



Instruction Manual

Spring Balancer

SBC-15-D
SBC-25-D

For safe and correct operation of the product, please be sure to read this manual and fully understand its content before use.
After reading, keep the manual safe so that you can find and use it readily.
In case of resale or transfer of this product, make sure to transfer the manual to the new owner.

Introduction



Thank you very much for purchasing the Spring Balancer. To prevent any trouble and obtain the best performance, please be sure to read this Instruction Manual and fully understand its content.

Notation in this Instruction Manual

Hazard levels

This product is designed with ultimate priority on the safety of operators. However, due to the nature of the system, there are risks that cannot be removed.

In this manual, the level of significance and risk is defined and indicated in two stages, "WARNING" and "CAUTION". Thoroughly read and fully understand the indicated items before operating the product and performing maintenance procedures. The indications for "WARNING" and "CAUTION" are described below in order of risk significance (WARNING > CAUTION).

 WARNING	A situation that, if mishandled, may cause death or serious disability.
 CAUTION	A situation that, if mishandled, may cause minor or moderate injury, or property damage.

The extent of the problem described above (disability, injury, and property damage) is defined as follows.

Serious disability: Loss of eyesight, wound, burn (high-temperature or low-temperature), electric shock, bone fracture, poisoning, and other injuries that leave aftereffects and that require hospitalization or long-term outpatient treatment.




Moderate injury: Burn, electric shock, bone fracture, and other injuries that do not require hospitalization or long-term outpatient treatment.

Minor injury: Scratch, bruise, laceration, and other injuries that have a minor impact on health.

Property damage: Extended damage to buildings, household articles, and injury to domestic animals or pets.

Symbols

This Instruction Manual uses the following symbols that simply describe warning information in addition to the indications above, "WARNING" and "CAUTION".

	Indicates a PROHIBITED action that must not be performed.
	Indicates a REQUIRED action that must be performed.
	Indicates potential property damage or a danger that may inflict bodily injury.

Scope of warranty and liabilities for the equipment

Warranty and liabilities for the equipment

1. We will repair or replace the product free of charge if a failure due to manufacturing defects occurs under proper usage during the warranty period. For details, contact us or your dealer.
2. The warranty will be void in the following cases:
 - 1) Change in ownership.
 - 2) Repair, adjustment, or modification performed by a party other than the manufacturer, agents, or dealers.
3. The warranty period is one (1) year from the date of purchase.
4. Repairs applicable to any of the following shall be charged even during the warranty period:
 - 1) Failure/damage caused by incorrect use.
 - 2) Failure/damage caused by use of non-genuine parts.
 - 3) Failure/damage caused by fire, earthquake, natural disaster, or other unexpected incident.
 - 4) Incident caused by fall, shock, negligence, or by inadequate storage.
 - 5) Failure/damage caused by use of parts or other equipment that are not included in this product.
 - 6) Replacement of consumables.
 - 7) Usage in violation of dangers or cautions stipulated in this Instruction Manual or the warning labels.
 - 8) Failure/damage caused by any reason that is not attributable to the manufacturer.
5. Warranty exclusions such as opportunity loss.
Either during or after the warranty period, opportunity loss, damage to anything other than our product(s), or other duties incurred on you/your customer as a result of the failure of our product(s) are outside the scope of the warranty.

Copyright and liabilities

The copyright for this Instruction Manual (included with the product) belong to Endo Kogyo Co., Ltd.

The Instruction Manual is provided for the limited purpose of supporting the safe and proper use of the product. It cannot be used for other purposes.

The customer may not use or make copies of this manual, in whole or in part, outside of this purpose without receiving prior consent from Endo Kogyo Co., Ltd.

The customer is also prohibited from translating or modifying the content of the manual, in whole or in part.




The content described in the manual is subject to change without advance notice. Please note this in advance.




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1. Precautions for Handling

Incorrect handling of this product may cause damage to the product itself as well as injury. Thoroughly read the following precautions and be sure to heed the instructions when handling the machinery.

 WARNING	
	<ul style="list-style-type: none">● Do not use in any locations where dropped loads may cause an injury.● Do not put your head or body under a suspended load or within the motion range of the tube.● Do not perform any modification of the product.● Do not remove tools (equipment) with the tube pulled out.
	<ul style="list-style-type: none">● Install the product correctly in accordance with the descriptions in this manual.

 CAUTION	
	<ul style="list-style-type: none">● Do not pull out the tube further than its stroke.● Do not pull the tube out at an excessive angle. (within 15°)● Do not operate without load.
	<ul style="list-style-type: none">● Be sure to perform daily and periodic inspections.● Always adjust the spring tension before using the balancer.● Be sure to use the product within the capacity range that is described in the specifications.● Tighten stopper's screws surely.● Do not put the stopper on lower than the pre-adjusted position. This might cause poor retrieving of tube due to disengagement with drum.

