPTION
1	Red	AWG26	Vcc	HALL positive:+5—+24V
2	Blue		Hall U	
3	Green		Hall V	
4	White		Hall W	
5	Black		GND	HALL negative
6	Yellow	AWG20–24	U	
7	Red		V	
8	Black		W	

● ELECTRICAL SPECIFICATIONS

Model	Unit	FL36CBL60–24V –4840A	FL36CBL57–24V –4533A	FL36CBL40–24V –4818A	FL36CBL30–24V– 488A
Number of poles		8			
Number of phase		3			
Rated voltage	VDC	24			
Rated speed	RPM	4800	4500	4800	4800
Continuous running torque	mN.m	96	84	42	18
Rated torque	mN.m	80	70	35	15
Rated power	W	40	33	18	8
Peak torque	mN.m	240	210	105	45
Peak current	A	6.5	5.3	3.0	1.5
Line to line resistance	ohms@20℃	0.93	1.3	2.7	7.8
Line to line inductance	mH	1.3	1.6	2.6	5.5
Torque constant	mNm/A	38.5	41.2	37.1	34.1
Back E.M.F	Vrms/KRPM	2.85	3.05	2.75	2.53
Rotor inertia	$g.cm^2$	30	27	12	6
Body length(L)	mm	60	57	40	30
Weight	Kg	0.28	0.25	0.16	0.12

● DIMENSIONS



*This motor can be designed & manufactured with customized request.

Brushless DC Motor

FL42BLS SERIES

● INDICATIONS OF THE MODELS

FL 42 BLS 01

- 01 — Series number
- BLS — Brushless motor
- 42 — Motor frame size: 42mm
- FL — Fulling

●GENERAL SPECIFICATIONS

Winding type	Delta
Hall effect angle	120 degree electrical angle
Shaft run out	0.025mm
Radial play	0.02mm@450g
End play	0.08mm@450g
Max. radial force	28N @ 20mm from the flange
Max. axial force	10N
Insulation class	Class B
Dielectric strength	500VAC for one minute
Insulation resistance	100MΩMin., 500VDC

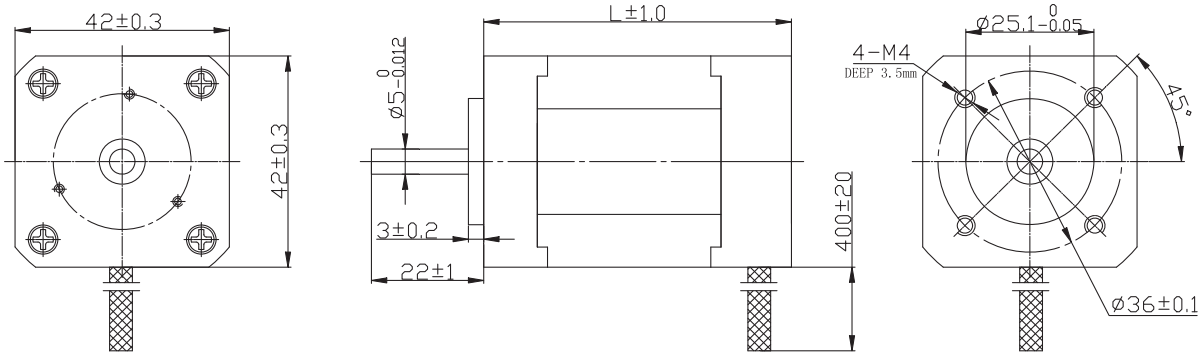
●ELECTRIC CONNECTION

Lead No.	Lead Color	Lead Gauge	FUNCTION	DESCRIPTION
1	Red	UL1430 26AWG	Vcc	Power supply positive of Hall:+5VDC—+24VDC
2	Blue		Hall A	
3	Green		Hall B	
4	White		Hall C	
5	Black		GND	Power supply negative of Hall
6	Yellow	UL1430 20AWG	Phase U	
7	Red		Phase V	
8	Black		Phase W	

● ELECTRICAL SPECIFICATIONS

Model		FL42BLS01	FL42BLS02	FL42BLS03	FL42BLS04
Number of poles		8			
Number of phase		3			
Rated voltage	VDC	24			
Rated speed	RPM	4000			
Continuous stall torque	N.m	0.075	0.15	0.22	0.3
Rated torque	N.m	0.0625	0.125	0.185	0.25
Rated power	W	26	52.5	77.5	105
Peak torque	N.m	0.19	0.38	0.56	0.75
Peak current	A	6	10.8	15.5	21.7
Line to line resistance	ohms	1.5	0.8	0.43	0.3
Line to line inductance	mH	2.1	1.2	0.71	0.5
Torque constant	N.m/A	0.033	0.036	0.037	0.035
Back E.M.F	Vrms/Krpm	2.45	2.71	2.74	2.62
Rotor inertia	$g.cm^2$	24	48	72	96
Body length	mm	40.3	60.3	80.3	100.3
Mass	Kg	0.3	0.45	0.65	0.8

● DIMENSIONS



*This motor can be designed & manufactured with customized request.

