

CERTIFICATE



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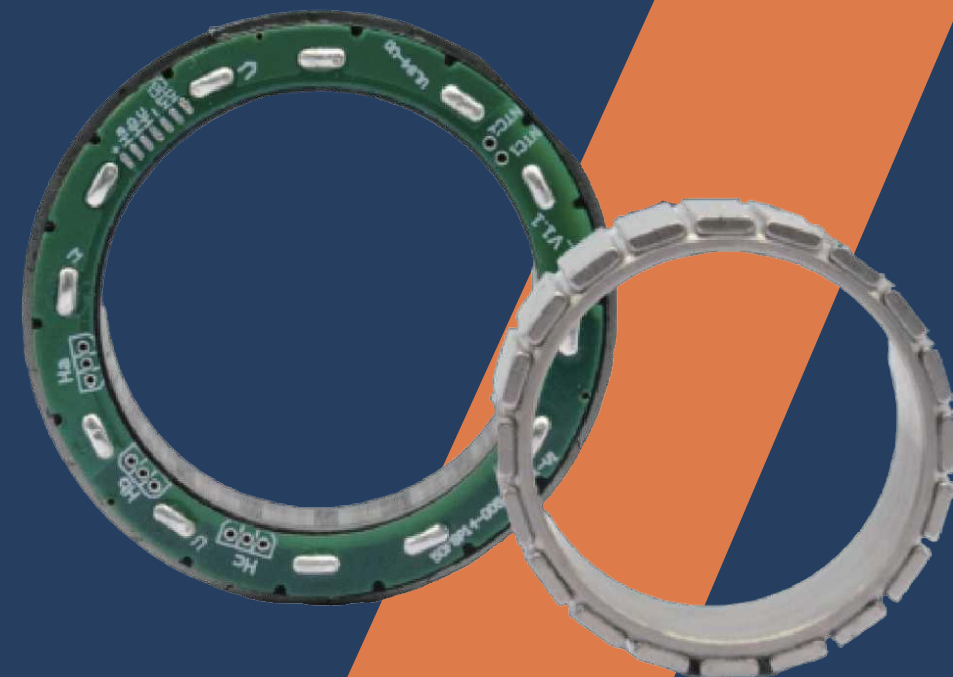
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Frameless servo kits



Frameless motor explanation

A frameless motor is a type of motor that lacks a traditional outershell or frame, typically consisting only of the stator and rotor, without independent bearings, housings, or end caps. This design allows the frameless motor to be directly integrated into a machine or system, reducing overall size and weight while increasing design flexibility.

Frameless motors are widely used in applications that require high performance, low inertia, and compact structures, such as robots, aerospace equipment, precision machinery, and medical devices. Since they do not have an outer casing, they can be directly mounted into mechanical structures according to specific needs, saving space and optimizing the system's power transmission efficiency.



Eight advantages

high density

High torque density, high power density.

smooth running

Optimize slot-pole matching, reduce cogging torque, and ensure smooth operation.

low-temperature rise

Adopt advanced Japanese-style vacuum potting process, ensuring low temperature rise.

F **high reliability**

Class F insulation design for reliable operation at high temperatures and extreme operating conditions.

Seven sizes

Seven frame sizes and different stack thicknesses of frameless torque motors can cover load requirements ranging from 3 to 25 kg.

high adaptability

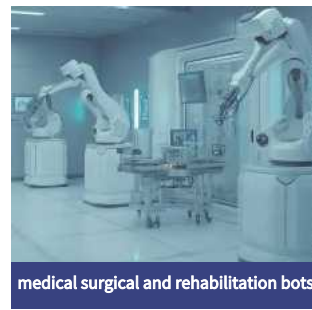
Optimized design with standardized dimensions, compatible with the dimensions of mainstream harmonic drive in the market.

