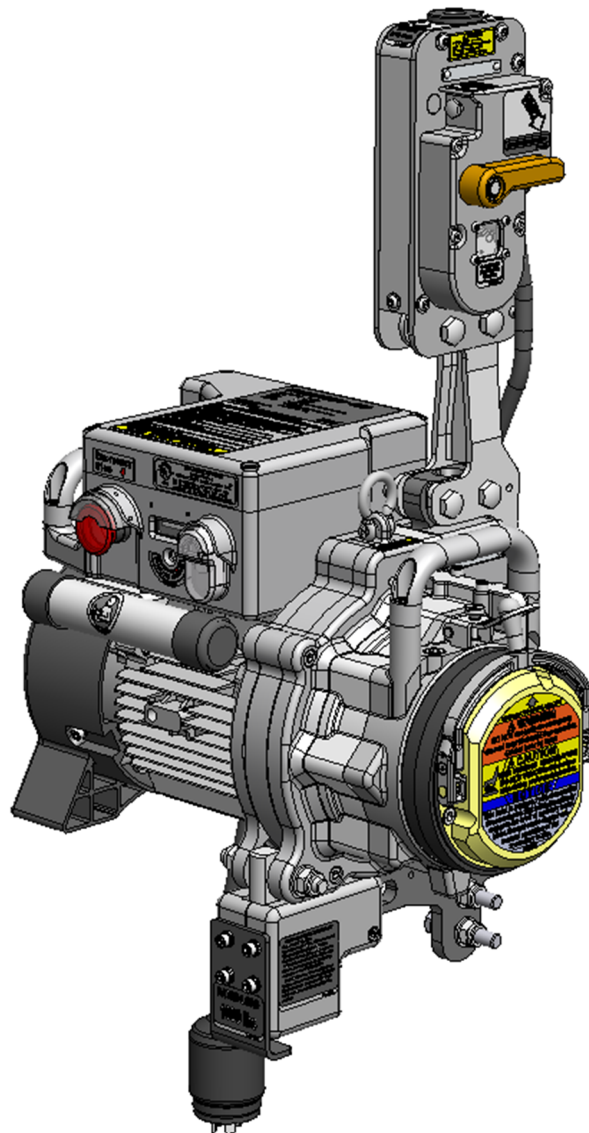

BISOMAC210

Specifications for North America 1P model

Electric Traction Hoist

Operator's Manual

[with Overload Detection Device]



NIHON BISOH CO., LTD.



IMPORTANT SAFETY INSTRUCTIONS

READ ALL INSTRUCTIONS BEFORE USING THIS EQUIPMENT.

Any operation in violation of these instructions may result in bodily injury or death.

WARNING

- + All operators must read and completely understand this manual.
- + All operators must be thoroughly trained and certified in the use of the equipment, its operational and safety features.
- + Only authorized and physically fit operators shall operate the equipment.
- + At the start of each work shift, daily test must be performed to ensure correct operation.
- + Any operations in violation of these instructions is operator's own risk and may result in serious injuries.
- + Keep this manual with the Hoist at all time.
- + Use only spare parts and steel wire rope recommended by NIHON BISOH.
- + Use only machinery or incorporated component, which **MUST COMPLY** with UL1323, CAN/CSA Z271-10 and national, regional, or local implementing.
- + Installation, dismantling and use of suspended scaffold shall be in accordance with Code of Safe Practices (COSP) for Adjustable Suspended Scaffold which implemented by Scaffolding, Shoring and Forming Institute (SSFI) and Scaffold & Access Industry Association (SAIA).
- + It is the responsibility of the user of this hoist to determine that this hoist is suitable to be used in conjunction with any other equipment. The user must also determine that this hoist and other components used will be in strict conformity with the provisions of Federal, State, National and local ordinances and regulations.

Manufacturer: NIHON BISOH CO., LTD.

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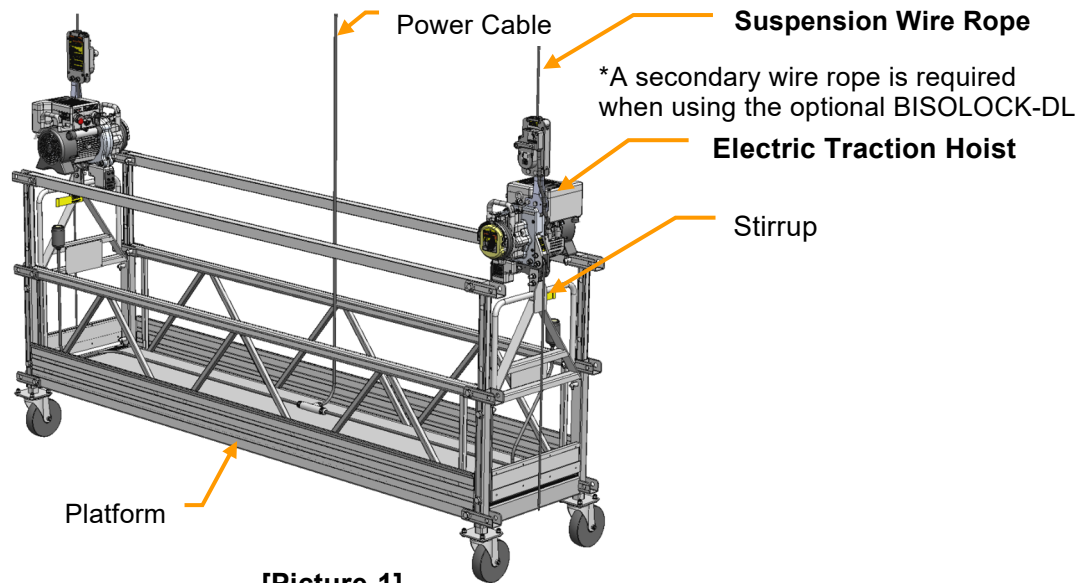
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Attachment: Electric diagram and description of electrical components

0. READ BEFORE USE

This Operator's Manual is written for operators to use the equipment safely and properly. To fully understand the usage of the equipment, please refer to the following instructions and system compositions. (See picture-1) It is responsibility of the user of this equipment to determine whether the equipment is safe according to this manual. Any operations in violation of the instructions in this manual is operator's own risk.

[System Components of the Hoist and other applications]



[Picture-1]

(1) POWER SUPPLY TO THE EQUIPMENT MUST BE FITTED WITH;

- a) Main switch

NOTE: Main switch or Junction box shall have key-lock.

- b) Residual current device (or Ground fault circuit interrupter) of 30 mA.
- c) Over current protection device (Automatic circuit breaker type-C)

NOTE: To avoid voltage drop due to cable length, make sure that the specifications of power cable matches the requirement of the equipment.

(2) USAGE ENVIRONMENT

Temperature Range: between 14°F (-10°C) and 104°F (+40°C).

Humidity: Less than 100% (without inundation, condensation and freezing)

Protection Grade: IP54

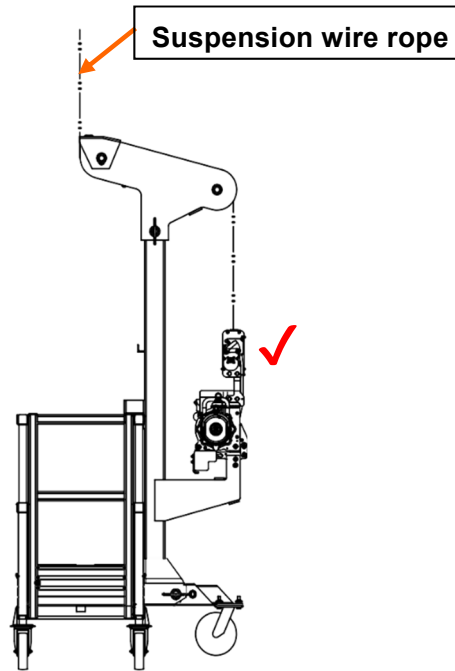
Maximum Wind Speed: In accordance with the specifications of platform.

Altitude: 3280ft (1000 m) or lower

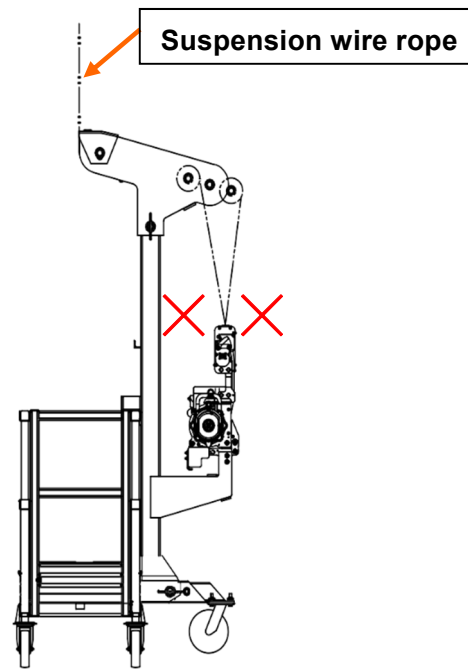
(3) CAUTIONS BEFORE USING

- a) Before using the equipment, operators must perform the daily test to ensure correct operation.
- b) Before using the equipment, operators must confirm that there are no obstacles along the movement of the equipment.
- c) Before using the equipment, suspension system must be checked to ensure that platform is stable at all times.
- d) In case the area below platform is open to the public, preventive measures have to be taken to safeguard the people below (Ex. Barriers, roof protected walk ways, etc.).
- e) All hazards related to platform encountering obstruction are not completely covered by platform's safety devices. The operators shall check for obstructions along the travel of platform.
- f) Overload Detection Device may not cover platform in all configurations. The operators must check that loading of platform does not exceed rated load of each platform.
- g) An area on the platform must be available to allow operators to operate the Hoist safely.
- h) Use only certified safety harness, lanyard, rope grabs, and independent life lines at all times.
- i) In the cold weather, lifting operation of the Hoist may not be available smoothly. Also, the Hoist may not descend even emergency controlled descent lever is operated. Preventive measure not the Hoist to be cooled must be taken.
- j) If the load on the platform is light, descent speed of emergency controlled descent may be slower.
- k) The main suspension wire rope must be vertically set and installed to the Hoist.

[Installation of the Hoist 1]

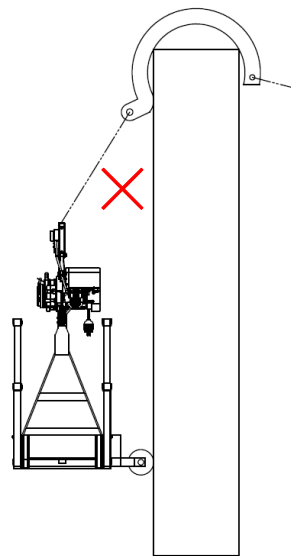
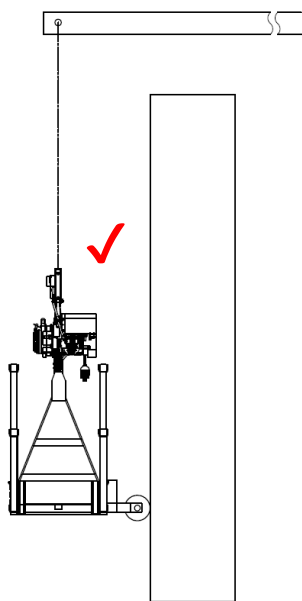


Correct installation

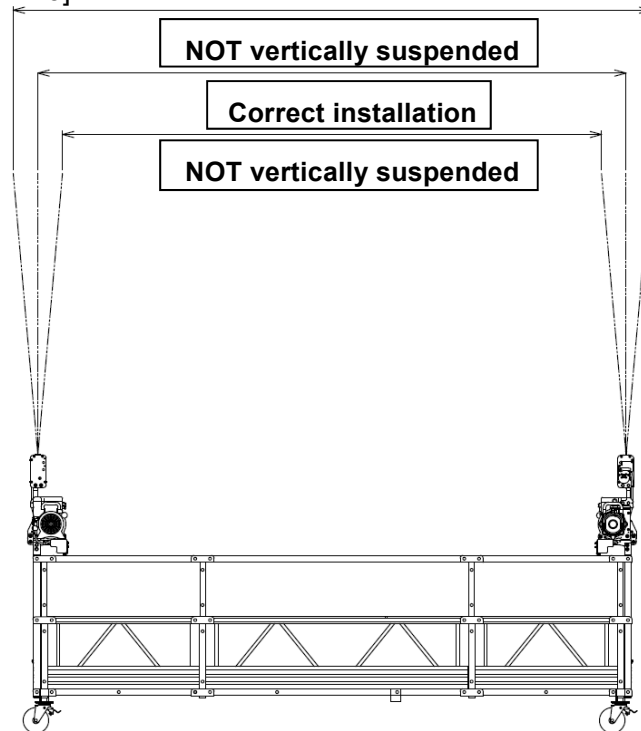


NOT vertically suspended

[Installation of the Hoist 2]



[Installation of the Hoist 3]



(4) CAUTIONS WHEN USING

- a) Stop operating and notify supervisor if any faults which may damage to safety of the equipment is found.
- b) Having suitable communication means between operators and supervisor is recommended.
- c) When not in use, unplug power cable and lock the equipment to protect from unauthorized use.
- d) If the Hoist isn't operated for more than 30 minutes in the cold weather, ascending operation may not be operated smoothly. In that case, idle the Hoist 30 seconds or operate descending operation before ascending.

