

RIKEN KEIKI Co.,Ltd.

MOTOR SPECIFICATION

PRODUCT: CORELESS MOTOR

MODEL: A 1 6 C - 0 6 - S S

APPD.	CHK.	DWN.
SHIBATA	FUKADA	OKAMOTO
'10.01.27	'10.01.27	'10.01.27

SPECIFICATIONS NO.

S B - 5 0 - A 1 6 0 5 9 - A

C.I.KASEI CO.,LTD.

MICRO MOTOR DEPARTMENT

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## 1 . Scope

These specifications apply to the DC coreless motor **A 1 6 C - 0 6 - S S**, delivered to **RIKEN KEIKI Co., Ltd.**, manufactured by C.I.KASEI CO., LTD.

## 2 . Standard operating conditions

	Item	Standard operating conditions
2 - 1	Operating temperature range	- 2 0 ~ + 5 0
2 - 2	Storage temperature range	- 2 5 ~ + 5 5
2 - 3	Input voltage	D C 3 . 4 V (Vin)
2 - 4	Operating voltage range	2 . 0 V ~ 6 . 0 V
2 - 5	Direction of rotation	Clockwise viewed from output shaft
2 - 6	Motor placement	Optional, irrespective of output shaft axis

## 3 . Appearance

	Item	Specifications
3 - 1	Appearance	Smooth, dull-polished silver surface
3 - 2	Dimensions	As per the attached Outer drawing

## 4 . Mechanical structure

	Item	Specifications
4 - 1	Weight	Approximately 2 3 . 6 g w
4 - 2	Output axis direction permissible static load	1 0 0 N Max.
4 - 3	End play of shaft	0 . 0 1 ~ 0 . 3 mm

## 5 . Electrical characteristics

	Item	Specifications
5 - 1	No load speed (No)	3 , 5 2 0 ± 5 5 0 r p m
5 - 2	No load current (Io)	1 5 m A Max.
5 - 3	Minimum starting voltage	0 . 8 V Max.
5 - 4	Stall current (Is)	3 7 4 m A (Nominal Value) Calculation method(*1)
5 - 5	Direction of rotation	Clockwise viewed from output shaft (The red lead wire is + and the black lead wire is -)
5 - 6	Stall torque (Ts)	2 . 8 m N m Min. Calculation method(*2)
5 - 7	Armature resistance (Ra)	9 . 1 ± 1 . 7
		7 . 7 ( - 2 0 ) (Nominal Value)
5 - 8	Withstanding voltage	The leakage current is 2 0 μ A max. (Input DC200V between the housing and the lead wire(-) for 2sec.)
5 - 9	Inductance	0 . 0 8 2 m H 【1kHz,50mV】 (Nominal Value)
		0 . 0 8 2 m H 【1kHz,50mV】 (-20 ) (Nominal Value)

$$(*1) I_s = \frac{V_{in} \cdot 10^3}{R_a} \quad [mA]$$

$$(*2) T_s = \frac{9.55 \cdot (I_s - I_o)^2 \cdot V_{in}}{N_o \cdot I_s} \quad [mNm]$$

**C.I.KASEI CO., LTD.**

## 6 . Reliability Test

	Item	Test Method and Specifications	
6 - 1	Life	Test Method	Voltage : D C 3.4 V Motor load : No load Operation : Continuation Time : 1,000 Hrs
		Assessment	The fluctuation of no load speed is not over $\pm 30\%$ of its initial value after the test.
6 - 2	Vibration	Test Method	Acceleration : 2 G Frequency : 20 ~ 200 Hz Period : 2 min. Direction : 3 mutually perpendicular axes Time : 10 min./Direction
		Characteristics(4-2~3)and(5-1~8) are maintained after the test	
6 - 3	Shock	Test Method	Pulse wave form : Half sine curve Peak value : 50 G max Normal duration : 11 msec Direction : 3 mutually perpendicular axes Number of shocks : 1 time/Direction
		Characteristics(4-2~3)and(5-1~8) are maintained after the test	
6 - 4	High Temperature storage	Test Method	Exposure to +60 for 96 hrs Normal room atmosphere for 2 hrs
		Characteristics(4-2~3)and(5-1~8) are maintained after the test	
6 - 5	Low Temperature storage	Test Method	Exposure to -25 for 96 hrs Normal room atmosphere for 2 hrs
		Characteristics(4-2~3)and(5-1~8) are maintained after the test	
6 - 6	Humidity storage	Test Method	Exposure to +40 and 90 % relative humidity for 96 hrs Normal room atmosphere for 2 hrs
		Characteristics(4-2~3)and(5-1~8) are maintained after the test	