Brushless DC Motor

FL57BL(S) SERIES

● INDICATIONS OF THE MODELS

FL 57 BL(S) 01

- 01: Series number
- BL(S): BL: Brushless motor with round front end bell; BLS:Brushless motor with square front end bell
- 57: Frame: 57mm
- FL: Fulling

● GENERAL SPECIFICATIONS

Winding type	Delta
Hall effect angle	120 degree electrical angle
Shaft run out	0.025mm
Radial play	0.025mm@460g
End play	0.025mm@4000g
Max. radial force	75N @ 20mm from the flange
Max. axial force	15N
Insulation class	Class B
Dielectric strength	500VAC for one minute
Insulation resistance	100MΩMin., 500VDC

● ELECTRIC CONNECTION

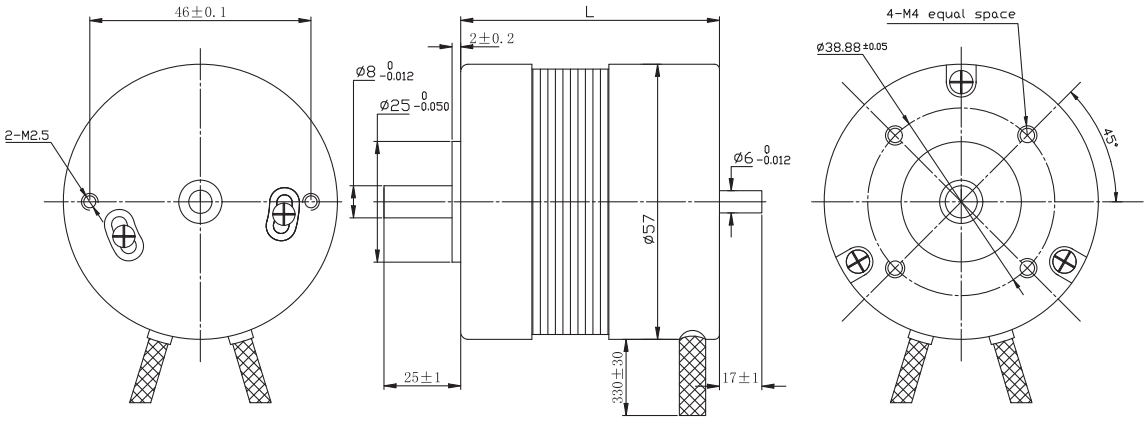
Lead No.	Lead Color	Lead Gauge	Function	Description
1	Red	UL1430 AWG26	Vcc	Power supply positive of hall +5VDC—+24VDC
2	Blue		Hall U	
3	Green		Hall V	
4	White		Hall W	
5	Black		GND	POWER SUPPLY NEGATIVE OF HALL
6	Yellow	UL1430 AWG20	Phase U	
7	Red		Phase V	
8	Black		Phase W	