2. Unpacking and Installation

2-1 Packaging arrangement and transportation

The standard set of this product is packaged for delivery in a cardboard box. When transporting the package, do not drop or apply excessive impact to it.

< Main equipment >

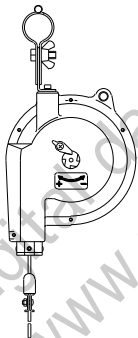

SBC-15-D Weight: Approximately 1.2 kg

SBC-25-D Weight: Approximately 1.3 kg

2-2 Checks after unpacking

After opening the package, check that the following products are included. Please contact us if you find anything missing or damaged.

■ Packing contents

Item	Appearance	Quantity
Spring Balancer (Main equipment)		1
Stopper assembly		1
Instruction Manual	(This manual)	1

2-3 Disposal of the packing materials

After opening the package, dispose of any packing and cushioning materials in accordance with the local regulations of the area where the product is used.

3. Product Description

3-1 Product specifications

Model	SBC-15-D	SBC-25-D
Capacity	0.5 kg – 1.5 kg	1.5 kg - 2.5 kg
Stroke	0.9 m	0.9 m
Main equipment mass	1.2 kg	1.3 kg

Note: Compatible with clean room cleanliness class 5 (ISO14644-1)/class 100 (Fed. Std-209E)

3-2 Operating environment

Installation location: General indoor
Ambient temperature: -10°C to +50°C (no freezing)

3-3 Disposal of the product

When disposing of the product, follow the local regulations of the area where the product is used, and properly treat it as industrial waste.

4. Installation

4-1 Preparation and check before installation

4-1-1 Tools for installation

For attachment of stopper assembly: a wrench (7 mm open end), a Phillips screwdriver
For tension adjustment: a hexagonal rod spanner (4 mm across flats)

4-1-2 Check of installation location

Before installing the product, check that the installation location does not have any of the following problems.

- 1 Check that the support member can withstand a force of at least 10 times the maximum capacity of the balancer.
- 2 Ensure that sufficient space for performing maintenance, including the adjustment of the spring tension, is available on a side of the main equipment.
- 3 Check that the installation location has the installation environment described in “3-2 Operating environment” (page 6).

4-2 Installation procedures

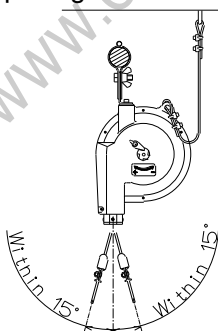
4-2-1 Balancer installation

CAUTION

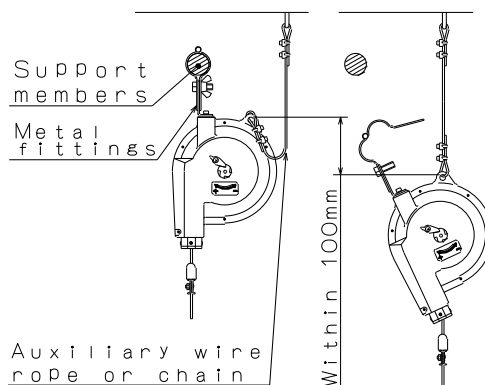


- Install the product correctly in accordance with the descriptions in this manual.
Incorrect installation may cause an injury, property damage, or damage to the Spring balancer.
- Prepare support members (metal hangers) that have a strength of at least 10 times the maximum capacity of the balancer.
- Attach the support members such that the Spring Balancer does not collide with its surroundings.
- Use support members with no opening so that the Spring Balancer does not come off while in motion.
- When installing multiple Spring Balancers, place the balancers at different heights so that they do not collide with each other.
- Be sure to attach an auxiliary wire rope or chain to the Position Balancer. The auxiliary wire rope or chain is necessary to protect workers from falling objects if the top hook or support members (metal hangers) for the Position Balancer are damaged and fall.
- Prepare an auxiliary wire rope or chain that has a strength of at least 10 times the maximum capacity of the balancer.


- 1 Install the balancer so that the tube pulled out might be within 15° against vertical motion. The dust might be caused by pulling out the wire rope at an excessive angle.



- 2 Attach an end of the auxiliary wire rope or chain to the auxiliary hanger. Attach the other end to a support member to which the balancer is not attached. The “slack” must be such that the Position Balancer stops within 100 mm if the top hook or support members for the balancer are damaged and fall.

