



ИННОДРАЙВ
ТЕХНОЛОГИИ ИМЕЮТ ЗНАЧЕНИЕ

Constar

无框力矩电机 产品目录

Frameless Torque Motor
Catalogue Manual



深圳市德达兴科技有限公司
Constar Motion Co.,Ltd

无框力矩电机

Frameless Torque Motor

属于永磁同步电机，是传统电机的主动扭矩和速度产生部分，但没有轴、轴承、外壳或尾夹。无框电机仅由两部分组成：转子和定子。转子通常是内部部件，由带有永磁体的旋转钢环形组件组成，直接安装在机器轴上。定子是外部部件，齿周围有钢叠片和铜绕组，可产生紧密安装在机器外壳体内的电磁力。

It is a permanent magnet synchronous motor, which is the active torque and speed generation part of the traditional motor, but there is no shaft, bearing, housing or tail clip. Frameless motors consist of only two parts: a rotor and a stator. The rotor is usually an internal component, consisting of a rotating steel ring assembly with permanent magnets, mounted directly on the machine shaft. The stator is an external component with steel laminates and copper windings around the teeth that generate an electromagnetic force that is tightly installed inside the machine housing.

▶▶▶ 产品优势 / Product Advantage

高性能：高效率、高功率密度、高加速；

High Performance: high efficiency, high power density, high acceleration;

低惯量：更高的响应速度；

Low Inertia: higher response speed;

精密控制：闭环控制、位置反馈；

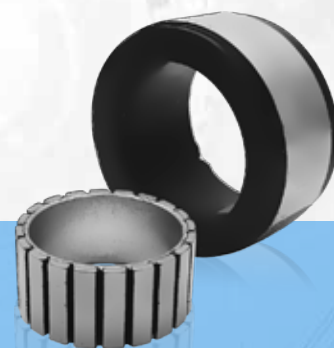
Precision Control: closed-loop control, position feedback;

设计紧凑：减轻重量、减少安装空间；

Compact Design: reduces weight and installation space;

适配性强：适配不同外壳、反馈装置、减速箱等部件的集成。

Strong Adaptability: integration of different enclosures, feedback devices, gear boxes and other components.



▶▶▶ 应用领域 / Applications



协作机器人 / Cooperative Robotic



人形机器人 / Humanoid Robotic



智慧农业 / Smart Farming



工业自动化 / Industrial Automation



医疗影像 / Medical Imaging



精密转台 / Precision Turntable

无框电机系列 Frameless Motor

BS5016NFL Ø50mm*24mm, 内转子有槽无传感器 (Inner Rotor, Slotted, Sensorless)

▶▶▶ 主要技术指标 / Characteristics

				-14-48.0	-29-48.0	-58-48.0
电机参数 / Motor Data						
1	电压	Voltage	V	48.0	48.0	48.0
2	线电阻	Line resistance	Ω	10.0	2.5	0.63
3	线电感	Line inductance	mH	5.2	1.3	0.33
4	空载转速	No-load speed	rpm	1440	2880	5760
5	空载电流	No-load current	A	0.1	0.2	0.3
6	堵转转矩	Stall torque	N.m	1.5	3.0	6.1
7	堵转电流	Stall current	A	4.8	19.2	76.8
8	额定转矩	Nominal torque	N.m	0.53	0.46	0.38
9	额定转速	Nominal speed	rpm	835	2194	4857
10	额定电流	Nominal current	A	1.8	3.1	5.1
11	最大输出功率	Max.output power	W	56	227	914
12	最大效率	Max.efficiency	%	85	85	85
13	反电势常数	Back-EMF constant	mV/rpm	32.8	16.5	8.3
14	转矩常数	Torque constant	Nm/A	0.31	0.16	0.08
15	KV 值	KV Value	rpm/V	30	60	120
16	转速 / 转矩斜率	Speed/torque gradient	rpm/Nm	973	957	950
17	重量	Weight	g	138	138	138
热参数 / Thermal Data						
18	热阻 (线圈 - 环境)	Thermal resistance winding-ambient	K/W	3.3	3.3	3.3
19	热时常数 (线圈)	Thermal time constant winding	s	120	120	120
20	工作温度范围	Operating temperature range	°C	-40~+100	-40~+100	-40~+100
21	绕组耐温等级	Thermal class of winding	°C	180	180	180
22	绝缘等级	Insulation class		B	B	B
机械参数 / Mechanical Data						
23	极对数	No. of pole pairs		10	10	10
24	槽数	No. of slots		18	18	18
25	转子惯量	Rotor inertia	gcm ²	61	61	61
其它参数 / Other Specifications						
26	换向结构	Commutation		sensorless	sensorless	sensorless
27	绕组联结	Circuit type		Y	Y	Y
28	耐电压	Puncture	V	500VAC/5mA/1s	500VAC/5mA/1s	500VAC/5mA/1s
29	绝缘电阻	Insulation Resistance	Ω	100MΩ/500VDC	100MΩ/500VDC	100MΩ/500VDC
可选配置 / Options						