(5) PROHIBITIONS

- a) Do not use two or more units of the Hoist with one wire rope.
- b) Do not insert wire rope from the wire rope outlet of the Hoist.
- c) Do not tie and secure the discharged suspension wire rope from the wire rope outlet.
- d) Do not apply 44 lbs (20 kg) or more pulling load to the discharged suspension wire rope from the wire rope outlet.
- e) Do not use the Hoist in the water.
- f) Do not use the Hoist as a hoisting device for elevator which permanently installed.
- g) Do not use the Hoist as a medical traction device.
- h) Do not use the Hoist in potentially explosive atmosphere.

(6) STORAGE PROCEDURE

Products shall be stored in accordance with the following conditions.

- a) The products shall be stored indoor. In case necessarily store the products outdoor, only as a temporary storing, cover the products by waterproof sheeting or the like to prevent to be exposed to the direct sunlight and rain. Storage place shall be well ventilated not to become hot and humid, and avoid the products to be exposed to dusts, metal powders, and corrosive gas.
- b) Do not place the products directly to the ground but on the shelf or the pallets.
- c) Place the products as the wire rope inlet faces upward.
- d) If the products have been stored longer than 1 year, change the oil in the gear box and perform pre-shipment inspection according to the Maintenance Procedure Manual.
- e) If the products are to be stored longer than 3 months after use, operate without load a few minutes once every 3 months. When start using again, inspect the products if the electromagnetic brake works normally, and ensure that there is no abnormal noise, vibration, heating.

(7) WARRANTY EXEMPTION CONDITIONS

The warranty shall be null and void in the following cases even within the warranty period.

- a) Any defect caused by the installation of the product or failure of connection with any other equipment.
- b) Any defect caused by failure in storing as determined in the Operator's Manual.
- c) Normal wear, tear, deterioration, corrosion, and consumable items.
- d) Any defect caused by the improper condition, environment and treatment, and abuse or failure to follow the manufacturer's recommended operation determined in the Maintenance Procedure Manual, Operator's Manual, and any other documentation which issued by the manufacturer.
- e) Corrosion of the exterior.
- f) Any defect caused by the inclusion of water, oil, metal piece, or any other foreign materials.
- g) Any defect caused by negligence, accident, modification, misuse, unauthorized repair, and exploitation.
- h) Any defect caused by fall or the damage in transportation.
- i) Any defect caused by the earthquake, fire, wind, flood, salt damage, smoke damage, gas, thunderbolt, abnormal voltage, and any other natural disaster, hazard or irresistible force.
- j) Any defect of the products which the serial number is modified.
- k) Any defect of the products or parts which supplied by other than the authorized dealer of BISOMAC.
- l) Any defect caused by the use or installation of parts which supplied by other than the authorized dealer of BISOMAC.

1. FOR SAFE USE

1.1 General

This Operator's Manual is written for operators to use the equipment safely and properly.

Electric Traction Hoist 1P model manufactured by NIHON BISOH Co., Ltd. (referred to as the Hoist) is consists of Hoisting Device (referred to as BISOMAC), Fall Arrest Device (referred to as BISOLOCK) and Overload Detection Device (referred to as BISOLOAD).

Components of

Electric Traction Hoist

- I. BISOMAC (Hoisting Device)
- II. BISOLOCK (Fall Arrest Device)
BISOLOCK-SP (Overspeed Detection Device)
BISOLOCK-DL (Overspeed w/ Slack Rope Detection Integrated Device) *Option
- III. BISOLOAD (Overload Detection Device)

NOTE: The word "Safety Devices" in this manual indicates BISOLOCK and BISOLOAD.

For the specification of each device, refer to "2. SPECIFICATIONS".



1. Read and fully understand this manual before using this equipment.
2. The Hoist is designed to be used to raise, support and lower platform.
3. Operating, handling, maintenance, inspection, and repairing of the Hoist must be performed only by trained and certified operators.
4. Daily test and inspection must be performed at the start of each work shift according to "7. DAILY TEST AND INSPECTION".
5. Troubleshooting shall be done if any problem which possibly caused by the Hoist according to "9. TROUBLESHOOTING" to find the cause of problem and take corrective action.
6. The Hoist is used to raise, support and lower suspended scaffolds, work cages and bosun's chairs on, or in building(s) and structures. If used for any other purpose, you must take all necessary precautions to be sure that both design and operation are hazard free, and such use conforms with manufacturer's specifications.
7. This instruction manual is not all inclusive. It is impossible to anticipate every possible way this equipment (the whole equipment (including safety devices)) may be used, and all possible hazardous situations. It is very important that you determine for yourself whether the equipment is safe. You must understand the operating characteristic of this hoist. You must understand how the hoist will operate in your application. You must be certain not to put yourself or others in danger, or cause damage to property or other persons.

1.2 Maintenance

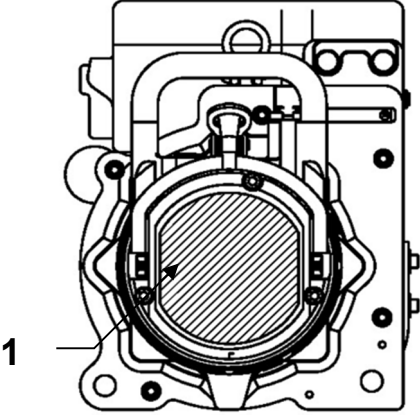
Handling, maintenance, inspections and repairs of the Hoist must be performed by trained and certified personnel according to Maintenance Procedure Manual of each device (separately issued).

1.3 Hazard Symbols

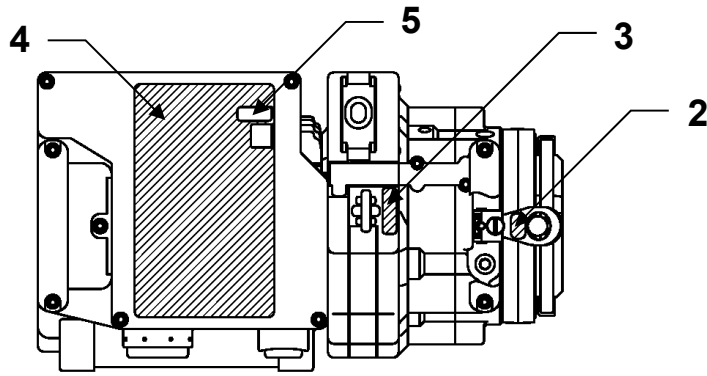
Safety instructions are classified according to risk levels.

Symbol	Term	Meaning
	WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and in damage to property.
NOTE:	NOTE	Indicates a potentially hazardous situation which, if not avoided, may result in damage to the Hoist or the Hoist may not operate properly.

Safety instructions attached to the Hoist and safety devices

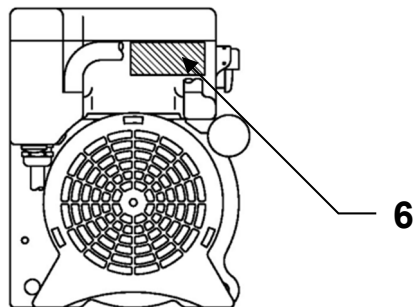
[BISOMAC Front side]	
	
Description	Meaning and Location
1. Emergency Control Descent & Electromagnetic Brake Caution	<ul style="list-style-type: none"> ● Instruction of Emergency controlled descent ● Instruction of Electromagnetic Brake ● Warning of skin burn [Electromagnetic Brake]

[BISOMAC Upper side]



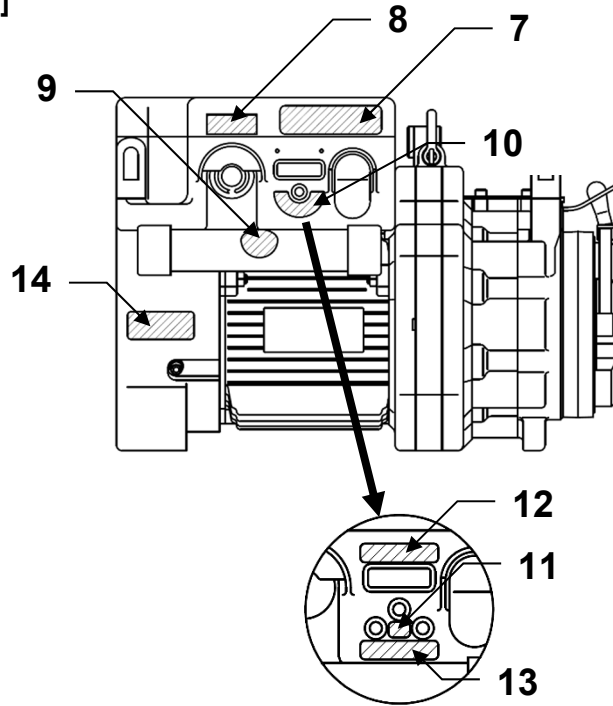
Description	Meaning and Location
2. Lever Stopper	<ul style="list-style-type: none"> ●Instruction of Lever Stopper [Lever Stopper]
3. Max Lift	<ul style="list-style-type: none"> ●Instruction of shackle's limit load [Casing A]
4. Specification and Operation	<ul style="list-style-type: none"> ●Instruction of Specification and operation ●QR code to access Operator's manual on website [Control Box Cover]
5. Ver. II	<ul style="list-style-type: none"> ●Instruction of the version of BISOMAC *Ver.2 only [Control Box Cover]

[BISOMAC Back side]



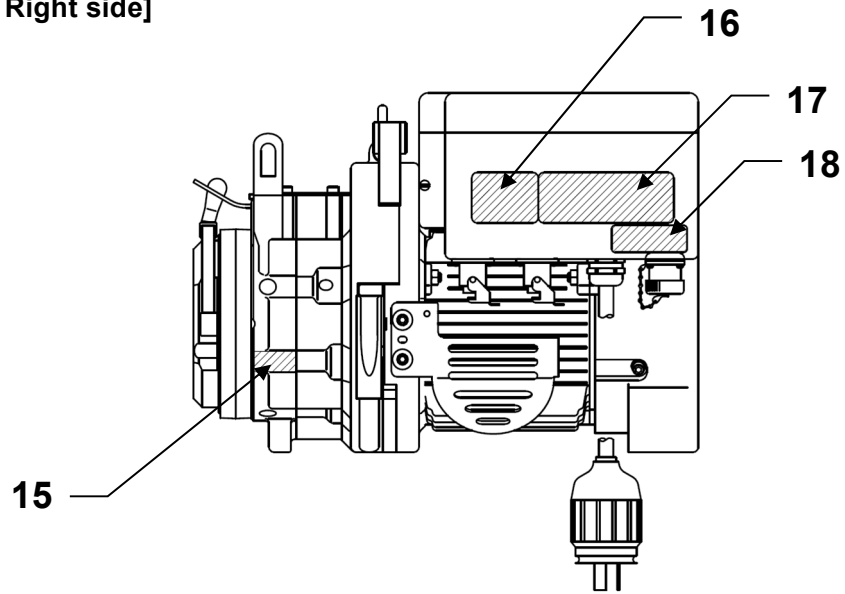
Description	Meaning and Location
6. Restriction Use	<ul style="list-style-type: none"> ●Instruction to the operator [Control Box Cover]

[BISOMAC Left side]



Description	Meaning and Location
7. UL & CUL Classification	<ul style="list-style-type: none"> ●Label of UL/CUL certification [Control Box]
8. Emergency Stop Button	<ul style="list-style-type: none"> ●Instruction of Emergency stop [Control Box Cover]
9. Manual Mark	<ul style="list-style-type: none"> ●Instruction of Operator's Manual [Operator's Manual Storage]
10. Overload Indicator	<ul style="list-style-type: none"> ●Instruction of Overload indicator *Ver.1 only [Control Box]
11. OL	<ul style="list-style-type: none"> ● Instruction of Overload indicator *Ver.2 only [Control Box]
12. Hour Meter	<ul style="list-style-type: none"> ●Instruction of Hour meter *Ver.2 only [Control Box]
13. Ver. II	<ul style="list-style-type: none"> ●Instruction of the version of BISOMAC *Ver.2 only [Control Box]
14. Power Voltage	<ul style="list-style-type: none"> ● Instruction of Voltage [Fan Cover]

