cpc 直得科技股份有限公司
CHIEFTEK PRECISION CO., LTD.

DR Series

DD Motor

LM-07-RB1-EN

cpc CHIEFTEK PRECISION CO., LTD.

HEADQUARTERS
CHIEFTEK PRECISION CO., LTD.
No.3, Dali I[st] Rd., Sinshih Township,
Tainan Science Park, 741-45 Tainan, Taiwan, R.O.C
TEL:+886-6-505 5858 Http://www.chieftek.com
E-mail:service@mail.chieftek.com

CHIEFTEK PRECISION USA
2280 E. Locust Court.
Ontario, CA 91761, USA
Tel: +1-909-628-9300
Fax: +1-909-628-7171

cpc Europa GmbH
Industriepark 314,
D-78244 Gottmadingen, Germany
TEL:+49-7731-59130-38
FAX:+49-7731-59130-28

CHIEFTEK MACHINERY KUNSHAN CO., LTD.
No.1188, Hongqiao Rd, Kunshan,
Jiangsu, P.R. China
TEL:+86-512-5525 2831
FAX:+86-512-5525 2851

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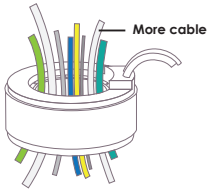
Features

Frameless type / DR series

❶ **Highest torque density & motor constant.**

❷ **Large pass through**



❸ **High heat dissipation**

❹ **Cable output option**

Ordering Information

DR	K	105	8	S	H	P	N	CS	0400

- 0400: Cable length (mm) : 0400 : 400 mm (Standard) Rotor : Blank
- CS: Cable exit direction : CS : Radial CU : Axial Rotor : Blank
- N: Cooling : N : No cooling W : Water cooling Rotor : Blank
- P: Temperature sensor: P : PTC-90°C K: KTY84-130 Rotor: Blank
- H: H : Hall sensor. NH : No hall sensor.
- S: Winding code : S : Standard F : Small current Rotor : Blank
- 8: Height (mm) : 105 series 8, 16, 24, 32, 40, 48, 56, 80, 88 140 series 8, 16, 24, 30, 32, 38, 50, 58, 70, 78
- 105: Outside diameter of the stator (mm) : 105, 140
- K: Part : K : Kit S : Stator R : Rotor KS : Kit KH : Kit with Hall sensor
- DR: Torque motor

* To support hall function, the rotor height need to be higher.
* Configuring table of Hall type.

Unit: mm

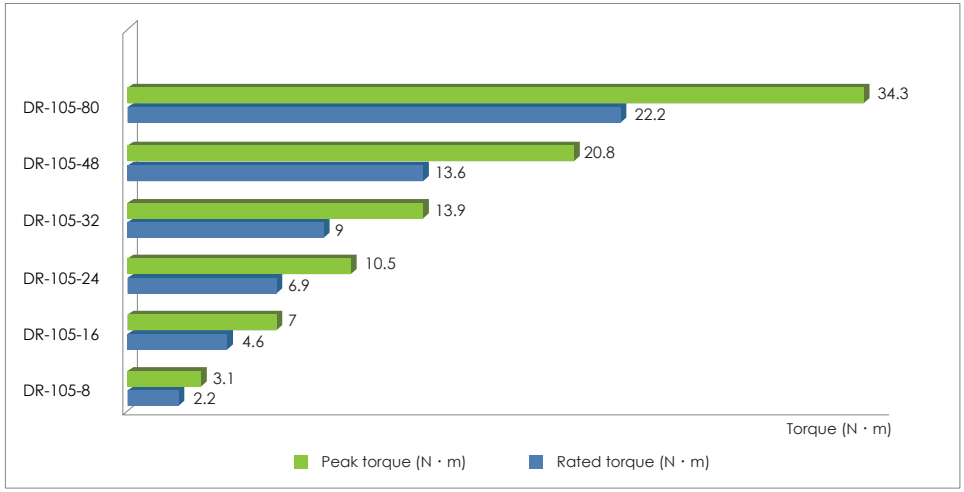
	Assembly height	Stator height	Rotor height
105 series	8	8	16
	16	16	24
	24	24	32
	32	32	40
	48	48	56
	80	80	88