easy-to-integrate

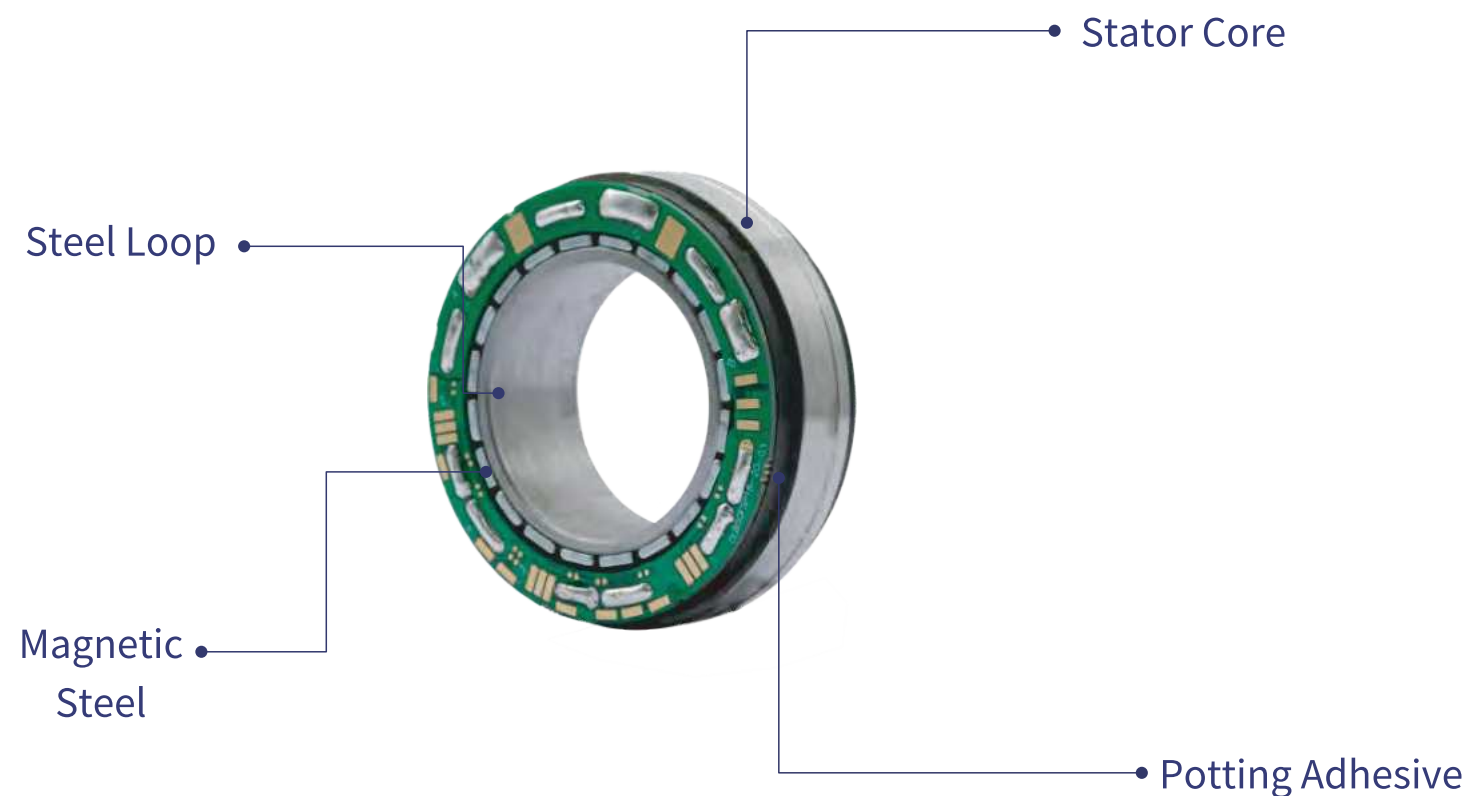
Large inner diameter through-hole design, compatible with encoders, cables, hoses, shafts, tools, and more.

customization optional

Custom solutions available, with options for Hall sensors, temperature sensors, wire outlet forms, and more.