● ELECTRICAL SPECIFICATION

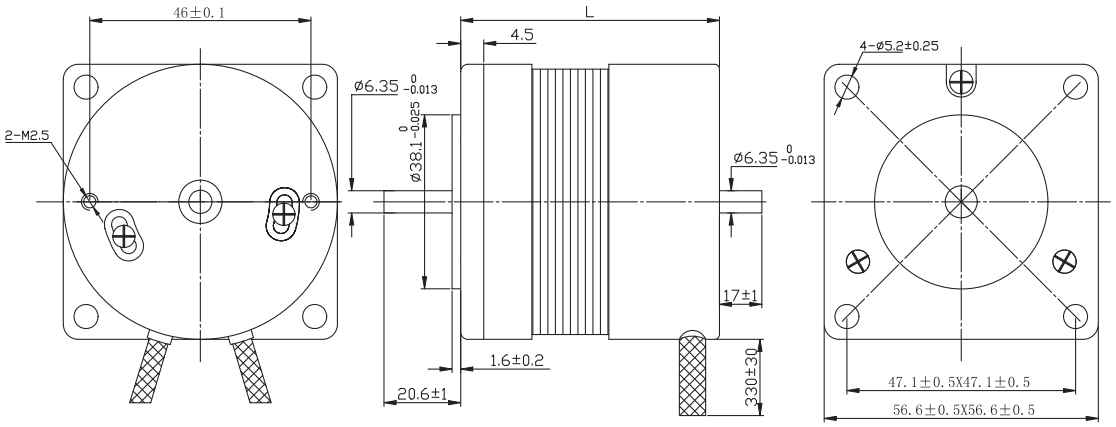
Model		FL57BL(S)005	FL57BL(S)01	FL57BL(S)02	FL57BL(S)03	FL57BL(S)04
Number of poles		4				
Number of phase		3				
Rated voltage	VDC	36				
Rated speed	RPM	4000				
Rated torque	N.m	0.055	0.11	0.22	0.33	0.44
Rated power	W	23	46	99	138	184
Peak torque	N.m	0.16	0.39	0.7	1	1.27
Peak current	A	3.5	6.8	12	16	21
Line to line resistance	ohms	4.3	1.63	0.64	0.45	0.33
Line to line inductance	mH	10	4.4	2.0	1.5	0.95
Torque constant	Nm/A	0.052	0.061	0.060	0.065	0.062
BackE.M.F	Vrms/KRPM	3.8	4.5	4.45	4.8	4.6
Rotor inertia	$g.cm^2$	30	75	119	173	230
Body length(L)	mm	43.6	53.6	73.6	93.6	113.6
Mass	Kg	0.33	0.44	0.72	0.95	1.2

● DIMENSIONS

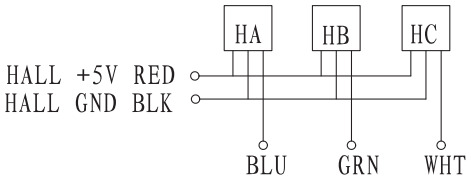
FL57BL



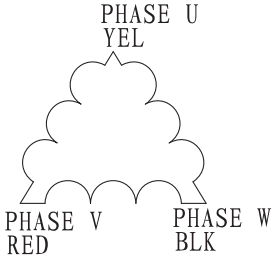
FL57BLS



HALL CONNECTING



THREE-PHASE CONNECTING



*This motor can be designed & manufactured with customized request.

Brushless DC Motor

FL86BLS SERIES

● INDICATIONS OF THE MODELS

FL 86 BLS 58

- 58 — Body length
- BLS — Brushless motor
- 86 — Motor frame size: Metric (mm)
- FL — Fulling

● GENERAL SPECIFICATIONS

Winding type	Star
Hall effect angle	120 degree electrical angle
Shaft run out	0.05mm
Radial play	0.02mm@450g
End play	0.08mm@450g
Max. radial force	220N @ 20mm from the flange
Max. axial force	60N
Insulation class	Class F
Dielectric strength	500VAC for one minute
Insulation resistance	100MΩMin., 500VDC

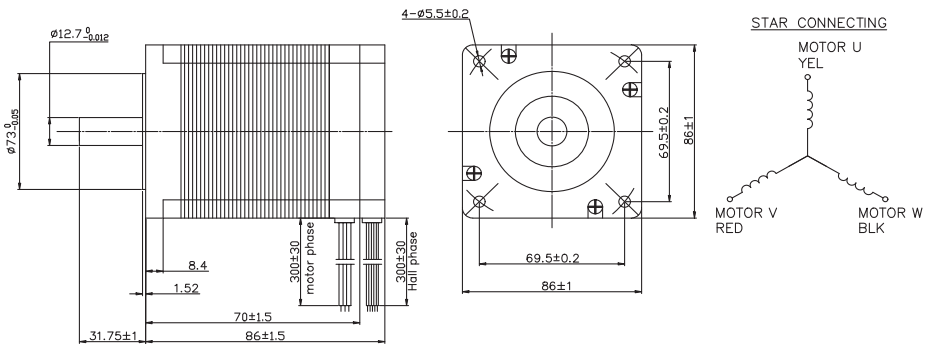
● ELECTRIC CONNECTION

Lead No.	Lead Color	Lead Gauge	FUNCTION	DESCRIPTION
1	Red	UL1332 22#AWG	Vcc	Power supply of Hall positive :+5VDC—+24VDC
2	Blue		Hall A	
3	Green		Hall B	
4	White		Hall C	
5	Black		GND	Power supply of Hall negative
6	Yellow	UL1332 18#AWG	Phase A	
7	Red		Phase B	
8	Black		Phase C	