Unit: mm

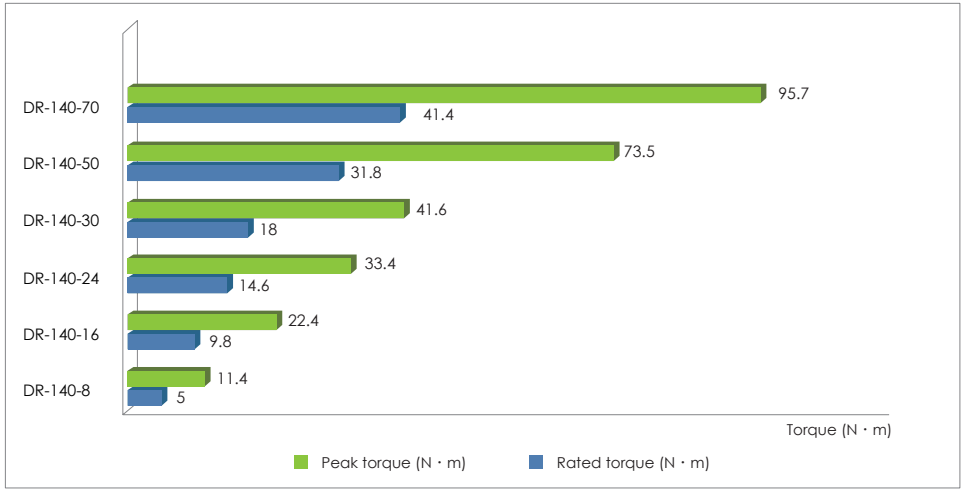
	Assembly height	Stator height	Rotor height
140 series	8	8	16
	16	16	24
	24	24	32
	30	30	38
	50	50	58
	70	70	78

Torque Overview

DR-105



DR-140



DR-105

	Unit	cpc											
		3-phase synchronous frameless Torque.230$V_{ac\ rms}$ (325V_{dc})											
Coil Assembly Model		DR-105-8		DR-105-16		DR-105-24		DR-105-32		DR-105-48		DR-105-80	
Winding code		S	F	S	F	S	F	S	F	S	F	S	F
Perormance													
Peak Torque[2][3]	Nm	3.1		7.0		10.5		13.9		20.8		34.3	
Contionuous Torque with heat sink[1][2]	Nm	2.2		4.6		6.9		9.0		13.6		22.2	
Contionuous Torque without heat sink[2][3]	Nm	1.1		2.2		3.3		4.2		6.3		10.1	
Maximum Power with heat sink[1][2]	W	183.7		242.8		301.8		352.0		467.2		680.3	
Contionuous Power with heat sink[1][2]	W	73.3		96.2		119.6		143.1		182.5		261.7	
Contionuous Power without heat sink[2][3]	W	18.3		25.0		31.1		34.4		45.6		62.8	
Maximum speed AC 230V@DC 325V	rpm	5130	1710	2590	858	1721	571	1288	428	861	286	516	171
Maximum speed AC 420V@DC 600V	rpm	9470	3157	4783	1584	3178	1054	2380	791	1589	527	953	316
Mechanical													
Stator OD	mm	105											
Rotor ID	mm	56											
Lamination Stack Height	mm	8		16		24		32		48		80	
Rotor Inertia	kg*m^2	5.8*10^{-5}		1.2*10^{-4}		1.7*10^{-4}		2.3*10^{-4}		3.5*10^{-4}		5.8*10^{-4}	
Stator Mass	kg	0.51		0.92		1.42		1.93		2.95		4.98	
Rotor Mass	kg	0.06		0.12		0.19		0.25		0.37		0.62	
Total Mass	kg	0.57		1.04		1.61		2.18		3.32		5.6	
Electrical													
Peak Current[2][3]	A_{pk}	8.1	2.7	8.1	2.7	8.1	2.7	8.0	2.6	8.0	2.6	7.9	2.5
Contionuous Current with heat sink[1][2]	A_{pk}	5.1	1.7	5.1	1.7	5.1	1.7	5.1	1.6	5.0	1.6	4.9	1.5
Contionuous Current without heat sink[2][3]	A_{pk}	2.6	0.8	2.6	0.8	2.6	0.8	2.5	0.7	2.5	0.7	2.4	0.6
Max. current (Linear range)[2]	A_{pk}	5.5	1.9	5.5	1.9	5.5	1.9	5.5	1.9	5.4	1.8	5.4	1.8
Motor Torque constant	Nm/A_{pk}	0.43	1.30	0.86	2.60	1.29	3.90	1.72	5.20	2.58	7.81	4.30	13.01
Back EMF constant[2]	V/rad/s	0.50	1.50	0.99	2.99	1.49	4.49	1.99	5.99	2.98	8.98	4.97	14.97
Resistance	Ω	2.8	24.8	3.7	32.2	4.6	39.6	5.5	47	7.3	61.8	10.9	91.4
Inductance	mH	16.50	132.50	29.20	229.30	41.90	326.10	54.60	422.90	80.00	616.50	130.80	1003.7
Time constant[2]	ms	5.9	5.3	7.9	7.1	9.1	8.2	9.9	9.0	11.0	10.0	12.0	11.0
Thermal Resistance without heat sink [2][3]	°C/W	1.19		0.83		0.67		0.59		0.44		0.31	
Thermal Resistance with heat sink[1][2]	°C/W	4.80		3.66		2.96		2.72		2.07		1.50	
Motor Constant[2]	N/√W	0.26		0.45		0.60		0.73		0.95		1.30	
Magnet poles	(N 2τ)	20											
Ph-PE dielectric strength		≧1.5KV(AC)											
Ph-PE insulation Resistance		≧ 600V(DC)											