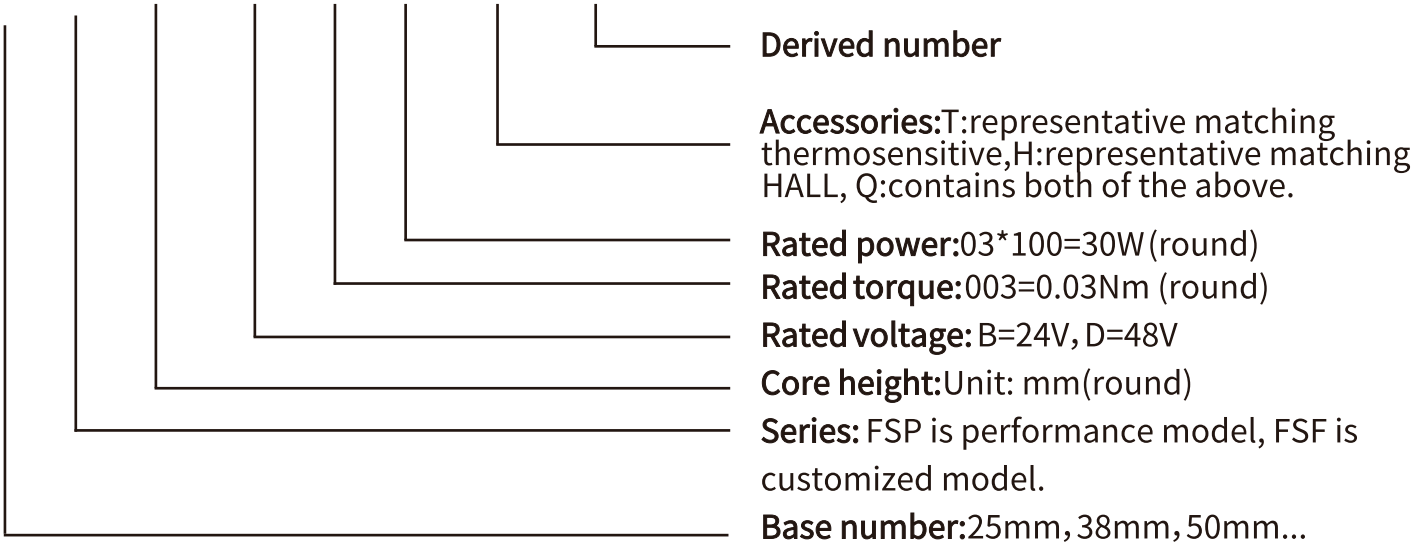


Product composition



Product naming rules

25 FSP 05 - D 003 03 - T - 01



Electrical parameters (FSP series)

25 Frame			38 Frame		50 Frame		70 Frame
Motor Model	25FSP04 -B00307-X-00	25FSP08 -B00608-X-00	38FSP06 -B01011-X-00	38FSP12 -D02324-X-00	50FSP08 -D03021-X-00	50FSP14 -D05421-X-00	70FSP10 -D06625-X-00
Pole pairs	7	7	7	7	10	10	10
Max power [W]	70	80	110	240	210	210	250
Rated voltage [V]	24	24	24	48	48	48	48
Rated torque [Nm]	0.032	0.063	0.102	0.23	0.298	0.54	0.66
Peak torque [Nm]	0.105	0.204	0.32	0.76	0.96	1.75	2.13
Rated current [A]	3.8	4.3	5.5	6.1	5.1	5	6.1
Max speed [rpm]	22650	13530	10470	10190	6850	3870	3650
Rated speed [rpm]	18875	11275	8725	8491.67	5708	3225	3042
Torque constant [Nm/A]	0.0088	0.0147	0.0182	0.039	0.058	0.103	0.109
Inertia [kgcm²]	0.00147	0.00231	0.0101	0.0203	0.054	0.09	0.196
BEMF [V/krpm]	0.5	0.9	1.1	2.3	4.9	8.3	6.5

Electrical parameters (FSP series)