## 7 . Standard measure &amp; test conditions

- 1 ) If not any directions, measure & test conditions are as below.  
 Temperature :  $20 \pm 1.5$   
 Relative humidity :  $65 \pm 2.0\%$   
 Motor posture : Horizontal

## 8 . Lot number

## 1 ) Print

The lot number is printed on each motor in non-erasable ink.  
 The printed lot number is clear and difficult to erase.  
 The print position is shown in the Outer drawing.

## 2 ) Using characters and meaning

The lot number consists of 3 letters and has meaning as below.

Letter	Using characters	Meaning	
First	Numeral (0~9)	Year of manufacturing	The last letter of the year
2nd and 3rd	Numeral (01~53)	Week of manufacturing	

- 3 ) Example of the lot number : 003 manufactured in 18th.~24th.Nov.2010  
 004 manufactured in 25th.~31th.Nov.2010

## 9 . Relation of environment

「The RoHS directive compliance」

## 10 . Packaging

Standard packaging is as below and it may change with the number of motors.

## 1 ) Using containers

Method of package	Inside package	Outside package (MD-2)
Kind of container	Foamed polystyrene case	Corrugated cardboard box
Material of container	Polystyrene	Hard paper pulp
Dimension of container	(L) 254 (W) 355 (H) 45	(L) 390 (W) 560 (H) 365
Weight of container	About 50g/Case	About 1.2kg/Box
Number of capacity	Max 50pcs/Case	Max 700pcs/Box (14cases/Box)

## 2 ) Display

Motor model, amount, and lot number are specified on the outside box.

## 3 ) Total weight

About 20kg/Box

## 11 . Cautions

## 1 ) Storage

Avoid storing in high temperature, high humidity and corrosive gas environment.  
Not to be stored without running for more than 6 months.

## 2 ) Soldering

To avoid damage to terminals or lead wires, soldering time should be completed within 2 ~ 3 seconds.

## 3 ) Locked operation

To avoid damage to motors, please do not drive them with their shafts locked.

## 12 . Note

If there's any malfunction caused by our motor, we are willing to hold consultation about it and take countermeasures against it.



# Characteristic curve / モータ特性図

Model / 型式

A16C-06-SS

Input voltage / 印加電圧 3.4 [V]

No load speed / 無負荷回転数 3520 [rpm]

No load current / 無負荷電流 8 [mA]

