INSTRUCTION MANUAL

AIR BALANCER

CONTROL MODULES

MS
MSS
MS-A
MS-AG
MS-ATC
BC1
BC2

Copied digital data from https://www.endo-kogyo.co.jp/

⚠ WARNING

- Never use the air balancer for lifting or lowering people.
- Supply this manual to the user.
- Read this manual before installation, operation, or maintenance.
- Keep this manual available.

ENDO KOGYO CO., LTD.

ENDO

HM-10087s

Issued on Mar. 2019

Copyright and liabilities

The copyright for this manual belongs to Endo Kogyo Co., Ltd.
The 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.

ENDO KOGYO CO., LTD.

Copied digital data
from https://www.endo-kogyo.co.jp /

SAFETY ALERT SYMBOL AND ALERT SIGNS

Please read this manual carefully and follow its instructions.

The SAFETY ALERT SYMBOL(⚠), WARNING, CAUTION, and NOTE carry special messages.

⚠ This SAFETY ALERT SYMBOL is used to call your attention to items or operations that could be dangerous to you or other persons using this equipment. Please read these messages and follow these instructions carefully.

⚠ **WARNING** : WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ **CAUTION** : CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury, damage or destruction or the equipment and others.

NOTE : NOTE indicates a special instruction in operation or maintenance.

Copied digital data from https://www.endo-kogyo.co.jp/

CONTENTS

1. Specification ---------- 1
2. Checks and Instructions before installation ---------- 1
3.Preparation for installation of Accessories ---------- 2
4. Installation of Accessories ---------- 3
4.1 Installing control module/MS・MSS ---------- 3
4.2 Installing control module/MS-A ---------- 6
4.3 Installing control module/MS-AG ---------- 8
4.4 Installing control module/MS-ATC ---------- 10
4.4 Installing control module/BC1 ---------- 14
4.5 Installing control module/BC2 ---------- 16
5. Checks after Installation and Test run ---------- 19
6. Lubrication ---------- 19
7. Parts list ---------- 20

Copied digital data from https://www.endo-kogyo.co.jp/

1. Specification

Control module

Each control module can be adapted to the air balancer of the circle in the table .

Model	Mass	Air inlet	Air balancer model						
	kg		EHB-50S EHB-50SC	EHB-50 EHB-50C	EHB-85 EHB-85C	EHB-130 EHB-130C	EHB-270 EHB-270C	EHB-270CR	EHB-450CR
MS	2	Rc 3/8	○	○	○	○		○	
MSS	2	Rc 3/8					○		○
MS-A	3.5	Rc 3/8	○	○	○	○	○	○	○
MS-AG	6	Rc 3/8	○	○	○	○			
MS-ATC	6	Rc 3/8	○	○	○	○			
BC1	1	Rc 1/4	○	○	○	○		○	
BC2	4	Rc 3/8	○	○	○	○		○	

Working conditions

- Application area: Indoor and normal atmospheric conditions.
- Temperature range: -10℃～+50℃
- Air pressure: 0.4MPa～0.7MPa

Copied digital data from https://www.endo-kogyo.co.jp/

2. Checks and Instructions before installation

- Check the delivered air balancer is what you ordered. (Check the name plate)
- Check there was no damaged or deformation on the air balancer during the transportation.
- Check the pressure of the available air supply corresponds to the working air pressure of the air balancer.

3. Preparation for installation of Accessories

Before installation of control module, remove a plug or cap and screws, assembled to the end cap. Check the combinations of air balancer and module, then remove the plug or cap and screws from the end cap, instruction is as follows.

EHB-50S, EHB-50SC, EHB-50, EHB-50C (Fig.1)

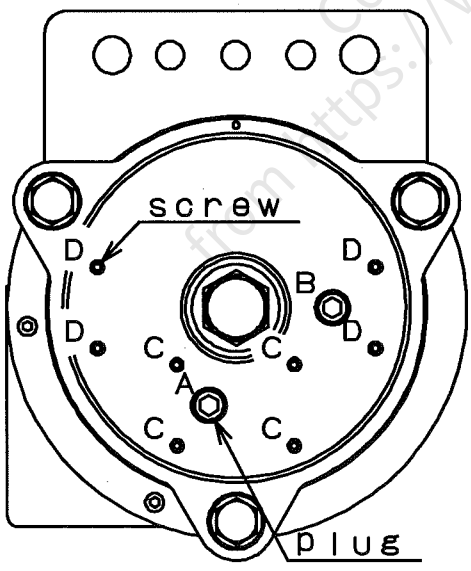
1. Control module / MS, BC1
   Remove plug and screws shown by A and C.
2. Control module / MS-A, MS-AG, MS-ATC
   Remove screws and plug shown by B and D.
3. Control module / BC2
   Remove plug shown by B.

EHB-85, EHB-85C, EHB-130, EHB-130C, EHB-270, EHB-270C, EHB-270CR, EHB-450CR

1. Control module / MS, MSS, BC1 (Fig.2)
   Remove the cap and screws shown by a and b.
2. Control module / MS-A, MS-AG, MS-ATC
   Remove the cap and screws shown by a and c.
3. Control module / BC2
   Remove the cap shown by a.

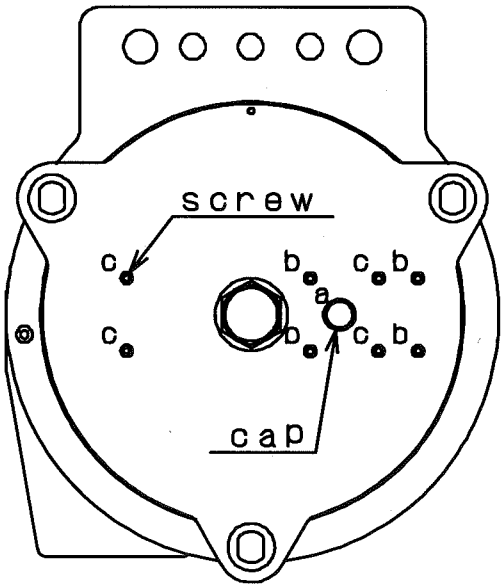
Note: After removing the plug from the air inlet, sealant might be adhesion left. If sealant goes inside of the air balancer, it might cause the failure, it must be removed cleanly

Copied digital data from https://www.ehac-kogyo.co.jp/



EHB-50S . EHB-50
EHB-50SC. EHB-50C

Fig.1



EHB-85 . EHB-130 . EHB-270
EHB-85C. EHB-130C. EHB-270C
EHB-270CR. EHB-450CR

Fig.2

4. Installation of Accessories

Accessories should be attached to the air balancer according to this instruction.

4.1 Installing control module / MS・MSS

4.1.1 Installing to the air balancer

1. Insert the O-ring (36) to the groove at the reverse side of the manifold (27).
2. Install the manifold (27) to the end cap by 4 bolts (35) (including washers) which are attached in the same box.

Note: Check the O-ring (36) on the manifold (27) and end cap if the O-ring is in right position or not. Also check if there is any foreign matter or not.

3. Install the control module as mentioned in Fig.3, or Fig.4.

4.1.2 Piping the air inlet

1. Before installing air hose and piping to the air balancer, blow the dust inside of piping. Then make sure there is no foreign matter in the piping.

2. Supply clean air pressure with no moisture and no foreign matter to the manifold (27). (Use less than 5μm air filter and supply air with no lubrication)

4.1.3 Operating adjustment

Note : Speed adjustment dial for "UP" (19) and "DN" (18) is strangled clockwise to prevent unexpected accident when the items are leaving from the manufacturer.

Turn each speed adjustment dial "UP" (18) and "DN"(19) gradually by 1/6-rotation at a time to counterclockwise with screwdriver, keep checking speed and adjust to arbitrary speed.
If making turns of the "UP" dial (19) to counterclockwise, the lifting speed will be increased.
In another hand, the lifting speed will be decreased if making turns to clockwise.
If making turns of the "DN" dial (18) to counterclockwise, the lowering speed will be increased.
In another hand, the lowering speed will be decreased if making turns to clockwise.
Never turn the each dials to counterclockwise after the each dials will touch the snap ring.

Note : The Lifting speed without the suspended load are different from the lifting speed with the suspended load.
In case the lifting speed is adjusted faster, the retract control system may work as the lifting speed without the suspended load is too fast. It is recommended to adjust the speed with the suspended load and the lifting speed must be adjusted in the range which the retract control system will not work.

Copied digital data from https://www.endo-kogyo.co.jp/

4.1.4 System reset

If the safety retract control system cannot be released, take the next procedures to release the system.

1. Payout the wire rope by pushing the lowering switch button (DN). But in case not to lower the bottom hook even if you took this procedure then pull down the bottom hook with pushing the lowering switch button.

2. After taking this procedure, the safety retract control system should be released and up / down control will be available.

4.1.5 Operation

Push lifting push button "UP" for lifting.
Push lowering push button "DN" for lowering.
The buttons have variable speed adjustment lever so the speed changes according to the degree of pushing level.
After releasing the handle, it is available within a certain limit.
Therefore, it is the floating system and convenient to place the suspended load into the certain place.
This floating condition is different from the balance condition because the floating system is applied with the characteristic of air, so the suspended load will come back to the initial suspended position when an operator releases a hands.

Copied digital data from https://www.endo-kyo.co.jp/

⚠ WARNING

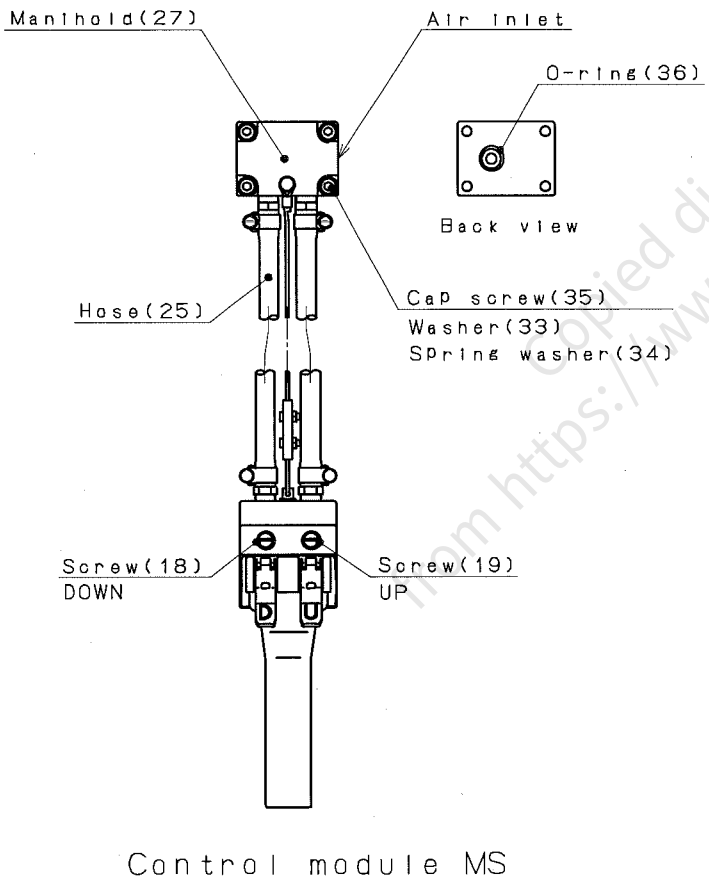
-If the left side of the hose (25) mentioned in Fig.3, and the hose (39) mentioned in Fig.4 is cut, broken or come off, the suspended load will drop down rapidly. Internal inspection is required when the suspended load fells from air balancer because the hose between air balancer and its module is cut, broken or come off.
-if the air supply is stopped, the suspended load will go down slowly with time.