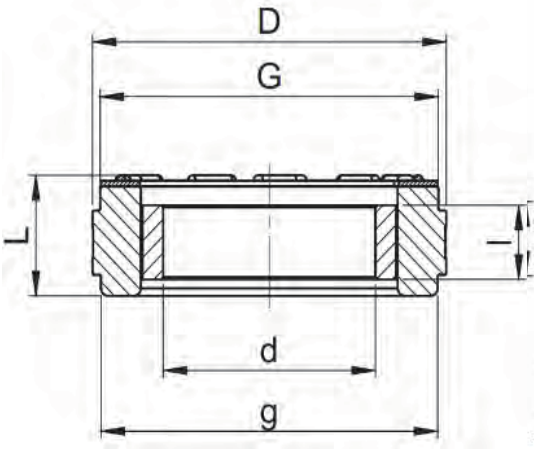
70 Frame			85 Frame			115 Frame		
Motor Model		70FSP18 -D12427-X-00	85FSP04 -D03029-X-00	85FSP13 -D14444-X-00	85FSP23 -D25646-X-00	85FSP26 -D29047-X-00	115FSP25 -D39057-X-00	115FSP50 -D95162-X-00
Pole pairs		10	10	10	10	10	10	10
Max power [W]		270	290	440	460	470	570	618
Rated voltage [V]		48	48	48	48	48	48	48
Rated torque [Nm]		1.24	0.3	1.44	2.56	2.9	3.9	9.51
Peak torque [Nm]		4.05	0.99	4.66	8.3	9.4	12.7	31.4
Rated current [A]		5.45	7.2	10.8	9.6	11.5	14.1	15.1
Max speed [rpm]		2120	7900	2950	1730	1560	1400	620
Rated speed [rpm]		1767	6583	2458	1442	1300	1167	517
Torque constant	[Nm/A]	0.187	0.043	0.134	0.229	0.253	0.251	0.64
Inertia	[kgcm²]	1.321	0.276	0.61	0.98	1.06	3.93	7.9
BEMF	[V/krpm]	17.0	2.5	8.1	19.7	15.2	16.7	38.1

Mechanical parameters (FSP series)

25 Frame			38 Frame		50 Frame		70 Frame	
Motor Model	25FSP04	25FSP08	38FSP06	38FSP12	50FSP08	50FSP14	70FSP10	
	-B00307-X-00	-B00608-X-00	-B01011-X-00	-D02324-X-00	-D03021-X-00	-D05021-X-00	-D06625-X-00	
Stator core OD D	[mm]	25	25	38	38	50	50	69
PCB OD G	[mm]	23.8	23.8	36.2	36.2	47.6	47.6	66
Winding OD g	[mm]	23.8	23.8	36	36	47.8	47.8	66.5
Stator core height i	[mm]	4	8	6	12	8	14	10
Stator height L	[mm]	10.8	15.2	15.3	22.3	16.6	22.6	22.2
Rotor ID d	[mm]	11.6	11.6	18	18	30	30	42
Rotor height l	[mm]	6.3	9.7	8.1	16.2	9.9	16.1	12.7

Mechanical parameters (FSP series)

70 Frame		85 Frame				115 Frame	
Motor Model	70FSP18 -D12427-X-00	85FSP04 -D03029X-00	85FSP13 -D14444-X-00	85FSP23 -D25646X-00	85FSP26 -D29047-X-00	115FSP25 -D39057-X-00	115FSP50 -D95162-X-00
Stator core OD D [mm]	69	85	85	85	85	115	15
PCB OD G [mm]	66	81.5	81.5	81.5	81.5	111.8	111.8
Winding OD g [mm]	66.5	82	82	82	82	110	110
Stator core height i [mm]	18	4	13	23	26	25	50
Stator height L [mm]	30.5	17.6	27.2	37.2	40.7	39	68.4
Rotor ID d [mm]	42	52	52	52	52	74	74
Rotor height l [mm]	20.7	7.1	15.7	25.1	27.2	27.1	54.2



Electrical parameters (FSF series)