性能 Special coils: 连续运行范围内可定制 customizable in continuous operation range

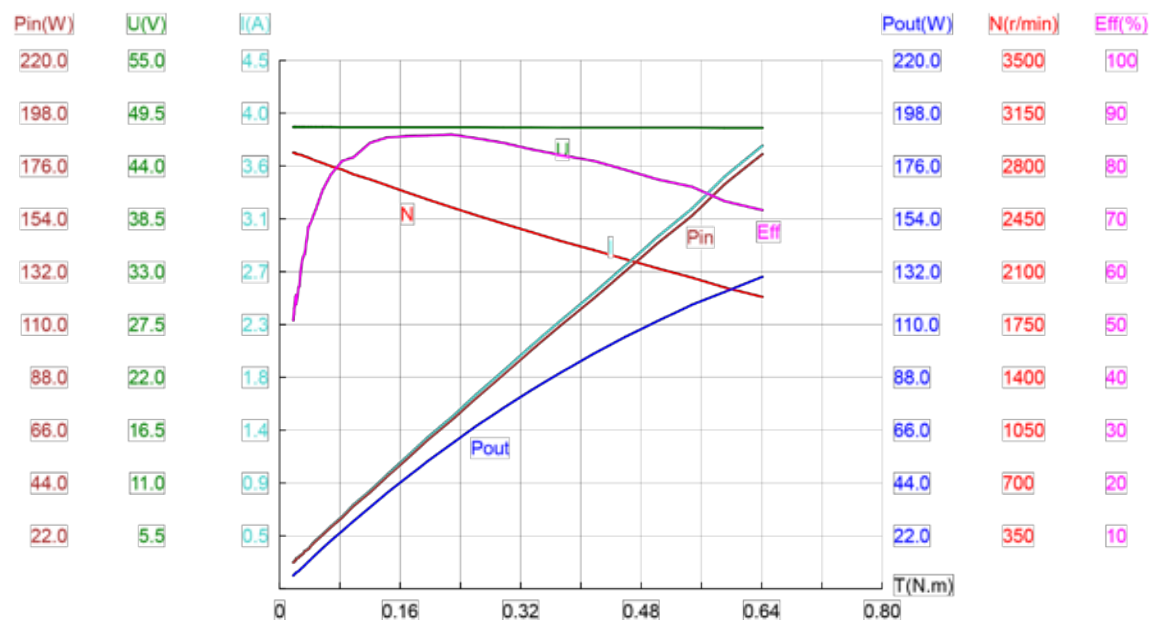
传感器 Sensor: 无传感器 sensorless/ 霍尔传感器 hall sensor