4.1.6 Check before operation

⚠ WARNING

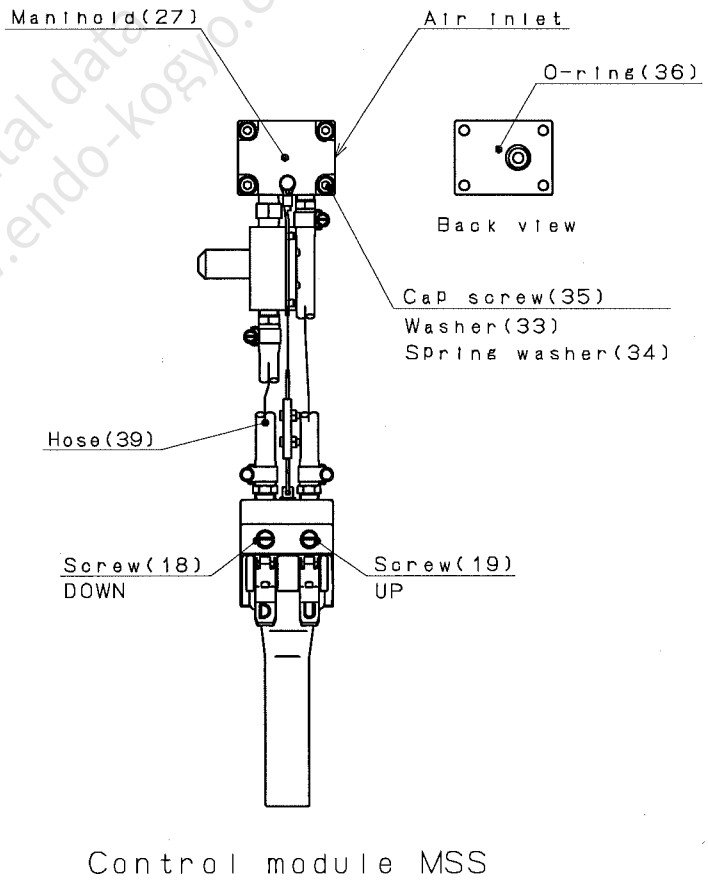
- Always execute the following checks at the beginning of each shift.
- If a malfunction occurs during the operation of the air balancer, stop operation immediately and take the necessary steps to rectify the problem. Never operate the air balancer if damaged or malfunctioning.
This is serious hazard and could result in personal injury or death.

1. Operations of push button are correct as indicated.
2. No air leakage
3. No loosen part
4. No crack or wear on hoses



Control module MS

Fig. 3



Control module MSS

Fig. 4

Copied digital data from https://www.endo-kogyo.co.jp/

4.2 Installing control module / MS-A

4.2.1 Installing to the air balancer

1. Attach the elbow (1) to the air inlet on the air balancer.
2. Remove the cover (27) from the control box and install the casing (2) to the end cap by 4 cap screws (26) (including washers) which are attached in the same box.
3. Connect the elbow (1) and the elbow (4) by the tube (22).
4. Attach the cover (27) to the casing (2) by machine screw (30) (including washer).

4.2.2 Piping the air inlet

1. Before installing air hose and piping to the air balancer, blow the dust inside of piping. Then make sure there is no foreign matter in the piping.
2. Supply clean air pressure with no moisture and no foreign matter to the casing (2). (Use less than 5μm air filter and supply air with no lubrication)

4.2.3 Operating adjustment

Note: Speed controller (15) for "UP" and "DN" speed adjustment is strangled clockwise to prevent unexpected accident when the items are leaving from the manufacturer.

Turn each speed controller (15) gradually by 1/6-rotation at a time to counterclockwise with screwdriver, keep checking speed and adjust to arbitrary speed.
If making turns of the knob to counterclockwise, the lifting and lowering speed will be increased. In another hand, the lifting and lowering speed will be decreased if making turns to clockwise.

Note: The Lifting speed without the suspended load are different from the lifting speed with the suspended load.
In case the lifting speed is adjusted faster, the retract control system may work as the lifting speed without the suspended load is too fast. It is recommended to adjust the speed with the suspended load and the lifting speed must be adjusted in the range which the retract control system will not work.

4.2.4 System reset

If the safety retract control system cannot be released, take the next procedures to release the system.

1. Payout the wire rope by pushing the lowering switch button (DN). But in case not to lower the bottom hook even if you took this procedure then pull down the bottom hook with pushing the lowering switch button.
2. After taking this procedure, the safety retract control system should be released and up / down control will be available.

4.2.5 Operation

Push lifting push button "UP" for lifting.
Push lowering push button "DN" for lowering.
After releasing the handle, it is available within a certain limit.
Therefore, it is the floating system and convenient to place the suspended load into the certain place.

This floating condition is different from the balance condition because the floating system is applied with the characteristic of air, so the suspended load will come back to the initial suspended position when an operator releases a hands.

4.2.6 Check before operation

⚠ WARNING

- Always execute the following checks at the beginning of each shift.
- If a malfunction occurs during the operation of the air balancer, stop operation immediately and take the necessary steps to rectify the problem. Never operate the air balancer if damaged or malfunctioning.
This is serious hazard and could result in personal injury or death.

1. Operations of push button are correct as indicated.
2. No air leakage
3. No loosen part
4. No crack or wear on hoses

Copied digital data from Kondo-Kogyo.co.jp

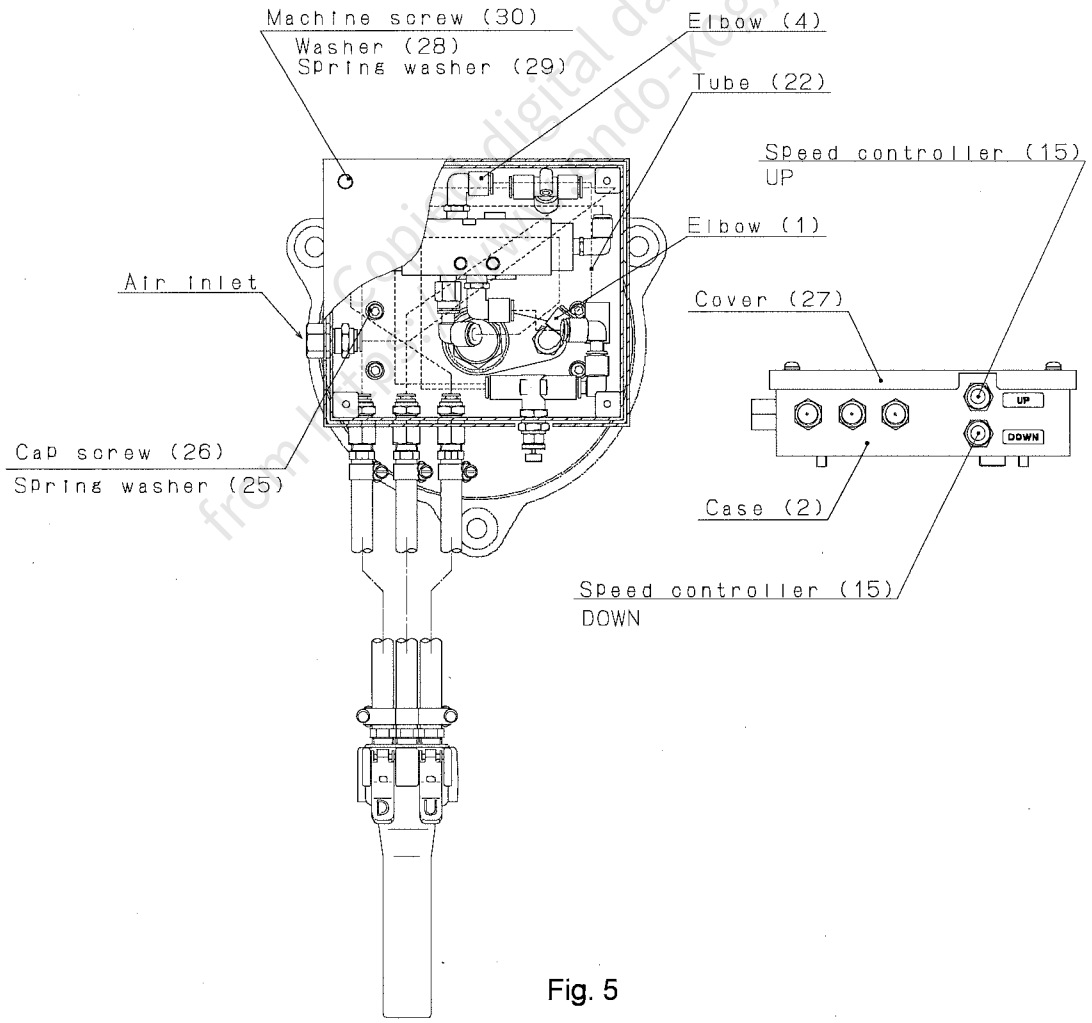


Fig. 5

4.3 Installing control module / MS-AG

4.3.1 Installing to the air balancer

1. Attach the elbow (1) to the air inlet on the air balancer.
2. Remove the cover (27) from the control box and install the casing (2) to the end cap by 4 cap screws (26)(including washers) which are attached in the same box.
3. Connect the elbow (1) and the elbow (4) by the tube (22).
4. Attach the cover (27) to the casing (2) by machine screw (30) (including washer).

4.3.2 Piping the air inlet

1. Before installing air hose and piping to the air balancer, blow the dust inside of piping.Then make sure there is no foreign matter in the piping.
2. Supply clean air pressure with no moisture and no foreign matter to the casing (2). (Use less than 5μm air filter and supply air with no lubrication)

4.3.3 Operating adjustment

Note: Speed controller (15) for "UP" and "DN" speed adjustment is strangled clockwise to prevent unexpected accident when the items are leaving from the manufacturer.

Turn each speed controller (15) gradually by 1/6-rotation at a time to counterclockwise with screwdriver, keep checking speed and adjust to arbitrary speed.
If making turns of the knob to counterclockwise, the lifting and lowering speed will be increased. In another hand, the lifting and lowering speed will be decreased if making turns to clockwise.

Note: The Lifting speed without the suspended load are different from the lifting speed with the suspended load.
In case the lifting speed is adjusted faster, the retract control system may work as the lifting speed without the suspended load is too fast. It is recommended to adjust the speed with the suspended load and the lifting speed must be adjusted in the range which the retract control system will not work.

4.3.4 System reset

If the safety retract control system cannot be released, take the next procedures to release the system.

1. Payout the wire rope by pushing the lowering switch button (DN). But in case not to lower the bottom hook even if you took this procedure then pull down the bottom hook with sliding down of grip.
2. After taking this procedure, the safety retract control system should be released and up / down control will be available.

4.3.5 Operation

Hold the grip,
the hook lifts when the grip is slid up and the hook lowers when the grip is slid down. After releasing the handle, it is available within a certain limit.
Therefore, it is the floating system and convenient to place the suspended load into the certain place.
This floating condition is different from the balance condition because the floating system is applied with the characteristic of air, so the suspended load will come back to the initial suspended position when an operator releases a hands.

4.3.6 Check before operation

⚠ WARNING

- Always execute the following checks at the beginning of each shift.
- If a malfunction occurs during the operation of the air balancer, stop operation immediately and take the necessary steps to rectify the problem. Never operate the air balancer if damaged or malfunctioning. This is serious hazard and could result in personal injury or death.

1. Operations of Grip are correct as indicated.
2. No air leakage
3. No loosen part
4. No crack or wear on Coil hose.
5. No crack or wear on hook or eye nut or swivel.

