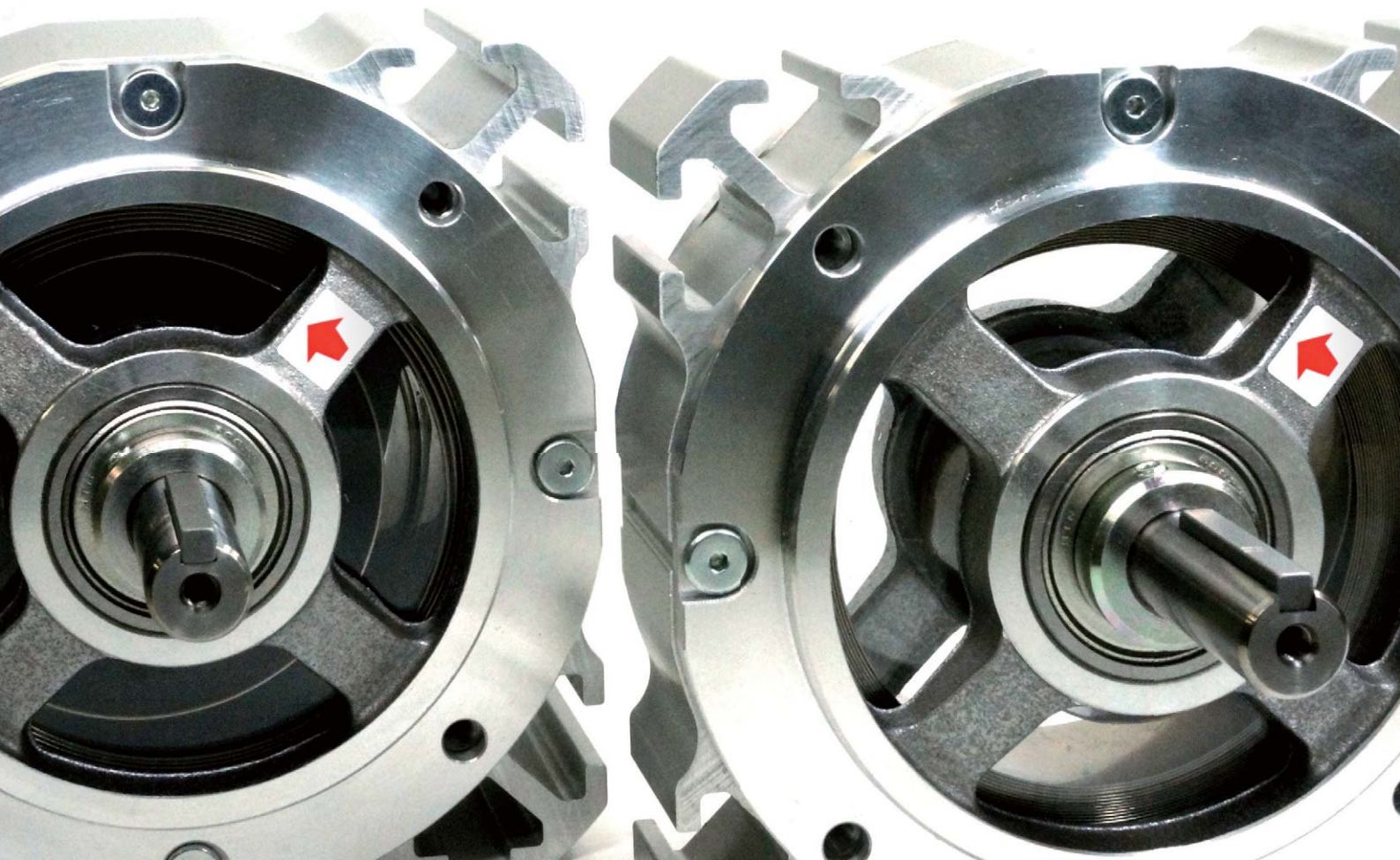


ZENMAI MOTOR

ZENDO

YouTube

ENDO KOGYO 



Maximizing the functionality and dynamic power of springs

Patent Pending

ZENMAI MOTOR

1 Feature

The Zenmai motor allows the dynamic power of springs to be used more directly for a wider range of applications. The motor shaft can be connected directly to a component, eliminating the need for an intermediate wire rope or drum.

2 Construction

Zenmai Motor is composed primarily of the following five (5) parts

1 Casing

Casing stores Zenmai (spring).