驱动器 Driver: 可定制 customizable upon request

电气连接 Electrical connection: 端子或导线 connector or wire / 导线长度 lead wires length

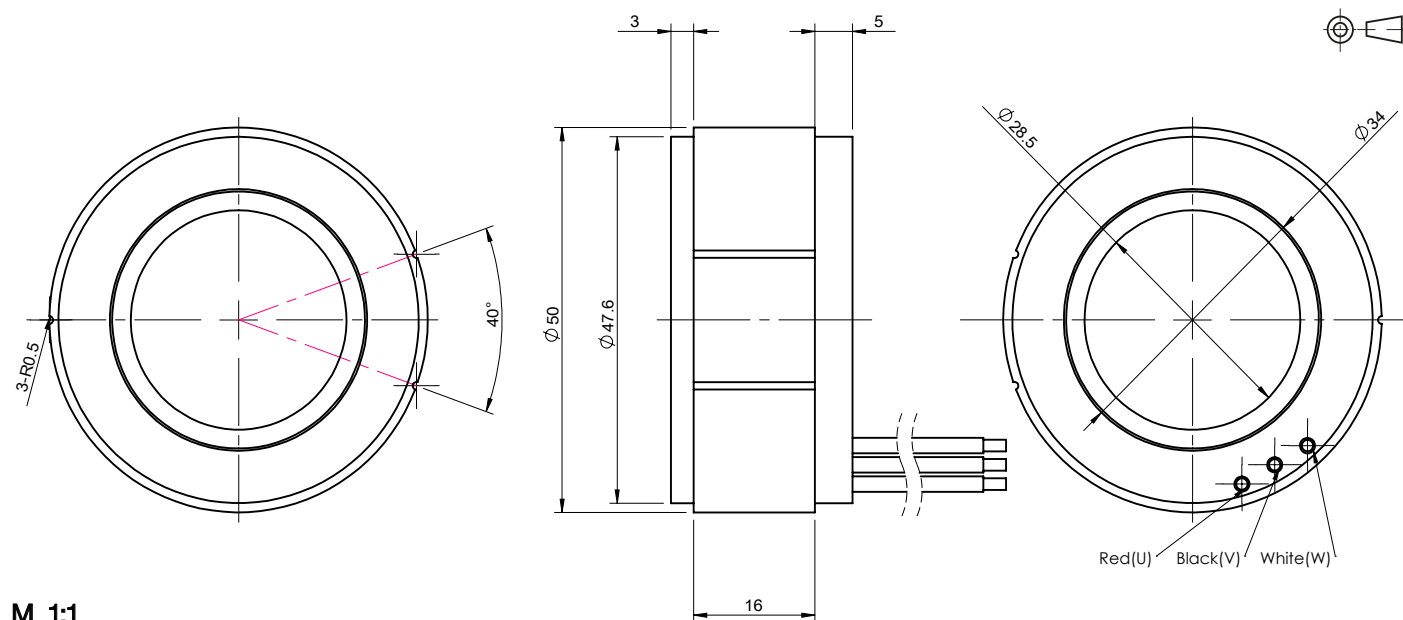
特性曲线指标 / Characteristics Curve

BS5016NFL-29-48.0



外观图 / Outline Drawing

端子定义 / Connection		
无传感器 /sensorless AWG 24		
Pin 1	U	Red 红
Pin 2	V	Black 黑
Pin 3	W	White 白



M 1:1

无框电机系列 Frameless Motor

BS6008NFL Ø60mm*16mm, 内转子有槽无传感器 (Inner Rotor, Slotted, Sensorless)

▶▶▶ 主要技术指标 / Characteristics

				-16-48.0	-33-48.0	-29-48.0
电机参数 / Motor Data						
1	电压	Voltage	V	48.0	48.0	48.0
2	线电阻	Line resistance	Ω	9.92	2.48	0.6
3	线电感	Line inductance	mH	4.16	1.04	0.26
4	空载转速	No-load speed	rpm	1640	3280	6560
5	空载电流	No-load current	A	0.08	0.15	0.3
6	堵转转矩	Stall torque	N.m	1.3	2.7	5.4
7	堵转电流	Stall current	A	4.8	19.4	77.4
8	额定转矩	Nominal torque	N.m	0.56	0.52	0.40
9	额定转速	Nominal speed	rpm	841	2377	5459
10	额定电流	Nominal current	A	2.1	3.9	6.1
11	最大输出功率	Max.output power	W	56	229	922
12	最大效率	Max.efficiency	%	86	86	86
13	反电势常数	Back-EMF constant	mV/rpm	28.8	14.5	7.3
14	转矩常数	Torque constant	Nm/A	0.28	0.14	0.07
15	KV 值	KV Value	rpm/V	34.2	68.3	136.7
16	转速 / 转矩斜率	Speed/torque gradient	rpm/Nm	1251	1232	1222
17	重量	Weight	g	119	119	119
热参数 / Thermal Data						
18	热阻 (线圈 - 环境)	Thermal resistance winding-ambient	K/W	1.6	1.6	1.6
19	热时常数 (线圈)	Thermal time constant winding	s	120	120	120
20	工作温度范围	Operating temperature range	°C	-40~+100	-40~+100	-40~+100
21	绕组耐温等级	Thermal class of winding	°C	180	180	180
22	绝缘等级	Insulation class		B	B	B
机械参数 / Mechanical Data						
23	极对数	No. of pole pairs		10	10	10
24	槽数	No. of slots		24	24	24
25	转子惯量	Rotor inertia	gcm ²	81	81	81
其它参数 / Other Specifications						
26	换向结构	Commutation		sensorless	sensorless	sensorless
27	绕组联结	Circuit type		Y	Y	Y
28	耐电压	Puncture	V	500VAC/5mA/1s	500VAC/5mA/1s	500VAC/5mA/1s
29	绝缘电阻	Insulation Resistance	Ω	100MΩ/500VDC	100MΩ/500VDC	100MΩ/500VDC
可选配置 / Options						