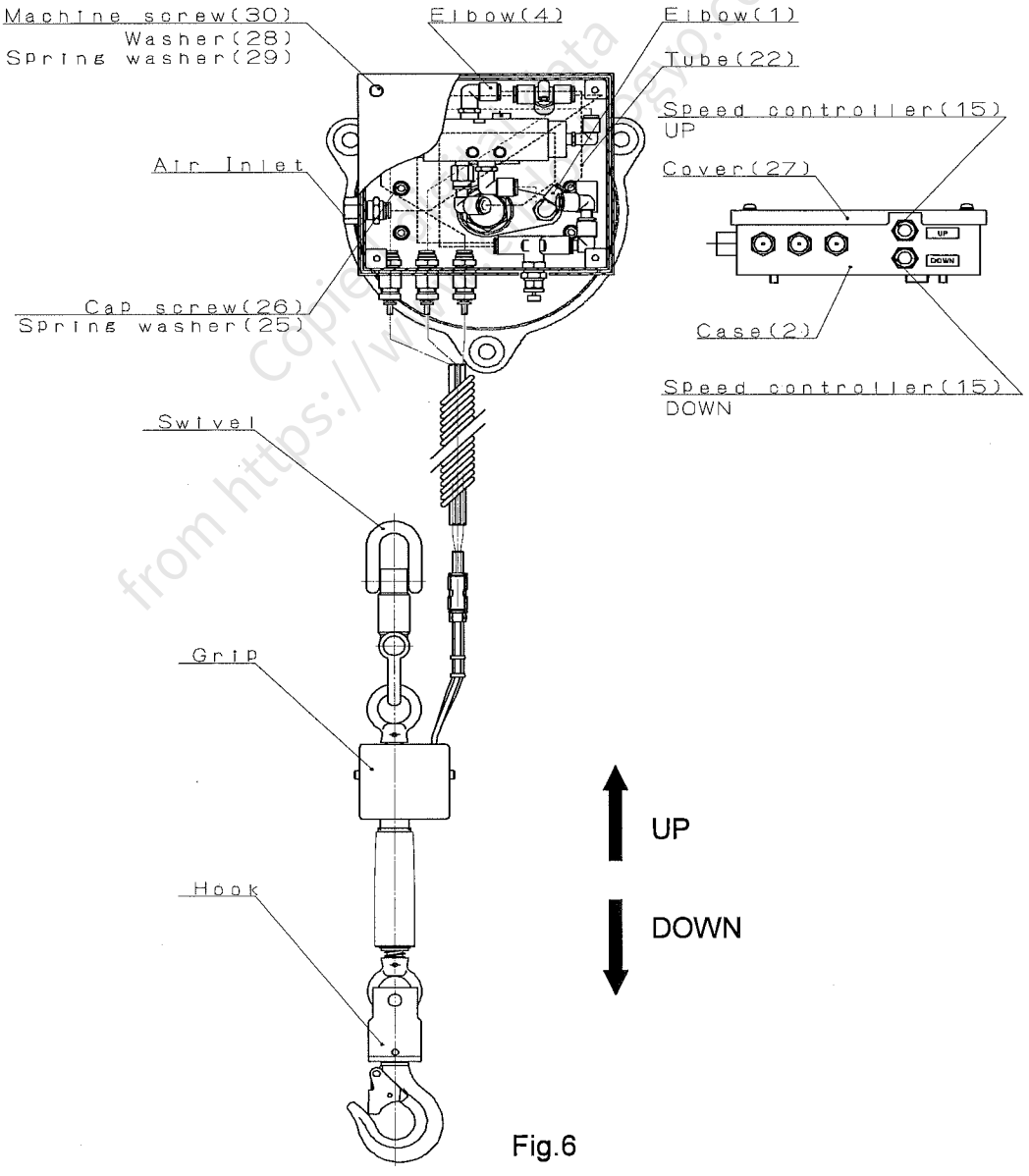


Fig.6

Copied from https://www.manuals.co.jp/

4.4 Installing control module / MS-ATC

4.4.1 Recombination of the air balancer.

1. Loosen 3 U-nuts of End cap(Fig.7), and remove the U-nuts and bolt for lower part. (Fig.8)
2. Remove the center pipe and exchange to the pipe packaged with MS-ATC.
3. Reassemble the bolt and U-nuts and tighten the loosen U-nuts.

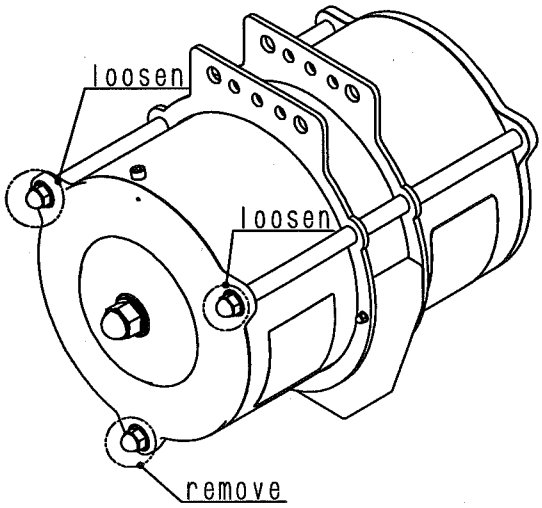


Fig.7

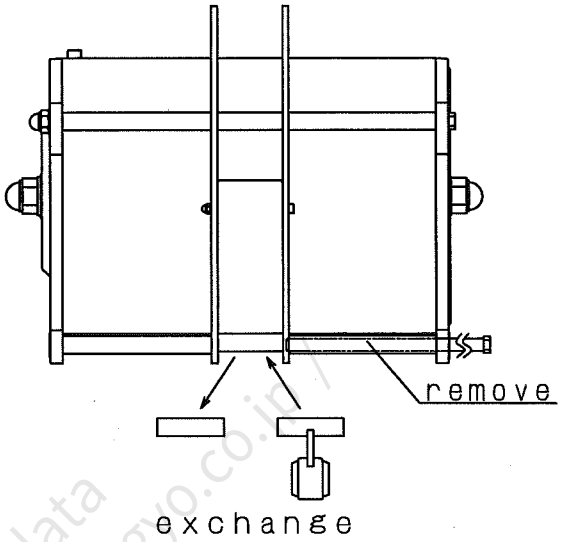


Fig.8

4.4.2 Installing to the air balancer

1. Attach the elbow (1) to the air inlet on the air balancer.
2. Remove the cover (27) from the control box and install the casing (2) to the end cap by 4 cap screws (26)(including washers) which are attached in the same box.
3. Connect the elbow (1) and the elbow (4) by the tube (22).
4. Attach the cover (27) to the casing (2) by machine screw (30) (including washer).
5. Pass the coil-tube (38) through a hole of the holder then plug into elbow (33)

4.4.3 Piping the air inlet

1. Before installing air hose and piping to the air balancer, blow the dust inside of piping. Then make sure there is no foreign matter in the piping.
2. Supply clean air pressure with no moisture and no foreign matter to the casing (2). (Use less than 5μm air filter and supply air with no lubrication)

from https://pdf.digital data endo-kogyo.co.jp/

4.4.4 Operating adjustment

Note: Speed controller (15) for " ↑ " and " ↓ " speed adjustment is strangled clockwise to prevent unexpected accident when the items are leaving from the manufacturer.

Turn each speed controller (15) gradually by 1/6-rotation at a time to counterclockwise with screwdriver, keep checking speed and adjust to arbitrary speed.
If making turns of the knob to counterclockwise, the lifting and lowering speed will be increased. In another hand, the lifting and lowering speed will be decreased if making turns to clockwise.

Note: The Lifting speed without the suspended load are different from the lifting speed with the suspended load.
In case the lifting speed is adjusted faster, the retract control system may work as the lifting speed without the suspended load is too fast. It is recommended to adjust the speed with the suspended load and the lifting speed must be adjusted in the range which the retract control system will not work.

4.4.5 System reset

If the safety retract control system cannot be released, take the next procedures to release the system.

1. Payout the wire rope by pushing the lowering switch button (↓). But in case not to lower the bottom hook even if you took this procedure then pull down the bottom hook with sliding down of grip.
2. After taking this procedure, the safety retract control system should be released and up / down control will be available.

4.4.6 Operation

Push lifting push button " ↑ " for lifting.
Push lowering push button " ↓ " for lowering.
After releasing the handle, it is available within a certain limit.
Therefore, it is the floating system and convenient to place the suspended load into the certain place.

This floating condition is different from the balance condition because the floating system is applied with the characteristic of air, so the suspended load will come back to the initial suspended position when an operator releases a hands.

from https://www.endo-kogyo.co.jp/ Copied digital data

4.4.7 Check before operation

⚠ WARNING

- Always execute the following checks at the beginning of each shift.
- If a malfunction occurs during the operation of the air balancer, stop operation immediately and take the necessary steps to rectify the problem.
Never operate the air balancer if damaged or malfunctioning.
This is serious hazard and could result in personal injury or death.

1. Operations of Grip are correct as indicated.
2. No air leakage
3. No loosen part
4. No crack or wear on Coil hose.
5. No crack or wear on hook or eye nut or swivel.

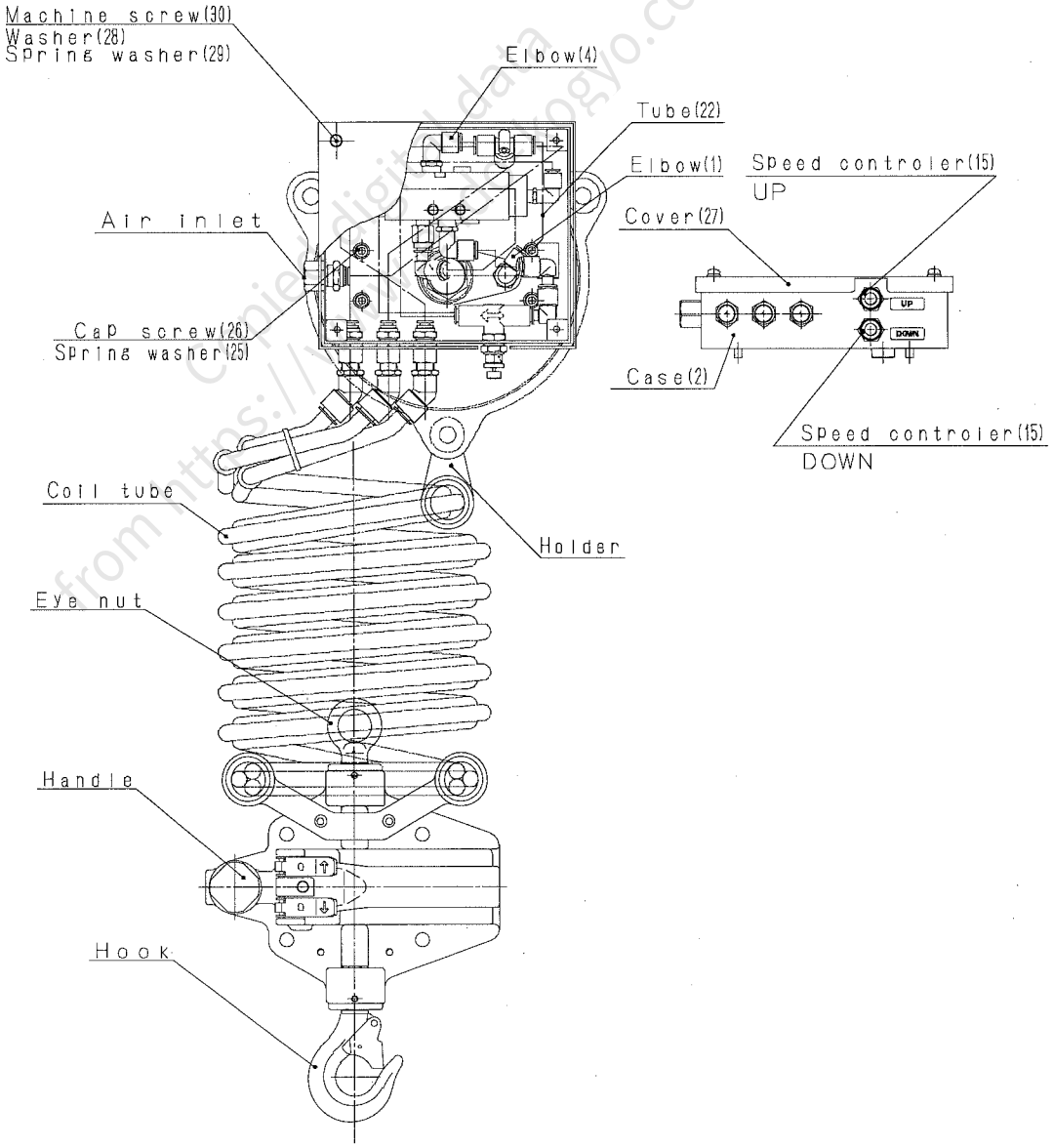


Fig.9

4.4.8. Inspection

(1) Inspection of Hook and Service Limit

> **⚠ WARNING**
> Never repair the hooks.
> Always replace a stretched, worn or damaged hook with new one.

Inspection on hook opening, cracks and wear.

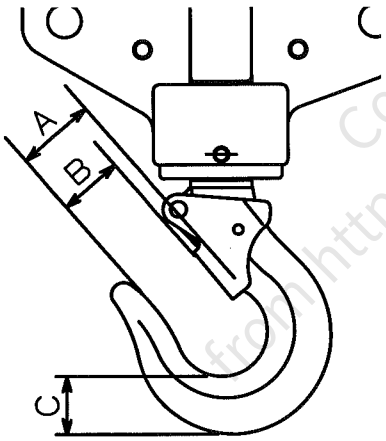
If any of the following conditions apply to the inspected hook, never reuse always replace with new one.

- The hook opening is visibly stretched, or the opening dimension is different from the specified.
- The hook is deformed or cracked.
  Carefully check for any bends or cracks on the hook shank.
- Wear on the hook saddle, where the lifting sling(suspension fastening).
  Rests, reaches the service limit.
- The hook latch is damaged or malfunctioning.
- Check hook rotates smoothly. Hook which does not rotate smoothly (feels rugged when manually rotated) is beyond it service limit.