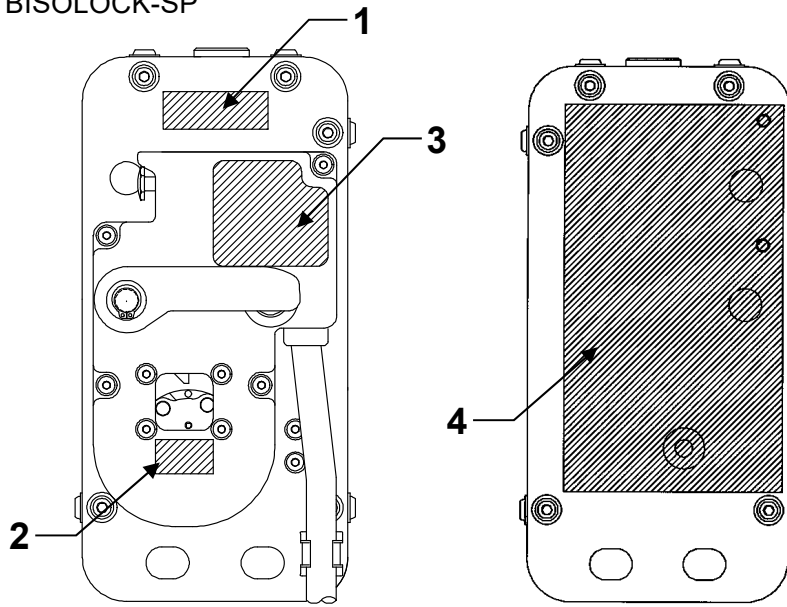
[BISOMAC Right side]



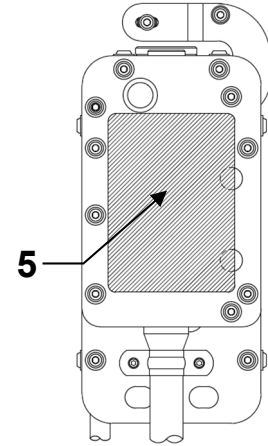
Description	Meaning and Location
15. Gear 210	<ul style="list-style-type: none"> ●Specifications of Gear Box [Gear Box]
16. Plug Mark	<ul style="list-style-type: none"> ●Instruction of connecting plug of safety device [Control Box]
17. Plug Connection	<ul style="list-style-type: none"> ●Instruction of connecting plug of remote control pendant switch [Control Box]
18. NOTICE	<ul style="list-style-type: none"> ●Instruction of the use of remote control pendant switch *Ver.2 only [Control Box]

[[BISOLOCK Front and Back side]]

BISOLOCK-SP



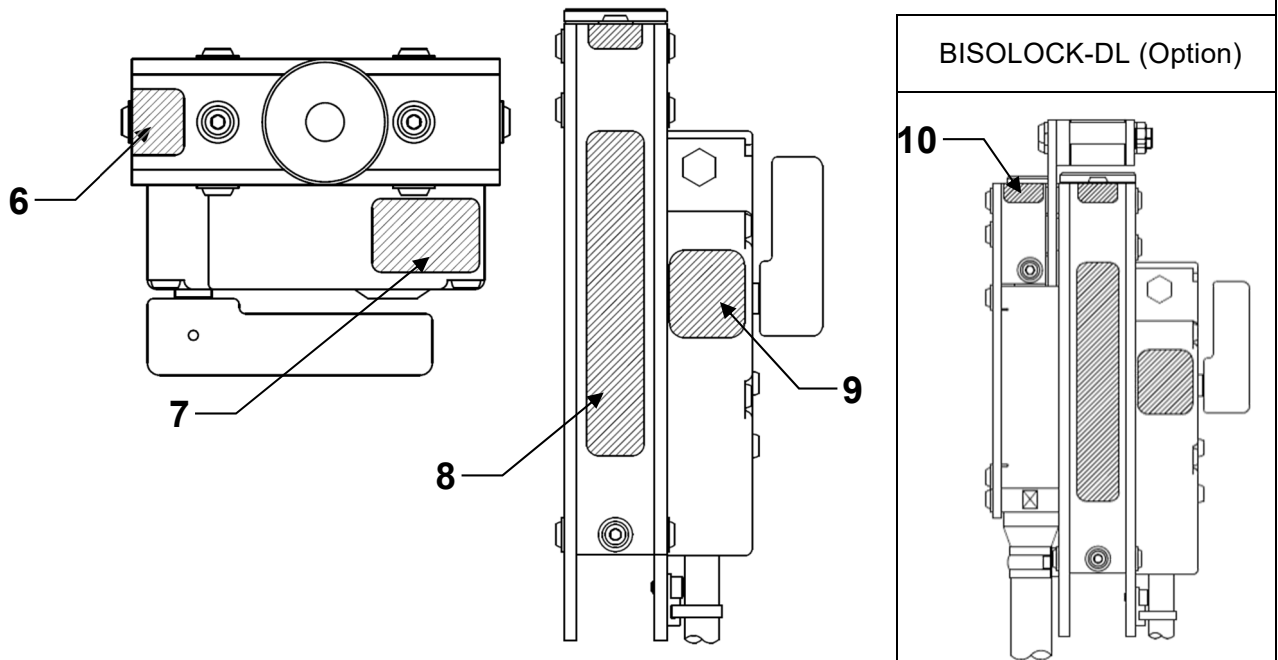
BISOLOCK-DL (Option)



Description	Meaning and Location
1. Instruction of Inability of Lifting	<ul style="list-style-type: none"> ●Instruction of inability of lifting [Side Plate 1]
2. Governor Inspection Window	<ul style="list-style-type: none"> ●Instruction of Governor [Governor Cover]
3. Overspeed Indicator & Reset	<ul style="list-style-type: none"> ●Instruction of activation lamp ●Instruction of Release Lever [Governor Cover]
4. Instruction of Overspeed Detection Device	<ul style="list-style-type: none"> ●Instruction of activation of the device ●Instruction of spec and operation of the device [Side Plate 2]
5. Fall Arrest	<ul style="list-style-type: none"> ●Instruction of and specification of the BISOLOCK-SP and BISOLOCK-DL [Side Plate DL]

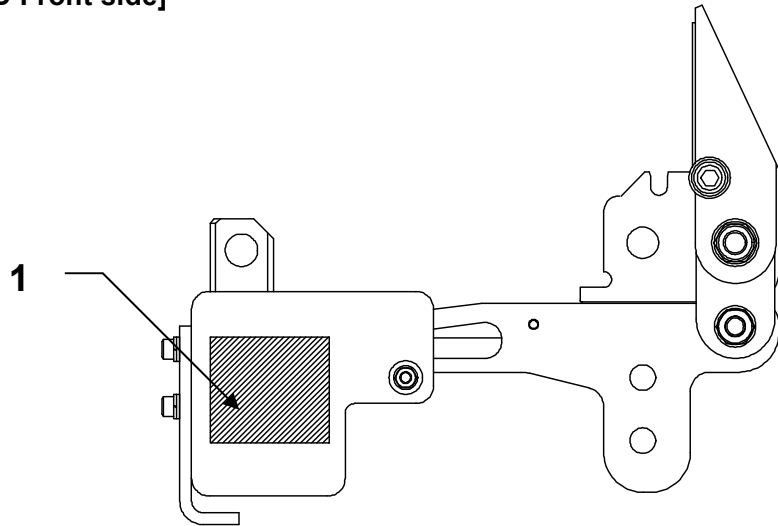
【BISOLOCK Left and Upper side】

BISOKOCL-SP



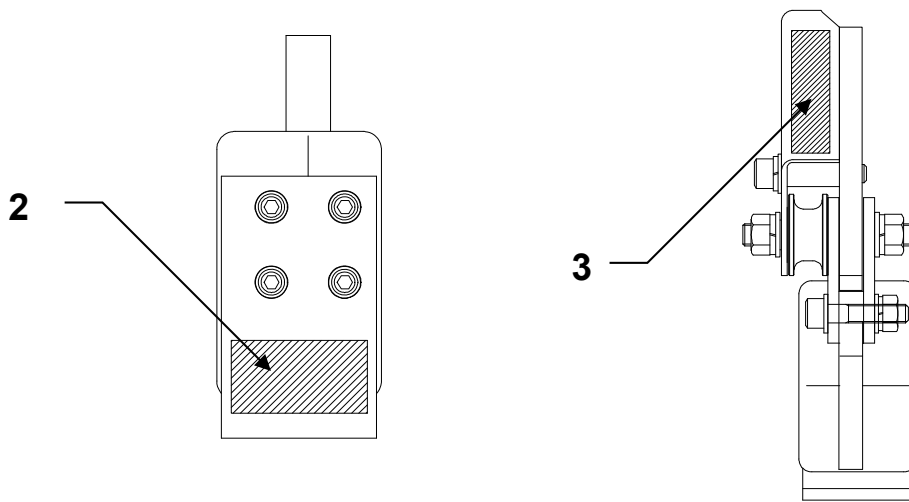
Description	Meaning and Location
6. Wire Rope Diameter	<ul style="list-style-type: none"> ●Instruction of wire rope diameter [Side Cover 1]
7. CUL 210AIR	<ul style="list-style-type: none"> ●Instruction of wire rope diameter *Only for 210AIR KIT model [Governor Cover]
7. Wire Rope Diameter	<ul style="list-style-type: none"> ●Instruction of wire rope diameter *only for φ9mm specification [Side Cover 1]
9. Instruction of Manual Trip Button	<ul style="list-style-type: none"> ●Instruction of Trip Button [Governor Cover]
10. Secondary Wire Rope Diameter	<ul style="list-style-type: none"> ●Instruction of secondary wire rope diameter [Side Cover 4]

[BISOLOAD Front side]



Description	Meaning and Location
1. Instruction of Overload Detection Device	<ul style="list-style-type: none"> ● Instruction of BISOLOAD [Limit Switch Cover LA]

[BISOLOAD Left and Right side]



Description	Meaning and Location
2. Rated Load	<ul style="list-style-type: none"> ● Instruction of rated load [Guard]
3. Wire Rope Exit	<ul style="list-style-type: none"> ● Instruction of wire rope outlet [Rope Cover]

2. SPECIFICATIONS

2.1 BISOMAC

Model	Rated Load	Voltage	Rated Current	Wire Rope dia.		Applicable Standard
				Nominal Diameter	Range	
BISOMAC210 -750	750 lbs (340 kg)	1Phase 208 V	10 A	5/16 in	0.315-0.331 in	•UL1323 •CAN/CSA Z271-10
BISOMAC210 -1000	1000 lbs (453 kg)					
BISOMAC210 -1500	1500 lbs (680 kg)		13 A	3/8 in	0.354 -0.374 in	
BISOMAC210 -1000U	1000 lbs (453 kg)		13 A	5/16 in	0.315-0.331 in	•UL1323
BISOMAC210 -1258U	1250 lbs (566 kg)					
BISOMAC210 -1508U	1500 lbs (680 kg)					

Power	Single Phase 208 V ± 10% (60 Hz)	
Motor Power	1.5 kW (4 P)	
Maximum Speed	35.0 ft/min (10.6 m/min)	
Controlled Descent	52.5 ft/min (15.9 m/min) or slower	
Minimum Load	60 minutes	
Rated Operating Time	440 lbs (200 kg)	
Noise Level	64 dB *Measured by noise meter setting at 3.3 ft (1 m) away from the Hoist. Noise level may vary depending on the voltage or environment.	
IP Rate	IP54	
Dimension (H×W×D) *Incl. safety device	30.2 in (766 mm)×13.3 in (313.6 mm)×17.9 in (454.7 mm) *32.0 in (812.5 mm)× 12.3 in (313.6 mm)× 17.9 in (454.7 mm)	
BISOMAC Self-Weight	108 lbs (49 kg)	
Weight *Incl. safety device	130 lbs (59 kg) *137 lbs (62 kg) {BISOLOCK: 11 lbs (5 kg), *18 lbs (8 kg) Mounting Bracket: 2 lbs (1 kg), BISOLOAD: 9 lbs (4 kg)}	
Control System	Individual Control	
Safety Features	1. Electromagnetic Brake 2. Descent Speed Control 3. Shutting down with Emergency Stop Switch 4. Thermal relay (overcurrent detection) 5. Motor with built-in thermal protector (temperature sensing) 6. Fall arrest (BISOLOCK) 7. Overload detection (BISOLOAD)	
Use Environment	Temperature	Between 14°F (-10°C) and 104°F (+40°C)
	Pressure	Atmospheric pressure
Maintenance Cycle	1 year or 100 operating hours since last maintenance. NOTE: It depends on the actual condition of use at work sites. (Refer to "4. WORK ENVIRONMENTS".	

*The value when option (BISOLOCK-DL) is installed.