(1) This value applies to the static sinusoidal drive under specific heat sink and temperature ranges from 25℃ up to 110℃. The actual performance is dependent on the heat sink configuration, system cooling condition and ambient temperature.

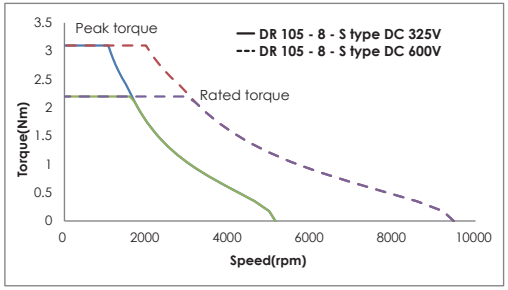
(2) The tolerance levels for the total performance and electrical specification is ±10%

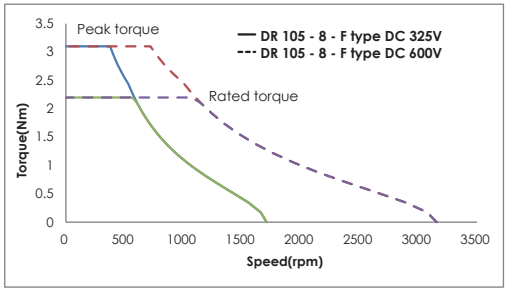
(3) This value applies to static sinusoidal drive operating under temperatures from 25℃ up to 110℃, without a heat sink.

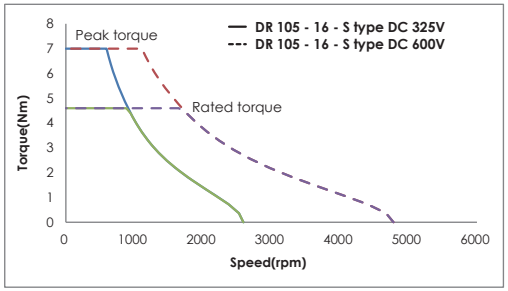
(4) The above "without heat sink" figure assumes a working condition of 1 atm, 25℃ ambient temperature, in which the linear motor is stationary and not in contact with any other objects, relying only on free air convection for cooling. As all heat conductive objects in direct contact with the motor, including the plate, bearing and housing, can be considered a kind of heat sink, the "with heat sink" figure should be taken as the primary reference in actual application design.