Copied digital data from https://www.endo-kogyo.co.jp/

Hook opening dimension and wear limit

For the hook opening dimension A, B, refer the standard dimension in the table right side for the inspectional standards.



	Standard dimension	Service limit
A	26.0mm	Never exceed the standard dimension
B	21.0mm	Never exceed the standard dimension
C	19.0mm	16.9mm

4.4.9. Replacement of Eye-nut and bottom hook

1. Remove the set screw (67) Fig.10.
2. Turn holder (66) and hock holder (74) counterclockwise and take it off.
3. Reinstall new lower hook and eye-nuts to each holder (66 and 74).

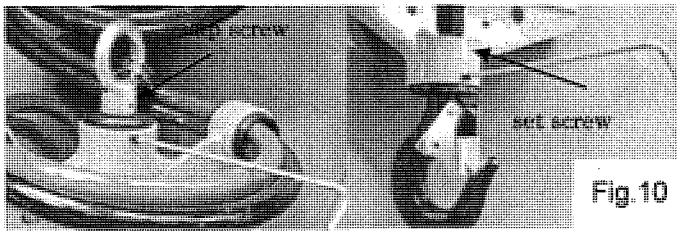


Fig.10

4. Reinstall holders (66 and 74) to the handle (40) and fix with set screw (67).

4.4.10. Thimble replacement for eye-nuts

Open the thimble (54) and remove.

Replace to new eye-nuts and close the thimble and fix it. (Fig.11)

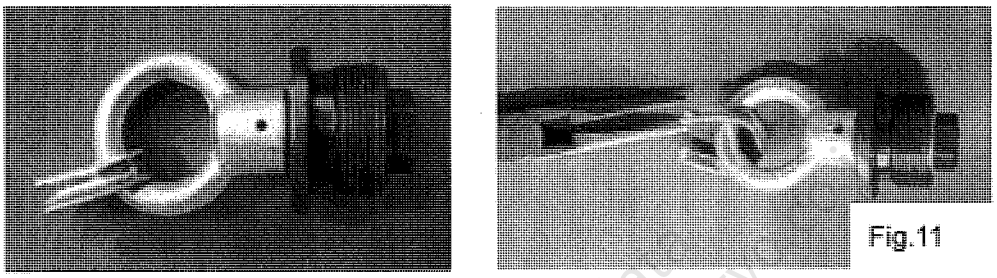


Fig.11

4.5 Installing control module / BC1

4.5.1 Installing to the air balancer

1. Insert the O-ring to the groove at the reverse side of the manifold (1).
2. Install BC1 to the end cap by 4 bolts (5) (including washers) which are attached in the same box.

Note: Check the O-ring (8) on the manifold (1) and end cap if the O-ring is in right position or not. Also check if there is any foreign matter or not.

3. Install the control module as mentioned in Fig.12.

4.5.2 Operating adjustment

Note: Balance adjustment dial is made the full turns to counterclockwise to prevent unexpected accident when the items are leaving from the manufacturer.

1. Before adjustment, hang the suspended load on Hook.
2. Keep turning Balance adjustment dial clockwise slowly until the suspended load is started lifting up. Adjust Balance adjustment dial with giving a vertical motion by hands to balance the suspended load.
3. When release the load from Hook, the suspended load must be taken down on the ground and Balance adjustment dial must be made the full turns counterclockwise.

Copied digital data from https://www.endo-kogyo.co.jp

4.5.3 System reset

If the safety retract control system cannot be released, take the next procedures to release the system.

1. Keep turning Balance adjustment dial counterclockwise slowly until Hook is started lowering. If Hook does not lower by the dial control, lower Hook by hand.
2. After taking this procedure, the safety retract control system should be released. And give BC1 operating adjustment as '3.4.2 Operating adjustment' again.

4.5.4 Check before operation

⚠ WARNING

- Always execute the following checks at the beginning of each shift.
- If a malfunction occurs during the operation of the air balancer, stop operation immediately and take the necessary steps to rectify the problem. Never operate the air balancer if damaged or malfunctioning. This is serious hazard and could result in personal injury or death.

1. Operation of Balance adjustment dial is correct as indicates
2. No air leakage
3. No loosen part

Copied digital data from https://www.ends-ryo.co.jp/

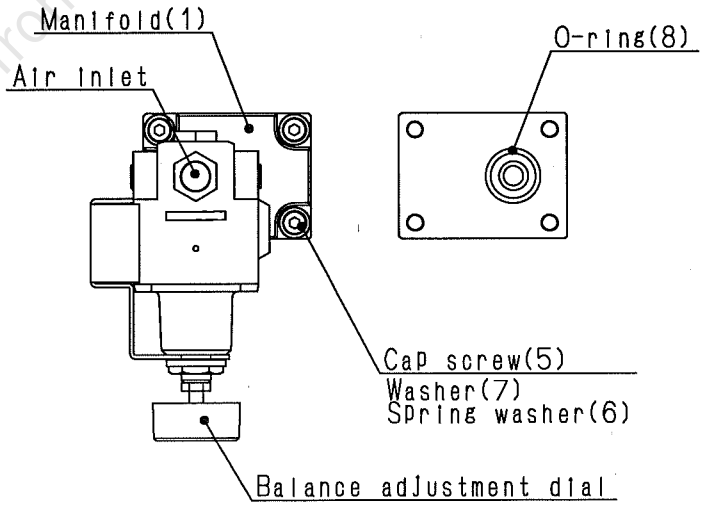


Fig.12

4.6 Installing control module / BC2

4.6.1 Installing to the air balancer

1. Insert Bracket(37) into the outside of Hanger(12) and fit mounting holes each other as Fig.13.
2. Set Pipe(64) between Hanger and insert Hex. bolt(62) into Pipe. Tighten Hex. Bolt firmly with Hex. nut(65) and U nut(66).
3. Connect Adaptor(42) with Air connection on Air balancer.
4. Install BC2 as Fig.13.

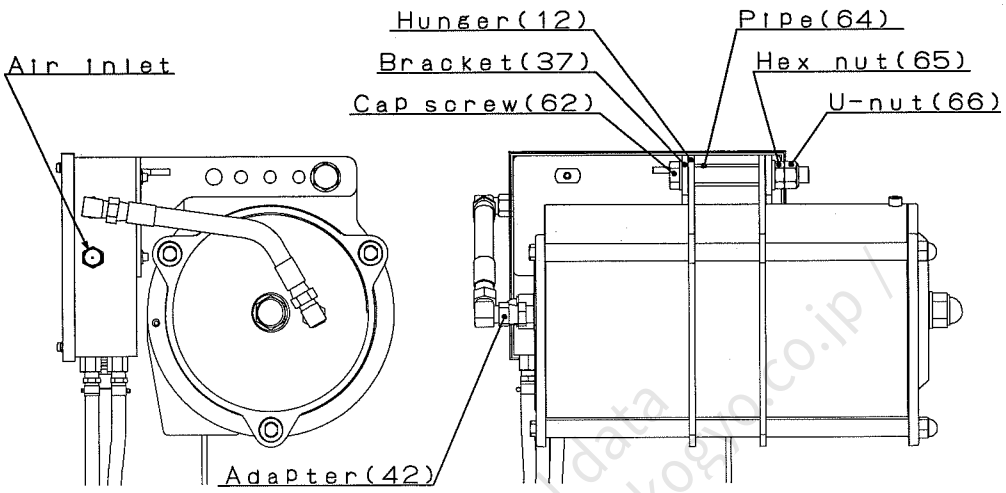


Fig.13

Copied digital data from https://www.endo-kogio.co.jp/

4.6.2 Operating adjustment

Note : Balance adjustment dial 'LOW' and 'HIGH' are made the full turns to counterclockwise to prevent unexpected accident when the items are leaving from the manufacturer.

1. Before adjustment, hang the suspended load on Hook.
2. Push 'LOW' button with pushing 'SELECT' button on the pendant to convert operation mode to LOW mode.
3. Keep turning Balance adjustment dial 'LOW' clockwise gradually until the suspended load starts to lift up. Adjust Balance adjustment dial 'LOW' with giving a vertical motion by hands to balance the suspended load.
4. Take the first suspended load down on the ground by hands.
5. Push 'HIGH' button with pushing 'SELECT' button on the pendant to convert operation mode to HIGH mode.
6. Add the second suspended load to the first suspended load.
   Keep turning Balance adjustment dial 'HIGH' clockwise gradually until these suspended loads start to lift up. Adjust Balance adjustment dial 'HIGH' with giving a vertical motion by hands to balance suspended loads.
7. When release loads from Hook, loads must be taken down on the ground and Balance adjustment 'HIGH' dial must be loosened counterclockwise maximum.
8. Manometer show measured value of pressure supplied to Air balancer in both mode. Refer to it when adjust module.

4.6.3 System reset

If the safety retract control system cannot be released, take the next procedures to release the system.

1. Keep turning Balance adjustment dial counterclockwise slowly until Hook is started lowering. If Hook does not lower by the dial control, lower Hook by hand.
2. After taking this procedure, the safety retract control system should be released. And give BC2 operating adjustment as '3.5.2 Operating adjustment' again.

4.6.4 Operation

1. Hang the first suspended load on Hook and push 'LOW' button with pushing 'SELECT' button on pendant.
2. Move the suspended load vertically by hands and balance it at any point.
3. Take the suspended load down on the ground by hands.
4. Add the second suspended load to the first suspended load.
5. Push 'HIGH' button with pushing 'SELECT' button on pendant.
6. Move suspended loads vertically by hands and balance it at any point.
7. Take suspended loads down on the ground by hands.
8. After push 'LOW' button with pushing 'SELECT' button, release the second suspended load.

⚠ WARNING

- Never use buttons on pendant for lifting or lowering. These are only for converting operation mode.
- Never change to ''LOW' mode until the suspended load touches the face to ground by pushing down with hand in 'HIGH' mode. After that convert operation mode to 'LOW'. It is very dangerous that convert 'HIGH' to 'LOW' without load touched to ground. It will cause sudden loads dropped down and personal injury.
- It is very dangerous that convert 'LOW' mode to 'HIGH' mode in 'LOW' mode without the second suspended load added. It will cause sudden load lifted up and personal injury.
- if the air supply is stopped, the suspended load will go down slowly with time.

Copied digital data from https://www.endo-kogyo.co.jp/

4.6.5 Check before operation

⚠ WARNING

- Always execute the following checks at the beginning of each shift.
- If a malfunction occurs during the operation of the air balancer, stop operation immediately and take the necessary steps to rectify the problem. Never operate the air balancer if damaged or malfunctioning.
This is serious hazard and could result in personal injury or death.