2.2 BISOLOCK

2.2.1 BISOLOCK-SP

Model	1. BISOLOCK210-SP808US 2. BISOLOCK210-SP809US
Rated Load	1500 lbs (680 kg)
Activation Speed	98.4 ft/min (30 m/min)
Dimension (H x W x D)	10.0 in (253 mm) x 5.0 in (126.6 mm) x 4.2 in (106.3 mm)
Self-weight	BISOLOCK: 11 lbs (5 kg)
Control Feature	Unable ascending when BISOLOAD is activated.
Voltage	208 V

2.2.2 BISOLOCK-DL *Option

Model	1. BISOLOCK210-DL808US 2. BISOLOCK210-DL809US
Rated Load	1500 lbs (680 kg)
Activation Speed	98.4 ft/min (30 m/min)
Dimension (H x W x D)	11.8 in (299.5 mm) x 5.7 in (143.5 mm) x 5.5 in (139.2 mm)
Self-weight Control Feature	BISOLOCK: 18 lbs (8 kg)
Voltage	Unable lowering when BISOLOCK-SP is activated.
Rated Load	208 V

2.3 BISOLOAD

Model	1. BISOLOAD210-750US 2. BISOLOAD210-1000US 3. BISOLOAD210-1250US 4. BISOLOAD210-1500US
Rated Load	1. 750 lbs (340 kg) 2. 1000 lbs (453 kg) 3. 1250 lbs (566 kg) 4. 1500 lbs (680 kg)
Dimension (H x W x D)	10.4 in (264 mm) x 12.4 in (314 mm) x 3.7 in (95 mm)
Self-weight	9 lbs (4 kg)
Activation Load	1. 1125 lbs (750 lbs x 150 %) 2. 1500 lbs (1000 lbs x 150 %) 3. 1875 lbs (1250 lbs x 150 %) 4. 2250 lbs (1500 lbs x 150 %)
Control Feature	Unable ascending when BISOLOAD is activated.
Voltage	208 V

2.4 Wire Rope (Designated by NIHON BISOH)

No.	1	2	3	4	5
Nominal Diameter	8.4 mm	8.0 mm	8.0 mm	8.2 mm	8.3 mm
Construction	5 x 26	4 x 39	4 x 40	6 x 19 IWRC	4 x 26
Min. Breaking Load	51.5 kN (5253 kg)	44.3 kN (4520 kg)	44.5 kN (4540 kg)	40.5 kN (4131 kg)	45.0 kN (4590 kg)
Finish	Galvanized	Galvanized	Galvanized	Galvanized	Galvanized
Applicable Model	<ul style="list-style-type: none"> •BISOMAC210-750 •BISOMAC210-1000 •BISOMAC210-1000U •BISOMAC210-1258U •BISOMAC210-1508U 				
NOTE	Designated wire ropes by NIHON BISOH				

No.	1	2	3
Nominal Diameter	9.5 mm	9.0 mm	9.2 mm
	*align with the wire rope specifications, the unit is expressed in mm only.		
Construction	5 x 19	4 x 36WS	5 x 26
Min. Breaking Load	64.0 kN (6530 kg)	67.15 kN (6850 kg)	66.8 kN (6816 kg)
Finish	Galvanized	Galvanized	Galvanized
Applicable Model	•BISOMAC210-1500		
NOTE	Not complied with CAN/CSA-Z271-10	Designated wire ropes by NIHON BISOH	



WARNING

1. Use only designated wire rope by Manufacturer

Using any other wire rope may cause BISOMAC and BISOLOCK malfunction. It could result in serious injury or death due to falling or tilting of the platform.

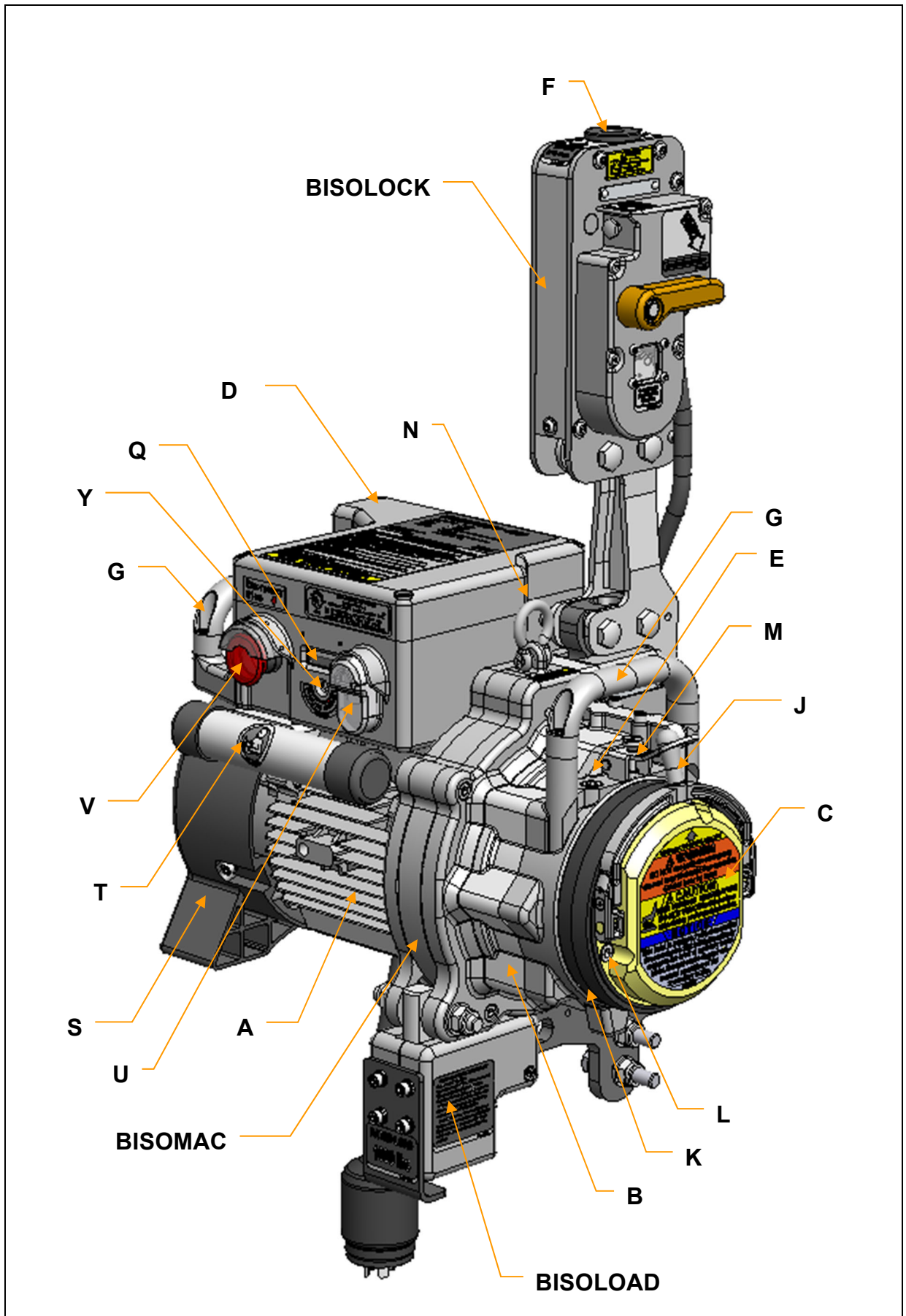
2.5 Power Cable

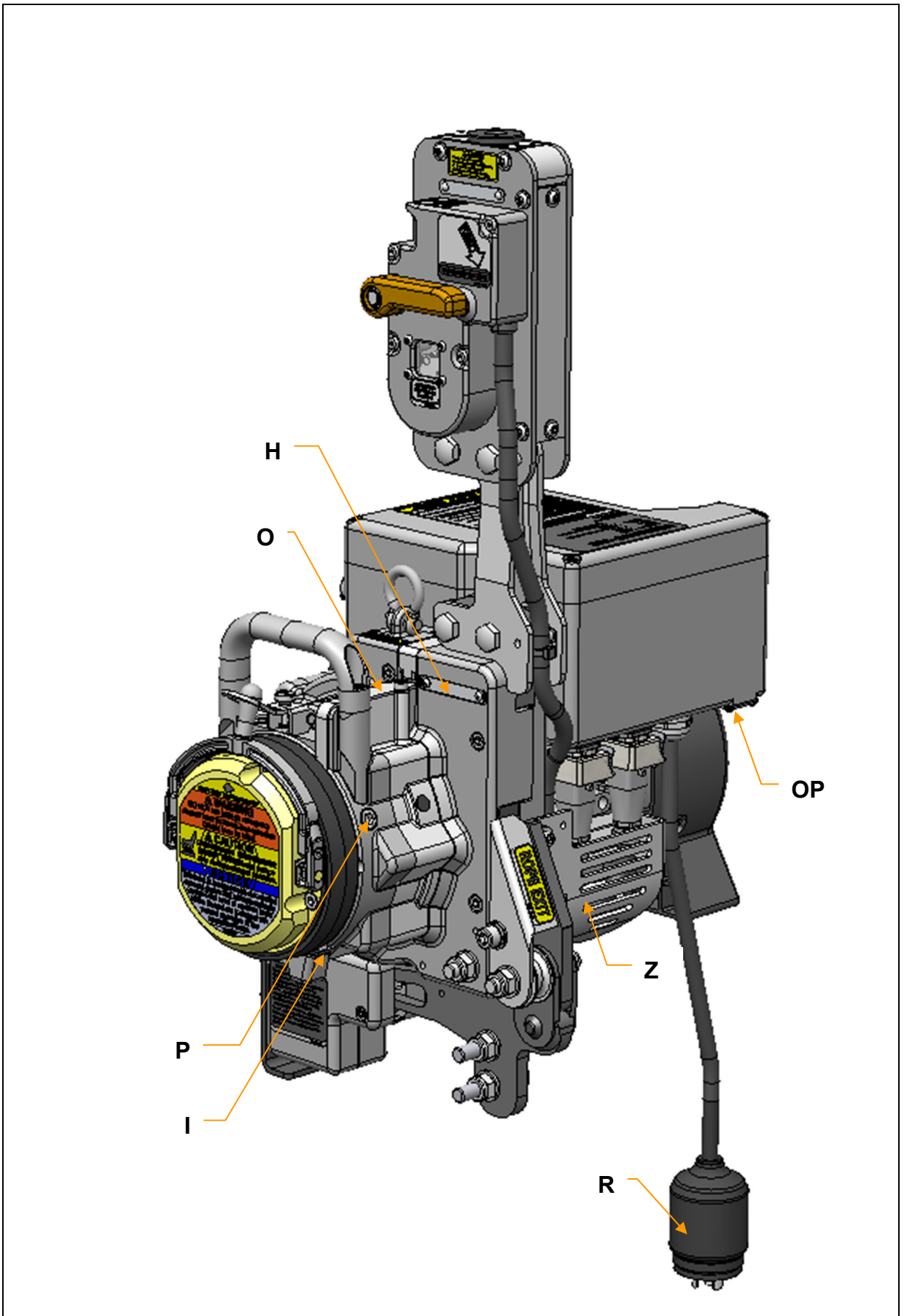
NOTE: Due to the various possible suspended platform loading situations and power sources, it is impossible to specify the maximum length of the power cable exactly. When the Hoist is difficult to start up, take measures against voltage drop such as boosting voltage and/or using thicker size of cable.

Type	SOOW
Core and Size	1P: 3 cores, 10 AWG minimum
Rated Voltage	600 V
Length	500 ft (152 m) or shorter per a platform

3. FUNCTION AND DESCRIPTION OF EACH COMPONENT

3.1 BISOMAC





	DESCRIPTION	FUNCTION
A	Electric Motor	BISOMAC is driven by the motor with electricity.
B	Gear Box	Decelerate rotation speed of the motor to lift the rated load with rated speed.
C	Electromagnetic Brake	Released when the operation button is pressed. When the operation button is released or power is cut off, brake is activated and BISOMAC stops lifting.
D	Control Box	Electric components inside.
E	Oil Inlet	Open it when replacing oil.
F	Suspension wire rope inlet	Inserting suspension wire rope from here.
G	Handle	Use when carrying BISOMAC.
H	Serial Number	Serial Number of BISOMAC.
I	Oil Outlet	Open it when discharging oil.
J	Emergency Controlled Descent Lever	It allows downward travel at a controlled speed without power.
K	Dust Cover	Protection cover not water and dirt to get into Electromagnetic Brake.
L	Water-proof Cap Bolt	Cap bolt with sealing to avoid water getting into Electromagnetic Brake.
M	Lever Stopper	Lock the lever automatically to prevent misoperation and malfunction of Emergency controlled descent lever.
N	Shackle	Use it when carrying BISOMAC by hanging. NOTE: Maximum lifting load is 165 lbs.
O	Guard Plate for Brake Cable	Protect Brake cable from damage.
P	Oil Level Gauge Plug	Open it to check the oil level.
Q	Hour Meter	Displays accumulated operating hours.
R	AC Power Plug	Connect it to power source to supply power to BISOMAC.
S	Fan Cover	Protects operator from being struck by the fan and prevents damage to the fan and motor.
T	Manual holder	Operator's manual is stored inside.
U	Power Indicator Lamp & UP/DOWN Switch	Lights up when power cable is connected. UP/DOWN while switch is pressed. Stop when released.
V	Emergency Stop Switch	In the event BISOMAC continue operating even released UP/DOWN switch, press Emergency Stop Switch. Red indicator lamp lights up and shut off the power to motor when pressed.
Y	Overload Indicator Lamp	Lights up when BISOLOAD is activated.
Z	Cable Guard	Protection plate for cable and connector.
OP	Pendant Control Socket *Optional	Remote control pendant switch can be connected. *1. Remote control pendant switch is optional. Contact distributor if necessary. *2. For ver.2, UP/DOWN operation with UP/DOWN button on the Hoist is unable when remote control pendant switch is used.