性能 Special coils: 连续运行范围内可定制 customizable in continuous operation range

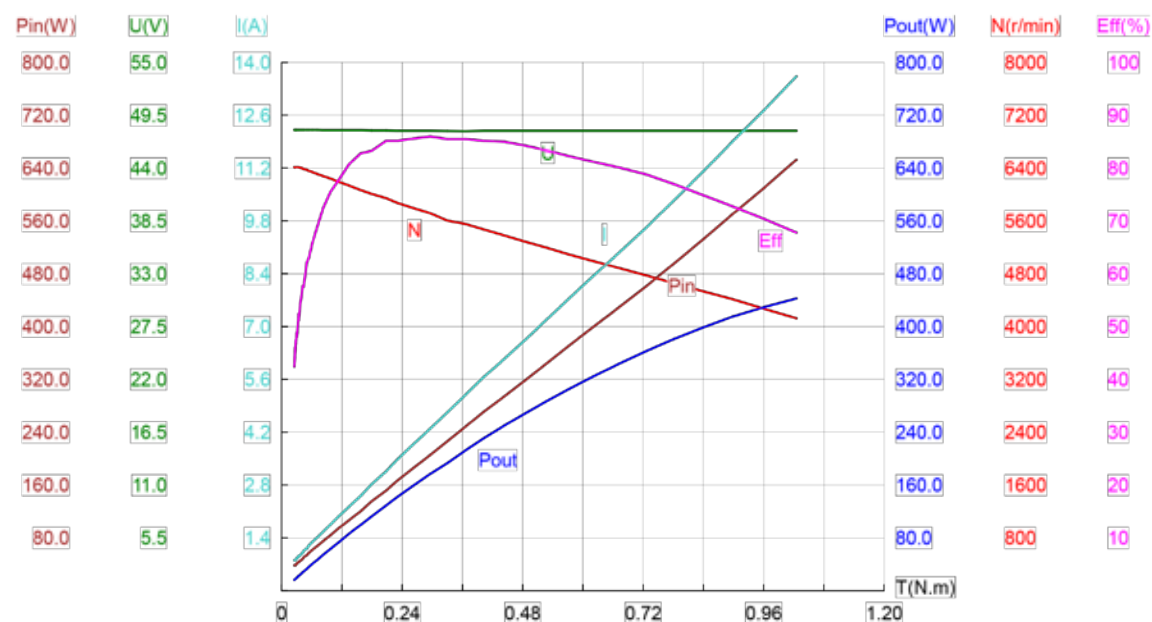
传感器 Sensor: 无传感器 sensorless/ 霍尔传感器 hall sensor