1. Operations of Balance adjustment dial are correct as indicates
2. Operations of push button are correct as indicated.
3. No air leakage
4. No loosen part
5. No crack or wear on hoses

Copied digital data from https://www.endo-kogyo.co.jp/

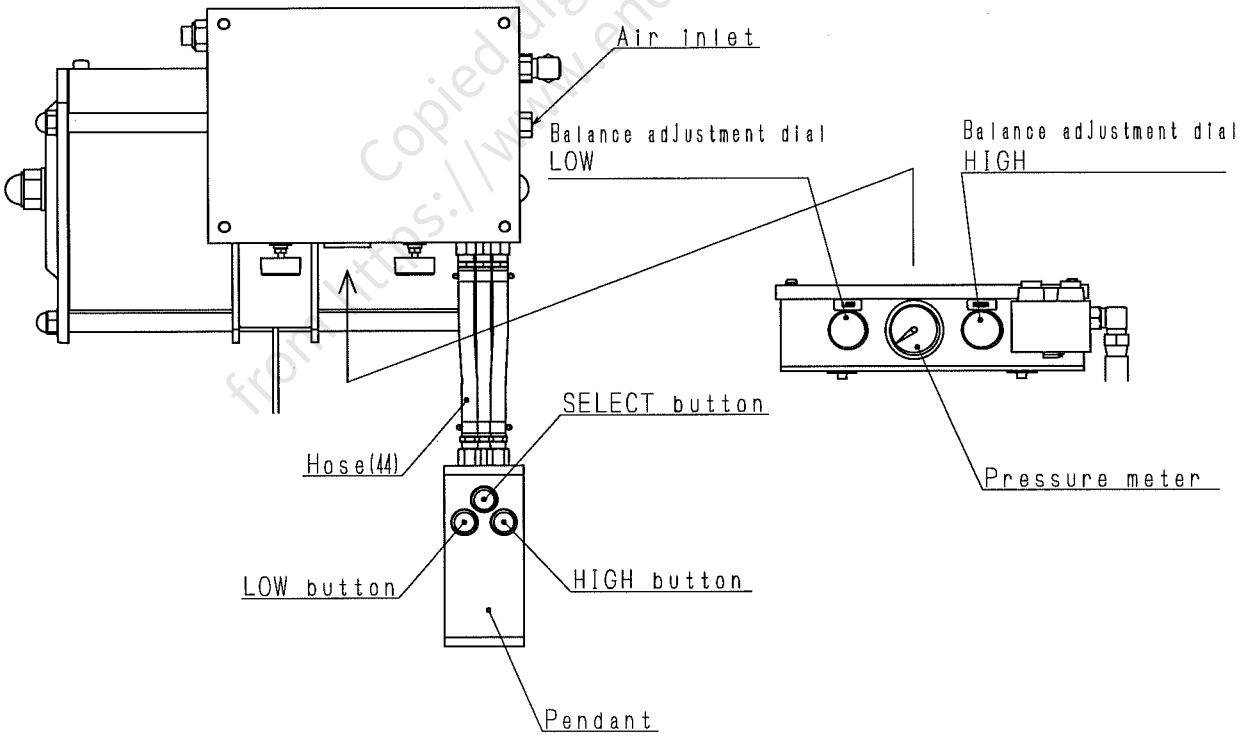


Fig.14

5. Checks after Installation and Test run

5.1 Check Lifting Operation

- Keep the working air pressure no greater than 0.7 MPa (7kgf/cm^2).
- Check the indications marked on the push buttons correctly show the actual directions of up / down operations.

5.2 Checking the safety retract control

⚠ WARNING

Never use the internal safety retract control and a ball stopper as a means of stopping air balancer. Use them only in emergency case of preventing the snap back of bottom hook.
It is very dangerous to use the ball stopper frequently. It will cause the breakage of the wire rope and the drop down of the suspended load.

Speed adjustment dial or speed controller for lifting and lowering are strangled clockwise when the items are leaving from the manufacturer.

And both Balance adjustment dial are made the full turns to counterclockwise.

For speed adjustment, refer to "Operating adjustment".

Check the activation of the safety retract control by making fast rotation to the drum when no load is suspended.

To release the safety retract control, push the "DN" button or turn the Balance adjustment dial to left fully to payout the wire rope.

But in case not to lower the bottom hook even if you took this procedure then pull down the bottom hook with pushing the lowering switch button or turn the Balance adjustment dial to left fully.

This procedure will release the safety retract control.

Copied digital data from https://www.kito-kogyo.com/

6. Lubrication

Each time the air balancer is disassembled for inspection, use lithium-saponified molybdenum disulfide grease corresponding to the No. 2 class of NLGI (National Lubrication Grease Institute) to slide O-ring.
(Molykote BR2-S or equivalents)

7. Disassembly drawing and part description on body part

Remarks when purchasing parts

- Specify the part No., part name and model name of the air balancer.
- State SER. No. (product No.) clearly if attached.
- Parts without a part number cannot be supplied individually.
  Please purchase a set or complete unit.

■ How to read parts list

Ref No.	Part No.	Quantity	Description
-	LHP001963	1	Handle assembly
-	LHP000851	1	—Handle compl.
1	P2H100058	1	——Handle
2	LHP000145	1	——Push button set
3	KA42410325	4	——Spring pin
4	P2H400296	1	——Silencer
5	P2H400297	1	——Support
6	P2H400298	1	——Collar
7	KA42410206	2	——Spring pin
• 8	KA50200090	1	—O-ring

The mark indicates the range of the set or the complete unit.

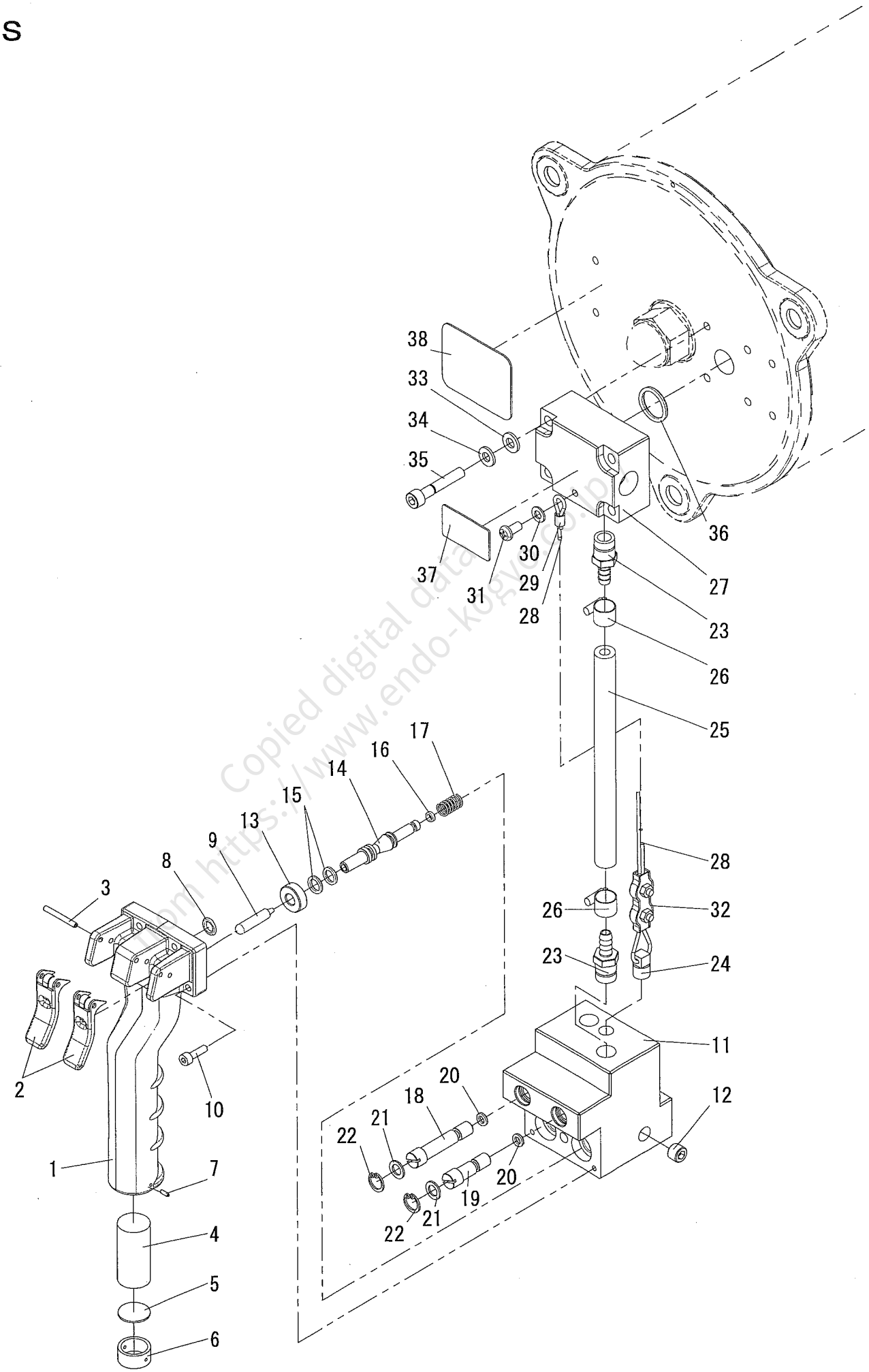
Copied digital data from https://www.ende-kogyo.co.jp/

■PARTS LIST MS

Ref.No.	Part No.	Quantity	Descrption	Ref.No.	Part No.	Quantity	Descrption
-	LHP001963	1	Handle assembly	31	KA10120510	1	Machine screw
-	LHP000851	1	−Handle compl.	32	P2H402440	1	Clip
1	P2H100058	1	−−Handle	33	KA30220600	4	Washer
2	LHP000145	1	−−Push button set	34	KA31120600	4	Spring washer
3	KA42410325	4	−−Spring pin	35	KA00910635	4	Cap screw
4	P2H400296	1	−−Silencer	● 36	KA50100180	1	O-ring
5	P2H400297	1	−−Support	37	P2H301220	1	Name plate
6	P2H400298	1	−−Collar	38	P2H301150	1	Warning label
7	KA42410206	2	−−Spring pin				
● 8	KA50200090	1	−O-ring				
9	P2H400307	2	−Pin				
10	P2H400957	4	−Cap screw				
11	P2H100080	1	−Valve body				
12	P2H400007	3	−Plug				
13	P2H401220	2	−Spacer				
14	P2H301146	2	−Spool				
● 15	KA50110060	4	−O-ring				
● 16	KA50200040	2	−O-ring				
17	P2H400293	2	−Spring				
18	P2H402370	1	−Screw				
19	P2H402371	1	−Screw				
● 20	KA50100050	2	−O-ring				
21	P2B400352	2	−Washer				
22	KA40210012	2	−Retaining ring				
23	P1R400322	2	−Nipple				
24	P2H400954	1	−Plug				
25	P2H402372	2	Hose				
26	KA86100120	4	Hose clip				
27	P2H301147	1	Manifold				
23	P1R400322	2	Nipple				
-	LHP001964	1	Wire rope				
28	—	1	−Wire rope				
29	—	1	−Lock tube				
30	KA30220500	1	Washer				

We recommend that you stock parts indicated by a bullet (●).
Parts without part numbers can not be supplied separately.