3.2 BISOLOCK

BISOLOCK is fall arrest device which holds wire rope when the platform suddenly fell down. When BISOLOCK is activated, lowering operation shall be locked electrically and Activation Indicator Lamp lights up if DOWN operation is operated. Only UP can be operated.

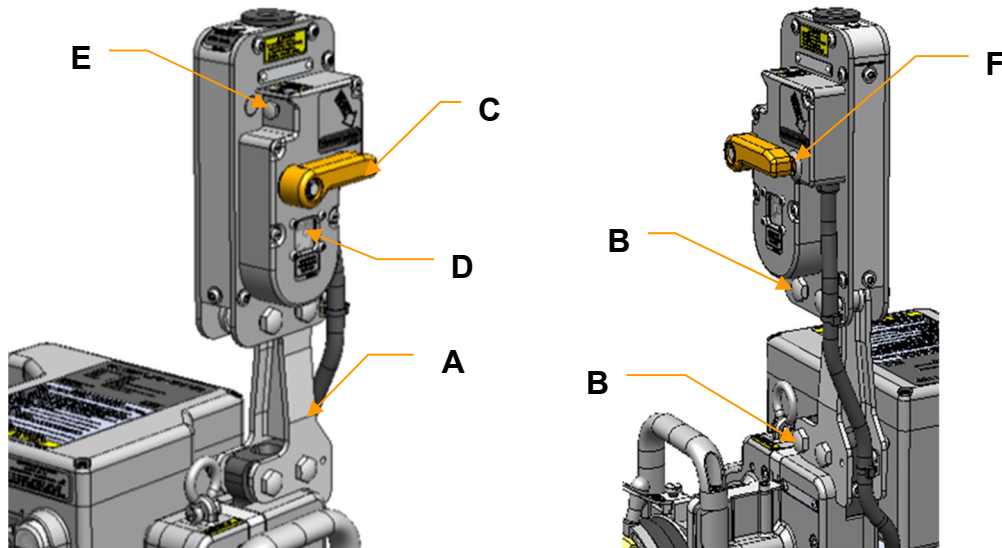
WARNING

1. If the platform suddenly fell down and BISOLOCK is activated, only trained and authorized personnel are allowed to release BISOLOCK.

Contact local authorized distributor for rescue. Improper reset may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

2. If the platform continue descending even you released DOWN button or pressed Emergency Stop Switch, press Trip Button to activate BISOLOCK.

Platform, operators, or objects might fall. It may result in serious injury or death to operators or passers-by.

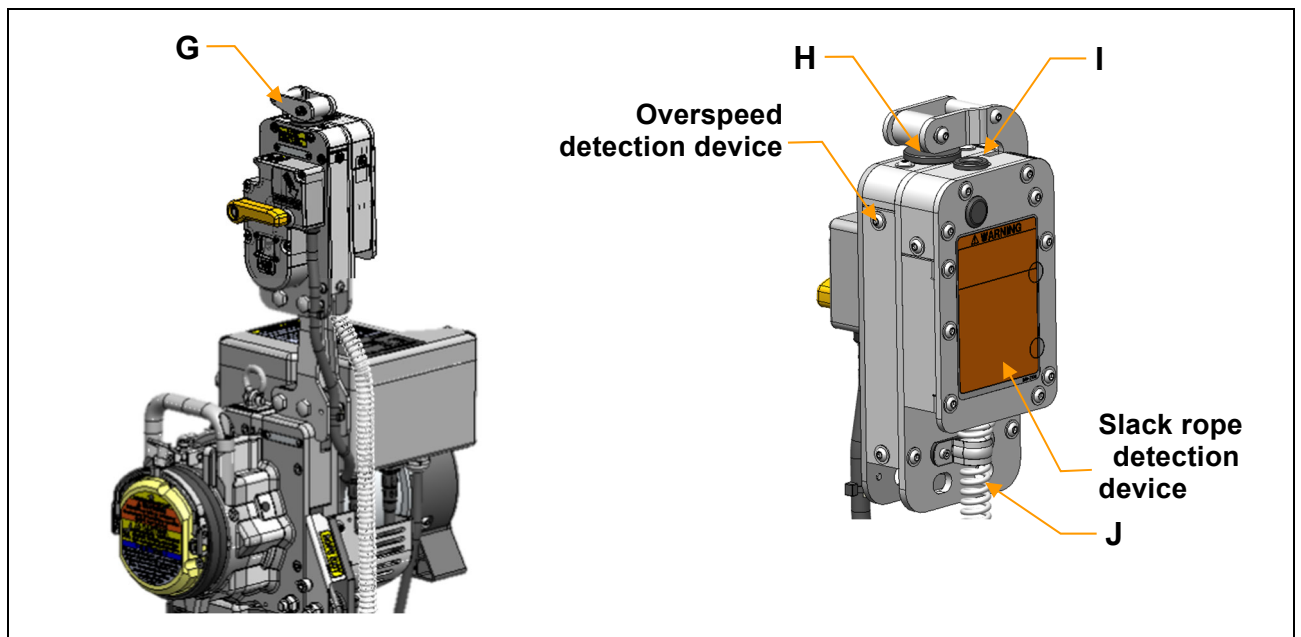


	DESCRIPTION	FUNCTION
A	BISOLOCK Mounting Bracket	Mounting bracket for fixing BISOLOCK to the Hoist.
B	Bolt for BISOLOCK & BISOLOCK Mounting Bracket	Bolts for fixing BISOLOCK and BISOLOCK Mounting Bracket to the Hoist.
C	Release Lever	Lever for deactivating BISOLOCK. NOTE: DO NOT forcibly release BISOLOCK when it is activated due to strong impact load. Safety pin will be broken and unable deactivate BISOLOCK.
D	Governor Inspection Window	Window to check the rotation of governor.
E	Trip Button	Switch to activate BISOLOCK manually.
F	Activation Indicator Lamp	Lights up if DOWN button is pressed when BISOLOCK is activated.

BISOLOCK-DL (Optional)

BISOLOCK-DL is a combination of an "overspeed detection device" that grabs the suspension wire rope when the platform suddenly drops and a "slack rope detection device" that grabs the secondary wire rope when the suspension wire rope becomes loose. Two safety devices prevent the platform from falling. The method of combining the BISOLOCK-SP and the Slack rope detection device is described in the "Installation Procedure of Slack Rope Detection unit to Overspeed Detection device" that comes with the Slack rope detection device. When assembling, refer to the above manual and follow the described procedure.

·WIKT202203 [Installation Procedure of Slack Rope Detection unit to Overspeed Detection unit]



	DESCRIPTION	FUNCTION
G	Roller Lever	A Lever that detects looseness of the platform.
H	Suspension wire rope inlet	Insert the suspension wire rope. The wire rope diameter differs depending on the color of the Bush.
I	Secondary wire rope inlet	Insert the secondary wire rope. The wire rope diameter differs depending on the color of the Bush.
J	Exit Tube for Secondary wire rope	Guides the discharge of the secondary wire rope.

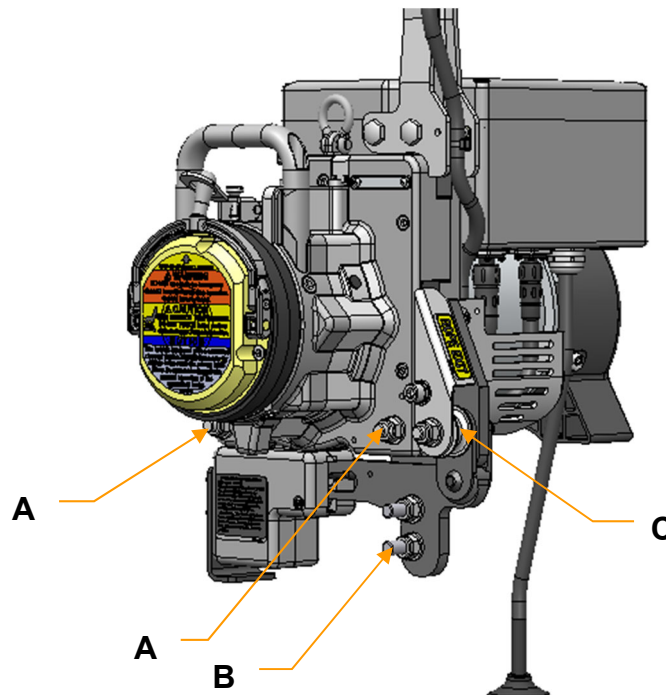
3.3 BISOLOAD

BISOLOAD is overload detection device. When BISOLOAD detects overload to the Hoist (150% of rated load), ascending operation shall be locked electrically and Activation Indicator Lamp lights up.

WARNING

If the Hoist does not ascend even UP button is pressed or pumps while ascending, unload from the platform.

Otherwise the rigging may fall or tilt due to overloading and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.



	DESCRIPTION	FUNCTION
A	BISOLOAD Mounting Bolt B	Bolts for fixing BISOLOAD to the Hoist.
B	Stirrup Fixing Bolt	Bolts for fixing BISOMAC to the platform.
C	Guide Roller	Guide roller to support the load of suspension wire rope (tail line).

4. WORK ENVIRONMENT

Many work environments where the Hoist is used contains contamination which may affect performance and operation of the Hoist. Inspect the operation of the Hoist frequently according to section 7.

When using the Hoist in a dirty environment that contains epoxy, paint, cement, sand blast residue, or corrosive material, protective covers are recommended.

Protective covers may hide safety instructions and warning labels. Before operating the Hoist, put off the covers and make sure to read all the labels and fully understand the instructions and warnings on the labels.

WARNING

1. When using the Hoist in a dirty environment, inspect the operation of the Hoist frequently.

Perform disassemble maintenance after completing work at each work site to remove contamination in the Hoist and inspect the operation of the Hoist.

Contamination in the Hoist may cause malfunction. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

2. Never operate the Hoist in an explosive atmosphere. The Hoist is not designed to be used in such environment.

If the Hoist is used in an explosive atmosphere, explosion or fire may occur. This might result in serious accidents.

NOTE: An explosive atmosphere is defined as a mixture of dangerous substances with air, under atmospheric conditions, in the form of gases, vapors, mist or dust in which, after ignition has occurred, combustion spreads to the entire unburned mixture.

CAUTION

Prolonged use of the Hoist with protective covers may cause overheating of motor.

When using protective covers, check if the air supply to the motor is sufficient frequently, and if it's overheated, stop operating and wait for cooling down.

NOTE: When using the Hoist in a dirty environment that contains epoxy, paint, cement, sand blast residue, or corrosive material, performance and operation of the Hoist may be affected. Using protective covers are recommended.

NOTE: When using the Hoist in freezing temperatures, freezing of moistures in the Hoist may affect the operation of components of the Hoist. Oil in the gear box may be cured. This may cause BISOMAC to start hardly. After work, necessary preventive measure not to freeze moistures in the Hoist must be taken.

5. SET UP INSTRUCTIONS

This section describes necessary procedure for safe use of the Hoist.

Read and fully understand procedures described in step 1-6 before setting the Hoist up.

[WARNING: INSTALLATION]

WARNING

1. Do not allow anyone under suspended equipment.

Objects might fall, resulting in serious injury or death to passers-by.

2. Do not use different type of hoist in one platform.

Otherwise, operation error may occur from the difference in the performance (lifting speed, etc.) and the difference of the operation method of hoists and safety devices. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

3. When attaching the Hoist to the platform, make sure how to fix safety devices in advance.

Otherwise, safety feature may not work properly. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

4. Attach ground fault circuit interrupter to power source and ensure that it is properly grounded.

Failure to do so, increases the risk of electric shock or electrocution.

5. Do not use power cable and control cable which damaged or cracked.

Doing so could result in electrocution or death.

6. When connecting safety devices to BISOMAC, make sure that the plug is completely dry and no moisture inside.

Otherwise, malfunction may occur. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

CAUTION

1. Using protective cover is recommended for dirt prevention.

Adhesion of foreign substances may cause the Hoist inoperable.

2. Replace rubber covers of Power Indicator Lamp and UP/DOWN Switch if damaged.

Adhesion of foreign substances may cause the Hoist inoperable.

[CAUTION: CONNECTING POWER]

CAUTION

Voltage supplied to the Hoist should not exceed the range within $\pm 10\%$ of rated voltage (refer to Section 2.1).

Otherwise motor may get overheated, result in malfunction or injury of operator.

Rated voltage range ($\pm 10\%$) is only temporarily acceptable. It does not mean continuously acceptable voltage range.

[WARNING: SUSPENSION WIRE ROPE]



WARNING

1. Use only authorized wire rope. Strictly follow the method of use and instructions of manufacturer.

Otherwise BISOMAC and safety devices cannot achieve proper supporting strength or the rope may get birdcaged or broken. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

2. Do not expose wire rope to fire, higher temperature than 200°F (93°C), passage of electrical current, or corrosive atmospheres and chemicals.

