

# DINGS'

Precision Motion Specialist

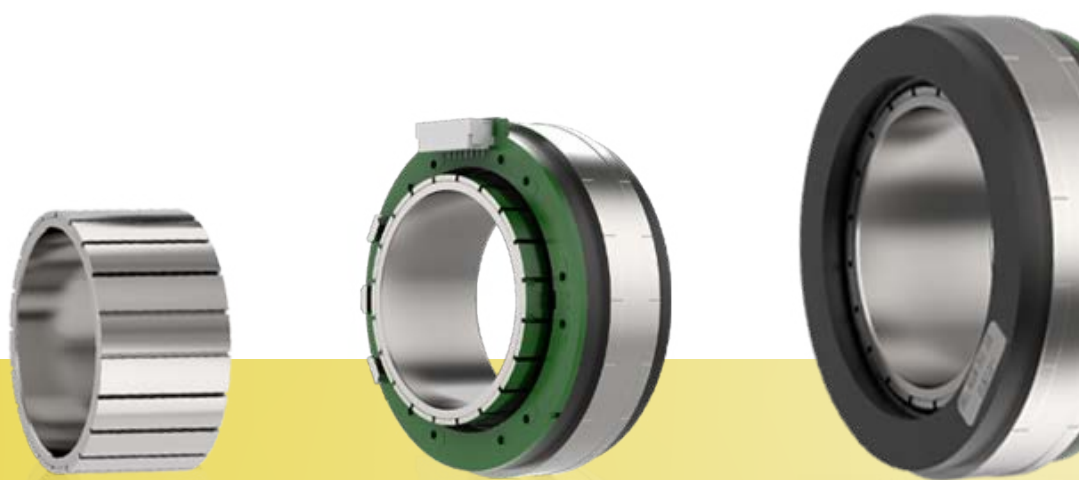
## FRAMELESS MOTOR PRODUCT CATALOG



The modular design of the stator and rotor, along with optimized slot ratios, improves the motor's torque density. The rotor has a large inner bore space, and the stator is designed for embedded installation by the customer, facilitating personalized design including mounting structures and cooling systems, offering greater flexibility for custom systems.

The optimized slot-pole combination reduces motor cogging torque, ensuring smooth motor operation.

The structure is compact and highly integrated.



# Frameless Motor

# CONTENTS

Part Number Construction

25 mm

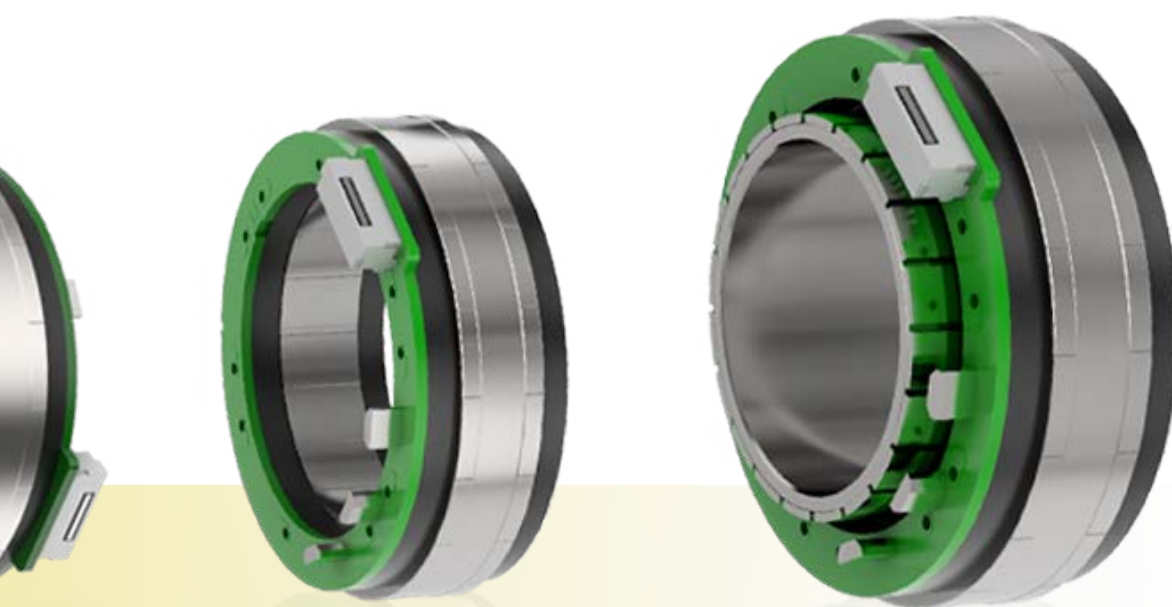
38 mm

50 mm

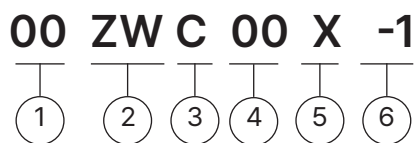
70 mm

85 mm

115 mm



## Part Number Construction



① Motor Size

| Motor Size (mm) | 25 | 38 | 50 | 70 | 85 | 115 |
|-----------------|----|----|----|----|----|-----|
|-----------------|----|----|----|----|----|-----|

② Product Name

ZW = Slotted Brushless DC Motor

③ Motor Shape

C = Circular type

④ Motor Length

Unit : mm

when the length involves decimal points, use "\_" instead

⑤ Motor Casing

X = Coreless

⑥ Customer Sequence Number

### Example

Part Number

50ZWC15X-001

Description

50mm frame size  
Round frameless torque motor  
Body length: 15mm  
Coreless type  
Customization number 001