Copied digital data from https://www.endo-kogyo.co.jp/



Copied digital data from https://www.endo-kogyo.co.jp/

YHM000637c

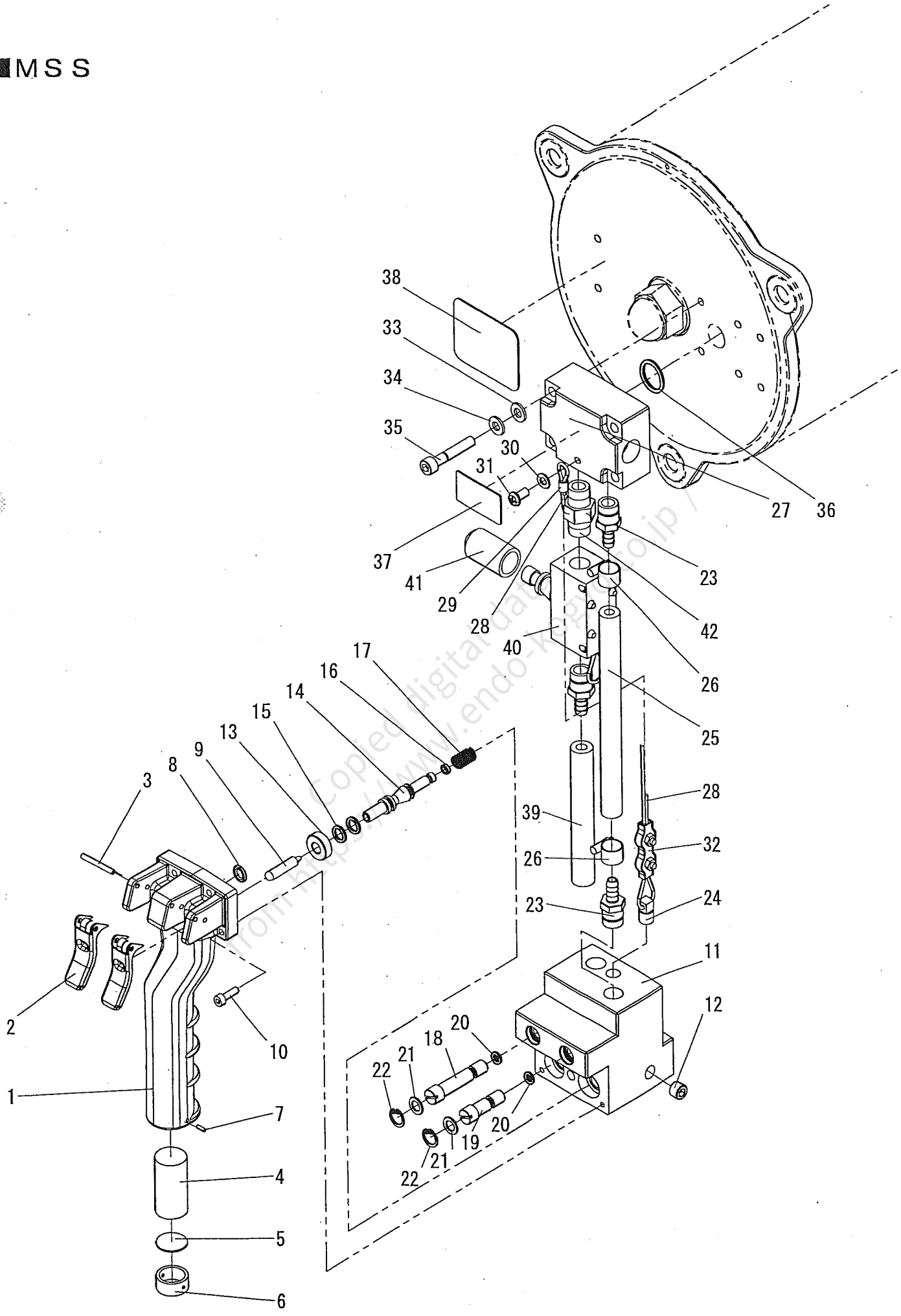
■PARTS LIST MSS

Ref.No.	Part No.	Quantity	Descrption	Ref.No.	Part No.	Quantity	Descrption
-	LHP001963	1	Handle assembly	-	LHP001964	1	Wire rope
-	LHP000851	1	—Handle compl.	28	—	1	—Wire rope
1	P2H100058	1	——Handle	29	—	1	—Lock tube
2	LHP000145	1	——Push button set	30	KA30220500	1	Washer
3	KA42410325	4	——Spring pin	31	KA10120510	1	Machine screw
4	P2H400296	1	——Silencer	32	P2H402440	1	Clip
5	P2H400297	1	——Support	33	KA30220600	4	Washer
6	P2H400298	1	——Collar	34	KA31120600	4	Spring washer
7	KA42410206	2	——Spring pin	35	KA00910635	4	Cap screw
● 8	KA50200090	1	—O-ring	● 36	KA50100180	1	O-ring
9	P2H400307	2	—Pin	37	P2H301220	1	Name plate
10	P2H400957	4	—Cap screw	38	P2H301150	1	Warning label
11	P2H100080	1	—Valve body				
12	P2H400007	3	—Plug				
13	P2H401220	2	—Spacer				
14	P2H301146	2	—Spool				
● 15	KA50110060	4	—O-ring				
● 16	KA50200040	2	—O-ring				
17	P2H400293	2	—Spring				
18	P2H402370	1	—Screw				
19	P2H402371	1	—Screw				
● 20	KA50100050	2	—O-ring				
21	P2B400352	2	—Washer				
22	KA40210012	2	—Retaining ring				
23	P1R400322	2	—Nipple				
24	P2H400954	1	—Plug				
25	P2H402372	2	Hose				
39	P2H402966	1	Hose				
-	LHP002421	-	Speed controller compl.				
40	—	1	-Speed controller				
41	—	1	-Cap				
26	KA86100120	4	Hose clip				
27	P2H301147	1	Manifold				
23	P1R400322	2	Nipple				

We recommend that you stock parts indicated by a bullet (●).
Parts without part numbers can not be supplied separately.

copied digital data from https://www.endo-kogyo.co.jp/

■MSS



Copied digital data from https://www.endo-kogyo.co.jp/

YHM000808

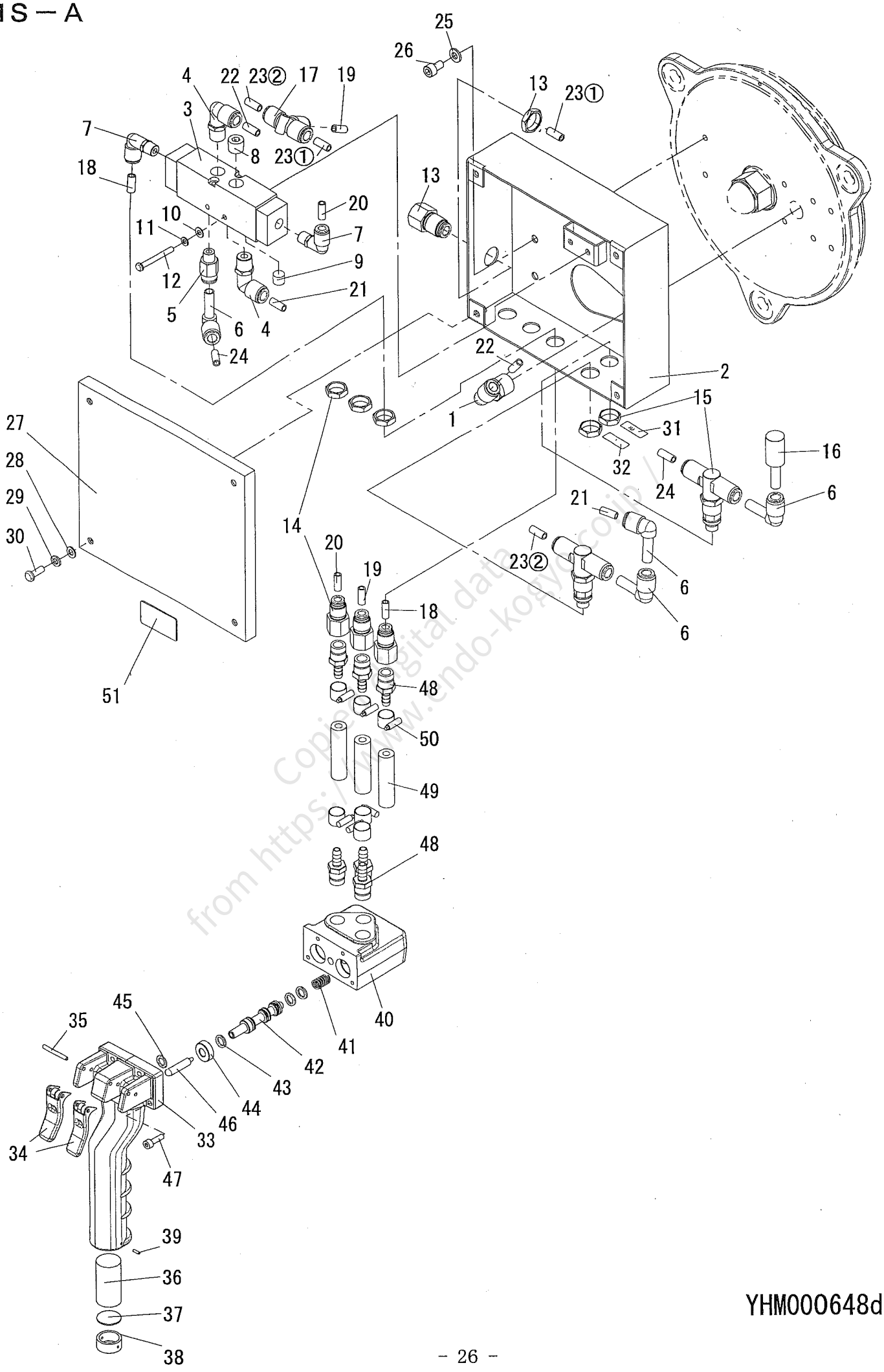
■PARTS LIST MS-A

Ref.No.	Part No.	Quantity	Descrption	Ref.No.	Part No.	Quantity	Descrption
-	LHP001939	1	Control box	-	LHP001941	1	Handle assembly
1	P2H402407	1	—Elbow	-	LHP000851	1	—Handle compl.
2	LHP001940	1	—Casing	33	P2H100058	1	——Handle
3	P2H301170	1	—Operate valve	34	LHP000145	1	——Push button set
4	P2H402406	2	—Elbow	35	KA42410325	4	——Spring pin
5	P2H402409	1	—Union	36	P2H400296	1	——Silencer
6	P2H402408	4	—Elbow	37	P2H400297	1	——Support
7	P2H402405	2	—Elbow	38	P2H400298	1	——Collar
8	P2B400179	1	—Plug	39	KA42410206	2	——Spring pin
9	P2H400007	1	—Plug	40	P2H200193	1	—Valve body
10	KA30220400	2	—Washer	41	P2H400293	2	—Spring
11	KA31120400	2	—Spring washer	42	P2H300170	2	—Spool
12	KA10120435	2	—Machine screw	● 43	KA50110080	6	—O-ring
13	P2H402411	1	—Union	44	P2H401220	2	—Spacer
14	P2H402410	3	—Union	● 45	KA50200090	1	—O-ring
15	P2H402412	2	—Speed controller	46	P2H400307	2	—Pin
16	P2H402404	1	—Silencer	47	P2H400957	4	—Cap screw
17	P2H402403	1	—Tee	48	P1R400322	3	—Nipple
18	P2H402415	1	—Tube	48	P1R400322	3	Nipple
19	P2H402416	1	—Tube	49	P2H402372	3	Hose
20	P2H402417	1	—Tube	50	KA86100120	6	Hose clip
21	P2H402418	1	—Tube	51	P2H301221	1	Name plate
22	P2H402419	1	—Tube				
23	P2H402421	2	—Tube				
24	P2H402422	1	—Tube				
25	KA31120600	4	—Spring washer				
26	KA00910610	4	—Cap screw				
27	P2H301172	1	—Cover				
28	KA30220500	4	—Washer				
29	KA31120500	4	—Spring washer				
30	KA10120514	4	—Machine screw				
31	P2H402428	1	—Label(DOWN)				
32	P2H402429	1	—Label(UP)				

We recommend that you stock parts indicated by a bullet (●).
Parts without part numbers can not be supplied separately.