	38 Frame	57 Frame			
Motor Model	38FSF09 -D01003-01	57FSF10 -D03210-01	57FSF20 -D06420-01	57FSE10 -D03210-01	57FSE20 -D06420-01
Pole pairs	7	5	5	10	10
Rated voltage [V]	48	48	48	48	48
Rated torque [N.m]	0.1	0.32	0.64	0.32	0.64
Rated current [A]	1.2	3.2	6.5	3.2	6.5
Rated speed [rpm]	3500	3000	3000	3000	3000
Rated power [W]	30	100	200	100	200
Max speed [rpm]	6000	5000	5000	5000	5000
Peak torque [N.m]	0.3	0.64	1.28	0.64	1.28
Peak current [A]	3.05	6.4	13	6.4	13
Torque constant [Nm/A]	0.113	0.109	0.107	0.109	0.107
BEMF [Vrms/krpm]	6.85	6.6	6.6	6.6	6.6

Electrical parameters (FSF series)

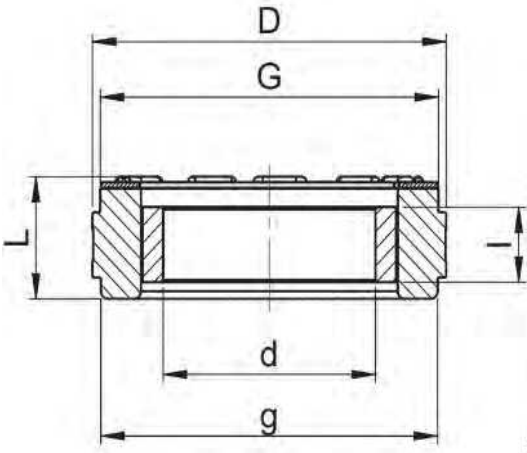
	60 Frame	77 Frame	94 Frame	123 Frame	
Motor Model	60FSF17 -D05020-01	77FSF30 -D15047-01	94FSF17 -D24050-01	123FSF34 -D38096-01	123FSF40 -D72015X-01
Pole pairs	10	5	10	5	5
Rated voltage [V]	48	48	48	48	48
Rated torque [N.m]	0.5	1.5	2.4	3.8	7.2
Rated current [A]	5	11.5	14	25.2	34.4
Rated speed [rpm]	3100	3000	2000	2400	2000
Rated power [W]	200	471	500	960	1500
Max speed [rpm]	4500	4000	4000	4500	2300
Peak torque [N.m]	1.08	3	4.8	7.6	14.4
Peak current [A]	18	23	24.5	51	69
Torque constant [Nm/A]	0.1	0.137	0.178	0.165	0.23
BEMF [Vrms/krpm]	7.7	8.3	10.72	11.1	14

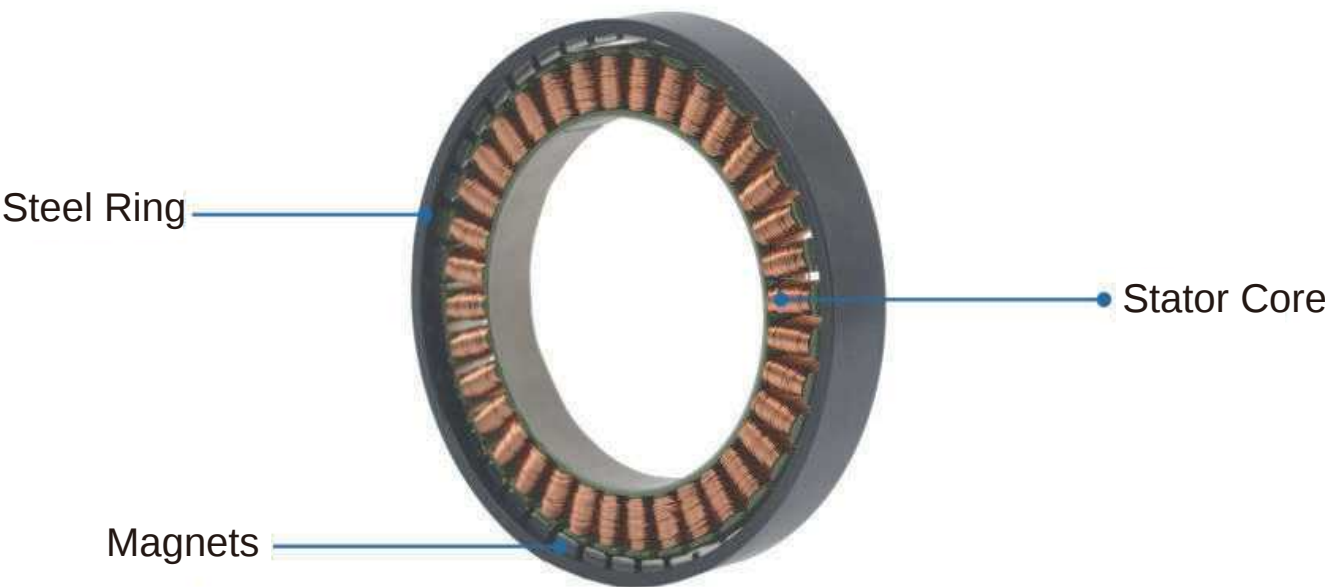
Mechanical parameters (FSF series)