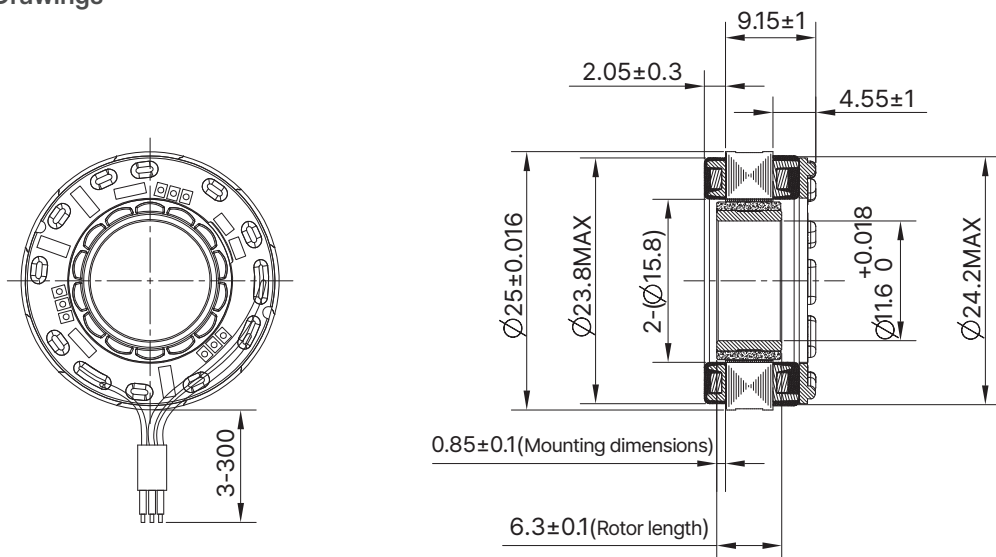
## 25mm Series

### Motor Characteristics

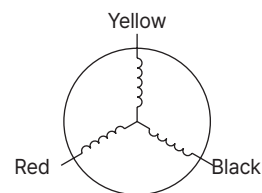
|                                         |                   |                 |
|-----------------------------------------|-------------------|-----------------|
| Motor part number                       | 25ZWC10X-1        |                 |
| Stator outer diameter                   | mm                | 25 (±0.016)     |
| Rotor inner diameter                    | mm                | 11.6 (+0.018)   |
| Number of slots                         | -                 | 12              |
| Pole pairs                              | -                 | 7               |
| Phase-to-phase resistance               | Ω                 | 0.42            |
| Phase-to-phase inductance               | mH                | 0.123           |
| Winding connection method               | -                 | Star connection |
| Insulation class                        | -                 | F               |
| Duty type                               | -                 | S2              |
| Feedback method                         | -                 | /               |
| Commutation angle                       | -                 | 120°            |
| Insulation strength (Withstand voltage) | -                 | 600VAC/1s/3mA   |
| Insulation resistance                   | -                 | 50 MΩ/500VDC    |
| Stator weight                           | g                 | 20              |
| Rotor weight                            | g                 | 3.2             |
| No-load speed                           | RPM               | 26000           |
| No-load current                         | A                 | 0.65(REF)       |
| Rated voltage                           | VDC               | 24              |
| Rated power                             | W                 | 70              |
| Rated torque                            | N·m               | 0.032           |
| Rated speed                             | RPM               | 22650           |
| Rated current                           | A                 | 3.8             |
| Torque constant                         | Nm/A              | 0.009           |
| Back-EMF constant (effective value)     | Vrms/Krpm         | 0.65            |
| Peak torque                             | N·m               | 0.105           |
| Peak current                            | A                 | 13.0            |
| Inertia moment                          | g·cm <sup>2</sup> | 1.47            |

## 25mm Series

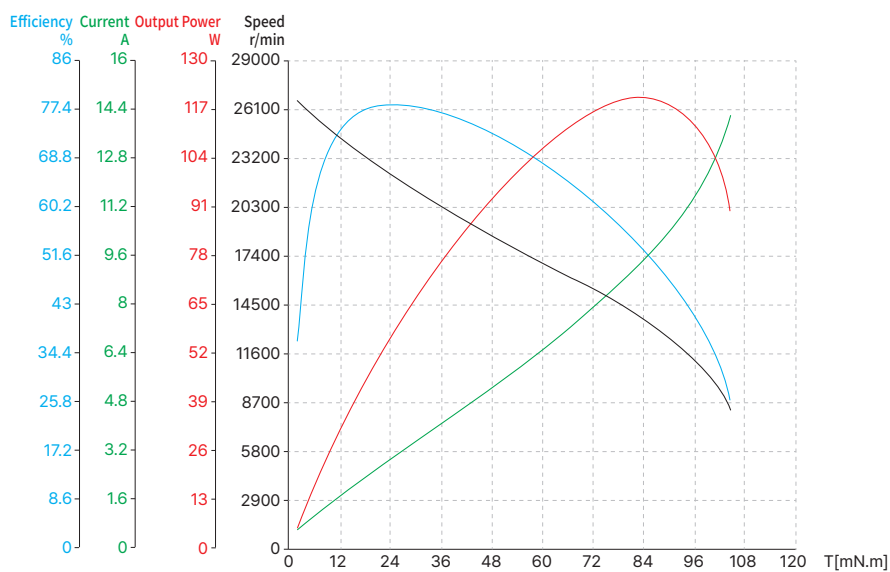
### Dimensional Drawings



| Lead-out type | Lead-out color | Function |
|---------------|----------------|----------|
| UL1332 AWG20  | Yellow         | U phase  |
|               | Red            | V phase  |
|               | Black          | W phase  |