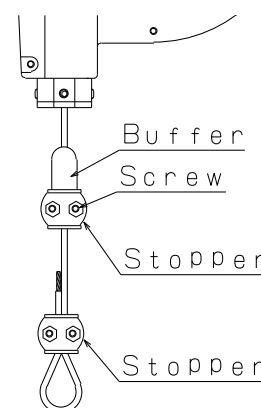


4-2-2 Stopper installation

! CAUTION	
	<ul style="list-style-type: none"> ● Always make sure to re-tighten the stopper before works.
	<p>If failure of re-tightening may cause poor retrieving, making a stopper creep down and a cable taken off from a drum.</p>
	<ul style="list-style-type: none"> ● Do not put the stopper on the lower position than the initial position. <p>Malfunction may occur, making a tube taken off from a drum.</p>

- 1 Always make sure to re-tighten the stopper (tightening torque: 2 N·m).

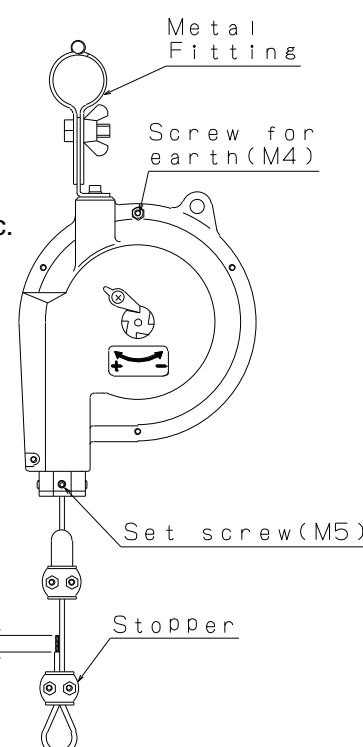
- 2 Mount the stopper supplied with the product when using a tool /device (tightening torque: 2 N·m).



4-2-3 Antistatic

Casing is of conductivity and is available for earth against static electricity generated from a tool by connecting the wire rope with a metal on a tool.

- 1 Cut the tube covering the wire rope as required.
- 2 Connect the naked wire rope with a tool using a terminal lug etc. If it is not available to make earth (ground) on the support, connect the earth line with a screw on the balancer body.





4-2-4 A vacuum pipe installation

The balancer is engineered for vacuuming dusts in the body on requests.

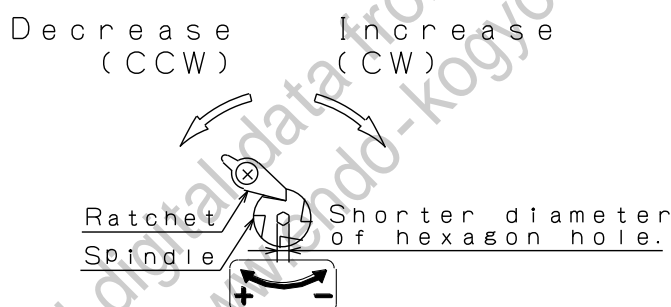
Install a pipe after removing a hex head screw (M5).

A pipe shall be provided by customers.

4-2-5 Adjustment of the spring tension

 CAUTION	
	<ul style="list-style-type: none"> ● Never pull the wire rope when unloaded. If the wire rope is released when extended with no load, it will snap back and could cause personal injury. ● Take care when adjusting the spring tension. A torque is on the spindle and it could move the adjusting tool you are holding. Look the spindle using the ratchet every 1/4 turn. ● If the spring tension is set over the maximum capacity, the balancer can not provide the specified cable travel and the spring life will be shortened.

- 1 Before attaching, check the mass (weight) of the complete Tool/device, including all accessories, is within the capacity range of the balancer.
- 2 Lift the complete tool/device up to the end of the tube and attach it. Fix the tube with a stopper. Never the tube down.
The suspended tool/device will drop down if the spring tension is not enough.
Lower the tool/device slowly by hand.
- 3 Adjust the spring tension by turning the spindle with a hexagon socket screw key.
Turn clockwise for increasing the spring tension, turn counterclockwise for decreasing.



- 4 Check the tool/device is balanced.
Over tensioning could cause damage to the balancer body or the tube.

4-2-6 Working stroke check

 CAUTION	
	<ul style="list-style-type: none"> ● Do not pull out the tube further than its stroke ,cause damage to the balancer.

- 1 Check the stroke is long enough for the application.
- 2 If necessary, lower the mounting height of the balancer or insert a suitable fitting between the balancer and tool/device.

5. Maintenance

⚠ CAUTION



- If you notice any damage or worn, stop using the product.