	38 Frame	57 Frame			
Motor Model	38FSF09 -D01003-01	57FSF10 -D03210-01	57FSF20 -D06420-01	57FSE10 -D03210-01	57FSE20 -D06420-01
Stator core OD D [mm]	(+0.02, -0.05) 37.2	57.5	57.5	57.5	57.5
PCB OD G [mm]	35	55	55	55.5	55.5
Winding OD g [mm]	35	55	55	55.5	55.5
Stator core height i [mm]	(+0.2, -0.8) 9	10	20	10	20
Stator height L [mm]	17	20.7	30.7	22.4	32.4
Rotor lD d [mm]	16	24	24	27	27
Rotor height l [mm]	10	15	20	10	20

Mechanical parameters (FSF series)

	60 Frame	77 Frame	94 Frame	123 Frame	
Motor Model	60FSF17 -D05020-01	77FSF30 -D15047-01	94FSF17 -D24050-01	123FSF34 -D38096-01	123FSF40 -D72015X-01
Stator core OD D [mm]	(+0.02, -0.05) 60	77	94	123	123
PCB OD G [mm]	56	74	91	119	119
Winding OD g [mm]	57	74	91	119	119
Stator core height i [mm]	(+0.2, -0.8) 16.5	30	17	34	40
Stator height L [mm]	28.8	45.3	28.5	64.6	71
Rotor lD d [mm]	17	32.6	51	45	45
Rotor height l [mm]	17	30	17	34	40





54 FW B - 18 065 027 - X - 00

Variant Model

Accessories X=standard lead wires
T= thermistor wires

Power: 27 W

Torque: 0.65 N.m

Rotor Housing Length: 18 mm

Voltage Code: A=12 V, B=24 V, C=36 V, D=48

Frameless Outer Rotor Motor

Stator Core OD: 54 mm

Frameless Outer Rotor Torque Motor



Electrical Parameters (FW Series)							
	18 Frame	22 Frame	28 Frame	32 Frame	34 Frame	43 Frame	
Motor Model	18FWA09-002002-X-00	22FWA08-003002-X-00	28FWA09-006006-X-00	32FWA12-011003-X-00	34FWA09-009004-X-00	43FWA13-020017-X-00	43FWA18-020006-X-00
Number of Pole Pairs	7	7	7	7	5	10	10
Maximum Output Power [W]	1.84	2.44	5.97	2.88	4.4	16.9	5.73
Rated Voltage [V]	12	12	12	12	12	24	24
Rated Torque [Nm]	0.02	0.029	0.06	0.11	0.09	0.2	0.23
Peak Torque [Nm]	0.04	0.058	0.12	0.22	0.18	0.4	0.46
Rated Current [A]	0.66	0.66	0.81	0.53	1.1	0.9	0.59
Rated Speed [rpm]	800	790	950	250	460	800	235
Maximum Speed [rpm]	2600	2950	1790	610	1650	1090	660
Torque Constant [Nm/A]	0.033	0.043	0.074	0.208	0.082	0.222	0.39
Rotor Inertia [10 ⁻⁴ kg·m²]	0.0067	0.0122	0.0373	0.099	0.0595	0.247	0.174
Back EMF Constant [Vrms/Krpm]	2.12	3.96	4.73	13.15	5.14	14.67	25.2