### Torque Performance Curves



Note : All drawings are 1st Angle Projection - ISO Compliant (3D models available)

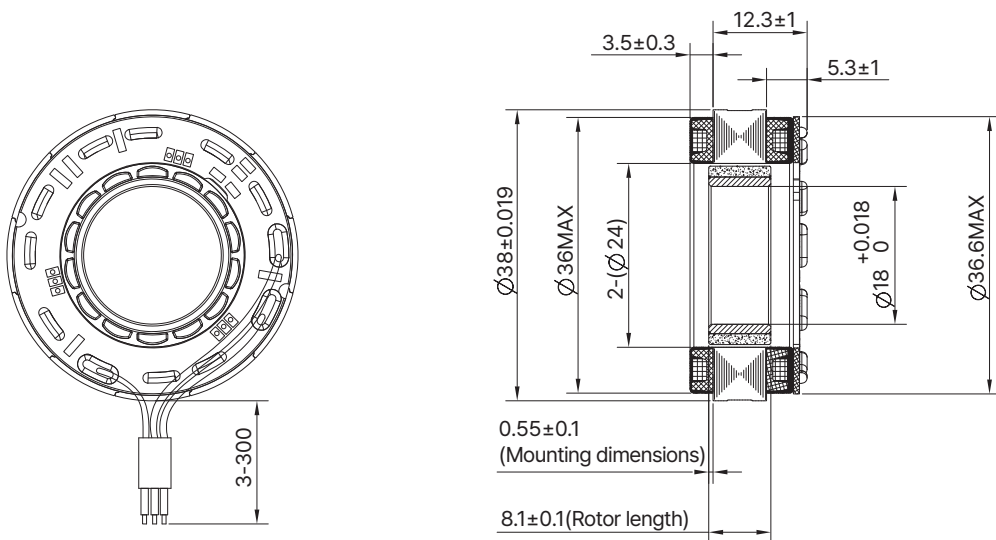
## 38mm Series

### Motor Characteristics

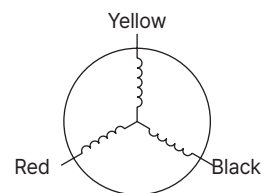
|                                         |                   |                 |
|-----------------------------------------|-------------------|-----------------|
| Motor part number                       | 38ZWC15X-1        |                 |
| Stator outer diameter                   | mm                | 38±0.019        |
| Rotor inner diameter                    | mm                | 18±0.018        |
| Number of slots                         | -                 | 12              |
| Pole pairs                              | -                 | 7               |
| Phase-to-phase resistance               | Ω                 | 0.8             |
| Phase-to-phase inductance               | mH                | 0.9             |
| Winding connection method               | -                 | Star connection |
| Insulation class                        | -                 | F               |
| Duty type                               | -                 | S2              |
| Feedback method                         | -                 | /               |
| Commutation angle                       | -                 | 120°            |
| Insulation strength (Withstand voltage) | -                 | 1200VAC/1s/3mA  |
| Insulation resistance                   | -                 | 50MΩ/500VDC     |
| Stator weight                           | g                 | 50              |
| Rotor weight                            | g                 | 10              |
| No-load speed                           | RPM               | 13000           |
| No-load current                         | A                 | 0.6(REF)        |
| Rated voltage                           | VDC               | 48              |
| Rated power                             | W                 | 110             |
| Rated torque                            | N·m               | 0.1             |
| Rated speed                             | RPM               | 10470           |
| Rated current                           | A                 | 2.75            |
| Torque constant                         | Nm/A              | 0.035           |
| Back-EMF constant (effective value)     | Vrms/Krpm         | 2.6             |
| Peak torque                             | N·m               | 0.32            |
| Peak current                            | A                 | 11              |
| Inertia moment                          | g·cm <sup>2</sup> | 10              |

## 38mm Series

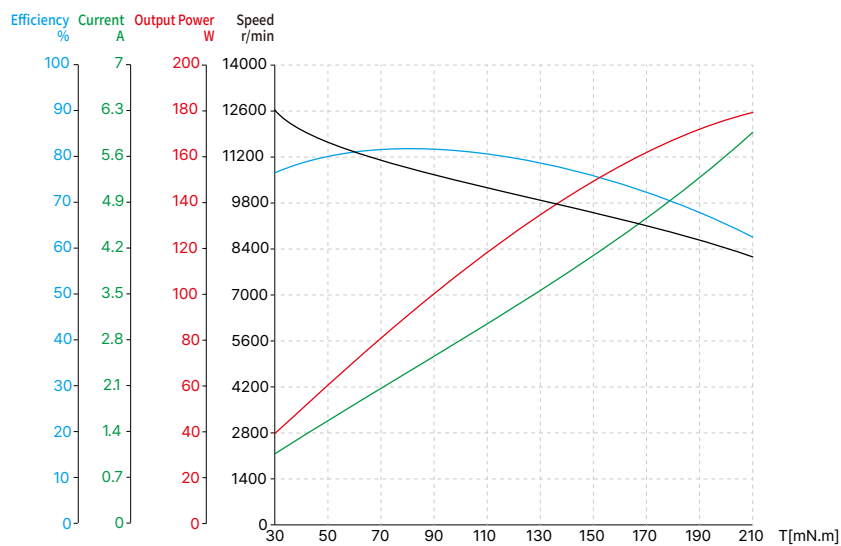
### Dimensional Drawings



| Lead-out type | Lead-out color | Function |
|---------------|----------------|----------|
| UL1332 AWG20  | Yellow         | U phase  |
|               | Red            | V phase  |
|               | Black          | W phase  |