This exposure will make the rope unsafe and may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

- Worn, kinked, birdcaged or damaged wire rope cannot be repaired. Must be replaced.
- When in doubt, replace wire rope.
- If wire rope is exposed to corrosive chemicals, do not save, replace it.

3. Be sure there is enough length of wire rope (at the shortest 6.56 ft (2 m) to reach the lowest possible point of travel.

Wire rope may get ran off from the platform. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

4. Do not operate the Hoist with faulty wire rope such as kinked, deformed, tied, etc.

Faulty wire rope may damage inside the Hoist or wire rope may be broken. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

5. When fixing wire rope to a building, be sure that the wire rope does not contact any sharp edge.

Otherwise, wire rope may be broken. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by. Also broken wire rope may fall.

6. Make sure that wire rope runs freely through the Hoist.

In consistent reeving speed suggests the wire rope or the Hoist may be damaged. Stop operation immediately and replace the wire rope or the Hoist. Otherwise, the wire rope may be broken or the Hoist may stop. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

7. Do not secure or apply load to the end of suspension wire rope which exited from wire rope outlet.

Parts inside the Hoist may be worn down excessively and the wire rope may be damaged or broken. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.



CAUTION

Keep your hands away from the wire rope inlet while winding the wire rope and the Hoist is operating.

There is a risk of fingers or the entire hand being pulled in with the wire rope. This may result in serious injury.

[CAUTION: INSTALLATION]

⚠ CAUTION

1. Do not throw or drop the Hoist.

The Hoist may be damaged and cannot be operated. Also this may cause person to be injured or damage to property.

2. Do not pull or step onto the cables.

Cables or connectors may be damaged and the Hoist cannot be operated.

STEP 1 Installation of safety devices to BISOMAC

Install BISOLOCK and BISOLOAD to BISOMAC. See instruction below.

*There is no difference in the following components used when BISOLOCK-SP and BISOLOCK-DL (option) is installed.

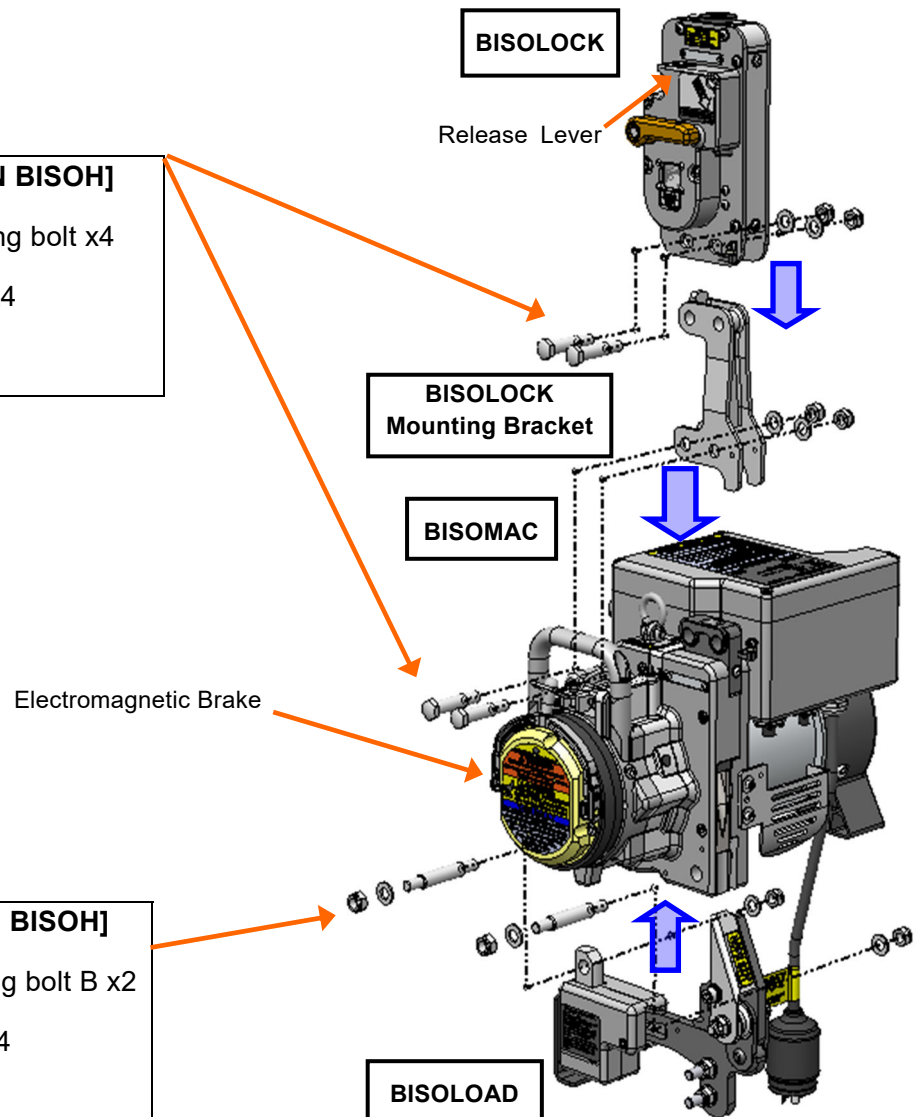
[Components]

[Provided by NIHON BISOH]

- BISOLOCK mounting bolt x4
- M12 Plain washer x4
- M12 Nylon nut x4

[Provided by NIHON BISOH]

- BISOLOAD mounting bolt B x2
- M12 Plain washer x4
- M12 Nylon nut x4



[Picture-2]

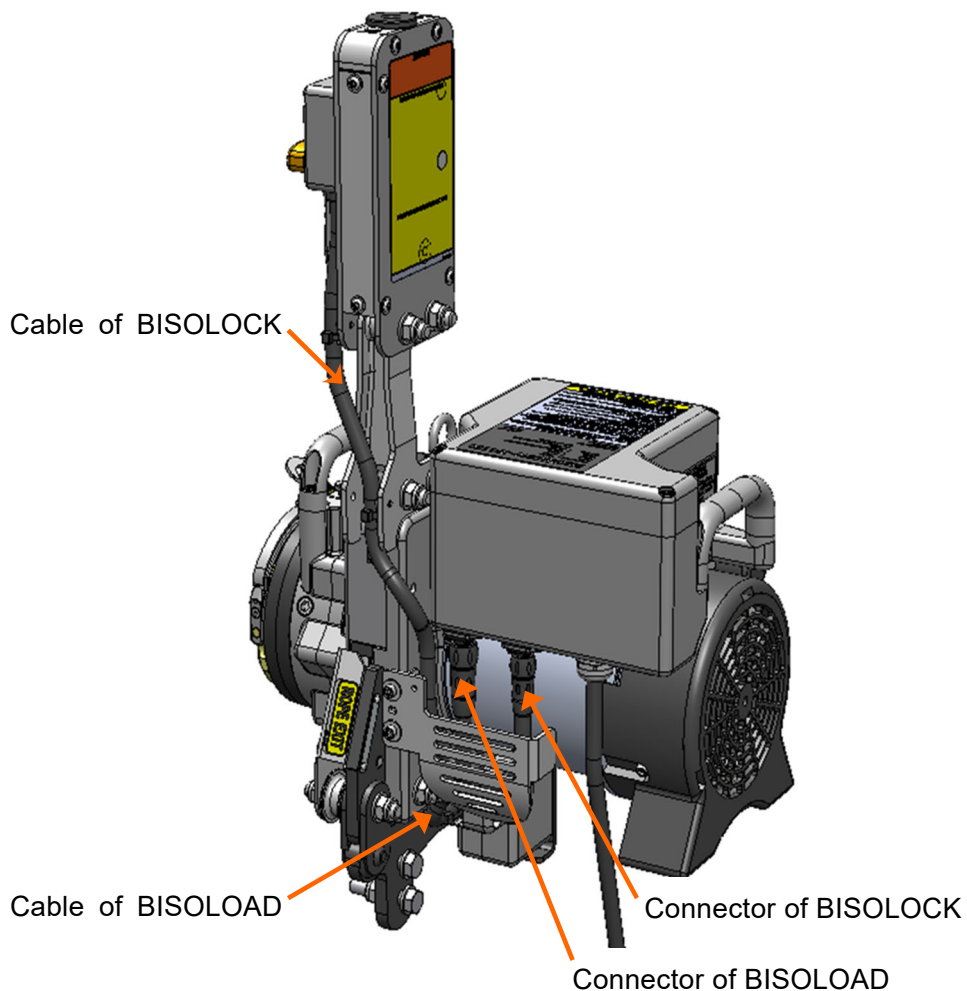
1. Set BISOLOCK mounting bracket to BISOMAC and fix with 2 pcs of bolt for BISOLOCK mounting bracket, 2 pcs of M12 Plain washer and 2 pcs of M12 Nylon nut.
2. Insert BISOLOCK to BISOLOCK mounting bracket from above and fix with 2 pcs of BISOLOCK mounting bolt, 2 pcs of M12 Plain washer and 2 pcs of M12 Nylon nut. Release Lever shall be Electromagnetic Brake side. (See Picture-2) Tighten the bolts with specified torque by using torque wrench.

Tightening torque: 76 N·m (770 kgf·cm)

3. Insert BISOLOAD to BISOMAC from below and fix with 2 pcs of BISOLOAD mounting bolt, 4 pcs of M12 Plain washer and 4 pcs of M12 Nylon Nut. (See Picture-2) Tighten the bolts with specified torque by using torque wrench.

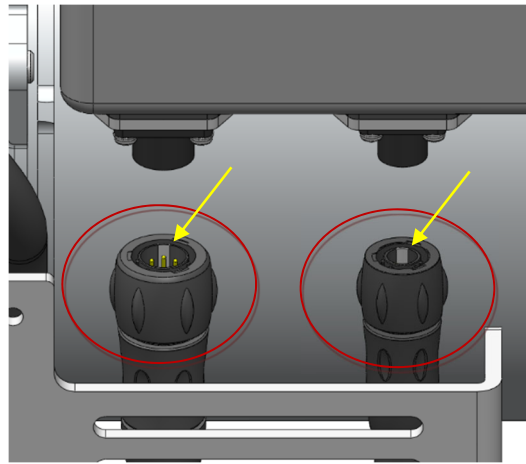
Tightening torque: 76 N·m (770 kgf·cm)

4. Connect the cables of BISOLOCK and BISOLOAD to BISOMAC. (See Picture-3)



[Picture-3]

5. Connect the cables as white marks (indicated with yellow arrow in the Picture-4) positioned Motor side and turn the connector counterclockwise to fix.
6. When disconnecting, turn the connector clockwise and pull out. See Picture-4.



[Picture-4]

STEP 2 Connecting to power supply

⚠ WARNING

Do not pull or step onto the power cable of BISOMAC and connection cables of safety devices.

Cables may be damaged and cause electric shock. This may result in serious injury or death.

⚠ CAUTION

Use only suitable power cable and power source for BISOMAC.

Using incorrect power may cause overheating and damage to the cable and other components, and the Hoist will not work properly.

1. Connect the power cable of BISOMAC to power supply from central control box.

Please check the types of connector.

Type	Manufacturer
HBL2323	HUBBELL

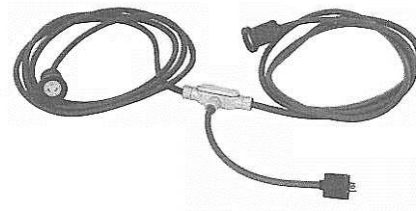
Cover the socket with appropriate cover shown below.

Type	Manufacturer
HBL6032	HUBBELL

2. Required power per one unit of BISOMAC.

Model	Rated current
BISOMAC 210-750	10 A
BISOMAC 210-1000	10 A
BISOMAC 210-1500	13 A
BISOMAC 210-1000U	10 A
BISOMAC 210-1258U	13 A
BISOMAC 210-1508U	13 A

When two hoists are used on a platform, apply Y-shape splitter to supply the power to both hoists. [See Photo-1]



[Photo-1]

3. Ensure that Emergency stop button on central control box and interlock of safety devices are not activated.

<CHECK>

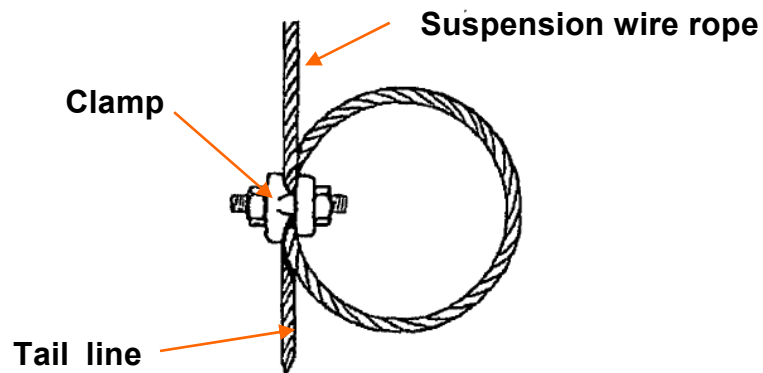
- Indicator lamp of Emergency Stop Switch is unlit.
- Release Lever of BISOLOCK is horizontal.
- The Hoist operates normally when UP/DOWN button is pressed.