Electrical Parameters (FW Series)								
	50 Frame	54 Frame	61 Frame		81 Frame			100 Frame
Motor Model	50FWB18-054006-X-00	54FWB18-065027-X-00	61FWB13-080024-X-00	61FWB28-180095-X-00	81FWB14-093034-X-00	81FWB19-120120-X-00	81FWC19-130050-X-00	100FWC30-400070-X-00
Number of Pole Pairs	14	7	14	14	21	21	21	14
Maximum Output Power [W]	6	27	24.6	95	34	120	50.6	70.4
Rated Voltage [V]	24	24	36	36	24	24	36	36
Rated Torque [Nm]	0.54	0.65	0.8	1.8	0.93	1.2	1.3	4
Peak Torque [Nm]	1.08	1.3	1.6	3.6	1.86	2.4	2.6	8
Rated Current [A]	1.24	1.6	1.3	7.4	2.49	5.8	2.1	3.8
Rated Speed [rpm]	400	400	290	500	350	950	370	168
Maximum Speed [rpm]	570	635	560	720	560	1140	530	330
Torque Constant [Nm/A]	0.435	0.42	0.69	0.24	0.42	0.22	0.63	1.08
Rotor Inertia [10 ⁻⁴ kg·m²]	0.708	0.592	0.916	2.075	1.542	2.186	2.186	7.231
Back EMF Constant [Vrms/Krpm]	28.15	25.36	41.6	15.3	25.51	13.92	40.36	68.7

Frameless Outer Rotor Torque Motor



Mechanical Parameters (FW Series)							
	18 Frame	22 Frame	28 Frame	32 Frame	34 Frame	43 Frame	
Motor Model	18FWA09-002002-X-00	22FWA08-003002-X-00	28FWA09-006006-X-00	32FWA12-011003-X-00	34FWA09-009004-X-00	43FWA13-020017-X-00	43FWA18-020006-X-00
Rotor Housing Outer Diameter [D]	22	26.5	34.5	40	40	49	49
Rotor Housing Pilot Inner Diameter [G]H7	21	25	32	38	38	47	47
Rotor Housing Pilot Height [H]	2	2	2	2	2	2	2
Stator Core Inner Diameter [d]	6.8	8.5	13	13	12	27	27
Stator Core Height [I]	6	5	6	10	6	10	15
Rotor Housing Height [L]	9	8	9	13	9	13	18
Lead Wire Bundle Height [h]	2.5	3	3	3	3	3	3
Winding Outer Diameter [g]	17.2	21.2	29.1	32	32.6	42	42

Electrical Parameters (FW Series)								
	50 Frame	54 Frame	61 Frame		81 Frame			100 Frame
Motor Model	50FWB18-054006-X-00	54FWB18-065027-X-00	61FWB13-080024-X-00	61FWB28-180095-X-00	81FWB14-093034-X-00	81FWB19-120120-X-00	81FWC19-130050-X-00	100FWC30-400070-X-00
Rotor Outer Diameter [D]	58.5	61	71	71	89.5	89.5	89.5	109.5
Rotor End Inner Diameter [G] H7	55	58.5	68	68	86.5	86.5	86.5	106.5
Rotor End Height [H]	2	2	2	2	3	3	3	3
Stator Iron Core Inner Diameter [d]	25.5	23.8	35.5	35.5	58.5	58.5	58.5	64
Stator Iron Core Height [I]	15	15	10	25	10	15	15	25
Rotor Height [L]	18	18	13	28	14	19	19	30
Lead Wire Length (Height) [h]	3	4	4.5	4.5	5	5	5	7
Winding Outer Diameter [g]	48.6	51	60	60	79	79	79	98