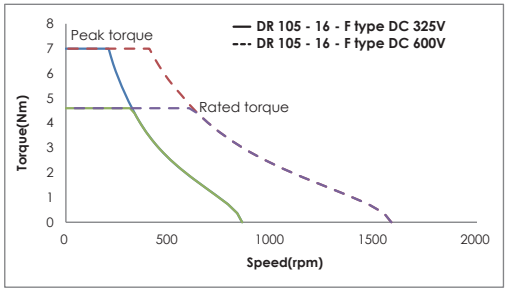
Torque / Speed Curve

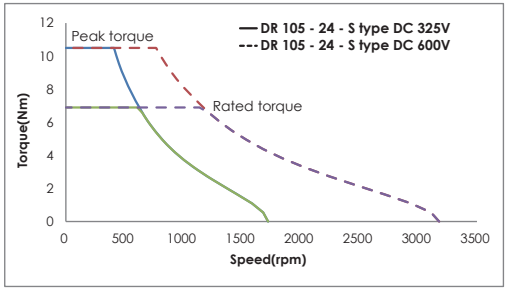
(AC 230V@DC 325V)
(AC 420V@DC 600V)

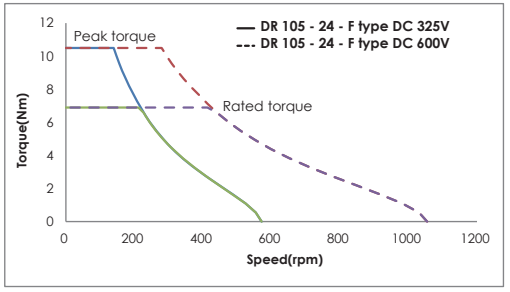


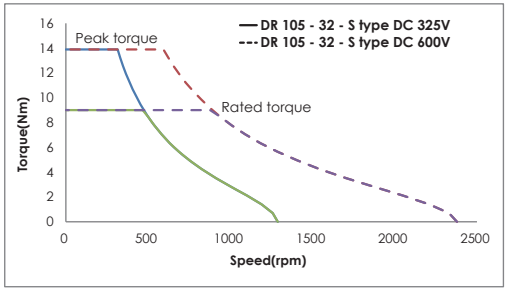


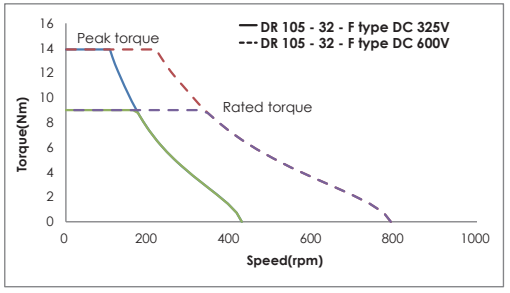




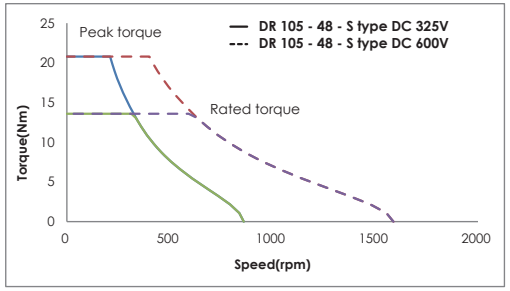


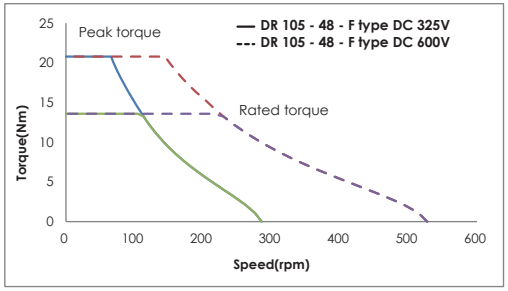


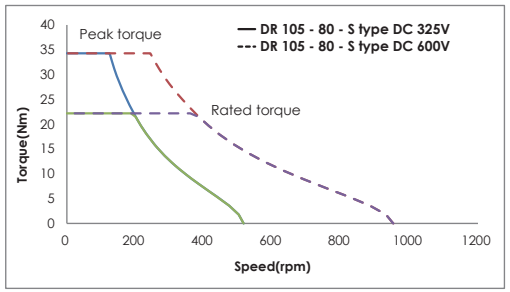


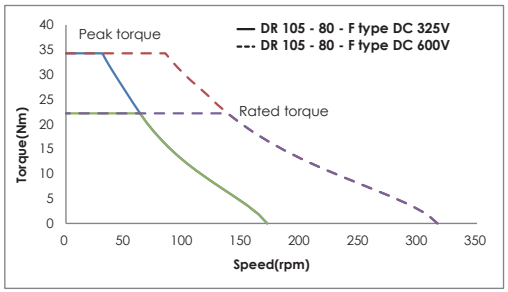


Torque / Speed Curve (AC 230V@DC 325V) (AC 420V@DC 600V)



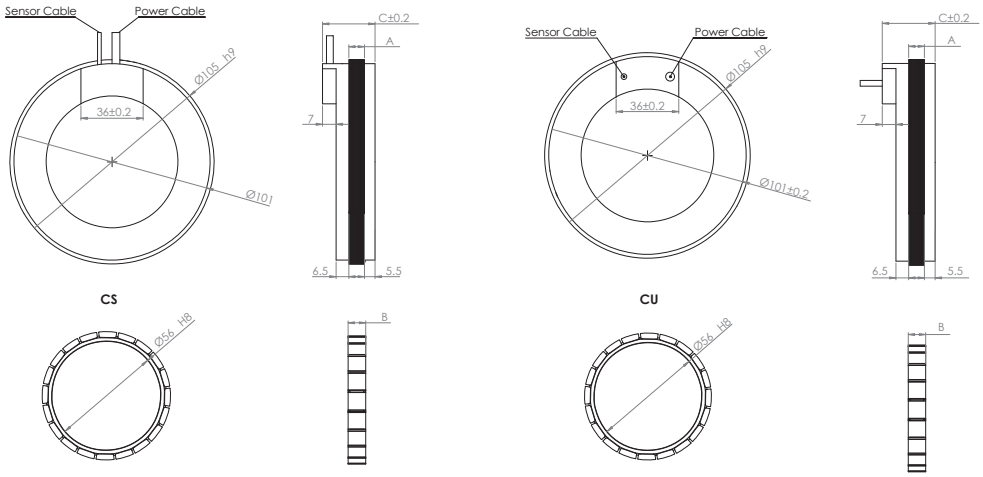






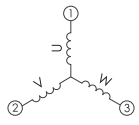
Dimension

Unit: mm



OUTPUT CABLE (All cable standard length is 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White	U phase	0.5 mm²	Pink	Hall A U phase	0.14 mm²	Brown	Thermal sensor	0.14 mm²
Yellow	V phase	0.5 mm²	Yellow	Hall B V phase	0.14 mm²	Blue		
Brown	W phase	0.5 mm²	Green	Hall C W phase	0.14 mm²	Shielding		
Green	PE + shielding	0.5 mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			



DIMENSIONS

Type	A	B	C
DR-105-8	8	9	27
DR-105-16	16	17	35
DR-105-24	24	25	43
DR-105-34	32	33	51
DR-105-48	48	49	67
DR-105-80	80	81	99