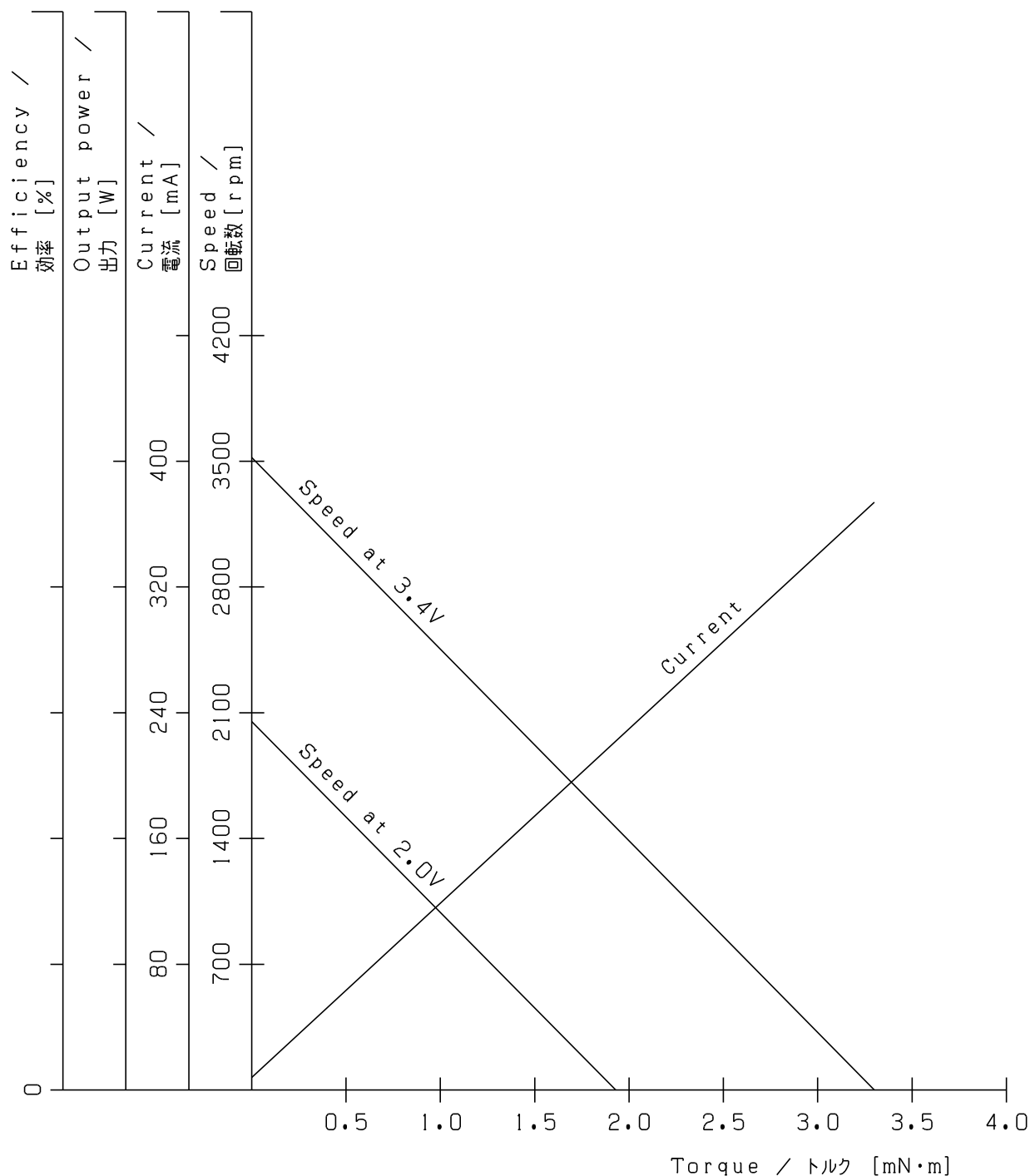
Stall current / 起動電流 374 [mA]

Stall torque / 起動トルク 3.30 [mN・m]

Max. Output power / 最大出力 [W]

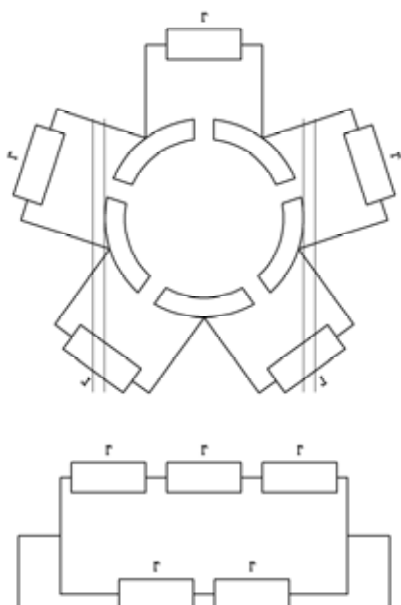
Max. Efficiency / 最大効率 [%]