### Torque Performance Curves



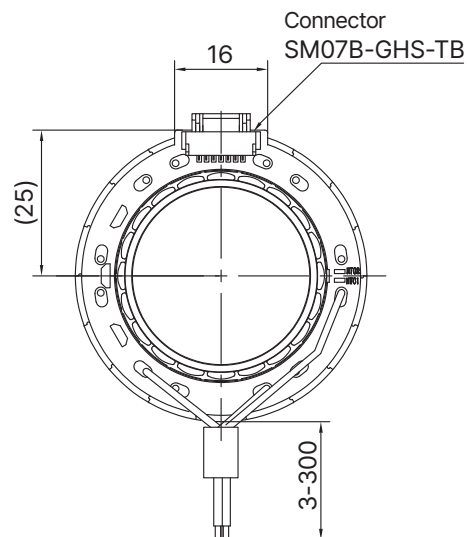
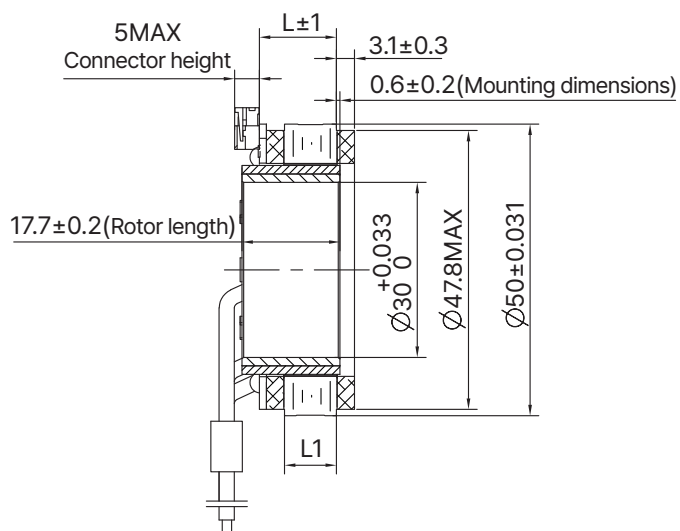
## 50mm Series

### Motor Characteristics

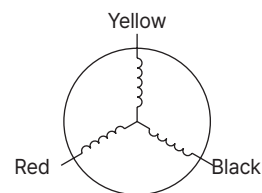
| Motor part number                       |                   | 50ZWC15X-1      | 50ZWC25X-1      |
|-----------------------------------------|-------------------|-----------------|-----------------|
| Stator outer diameter                   | mm                | 50±0.031        | 50±0.031        |
| Rotor inner diameter                    | mm                | 30+0.033        | 30+0.033        |
| Overall length (L)                      | mm                | 13.2            | 19.5            |
| Stack length (L1)                       | mm                | 8.9             | 15.2            |
| Number of slots                         | -                 | 18              | 18              |
| Pole pairs                              | -                 | 10              | 10              |
| Phase-to-phase resistance               | Ω                 | 0.62            | 0.6             |
| Phase-to-phase inductance               | mH                | 0.44            | 0.45            |
| Winding connection method               | -                 | Star connection | Star connection |
| Insulation class                        | -                 | F               | F               |
| Duty type                               | -                 | S2              | S2              |
| Feedback method                         | -                 | Hall sensor     | Hall sensor     |
| Commutation angle                       | -                 | 120°            | 120°            |
| Insulation strength (Withstand voltage) | -                 | 500VAC/1mA/1s   | 500VAC/1mA/1s   |
| Insulation resistance                   | -                 | 100MΩ/500VDC    | 100MΩ/500VDC    |
| Stator weight                           | g                 | 77.5            | 124             |
| Rotor weight                            | g                 | 38              | 50              |
| No-load speed                           | RPM               | 6400            | 5000            |
| No-load current                         | A                 | 0.4(REF)        | 1.1(REF)        |
| Rated voltage                           | VDC               | 48              | 48              |
| Rated power                             | W                 | 168             | 219             |
| Rated torque                            | N·m               | 0.3             | 0.51            |
| Rated speed                             | RPM               | 5350            | 4100            |
| Rated current                           | A                 | 4.4             | 5.65            |
| Torque constant                         | Nm/A              | 0.074           | 0.092           |
| Back-EMF constant (effective value)     | Vrms/Krpm         | 5.5             | 6.8             |
| Peak torque                             | N·m               | 0.96            | 1.5             |
| Peak current                            | A                 | 10.7            | 16.1            |
| Inertia moment                          | g·cm <sup>2</sup> | 100             | 135             |