4. Ensure that current capacity and size of circuit breaker is adequate. (See table above)

5. Ensure that connectors are not cracked or damaged.

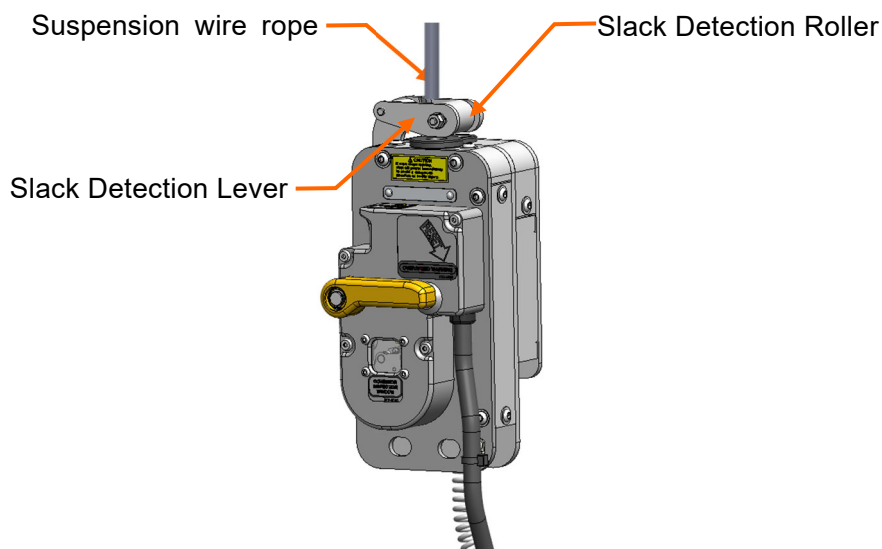
STEP 3 Installation of suspension wire rope

1. Insert the tip of suspension wire rope to wire rope inlet of BISOMAC approximately 16 inch (approx. 40 cm). *When using the BISOLOCK-DL, perform the procedure of ①-1.
2. Push UP button while pushing wire rope in to BISOMAC lightly until suspension wire rope feeds automatically.
3. Make sure that suspension wire rope comes out from outlet without any obstruction and moves both up and down direction freely.
4. Distances between riggings and wire rope inlet of the Hoist must be equal as suspension wire ropes are suspended vertically.
5. To prevent the platform from running off suspension wire ropes, secure the tail line as Picture-5.



[Picture-5]

***When BISOLOCK-DL is installed**



[Picture-6]

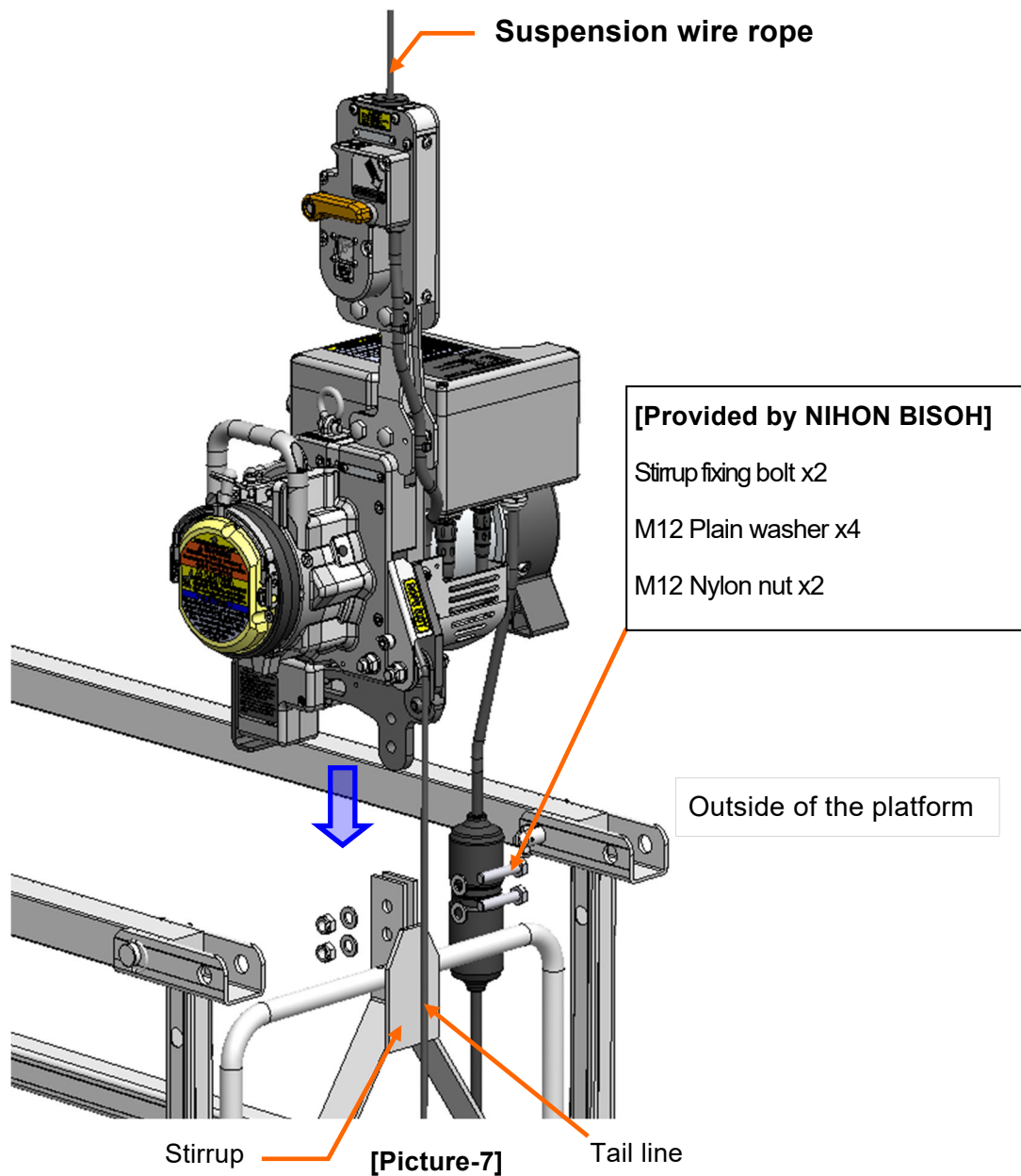
- ①-1 Push down the Slack Detection Lever and insert the end of the suspension wire rope into the BISOLOCK wire rope inlet approximately 16 in (approximately 40 cm). When inserting the suspension wire rope, pass it through the inside of the Slack Detection Roller. (See Picture-6)

STEP 4 Installation of the Hoist

Press UP button and lift the Hoist from the ground. Align bolt passing holes of BISOLOAD and stirrup of the platform, then fix with 2 pcs of Stirrup fixing bolt, 4 pcs pf Plain washer M12, and 2 pcs of Nylon nut M12. (See Picture-7) The Hoist shall be set as the exited wire ropes are positioned on the outer side of the platform. (See Picture-7)

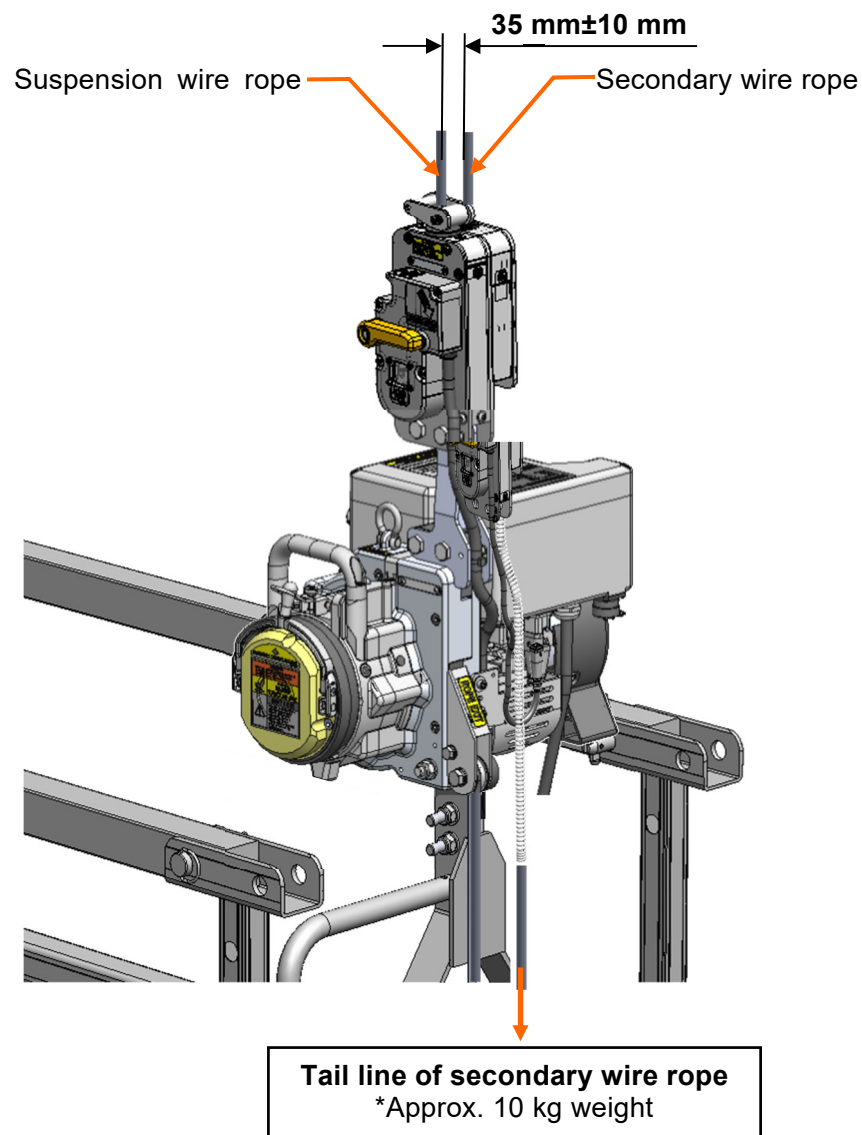
Tighten the bolts with specified torque by using torque wrench.

Tightening torque: 76 N·m (770 kgf·cm)



STEP 5 Installation of the secondary wire rope (When using BISOLOCK-DL)

1. Lift the platform and exert tension in the suspension wire rope.
2. Insert the end of the secondary wire rope into the wire rope inlet of Slack Rope Detection Device, remove the slack, and confirm that the secondary wire rope moves freely without resistance in the Slack Rope Detection Device.
3. Suspend a weight of 10 kg or more on the tail line of the secondary wire rope to prevent the secondary wire rope from being pulled up when ascending.
4. Install the suspension wire rope and the secondary wire rope so that the distance between them is $35\text{ mm}\pm 10\text{ mm}$. (See Picture-8)



[Picture-8]

STEP 6 Perform daily inspection

Perform daily inspection according to section 7.

6. OPERATING THE HOIST

This section describes the followings to handle and operate the Hoist safely.

1. Carrying and storing the Hoist.
2. Operation methods of the Hoist.

WARNING

1. Before operating the Hoist each operator must understand and follow the instructions in this manual and labels on the Hoist.

Failure to comply with these instruction may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

2. Do not overload on the platform.

Suspension rig may fall down, resulting in serious injury or death to operators or passers-by.

CAUTION

Do not apply excessive load to shackle.

Applying load exceeding 165 lbs (75 kg), shackle may be broken. It may cause the Hoist to fall, resulting in injury or damage to property.

[CAUTION: Carrying]

CAUTION

1. When carrying the Hoist by hands, hold handle to carry.

Unstable transporting may result in injury or damage to the Hoist or property.

2. Do not use handle for any purpose other than carrying the Hoist.

If excessive load is applied to handle, the Hoist may be broken. It may cause injury or damage to property.

[CAUTION: Storage]

CAUTION

When storing the Hoist, remove Stirrup from BISOMAC.

*Refer to section 5 to remove Stirrup.

Storing with unstable state cause the Hoist to fall down. It may cause injury or damage to the Hoist.

NOTE: Do not stack BISOMAC more than 2 steps. Otherwise BISOMAC may fall down and be damaged.

[WARNING: Lifting operation and Emergency stop]

 **WARNING**

1. Do not fix the operation switch in the pushed-in state.

The Hoist does not stop. It may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

2. Always allow BISOMAC to come to a full stop before changing the direction of travel.

Otherwise the Hoist may not stop properly due to control circuit failure. It may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

3. Do not use the Hoist if Emergency stop switch does not work properly.

In case of control circuit failure, the Hoist does not stop operation. It may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

4. Push the operating switch by hand only.

Using foreign objects to operate the Hoist may damage to switch or switch cover and allow water to get in to the Hoist. It may cause malfunction of the Hoist and the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

 **CAUTION**

Do not operate BISOMAC longer than 60 minutes during any 2 hours period.