Copied digital data from https://www.endokoyo.co.in/

■MS－A



Copied digital data from https://www.endo-kogyo.co.jp/

YHM000648d

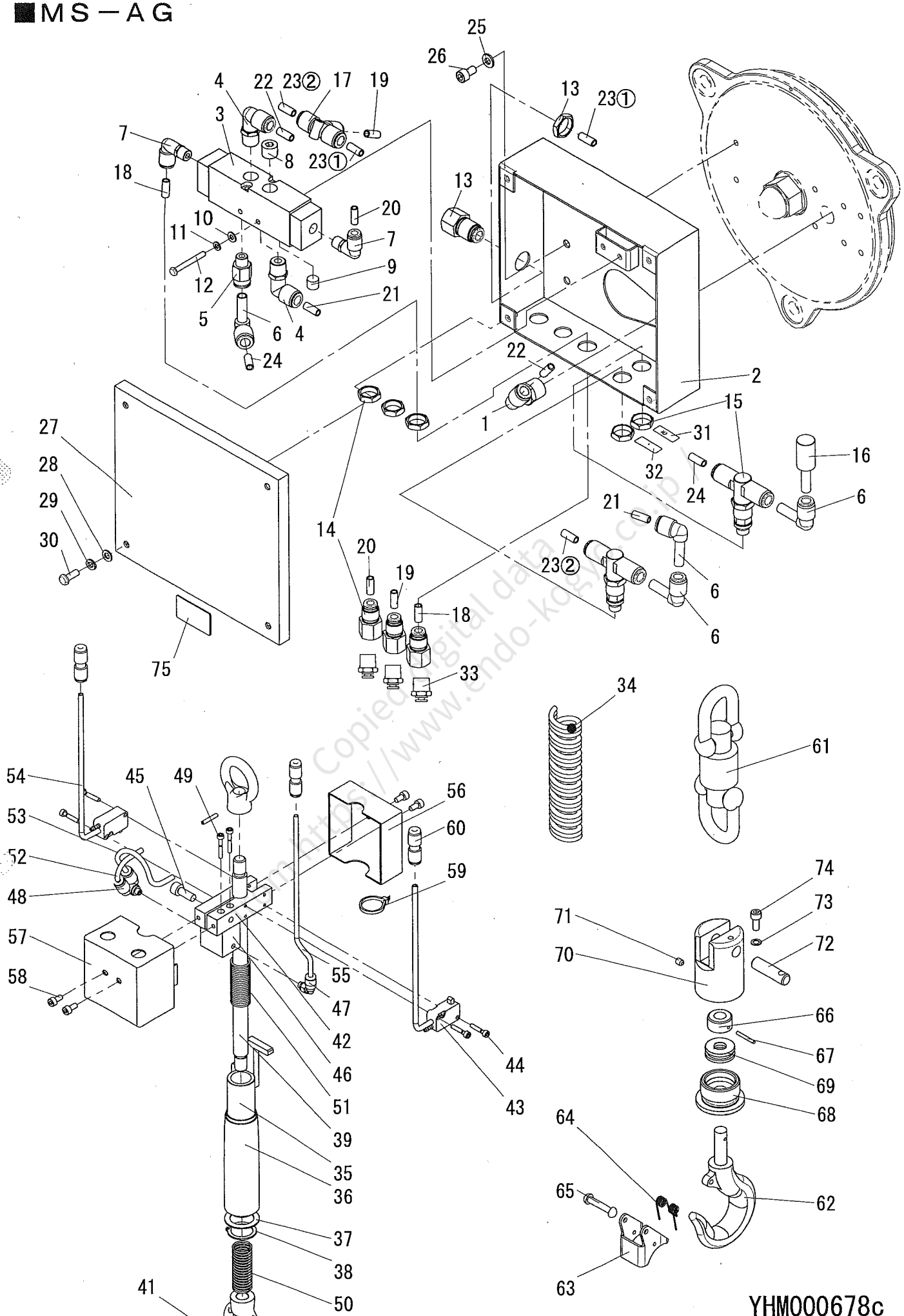
■PARTS LIST MS-AG

Ref.No.	Part No.	Quantity	Descrption	Ref.No	Part No.	Quantity	Descrption
—	LHP001939	1	Control box	39	—	1	——Shaft
1	P2H402407	1	—Elbow	40	—	2	——Eyenut
2	LHP001940	1	—Casing	41	—	2	——Spring pin
3	P2H301170	1	—Operate valve	42	P2H301257	1	—Plate
4	P2H402406	2	—Elbow	43	P2H402585	2	—mechanical valve
5	P2H402409	1	—Union	44	KA00910316	4	—Cap screw
6	P2H402408	4	—Elbow	45	KA00910616	1	—Cap screw
7	P2H402405	2	—Elbow	46	P2H402586	1	—manifold
8	P2B400179	1	—Plug	47	P2H402587	1	—Elbow
9	P2H400007	1	—Plug	48	P2H402588	1	—Elbow
10	KA30220400	2	—Washer	49	KA0910320	2	—Cap screw
11	KA31120400	2	—Spring washer	50	P2H402589	1	—Spring
12	KA10120435	2	—Machine screw	51	P2H402590	1	—Spring
13	P2H402411	1	—Union	52	P2H402591	1	—Tube
14	P2H402410	3	—Union	53	P2H402592	1	—Tube
15	P2H402412	2	—Speed controller	54	P2H402593	2	—Tube
16	P2H402404	1	—Silencer	55	P2H402594	1	—Tube
17	P2H402403	1	—Tee	56	P2H402595	1	—Cover
18	P2H402415	1	—Tube	57	P2H301258	1	—Cover
19	P2H402416	1	—Tube	58	KA00910408	4	—Cap screw
20	P2H402417	1	—Tube	59	P2H402597	5	—Banding band
21	P2H402418	1	—Tube	60	P2H402596	3	—Straight
22	P2H402419	1	—Tube	* 61	P2H400792	1	Swivel
23	P2H402421	2	—Tube	-	LHP000844	1	Swivel hook assembly
24	P2H402422	1	—Tube	-	LHP000843	1	—Hook compl.
25	KA31120600	4	—Spring washer	62	—	1	——Hook
26	KA00910610	4	—Cap screw	● -	LHP001674	1	——Hook latch set
27	P2H301172	1	—Cover	63	—	1	———Hook latch
28	KA30220500	4	—Washer	64	—	1	———Spring
29	KA31120500	4	—Spring washer	65	—	1	———Rivet
30	KA10120514	4	—Machine screw	66	—	1	——Nut
31	P2H402428	1	—Label(DOWN)	67	KA42419820	1	——Spring pin
32	P2H402429	1	—Label(UP)	68	P2H401216	1	—Hook holder
33	P2H402515	3	Union	69	KA60401000	1	—Thrust bearing
34	P2H402540	1	Spiral tube	70	P2H300665	1	—Hook holder
—	LHP002111	1	Grip switch	71	KA16510506	1	—set screw
35	LHP002110	1	—Grip	72	P2H401218	1	—Pin
36	P2H402584	1	—Grip	73	KA32410520	1	—CD washer
37	P2H402880	1	—Washer	74	KA00910512	1	—Cap screw
38	KA40110020	1	—Retaining ring	75	P2H301224	1	Name plate
—	LHP002185	1	—Shaft compl.				

We recommend that you stock parts indicated by a bullet (●).
Parts without part numbers can not be supplied separately.
Part has * will not be applied with chain type air balancer.

from https://www.eho-keiyo.co.jp/ Copied digital data

■MS－AG



YHM000678c

Copied digital data
https://www.endo-kogyo.co.jp/

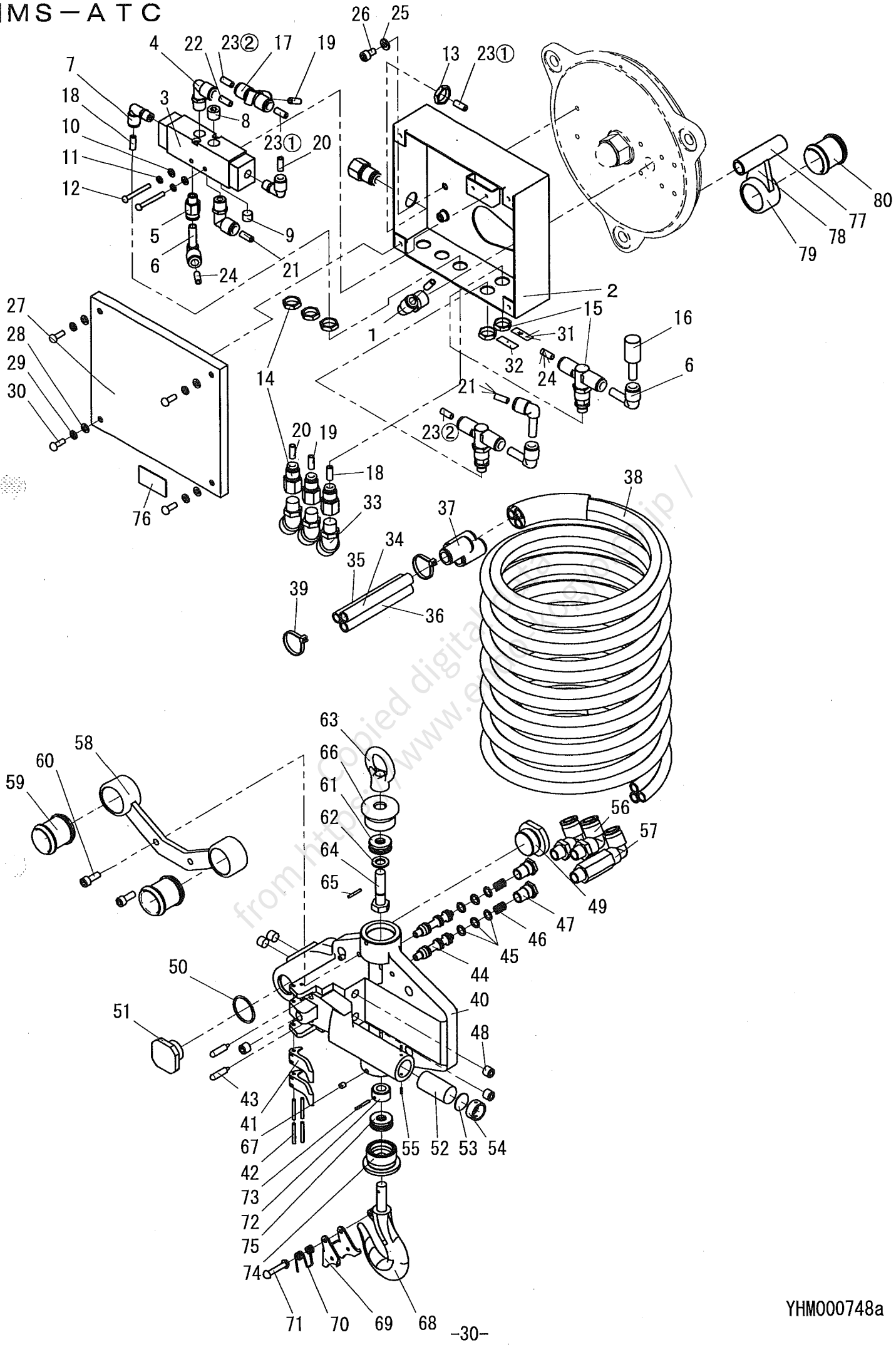
■PARTS LIST MS-ATC

Ref.No.	Part No.	Quantity	Descrption	Ref.No.	Part No.	Quantity	Descrption
-	LHP001939	1	Control box	42	KA42410325	4	—Spring pin
1	P2H402407	1	—Elbow	43	P2H402043	2	—Pin
2	LHP001940	1	—Casing	44	P2H300972	2	——Spool
3	P2H301170	1	—Operate valve	45	KA50110080	6	——O-ring
4	P2H402406	2	—Elbow	46	P2H400293	2	——Spring
5	P2H402409	1	—Union	47	P2H402042	2	——Cap
6	P2H402408	4	—Elbow	48	P2H400007	7	——Plug
7	P2H402405	2	—Elbow	49	P2H402056	1	——Plug
8	P2B400179	1	—Plug	50	KA50200280	1	——O-ring
9	P2H400007	1	—Plug	51	P2H402051	1	——Cap
10	KA30220400	2	—Washer	52	P2H400296	1	——Silencer
11	KA31120400	2	—Spring washer	53	P2H400297	1	——Support
12	KA10120435	2	—Machine screw	54	P2H400298	1	——collar
13	P2H402411	1	—Union	55	KA42410206	2	——Spring pin
14	P2H402410	3	—Union	56	P2H402039	2	—Elbow
15	P2H402412	2	—Speed controller	57	P2H402040	1	—Long elbow
16	P2H402404	1	—Silencer	58	LHP001525	1	—Holder
17	P2H402403	1	—Tee	59	P2H402041	1	—Bush
18	P2H402415	1	—Tube	60	KA00910616	2	—Cap screw
19	P2H402416	1	—Tube	61	KA60401000	1	—Thrust bearing
20	P2H402417	1	—Tube	62	KA30221000	1	—Wsher
21	P2H402418	1	—Tube	-	LHP002142	1	—Eye hook
22	P2H402419	1	—Tube	63	—	1	——Eye nut
23	P2H402421	2	—Tube	64	—	1	——Hex. bolt
24	P2H402422	1	—Tube	65	—	1	——Spring pin
25	KA31120600	4	—Spring washer	66	P2H401216	1	—Holder
26	KA00910610	4	—Cap screw	67	KA16510506	2	—Set screw
27	P2H301172	1	—Cover	—	LHP001683	1	Hook assembly
28	KA30220500	4	—Washer	—	LHP000843	1	—Hook compl.
29	KA31120500	4	—Spring washer	68	—	1	——Hook
30	KA10120514	4	—Machine screw	—	LHP001674	1	——Hook latch set
31	P2H402428	1	—Label(DOWN)	69	—	1	———Hook latch
32	P2H402429	1	—Label(UP)	70	—	1	———Spring
33	P2H402032	3	Elbow	71	—	1	———Rivet
34	P2H402668	1	Tube	72	—	1	——Nut
35	P2H402669	1	Tube	73	KA42419820	1	——Spring pin
36	P2H402670	1	Tube	74	P2H401216	1	—Hook holder
37	P2H402671	3	Straight	75	KA60401000	1	—Thrust bearing
38	LHP002145	1	Coil hose	76	P2H301286	1	Name plate
39	P2H400465	2	Convex belt	—	LHP002144	1	—Holder
—	LHP002143	1	Handle assembly	77	—	1	—Pipe
—	LHP001819	2	—Hanndle compl.	78	—	1	—Plate
40	P2H100071	1	—Valve housing	79	—	1	—collar
41	LHP001526	1	—Push button set	80	P2H402041	1	Bush

We recommend that you stock parts indicated by a bullet (●).
Parts without part numbers can not be supplied separately.