# 50mm Series

## Dimensional Drawings

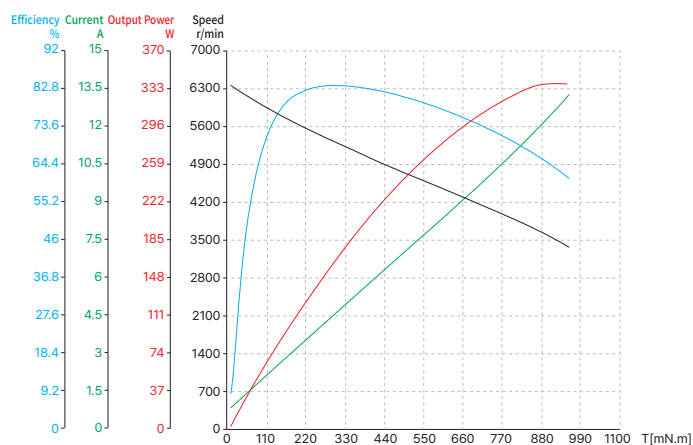


| Lead-out type | Lead-out color | Function |
|---------------|----------------|----------|
| UL1332 AWG20  | Yellow         | U phase  |
|               | Red            | V phase  |
|               | Black          | W phase  |

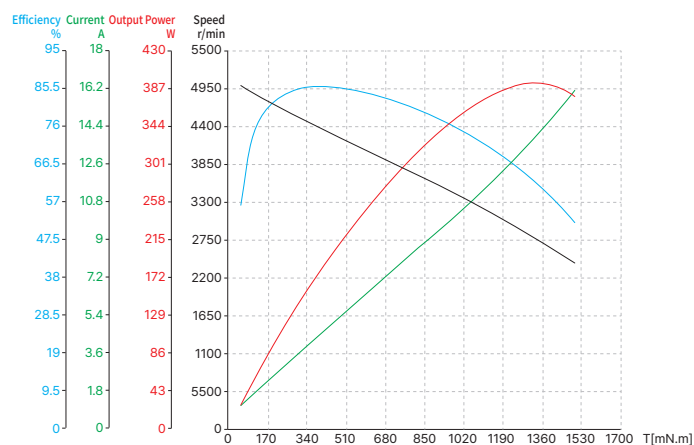


## Torque Performance Curves

### 50ZWC15X-1



### 50ZWC25X-1



Note : All drawings are 1st Angle Projection - ISO Compliant (3D models available)

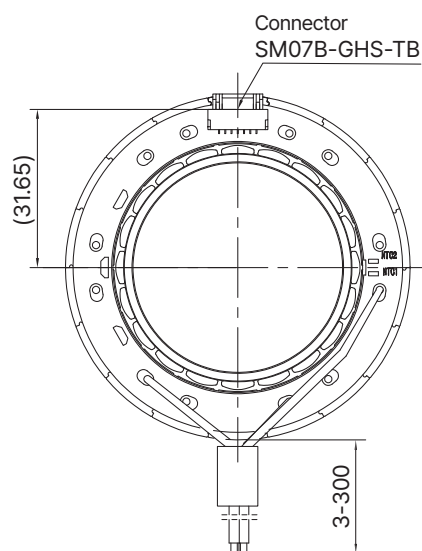
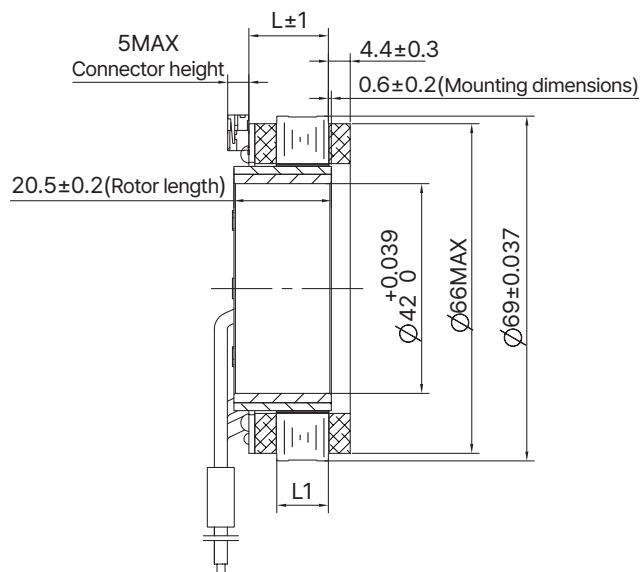
## 70mm Series