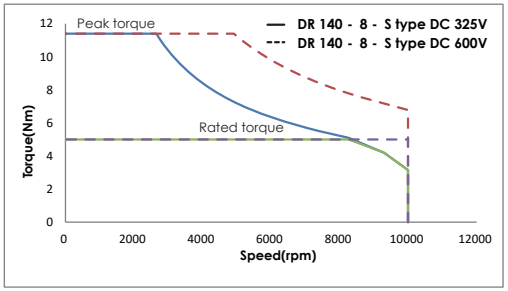
DR-140

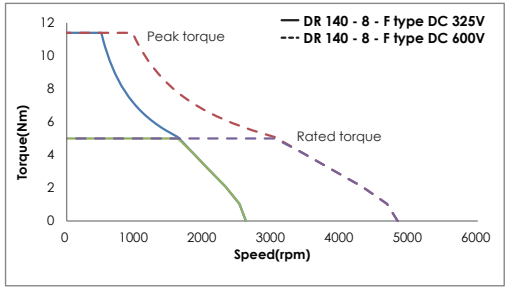
	Unit	cpc											
		3-phase synchronous frameless Torque.230V$_{ac\ rms}$ (325V$_{dc}$)											
Coil Assembly Model		DR-140-8		DR-140-16		DR-140-24		DR-140-30		DR-140-50		DR-140-70	
Winding code		S	F	S	F	S	F	S	F	S	F	S	F
Perormance													
Peak Torque[2][3]	Nm	11.4		22.4		33.4		41.6		73.5		95.7	
Contionuous Torque with heat sink[1][2]	Nm	5.0		9.8		14.6		18.0		31.8		41.1	
Contionuous Torque without heat sink[2][3]	Nm	3.0		6.0		8.9		10.8		19.1		24.4	
Maximum Power with heat sink[1][2]	W	1555.4		1952.3		2342.7		2616.4		3588.0		4487.5	
Contionuous Power with heat sink[1][2]	W	90.4		113.5		136.2		148.3		203.4		249.9	
Contionuous Power without heat sink[2][3]	W	33.3		41.8		50.1		53.4		73.2		88.0	
Maximum speed AC 230V@DC 325V	rpm	10000	2617	6576	1329	4422	890	3562	712	2019	402	1535	306
Maximum speed AC 420V@DC 600V	rpm	10000	4831	10000	2453	8164	1644	6576	1315	3728	743	2835	566
Mechanical													
Stator OD	mm	140											
Rotor ID	mm	60											
Lamination Stack Height	mm	8		16		24		30		50		70	
Rotor Inertia	kg*m²	3.99*10^{-4}		7.55*10^{-4}		1.11*10^{-3}		1.38*10^{-3}		2.27*10^{-3}		3.2*10^{-3}	
Stator Mass	kg	0.56		1.11		1.67		2.09		3.48		4.87	
Rotor Mass	kg	0.26		0.5		0.69		0.89		1.46		2.04	
Total Mass	kg	0.82		1.61		2.36		2.98		4.94		6.91	
Electrical													
Peak Current[2][3]	A_{pk}	126.0	25.3	126.0	25.3	126.0	25.3	126.0	25.2	126.0	25.2	125.0	25.0
Contionuous Current with heat sink[1][2]	A_{pk}	30.0	6.1	30.0	6.1	30.0	6.1	30.0	6.0	30.0	6.0	29.8	5.9
Contionuous Current without heat sink[2][3]	A_{pk}	18.0	3.7	18.0	3.7	18.0	3.7	18.0	3.6	18.0	3.6	17.8	3.5
Max. current (Linear range)[2]	A_{pk}	30.0	6.1	30.0	6.1	30.0	6.1	30.0	6.0	30.0	6.0	29.8	5.9
Motor Torque constant	Nm/A_{pk}	0.16	0.82	0.32	1.61	0.48	2.40	0.60	3.00	1.06	5.30	1.39	6.96
Back EMF constant[2]	V/rad/s	0.20	0.98	0.39	1.93	0.58	2.88	0.72	3.60	1.27	6.37	1.67	8.36
Resistance	Ω	0.10	2.43	0.12	3.05	0.15	3.66	0.16	4.12	0.23	5.65	0.29	7.18
Inductance	mH	0.43	10.75	0.86	21.50	1.29	32.20	1.62	40.40	2.70	67.50	3.74	93.50
Time constant[2]	ms	4.4		7.0		8.8		9.8		11.9		13.0	
Thermal Resistance without heat sink [2][3]	°C/W	0.94		0.75		0.62		0.57		0.42		0.34	
Thermal Resistance with heat sink[1][2]	°C/W	2.56		2.04		1.70		1.59		1.16		0.97	
Motor Constant[2]	N/√W	0.52		0.92		1.25		1.48		2.23		2.60	
Magnet poles	N(2τ)	20											
Ph-PE dielectric strength		≧1.5KV(AC)											
Ph-PE insulation Resistance		≧ 600V(DC)											