2 Mechanism to prevent reverse winding*1

Prevents reverse winding after the spring has completely unwound and the number of winding has reached zero.

3 Axis shaft*2

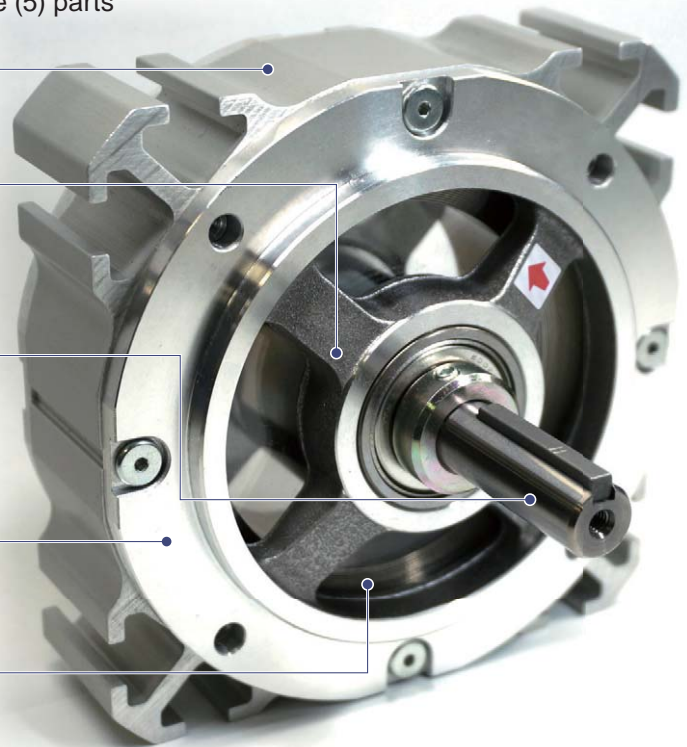
Transfers the rotation to the attached component. (option)

4 Mechanism to prevent excess winding*3

Prevents damage that could be caused by winding the spring beyond its maximum number of turns.

5 Zenmai (spring)

Provides the driving force for the motor.



3 Specifications



Type ZS



Type ZW

*1 : Mechanism to prevent reverse winding

Rapid release of the spring can cause damage or spring corruption. Please avoid rapid release of the spring in an unloaded state.

*2 : Axis shaft

This is optional. If the axis shaft is produced by the customer, please follow specifications below.

Diameter : $\phi 12$ h6 $\frac{0.011}{0.011}$
 Surface hardness : HRC58~64
 Surface roughness : Ra0.4

*3 : Mechanism to prevent excess winding

If the windings of the spring is beyond or greater than its maximum number of permitted rotations, the mechanism to prevent excess winding will produce a ticking/clicking sound.

Do not regularly use the Mechanism to prevent excess winding.

Single type (1 Spring)

Model	Max. torque	Max. number of turns	Mass
ZS-08	0.8N·m	15	1.3kg
ZS-16	1.6N·m	12	
ZS-24	2.4N·m	10	

Double type (2 Springs)

Model	Max. torque	Max. number of turns	Mass
ZW-16	1.6N·m	15	2.3kg
ZW-32	3.2N·m	12	
ZW-48	4.8N·m	10	

4 Installation Guidance

To install the main body, use grooves on body*¹ or M5 bolt hole on the body flange side*². We recommend commercial pre-assembly insertion 8mm nut for aluminum frame to groove.



Pre-assembly insertion nut

Bolt

Name	Bolt size	Part No.	Qty/unit
Pre-assembly insertion nut	M5	LBP001973	10
	M6	LBP001974	10