### Motor Characteristics

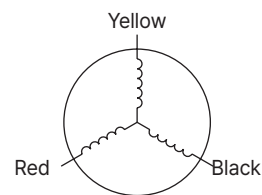
| Motor part number                       |                   | 70ZWC20X-1      | 70ZWC25X-1      |
|-----------------------------------------|-------------------|-----------------|-----------------|
| Stator outer diameter                   | mm                | 69±0.037        | 69±0.037        |
| Rotor inner diameter                    | mm                | 42±0.039        | 42±0.039        |
| Overall length (L)                      | mm                | 15.9            | 21.5            |
| Stack length (L1)                       | mm                | 10.3            | 15.9            |
| Number of slots                         | -                 | 18              | 18              |
| Pole pairs                              | -                 | 10              | 10              |
| Phase-to-phase resistance               | Ω                 | 0.32            | 0.22            |
| Phase-to-phase inductance               | mH                | 0.52            | 0.35            |
| Winding connection method               | -                 | Star connection | Star connection |
| Insulation class                        | -                 | F               | F               |
| Duty type                               | -                 | S2              | S2              |
| Feedback method                         | -                 | Hall sensor     | Hall sensor     |
| Commutation angle                       | -                 | 120°            | 120°            |
| Insulation strength (Withstand voltage) | -                 | 500VAC/1mA/1s   | 500VAC/1mA/1s   |
| Insulation resistance                   | -                 | 100MΩ/500VDC    | 100MΩ/500VDC    |
| Stator weight                           | g                 | 167.5           | 224             |
| Rotor weight                            | g                 | 72              | 90              |
| No-load speed                           | RPM               | 4350            | 4400            |
| No-load current                         | A                 | 0.5(REF)        | 1.3(REF)        |
| Rated voltage                           | VDC               | 48              | 48              |
| Rated power                             | W                 | 216             | 456             |
| Rated torque                            | N·m               | 0.55            | 1.3             |
| Rated speed                             | RPM               | 3750            | 3350            |
| Rated current                           | A                 | 5.4             | 11.4            |
| Torque constant                         | Nm/A              | 0.109           | 0.13            |
| Back-EMF constant (effective value)     | Vrms/Krpm         | 8.1             | 9.6             |
| Peak torque                             | N·m               | 1.65            | 2.6             |
| Peak current                            | A                 | 14.2            | 21              |
| Inertia moment                          | g·cm <sup>2</sup> | 358             | 455             |

# 70mm Series

## Dimensional Drawings

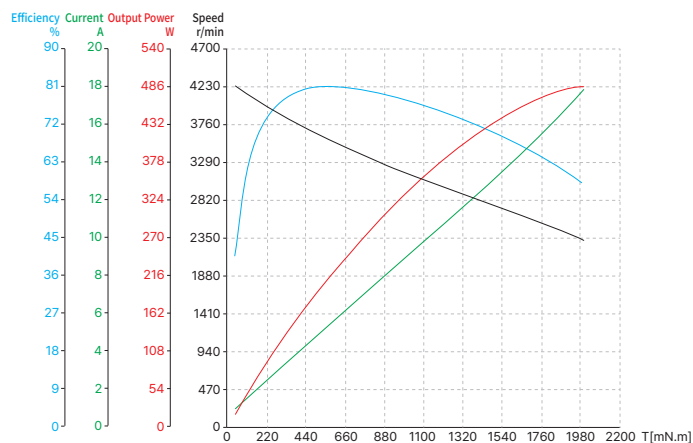


| Lead-out type | Lead-out color | Function |
|---------------|----------------|----------|
| UL1332 AWG20  | Yellow         | U phase  |
|               | Red            | V phase  |
|               | Black          | W phase  |

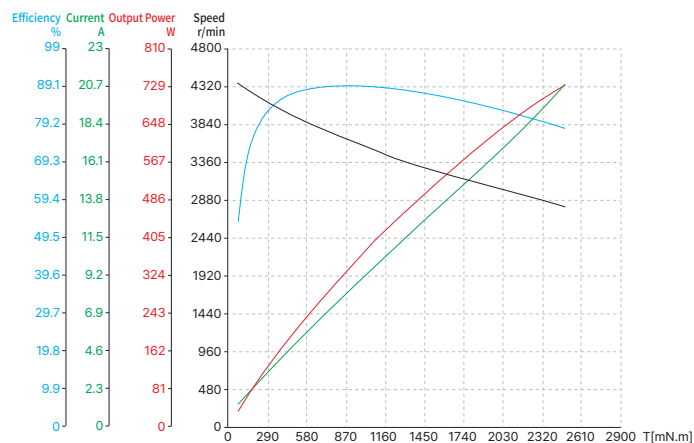


## Torque Performance Curves

### 70ZWC20X-1



### 70ZWC25X-1



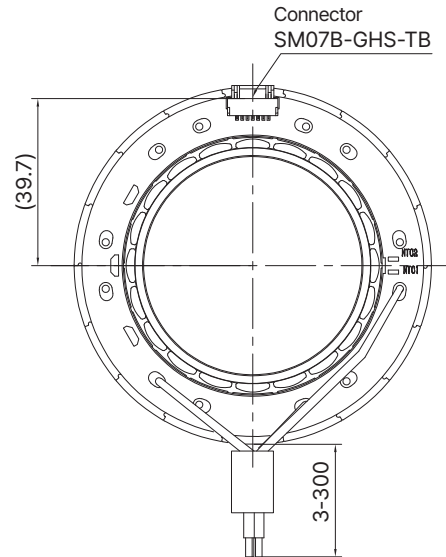
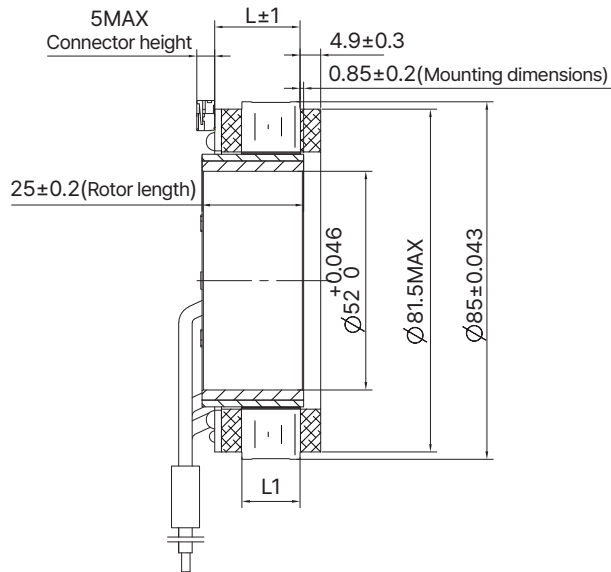
## 85mm Series