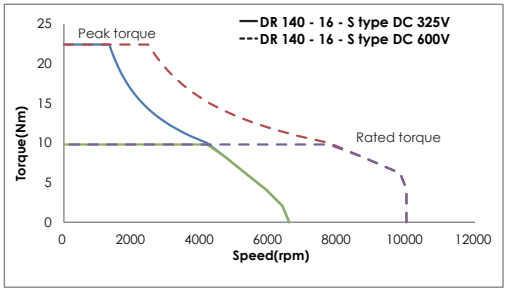
(1) This value applies to the static sinusoidal drive under specific heat sink and temperature ranges from 25℃ up to 110℃. The actual performance is dependent on the heat sink configuration, system cooling condition and ambient temperature.
(2) The tolerance levels for the total performance and electrical specification is ±10%
(3) This value applies to static sinusoidal drive operating under temperatures from 25℃ up to 110℃, without a heat sink.
(4) The above "without heat sink" figure assumes a working condition of 1 atm, 25℃ ambient temperature, in which the linear motor is stationary and not in contact with any other objects, relying only on free air convection for cooling. As all heat conductive objects in direct contact with the motor, including the plate, bearing and housing, can be considered a kind of heat sink, the "with heat sink" figure should be taken as the primary reference in actual application design.

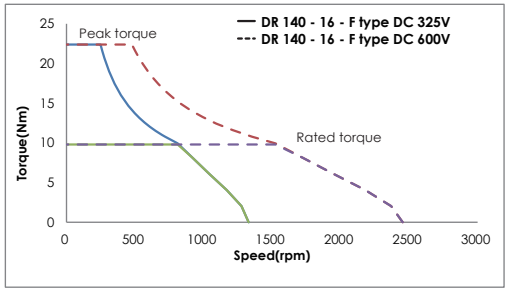
Torque / Speed Curve

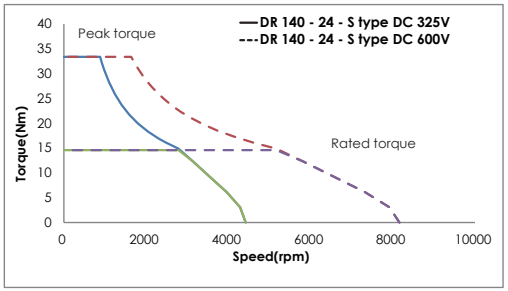
(AC 230V@DC 325V)
(AC 420V@DC 600V)