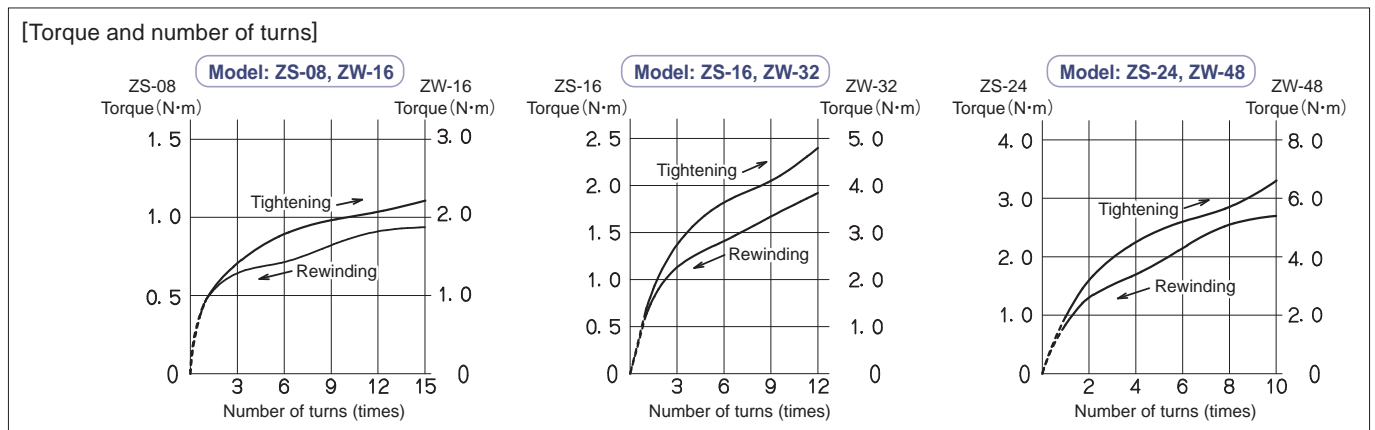
*Pre-assembly insertion nut is optional.



*2

5 Torque curves

Perform the initial turn and other settings as indicated in the graphs below.

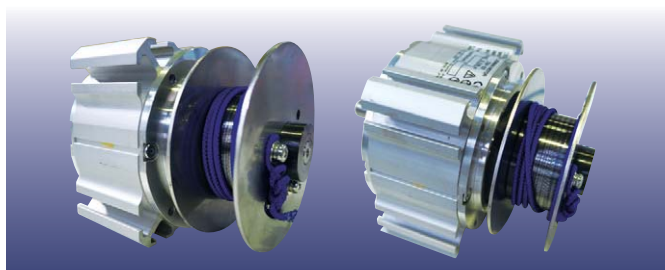


*Due to the characteristics of the product, the spring may not fully return, even without any torque. This makes the product inoperable within the ranges that are indicated by the broken lines in the graphs.

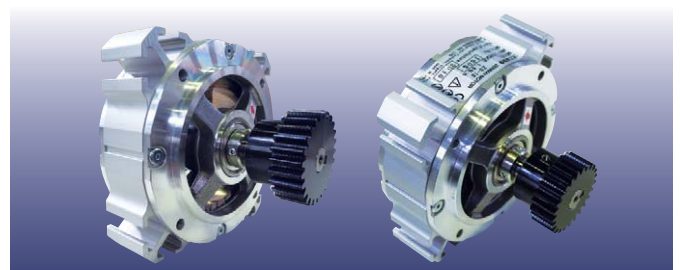
*Operate the product within about one turn less than the maximum number of turns.

6 Product Applications

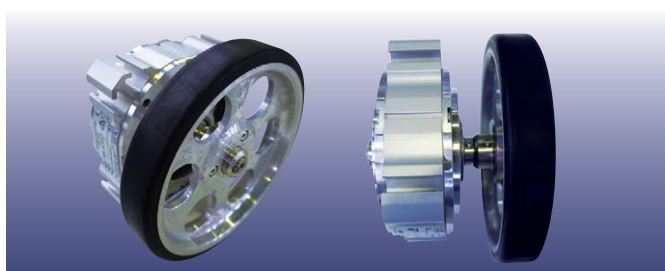
(When used with a variety of applications,) it can be used as a drive source to wide range of systems.



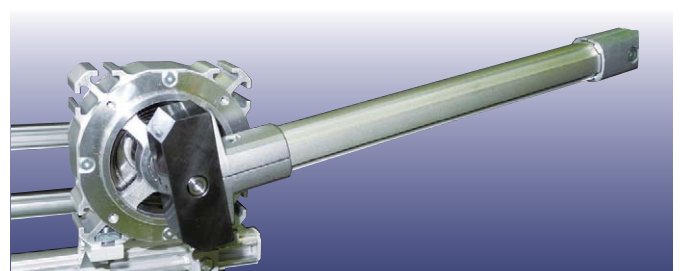
With drum



With gear



With wheel



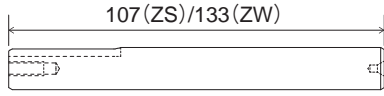
With arm

7 Optional parts

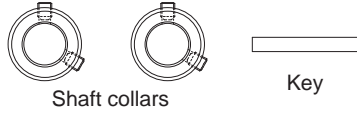


Single axis shaft set

Includes axis shaft, shaft collars and keys.