### Motor Characteristics

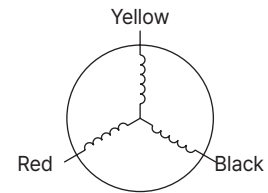
| Motor part number                       |                   | 85ZWC25X-1      | 85ZWC35X-1      |
|-----------------------------------------|-------------------|-----------------|-----------------|
| Stator outer diameter                   | mm                | 85±0.043        | 85±0.043        |
| Rotor inner diameter                    | mm                | 52+0.046        | 52+0.046        |
| Overall length (L)                      | mm                | 20.3            | 30.1            |
| Stack length (L1)                       | mm                | 13.8            | 23.6            |
| Number of slots                         | -                 | 18              | 18              |
| Pole pairs                              | -                 | 10              | 10              |
| Phase-to-phase resistance               | Ω                 | 0.14            | 0.06            |
| Phase-to-phase inductance               | mH                | 0.34            | 0.12            |
| Winding connection method               | -                 | Star connection | Star connection |
| Insulation class                        | -                 | F               | F               |
| Duty type                               | -                 | S2              | S2              |
| Feedback method                         | -                 | Hall sensor     | Hall sensor     |
| Commutation angle                       | -                 | 120°            | 120°            |
| Insulation strength (Withstand voltage) | -                 | 500VAC/1mA/1s   | 500VAC/1mA/1s   |
| Insulation resistance                   | -                 | 100MΩ/500VDC    | 100MΩ/500VDC    |
| Stator weight                           | g                 | 324             | 460             |
| Rotor weight                            | g                 | 136             | 189             |
| No-load speed                           | RPM               | 3650            | 4700            |
| No-load current                         | A                 | 0.6(REF)        | 2.4(REF)        |
| Rated voltage                           | VDC               | 48              | 48              |
| Rated power                             | W                 | 422             | 827             |
| Rated torque                            | N·m               | 1.3             | 2               |
| Rated speed                             | RPM               | 3100            | 3950            |
| Rated current                           | A                 | 10.3            | 20.6            |
| Torque constant                         | Nm/A              | 0.131           | 0.117           |
| Back-EMF constant (effective value)     | Vrms/Krpm         | 9.7             | 8.66            |
| Peak torque                             | N·m               | 3.9             | 6               |
| Peak current                            | A                 | 27              | 62              |
| Inertia moment                          | g·cm <sup>2</sup> | 1086            | 1520            |

## 85mm Series

### Dimensional Drawings

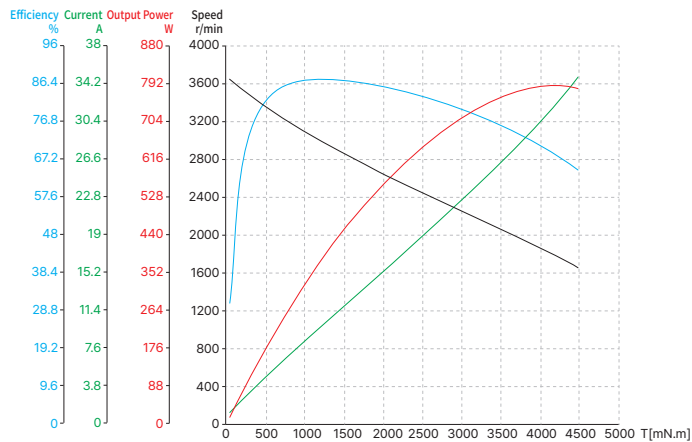


| Lead-out type | Lead-out color | Function |
|---------------|----------------|----------|
| UL1332 AWG16  | Yellow         | U phase  |
|               | Red            | V phase  |
|               | Black          | W phase  |