from http://www.eldorado.co.jp / Copied digital data

■MS－ATC



Copied digitally from http://www.e-bikemanuals.com/

YHM000748a

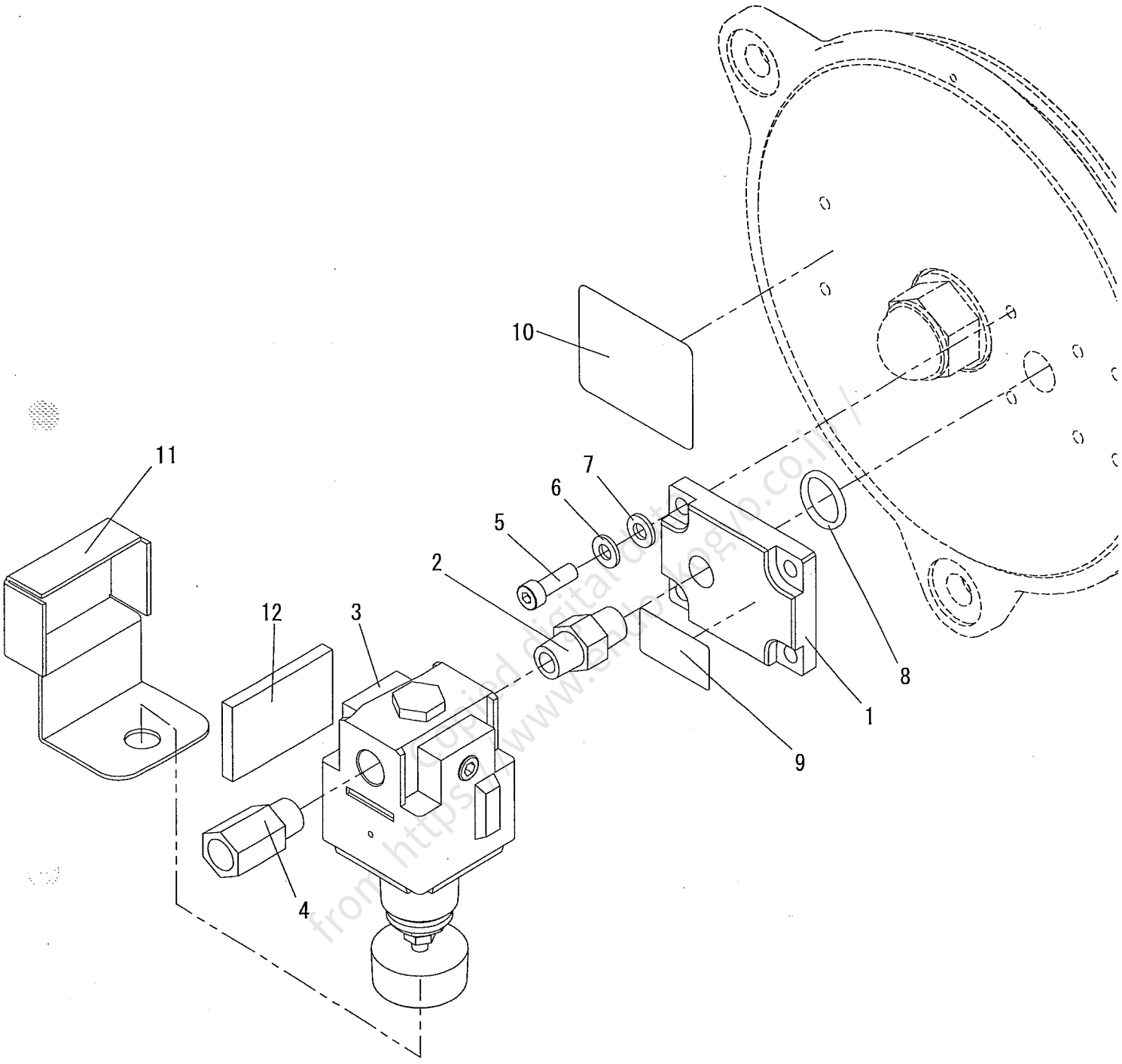
■PARTS LIST BC1

Ref.No.	Part No.	Quantity	Descrption	Ref.No.	Part No.	Quantity	Descrption
1	P2H301236	1	Manifold				
2	P2H402543	1	Nipple				
3	P2H402544	1	Regulator				
4	P2H402545	1	Check valve				
5	KA00910618	4	Cap screw				
6	KA31120600	4	Spring washer				
7	KA30220600	4	Washer				
● 8	KA50100180	1	O-ring				
9	P2H301237	1	Name plate				
10	P2H301246	1	Label				
11	P2H301366	1	bracket				
12	P2H402894	3	silencer				

Copied digital data from https://www.endo-kogyo.co.jp/

We recommend that you stock parts indicated by a bullet (●).

■BC1



Copied digital data from https://www.shop-kogyo.co.jp/

YHM000726b

■PARTS LIST BC2

Ref.No.	Part No.	Quantity	Descrption	Ref.No.	Part No.	Quantity	Descrption
—	LHP002124	1	Control box	37	LHP002126	1	Bracket
1	LHP002125	1	—Casing	*1 37	LHP002284	1	Bracket
2	P2H402544	2	—Regulator	*2 37	LHP002136	1	Bracket
3	P2H402406	4	—Elbow	*3 37	LHP002703	1	Bracket
4	P2H301279	1	—Operate valve	38	KA00910614	4	Cap screw
5	P2H402407	3	—Elbow	39	KA31120600	4	Spring washetr
6	P2H402627	2	—Elbow	40	P2H402461	2	Adapter
7	P2H400137	2	—Taper plug	41	P2H301191	1	Hose
8	KA10120440	3	—Machine screw	42	P2H402460	1	adapter
9	KA31120400	3	—Spring washer	43	P1R400322	3	Hose nipple
10	KA30220400	3	—Washer	44	P2H402372	3	Hose
11	P2H402624	1	—Pressure meter	45	KA86100120	6	Hose clip
12	P2H402629	1	—Union	—	LHP002122	1	Handle assembly
13	P2H402411	2	—Union	46	P2H301272	1	—Casing
14	P2H402410	3	—Union	47	P2H301274	1	—Cap
15	P2H402403	2	—Tee	48	P2H301275	1	—Cap
16	P2H402408	5	—Elbow	49	P2H402613	1	—button(red)
17	P2H402626	1	—Union	50	P2H402614	1	—button(green)
18	P2H402625	2	—Check valve	51	P2H402615	1	—button(black)
19	P2H402463	1	—Tube	52	P2H402616	1	—Tee
20	P2H402630	1	—Tube	53	P2H402617	2	—Elbow
21	P2H402631	1	—Tube	54	P2H402621	3	—Union
22	P2H402632	1	—Tube	55	P2H402618	2	—Tube
23	P2H402633	3	—Tube	56	P2H402619	1	—Tube
24	P2H402634	3	—Tube	57	P2H402620	3	—Tube
25	P2H402464	1	—Tube	58	P2H402622	2	—Machine screw
26	P2H402635	1	—Tube	59	KA30220500	2	—Washer
27	P2H402419	1	—Tube	60	KA25720502	2	—U-nut
28	P2H402636	1	—Tube	61	P2H301276	1	Warning label
29	P2H301278	1	—Cover	62	KA00171667	1	Hex.bolt
30	KA10120512	4	—Machine screw	*3 62	KA00171669	1	Hex.bolt
31	KA31120500	4	—Spring washer	63	KA30221600	2	Washer
32	KA30220500	4	—Washer	64	P2H402475	1	Pipe
33	P2H402637	1	—Label	65	KA20321600	1	Hex.nut
34	P2H402638	1	—Label	66	KA25521601	1	U-nut
35	P2H301280	1	—Name plate				
36	P2H300777	1	—Name plate				

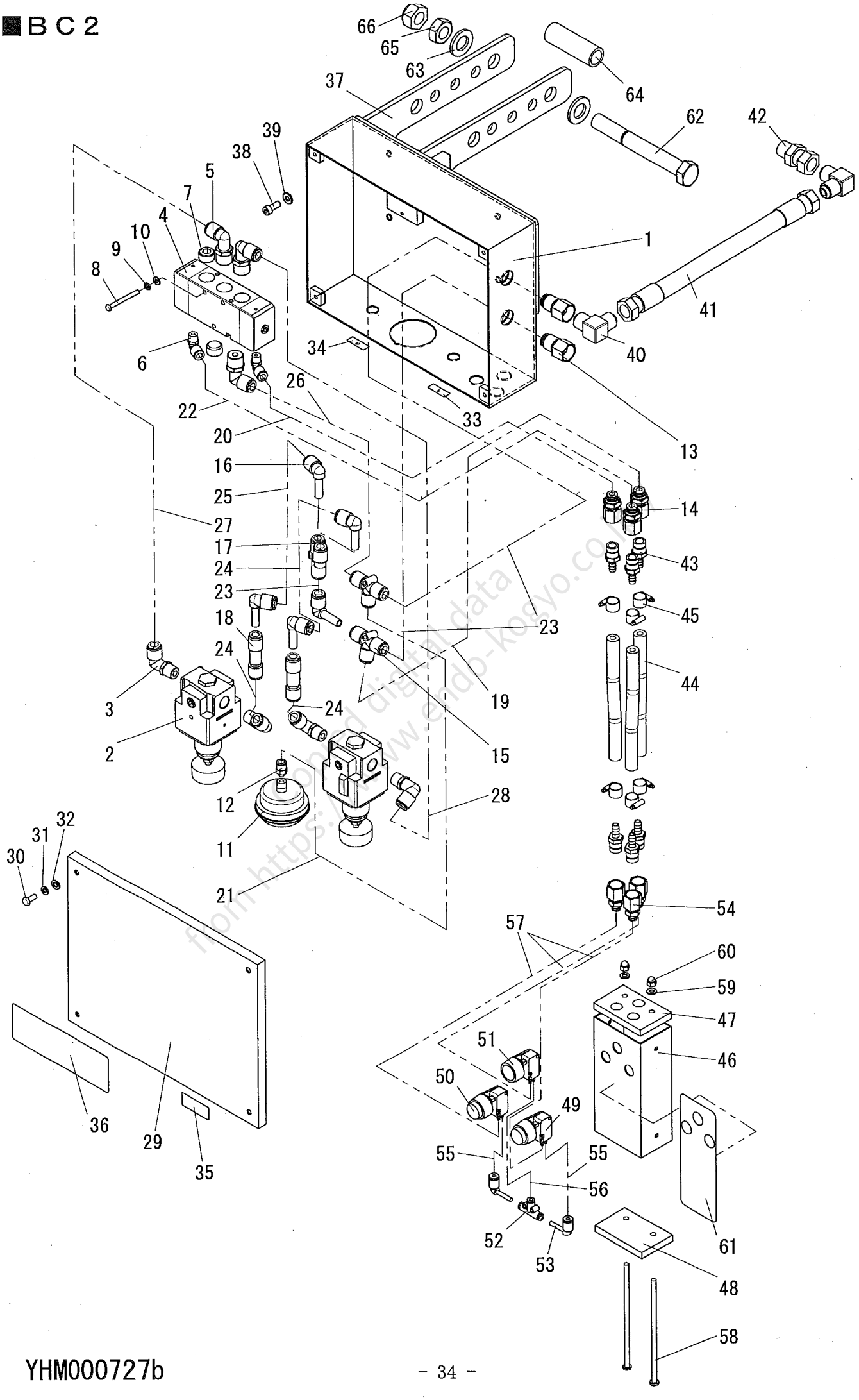
from https://www.enomoto.co.jp/ Copied digital data

We recommend that you stock parts indicated by a bullet (●).

Parts without part numbers can not be supplied separately.

Parts has" * 1"will be applied with EHB-50S or EHB-50SC
Parts has" * 2"will be applied with EHB-130 or EHB-130C
Parts has" * 3"will be applied with EHB-270CR

■BC2



from https://www.sndb-kogyo.co.jp/

YHM000727b

Copied digital data
from https://www.endo-kogyo.co.jp /

ENDO 遠藤工業株式会社

〒959-1261　新潟県燕市秋葉町 3 丁目 14 番 7 号
TEL:0256-62-5133　FAX:0256-62-5772
https://www.endo-kogyo.co.jp

事業所情報につきましては、
二次元バーコードよりご確認ください。

ENDO ENDO KOGYO CO., LTD.

3-14-7, Akiba cho, Tsubame, Niigata 959-1261, Japan
https://www.endo-kogyo.co.jp/english TEL: 81-256-62-5133

- 本書ならびに本商品の仕様は改善のために予告なしに変更することがあります。
- 本書の内容の無断転載を禁止します。
- This manual and the specifications of this product are subject to change for improvement without advance notice.
- It is strictly prohibited to reprint or copy any information contained in this manual.