APPV. 承認	CHK. 検図	DRW. 作成
SHIBATA	FUKADA	OKAMOTO
'09.11.30	'09.11.30	'09.11.30

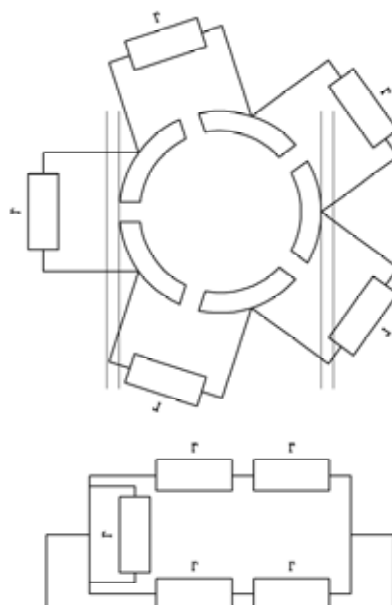


## 15 . Addenda

## 1 ) Armature resistance measurement

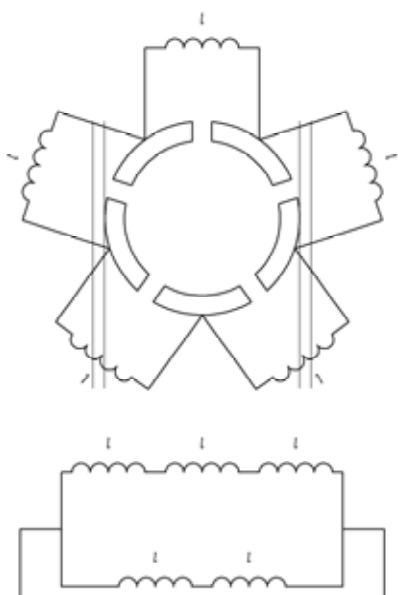


$$\begin{aligned}
 R_a &= \{ (2 \times 3) / (2+3) \} \times r \\
 &= (6/5) \times r \\
 &= 1.2r \text{ (Nominal value: } 9.1 [\Omega] \text{)}
 \end{aligned}$$

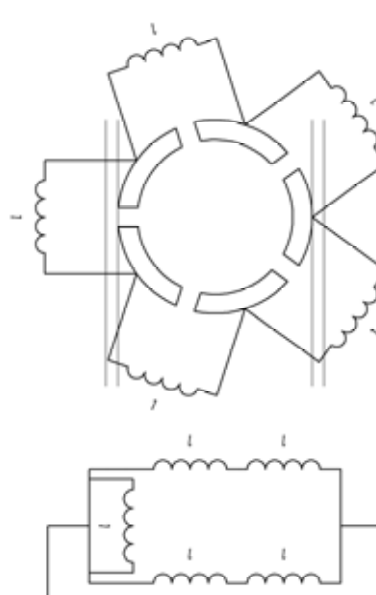


$$\begin{aligned}
 R_a' &= \{ (2 \times 2) / (2+2) \} \times r \\
 &= (4/4) \times r \\
 &= 1r \text{ (Nominal value: } 7.58 [\Omega] \text{)}
 \end{aligned}$$

## 2 ) Inductance measurement



$$\begin{aligned}
 L &= \{ (2 \times 3) / (2+3) \} \times l \\
 &= (6/5) \times l \\
 &= 1.2l \text{ (Nominal value: } 0.082 [\text{mH}] \text{)} \\
 &\quad [1 \text{ kHz, } 50 \text{ mV}]
 \end{aligned}$$



$$\begin{aligned}
 L' &= \{ (2 \times 2) / (2+2) \} \times l \\
 &= (4/4) \times l \\
 &= 1l \text{ (Nominal value: } 0.068 [\text{mH}] \text{)} \\
 &\quad [1 \text{ kHz, } 50 \text{ mV}]
 \end{aligned}$$



## 15 . Addenda

### 3 ) History of preparation & revision

[illegible]