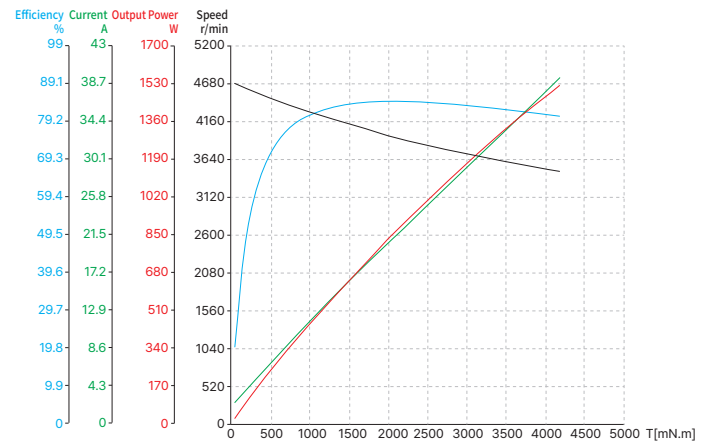


### Torque Performance Curves

#### 85ZWC25X-1



#### 85ZWC35X-1



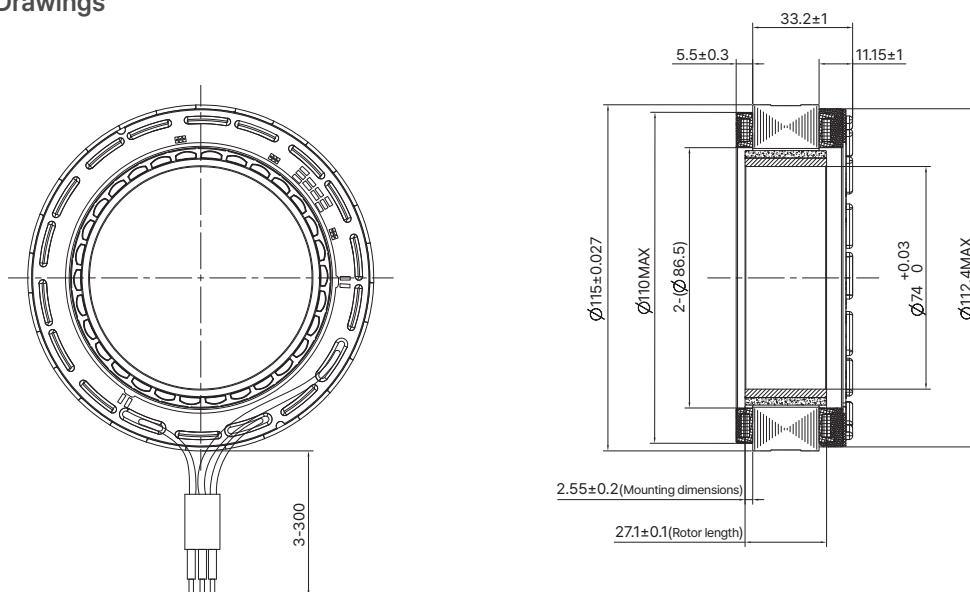
## 115mm Series

### Motor Characteristics

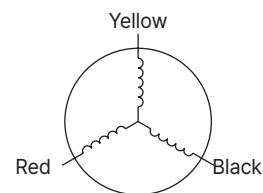
|                                         |                   |                 |
|-----------------------------------------|-------------------|-----------------|
| Motor part number                       | 115ZWC37X-1       |                 |
| Stator outer diameter                   | mm                | 115±0.027       |
| Rotor inner diameter                    | mm                | 74+0.03         |
| Number of slots                         | -                 | 27              |
| Pole pairs                              | -                 | 15              |
| Phase-to-phase resistance               | Ω                 |                 |
| Phase-to-phase inductance               | mH                |                 |
| Winding connection method               | -                 | Star connection |
| Insulation class                        | -                 | F               |
| Duty type                               | -                 | S2              |
| Feedback method                         | -                 | Hall sensor     |
| Commutation angle                       | -                 | 120°            |
| Insulation strength (Withstand voltage) | -                 | 1200VAC/1s/3mA  |
| Insulation resistance                   | -                 | 50 MΩ/500VDC    |
| Stator weight                           | g                 | 815             |
| Rotor weight                            | g                 | 245             |
| No-load speed                           | RPM               | 1750            |
| No-load current                         | A                 | 1.8(REF)        |
| Rated voltage                           | VDC               | 48              |
| Rated power                             | W                 | 570             |
| Rated torque                            | N·m               | 3.9             |
| Rated speed                             | RPM               | 1400            |
| Rated current                           | A                 | 14.1            |
| Torque constant                         | Nm/A              | 0.281           |
| Back-EMF constant (effective value)     | Vrms/Krpm         | 20.8            |
| Peak torque                             | N·m               | 12.7            |
| Peak current                            | A                 | 47              |
| Inertia moment                          | g·cm <sup>2</sup> | 3930            |

# 115mm Series

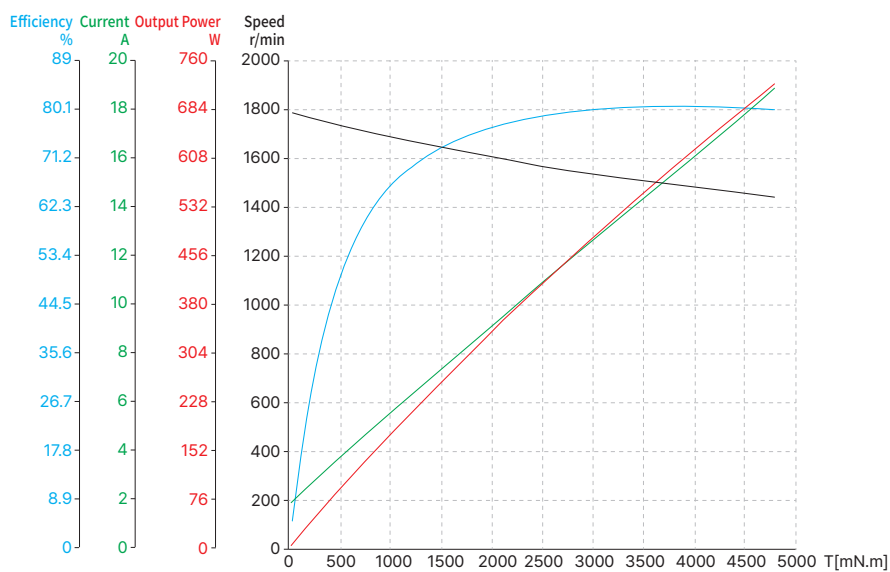
## Dimensional Drawings



| Lead-out type | Lead-out color | Function |
|---------------|----------------|----------|
| UL1332 AWG14  | Yellow         | U phase  |
|               | Red            | V phase  |
|               | Black          | W phase  |



## Torque Performance Curves



# DINGS'

**Precision Motion Specialist**

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