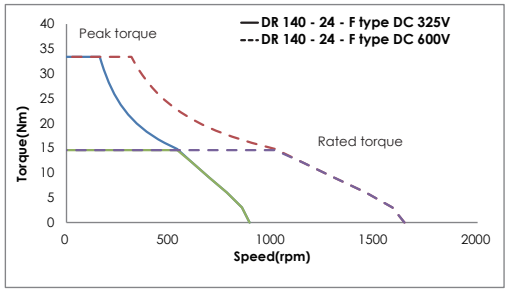


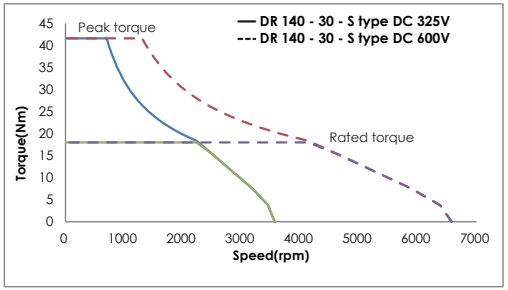


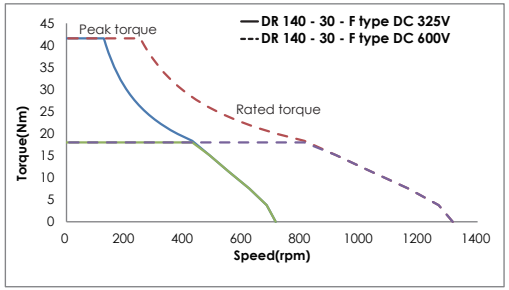


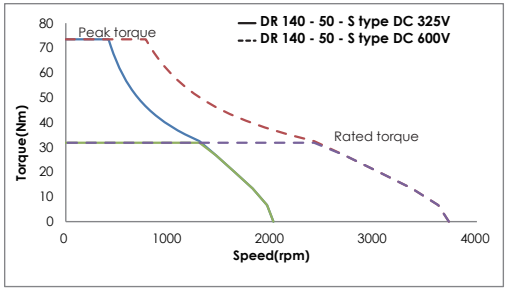


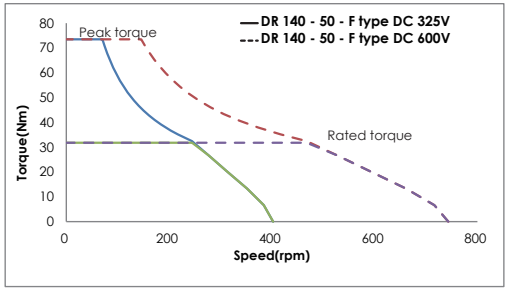


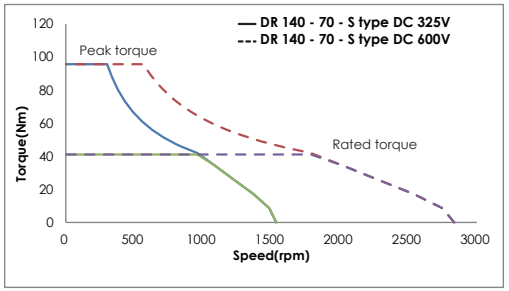


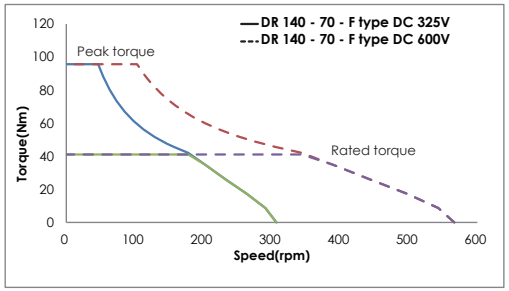






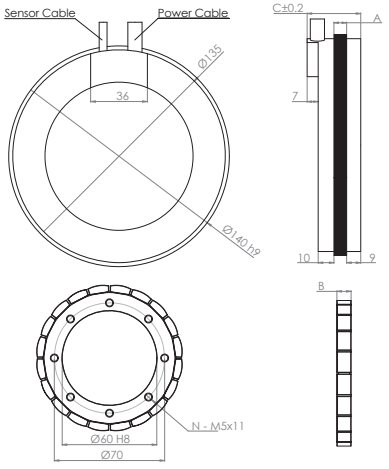


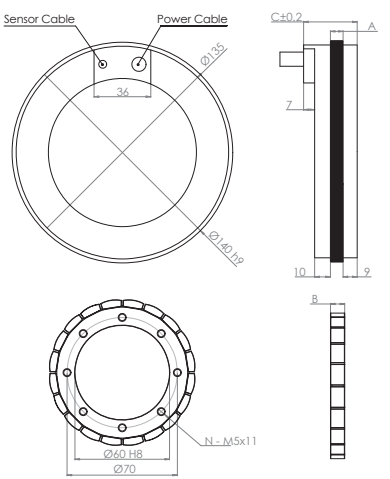




Dimension

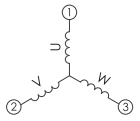
Unit: mm





OUTPUT CABLE (All cable standard length is 400 mm)

Motor Wire Table			Hall Sensor Wire Table and Thermal Protection Wire Table					
Pin Number	Function	Cross section	Color	Function	Cable Dia.	Color	Function	Cable Dia.
White (1)	U phase	1.5 mm²	Pink	Hall A U phase	0.14 mm²	Brown	Thermal sensor	0.14 mm²
Yellow (2)	V phase	1.5 mm²	Yellow	Hall B V phase	0.14 mm²	Blue		
Brown (3)	W phase	1.5 mm²	Green	Hall C W phase	0.14 mm²	Shielding		
Green	PE + shielding	1.5 mm²	Grey	Hall IC + 5V	0.14 mm²			
			White	GND	0.14 mm²			



DIMENSIONS

Type	N	A	B	C
DR-140-08	8	8.05	9	34
DR-140-16		16.1	17	42
DR-140-24		24.15	25	50
DR-140-30		30.1	31	56
DR-140-50		50.05	51	76
DR-140-70		70	71	96