驱动器 Driver: 可定制 customizable upon request

电气连接 Electrical connection: 端子或导线 connector or wire / 导线长度 lead wires length

特性曲线指标 / Characteristics Curve

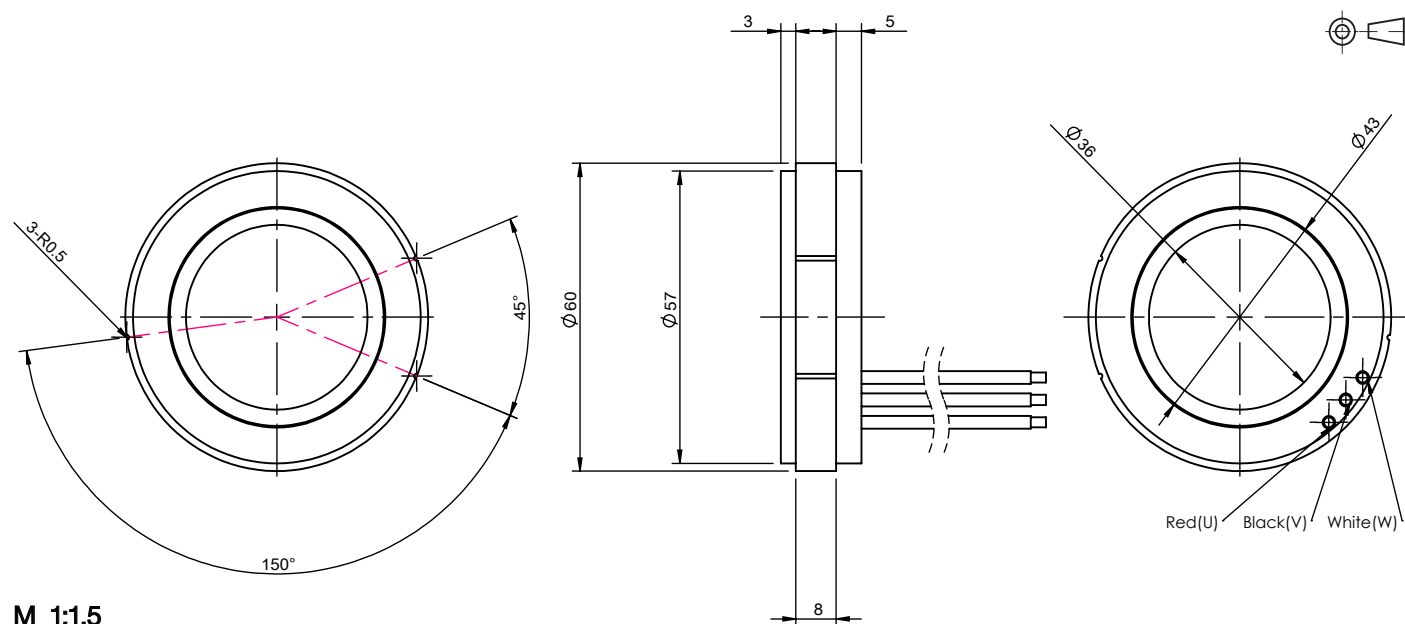
BS6008NFL-29-48.0



—	功率 (W)
—	电压 (V)
—	电流 (A)
—	输出功率 (W)
—	转速 (r/min)
—	效率 (%)

外观图 / Outline Drawing

端子定义 / Connection		
无传感器 /sensorless AWG 24		
Pin 1	U	Red 红
Pin 2	V	Black 黑
Pin 3	W	White 白



M 1:1.5

无框电机系列 Frameless Motor

BS8413NFL Ø84mm*21mm, 内转子有槽无传感器 (Inner Rotor, Slotted, Sensorless)

▶▶▶ 主要技术指标 / Characteristics

				-9-48.0	-17-48.0	-35-48.0
电机参数 / Motor Data						
1	电压	Voltage	V	48.0	48.0	48.0
2	线电阻	Line resistance	Ω	4.4	1.1	0.28
3	线电感	Line inductance	mH	2.36	0.59	0.15
4	空载转速	No-load speed	rpm	865	1730	3460
5	空载电流	No-load current	A	0.13	0.25	0.5
6	堵转转矩	Stall torque	N.m	5.6	11.4	23.0
7	堵转电流	Stall current	A	10.9	43.6	174.5
8	额定转矩	Nominal torque	N.m	1.5	1.3	1.0
9	额定转速	Nominal speed	rpm	565	1379	2979
10	额定电流	Nominal current	A	3.1	5.2	8.0
11	最大输出功率	Max.output power	W	128	518	2082
12	最大效率	Max.efficiency	%	86	86	86
13	反电势常数	Back-EMF constant	mV/rpm	54.9	27.6	13.8
14	转矩常数	Torque constant	Nm/A	0.52	0.26	0.13
15	KV 值	KV Value	rpm/V	18.0	36.0	72.1
16	转速 / 转矩斜率	Speed/torque gradient	rpm/Nm	153	151	150
17	重量	Weight	g	255	255	255
热参数 / Thermal Data						
18	热阻 (线圈 - 环境)	Thermal resistance winding-ambient	K/W	1.9	1.9	1.9
19	热时常数 (线圈)	Thermal time constant winding	s	120	120	120
20	工作温度范围	Operating temperature range	°C	-40~+100	-40~+100	-40~+100
21	绕组耐温等级	Thermal class of winding	°C	180	180	180
22	绝缘等级	Insulation class		B	B	B
机械参数 / Mechanical Data						
23	极对数	No. of pole pairs		16	16	16
24	槽数	No. of slots		36	36	36
25	转子惯量	Rotor inertia	gcm ²	535	535	535
其它参数 / Other Specifications						
26	换向结构	Commutation		sensorless	sensorless	sensorless
27	绕组联结	Circuit type		Y	Y	Y
28	耐电压	Puncture	V	500VAC/5mA/1s	500VAC/5mA/1s	500VAC/5mA/1s
29	绝缘电阻	Insulation Resistance	Ω	100MΩ/500VDC	100MΩ/500VDC	100MΩ/500VDC
可选配置 / Options						