● ELECTRICAL SPECIFICATIONS

Model		FL86BLS58	FL86BLS71	FL86BLS84	FL86BLS98	FL86BLS125
Number of poles		8				
Number of phase		3				
Rated voltage	VDC	48				
Rated speed	RPM	3000				
Rated torque	N.m	0.35	0.7	1.05	1.4	2.1
Rated power	W	110	220	330	440	660
Peak torque	N.m	1.05	2.1	3.15	4.2	6.3
Peak current	A	9.5	20	24	33	56
Line to line resistance	ohms	0.9	0.34	0.2	0.16	0.10
Line to line inductance	mH	2.6	1	0.66	0.5	0.31
Torque constant	Nm/A	0.116	0.124	0.127	0.127	0.128
Back E.M.F	Vrms/KRPM	8.6	9	9.4	9.4	9.5
Rotor inertia	$g.cm^2$	400	800	1200	1600	2400
Body length (L)	mm	56	70	84	96	123
Mass	Kg	1.6	2.12	2.64	3.15	4.2

● DIMENSIONS



*This motor can be designed & manufactured with customized request.

Outer Rotor Brushless DC Motor

FL45BLW SERIES

● INDICATIONS OF THE MODELS

FL 45 BLW 18 – 24V– 65 30 A

- FL: Fulling
- 45: The motor outer diameter: 45mm
- BLW: Outer rotor BLDC motor
- 18: Body length:18mm
- 24V: Rated voltage：24V
- 65: No load speed 1%
- 30: Rated power：30W
- A: Single shaft(A) (B：double shaft)

● GENERAL SPECIFICATIONS

Winding type	Star
Electrical degree	120
Radial play	0.02mm@4N
End play	0.14mm@4N
Max. radial force	28N
Max. axial force	10N
Insulation class	Class B
Dielectric strength	500VAC for one minute
Insulation resistance	100MΩMin., 500VDC

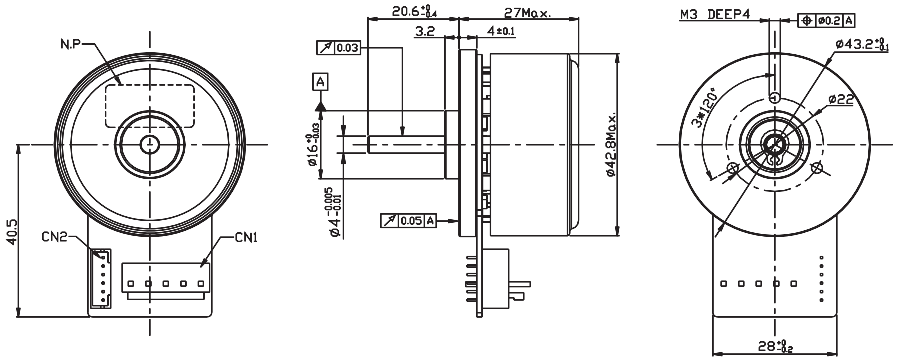
● ELECTRIC CONNECTION

Connector No.	PiN No.	Function	Description
CN1	1	Motor U	
	2	Motor V	
	3	Motor W	
CN2	1	GND	Ground for hall sensors
	2	Vcc	Supply voltage for hall sensors+5VDC—+24VDC
	3	HALL A	
	4	HALL B	
	5	HALL C	

● ELECTRICAL SPECIFICATIONS

Model	Unit	Tolerance	FL45BLW18–24V–6530A	FL45BLW21–24V–6750A	FL45BLW27–24V–6170A
Number of poles			16	16	16
Number of phase			3	3	3
Rated voltage	VDC		24	24	24
Noload speed	RPM	±10%	6500	6700	6100
No load current	A	<0.5A	0.27	0.33	0.38
Rated speed	RPM	±10%	5000	5260	4840
Rated torque	mN.m		50	84	130
Rated power	W		30	50	70
Peak torque	mN.m		150	250	390
Peak current	A	±10%	4.8	7.8	11
Resistance	ohms@25℃	±10%	1.42Ω	0.70Ω	0.56Ω
Inductance	mH	±20%	0.59	0.33	0.27
Torque constant	mNm/A	±10%	35.3	34.2	37.2
BackE.M.F constant	Vrms/KRPM	±10%	2.61	2.53	2.75
Rotor inertia	$g.cm^2$		99	135	181
Weight	g		80	120	150

● DIMENSIONS



*This motor can be designed & manufactured with customized request.