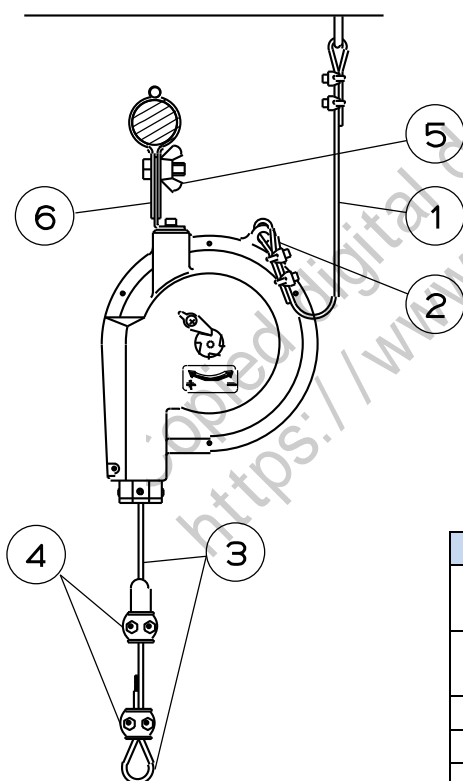
Daily inspections are required for the product to be used safely and properly.

If any failure is found in the inspections, the relevant parts must be replaced. For details, contact us or your dealer.

5-1 Daily inspections

Before starting the operation, check the following items daily:

- If any loose bolts or screws are found in the inspections, retighten the bolts and screws.
- When you notice any worn, deterioration or deformation of the parts, contact us or your dealer.



No.	Name	Inspection description
(1)	Auxiliary wire rope (chain)	<ul style="list-style-type: none"> • Check that the auxiliary is not worn. • Check that the bolts are not loose.
(2)	Auxiliary hanger	<ul style="list-style-type: none"> • Check that the auxiliary hanger is not worn..
(3)	tube	<ul style="list-style-type: none"> • Check that the tube is not worn
(4)	Stopper	<ul style="list-style-type: none"> • Check that the bolts are not loose.
(5)	Wing nut	<ul style="list-style-type: none"> • Check that the nut is not loose.
(6)	Metal fittings	<ul style="list-style-type: none"> • Check that it is not damage.

6. Troubleshooting

6-1 Countermeasures

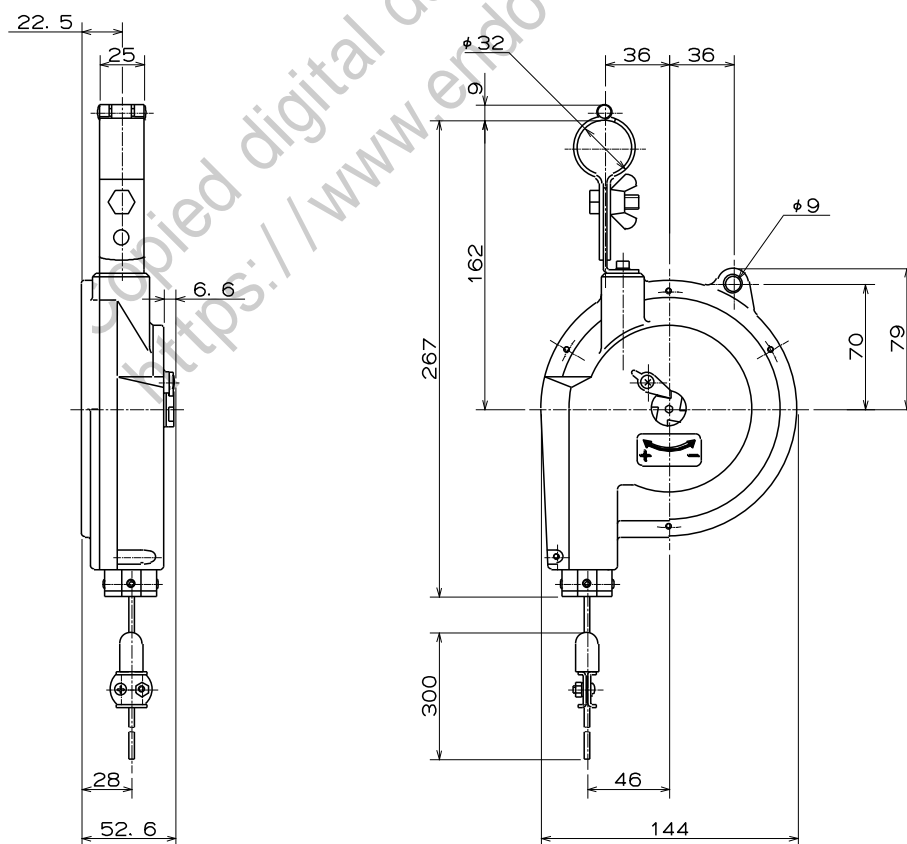
! CAUTION



- If you notice anything unusual, stop the operation immediately. After checking the items listed in the table below, appropriate measures should be taken.
- If the situation does not relate to any of the listed items in the table below, contact us or your dealer.

Failure	Reason	Measure
Wire rope can not be pulled out.	Spring is fully wound UP because of over-tensioning.	Release spring. See Chapter 4-2-5.
Other than above	Other than above	Contact your dealer.

7. Outline Drawing



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