性能 Special coils: 连续运行范围内可定制 customizable in continuous operation range

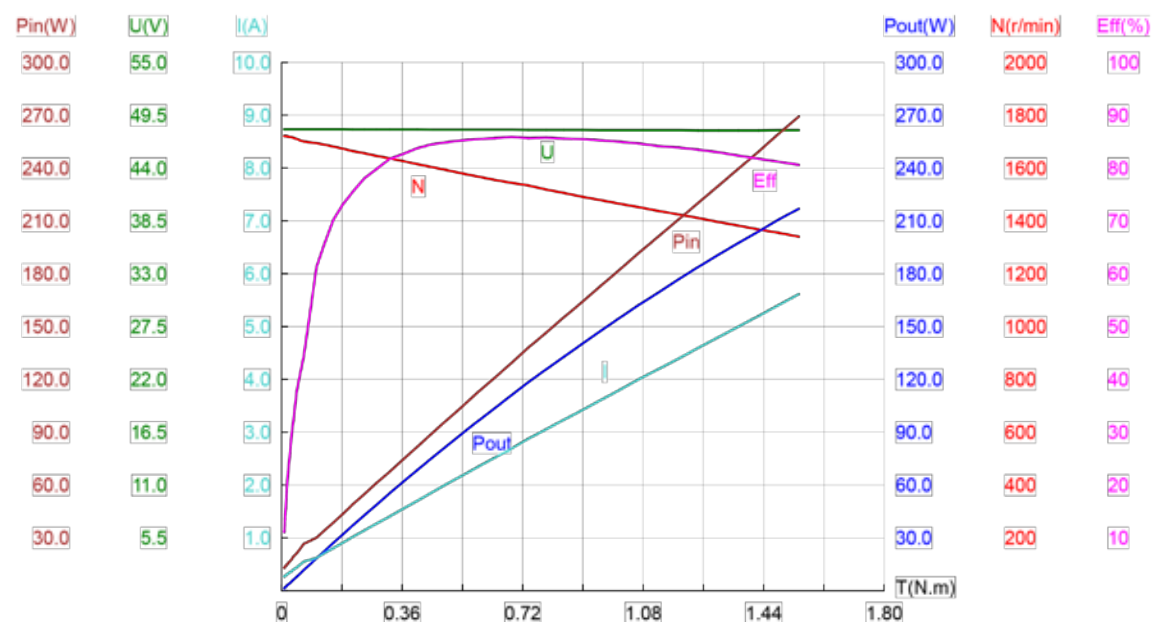
传感器 Sensor: 无传感器 sensorless/ 霍尔传感器 hall sensor

驱动器 Driver: 可定制 customizable upon request

电气连接 Electrical connection: 端子或导线 connector or wire / 导线长度 lead wires length

特性曲线指标 / Characteristics Curve

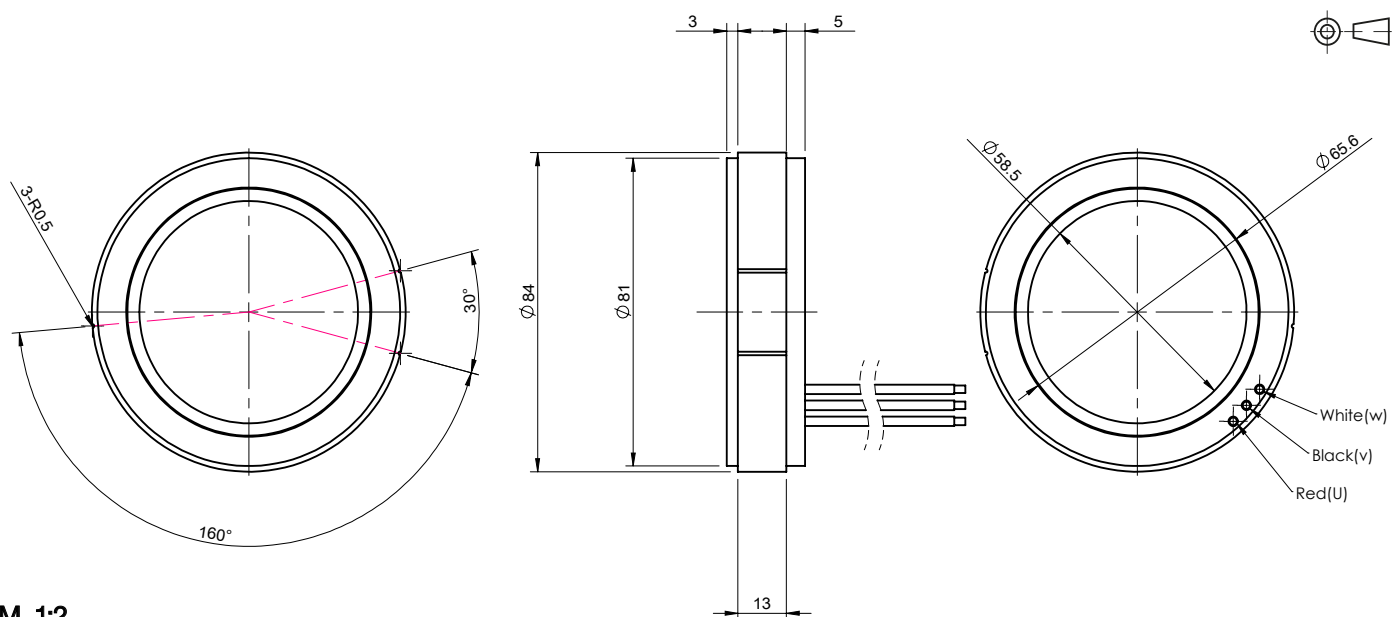
BS8413NFL-17-48.0



—	功率 (W)
—	电压 (V)
—	电流 (A)
—	输出功率 (W)
—	转速 (r/min)
—	效率 (%)