Axis shaft

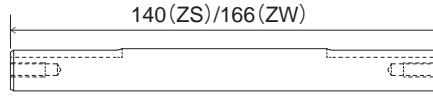


Shaft collars

Key

Dual axes shaft set

Includes axis shaft, shaft collars and keys.



Axis shaft



Shaft collars

Key

Part No.	Name	Model
LBP001953	Single axis shaft set	Type ZS
LBP001954	Dual axes shaft set	
LBP001955	Single axis shaft set	Type ZW
LBP001956	Dual axes shaft set	

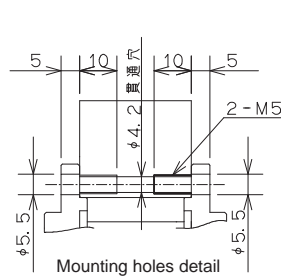
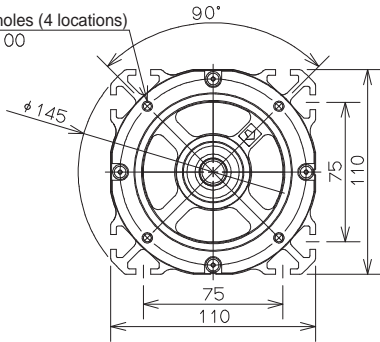
Shaft collars only

Part No.	Name
LBP001975	Shaft collars (2 pcs) (4 screws attached)

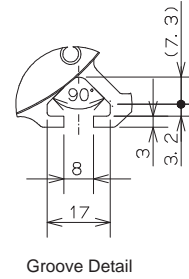
8 Outline drawings



Mounting holes (4 locations)
P. C. D. 100

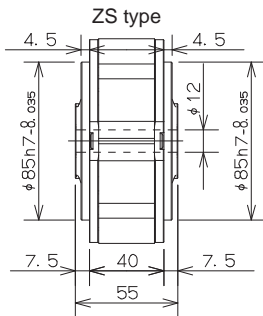


Mounting holes detail

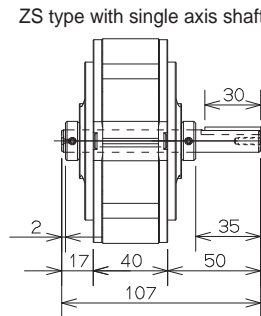


Groove Detail

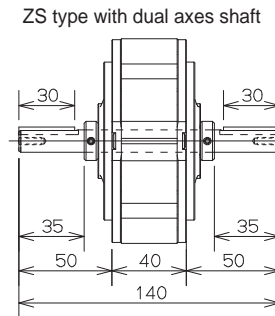
ZS-08
ZS-16
ZS-24



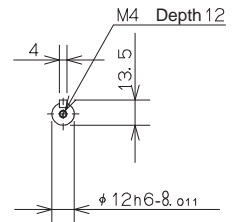
ZS type



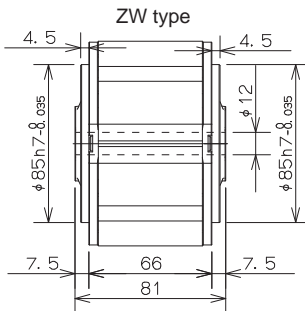
ZS type with single axis shaft



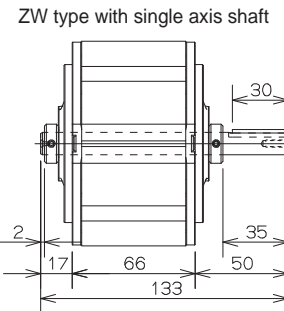
ZS type with dual axes shaft



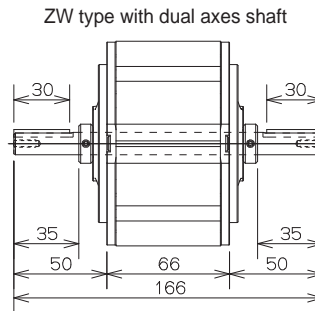
ZW-16
ZW-32
ZW-48



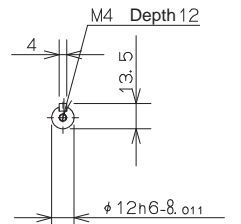
ZW type



ZW type with single axis shaft



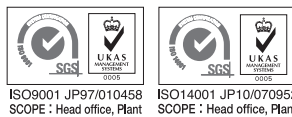
ZW type with dual axes shaft



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