外观图 / Outline Drawing

端子定义 / Connection		
无传感器 /sensorless AWG 24		
Pin 1	U	Red 红
Pin 2	V	Black 黑
Pin 3	W	White 白



M 1:2

无框电机系列 Frameless Motor

BS10413NFL Ø104mm*21mm, 内转子有槽无传感器 (Inner Rotor, Slotted, Sensorless)

▶▶▶ 主要技术指标 / Characteristics

				-9-48.0	-17-48.0	-34-48.0
电机参数 / Motor Data						
1	电压	Voltage	V	48.0	48.0	48.0
2	线电阻	Line resistance	Ω	1.8	0.45	0.11
3	线电感	Line inductance	mH	1.7	0.43	0.11
4	空载转速	No-load speed	rpm	850	1700	3400
5	空载电流	No-load current	A	0.2	0.40	0.80
6	堵转转矩	Stall torque	N.m	14.2	28.5	57.3
7	堵转电流	Stall current	A	27	107	427
8	额定转矩	Nominal torque	N.m	2.2	1.8	1.4
9	额定转速	Nominal speed	rpm	646	1431	2985
10	额定电流	Nominal current	A	4.3	7.3	11.2
11	最大输出功率	Max.output power	W	315	1270	5100
12	最大效率	Max.efficiency	%	86	86	86
13	反电势常数	Back-EMF constant	mV/rpm	56.0	28.1	14.1
14	转矩常数	Torque constant	Nm/A	0.54	0.27	0.13
15	KV 值	KV Value	rpm/V	17.7	35.4	70.8
16	转速 / 转矩斜率	Speed/torque gradient	rpm/Nm	60	60	59
17	重量	Weight	g	405	405	405
热参数 / Thermal Data						
18	热阻 (线圈 - 环境)	Thermal resistance winding-ambient	K/W	2.3	2.3	2.3
19	热时常数 (线圈)	Thermal time constant winding	s	120	120	120
20	工作温度范围	Operating temperature range	°C	-40~+100	-40~+100	-40~+100
21	绕组耐温等级	Thermal class of winding	°C	180	180	180
22	绝缘等级	Insulation class		B	B	B
机械参数 / Mechanical Data						
23	极对数	No. of pole pairs		16	16	16
24	槽数	No. of slots		36	36	36
25	转子惯量	Rotor inertia	gcm ²	1256	1256	1256
其它参数 / Other Specifications						
26	换向结构	Commutation		sensorless	sensorless	sensorless
27	绕组联结	Circuit type		Y	Y	Y
28	耐电压	Puncture	V	500VAC/5mA/1s	500VAC/5mA/1s	500VAC/5mA/1s
29	绝缘电阻	Insulation Resistance	Ω	100MΩ/500VDC	100MΩ/500VDC	100MΩ/500VDC
可选配置 / Options						

性能 Special coils: 连续运行范围内可定制 customizable in continuous operation range

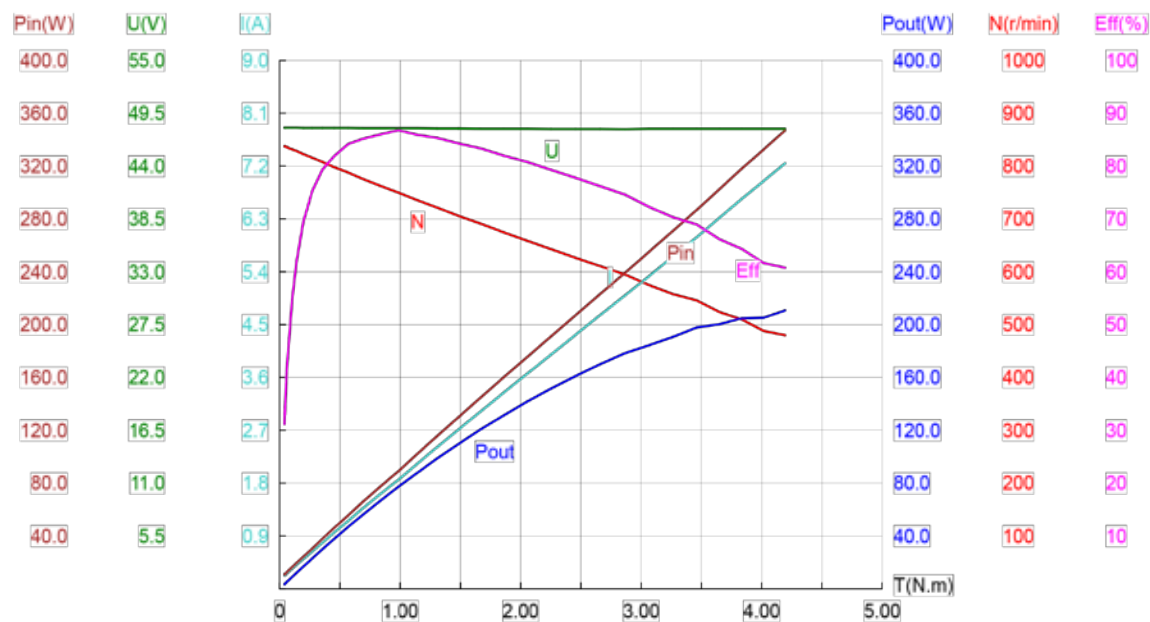
传感器 Sensor: 无传感器 sensorless/ 霍尔传感器 hall sensor

驱动器 Driver: 可定制 customizable upon request

电气连接 Electrical connection: 端子或导线 connector or wire / 导线长度 lead wires length

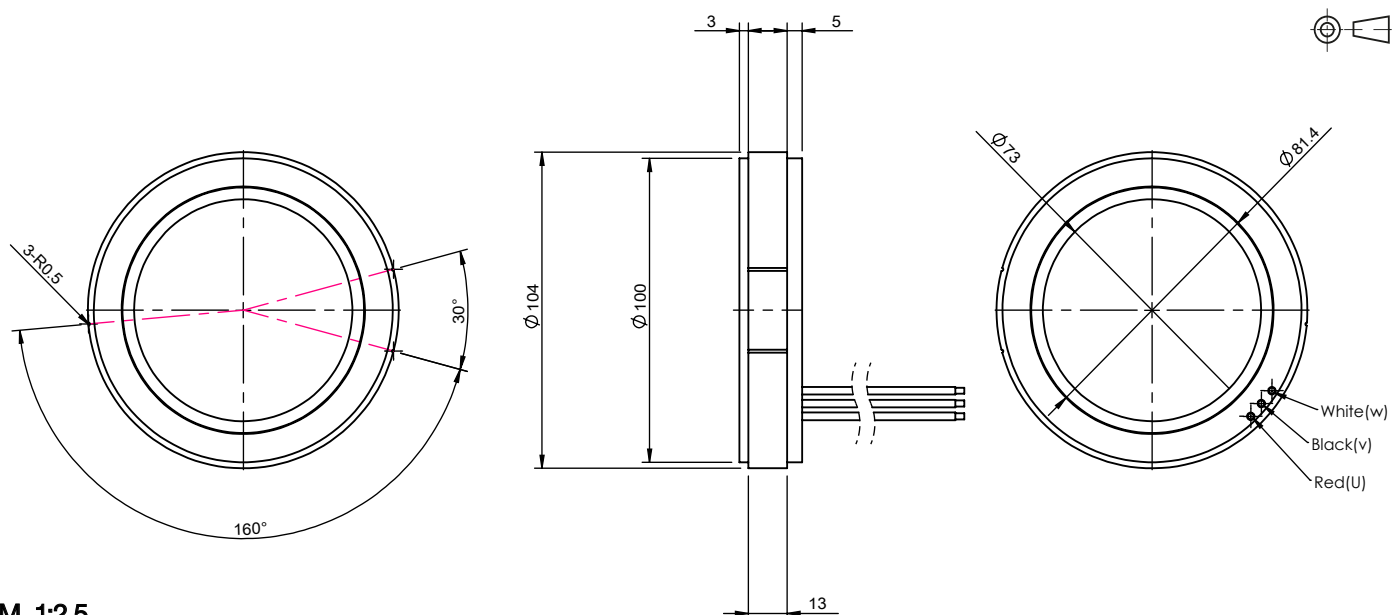
特性曲线指标 / Characteristics Curve

BS10413NFL-9-48.0



外观图 / Outline Drawing

端子定义 / Connection		
无传感器 /sensorless AWG 24		
Pin 1	U	Red 红
Pin 2	V	Black 黑
Pin 3	W	White 白



M 1:2.5