Otherwise Electromagnetic brake and Motor will become very hot and could result in burn injury.

[WARNING: Remote control pendant switch]

 **WARNING**

1. Cable length of remote control pendant switch must be within the reach of operator.

Otherwise in case of emergency when operating from a distant, operator cannot operate Emergency Stop Switch of the Hoist. It may cause platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

2. When remote control pendant switch is not under use, seal the socket with waterproofing cap.

Electric leakage due to inundation may cause malfunction or unintentional move. It may cause platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

3. Before connecting remote control pendant switch to the Hoist, ensure that there is no water in the connector.

Electric leakage due to inundation may cause malfunction or unintentional move. It may cause platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

[WARNING: Controlled descent lever]

 **WARNING**

1. Use Emergency controlled descent lever only when power supply is cut off.

After use, make sure to lock the Emergency controlled descent lever with lever stopper. Otherwise the Hoist may not stop during operation. It may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

2. Do not operate Emergency controlled descent lever when operating the Hoist with operating switch.

The Hoist may not stop during operation and It may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

3. Before operating the Hoist, ensure that Emergency controlled descent lever is vertical and locked with lever stopper. (See Picture-9)

The Hoist may not stop or the brake may not work properly. It may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

4. Operate Emergency controlled descent lever only by hand.

The Hoist may not stop during operation and It may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

5. After using Emergency controlled descent lever, make sure that the lever is locked automatically by lever stopper. (See Picture-9)

The Hoist may not stop or the brake may not work properly. It may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

 **CAUTION**

1. Disconnect power cable from central control box when using Emergency controlled descent lever.

Otherwise, sudden movement may be induced when the power is regained. This may cause injury or damage to property.

2. Pull Emergency controlled descent lever as far as it go toward.

If lowering down without releasing the brake completely, the Hoist may get overheated or the brake gets worn down and loses braking force. In this case, the brake may not be repairable.

NOTE: Do not use the Hoist if Emergency controlled descent lever does not work properly. Otherwise, in the event of power loss, the platform may not be able to descend and operator cannot escape. Such hoist must be repaired and retested before using.

6.1 Carrying the Hoist

In order to safely transport the Hoist, detach BISOLOCK and BISOLOAD from BISOMAC.

(Refer to section 5 Step 1)

[Weight of each device]

BISOMAC: 108 lbs (49 kg)

BISOLOCK-SP: 11 lbs (5 kg)

BISOLOCK-DL: 18 lbs (8 kg) *Option

BISOLOCK Mounting Bracket: 2 lbs (1 kg)

BISOLOAD: 9 lbs (4 kg)

6.2 Operation methods of the Hoist

6.2.1 Lifting and Emergency stop

- Press UP button to UP travel.
- Press DOWN button to DOWN travel.
- If Emergency stop button is pressed, power is cut off. The Hoist shall not run in either direction.

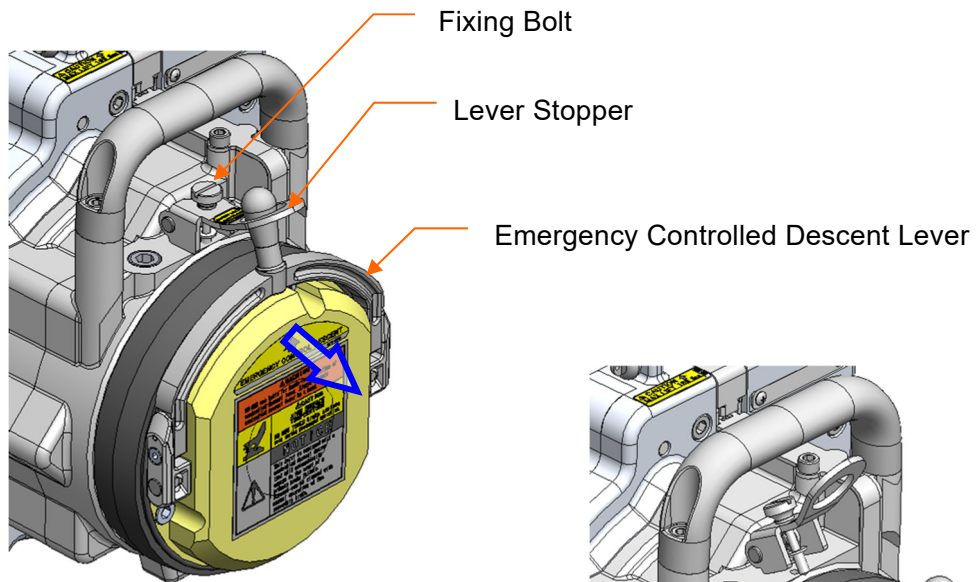
6.2.2 Emergency controlled descent lever

•Allows downward travel at a controlled rate of speed in the event of power loss.

[Procedure of Emergency controlled descent]

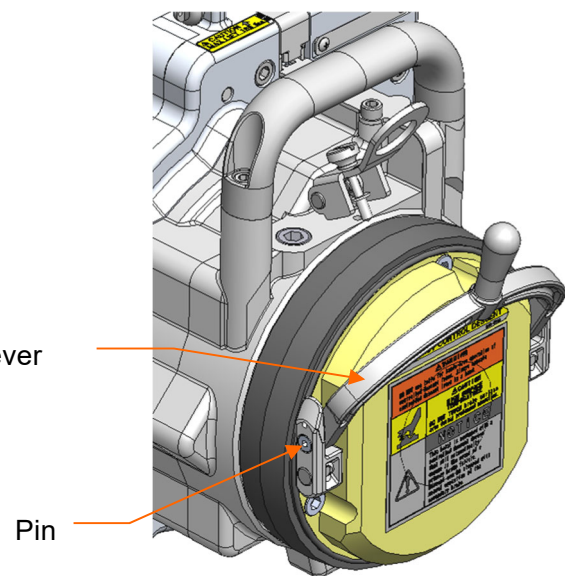
1. Disconnect power plug from central control box.
2. Slide sliding knob and unlock lever stopper. (See Picture-9)
3. Release Electromagnetic brake by gently pulling Emergency controlled descent lever. The Hoist will travel downward at a controlled rate of speed. (Picture-9)
4. The Hoist stops when Emergency controlled descent lever is released.

NOTE: Do not apply excessive force to Emergency controlled descent lever. If more than 100 kg of the load is applied to the pins of Emergency controlled descent lever, they may be broken and consequently unable to descend in the event of emergency. (See Picture-10) If Emergency controlled descent lever is broken, refer to Maintenance Procedure Manual (separately issued).



[Picture-9]

Emergency Controlled Descent Lever



[Picture-10]

6.2.3 Releasing procedure of BISOLOCK

WARNING

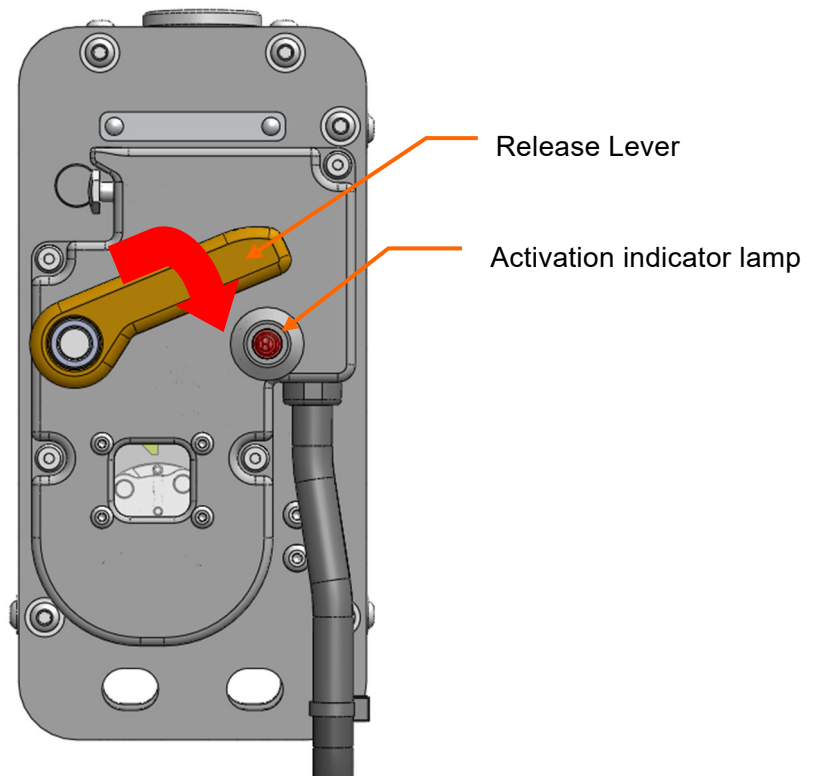
If BISOLOCK is activated, do not release it until safety is confirmed.

It may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

[How to reset BISOLOCK]

1. Operate UP travel to reeve wire rope approximately 2 in (approx. 5 cm).
2. Pull down Release Lever and deactivate BISOLOCK. (See Picture-11)
3. Confirm that both activation indicator lamps on the hoist and BISOLOCK is unlit.

(See Picture-11)



[Picture-11]

6.2.4 Releasing procedure of BISOLOCK-DL (Option)

WARNING

If BISOLOCK-DL is activated, do not release the BISOLOCK until safety is confirmed.

The platform, operators, or objects within the platform may fall, resulting in serious injury or death to operators or passers-by.

BISOLOCK-DL (Option) Release method is following;

1. Press the UP button to wind up the wire rope and make the platform horizontal.
2. When the Slack Detection Lever is pushed down, the BISOLOCK-DL is released.

NOTE: Do not push down the Slack Detection Lever by using force to release BISOLOCK-DL. Parts inside BISOLOCK-DL may be damaged and may cause BISOLOCK-DL. Make sure to release BISOLOCK-DL after platform became level and safe state.

7. DAILY TESTS AND INSPECTIONS

This section describes procedure of daily tests and inspections. Do not use the Hoist until following tests and inspections have been completed to ensure correct operation.

- Read 7.1-7.3 and fully understand procedures of tests and inspections.
- Devices and parts not described in this manual, follow manuals of each device and part.

WARNING

1. Do not allow anyone under suspended platform.

Objects might fall, resulting in serious injury or death to passers-by.

2. Never perform any disassembly, maintenance, repair, or part replacement of the equipment when it is suspended in the air or is under load.

Platform may fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

3. Perform all tests and inspection at the start of each work shift.

The equipment may malfunction. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

4. Daily tests and inspections must be performed carefully according to this manual

Correct operation of the equipment must be ensured. Otherwise, platform may fall or tilt due to malfunction and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

5. Using the equipment in severe environment, perform tests and inspections more frequently. (Refer to section 4)

Perform disassemble maintenance after completing work at each project site to remove dusts and contaminations from the Hoist and BISOLOCK inside and perform inspection. Otherwise, accumulated dusts and contaminations bother proper operation of the Hoist. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

7.1 Tests and inspections: Rigging materials

[WARNING: Tests and inspections of rigging materials]

WARNING

If any abnormalities are found on rigging materials, do not use the platform with such faulty materials.

Wire ropes may be cut or run off. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

Inspect all rigging materials which support load of the equipment (such as nut, bolt, clamp, wire clip, shackle, and so on) and wire ropes. Ensure that they are not damaged or worn down and that they are secured properly.

7.2 Tests and inspections: Wire rope

[WARNING: Tests and inspections of wire rope]

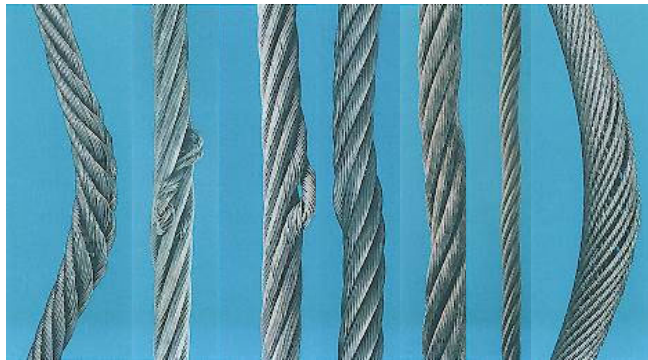
WARNING

Inspect wire ropes periodically. If any abnormalities are found, replace with new one.

Wire rope is worn down by repeated using. Damaged or deformed wire rope may be cut due to loss of strength. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

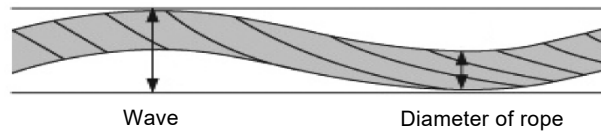
7.2.1 Shape and size of wire rope

- Replace wire rope if any of below conditions are found. (See Photo-2 below)



[Photo-2]

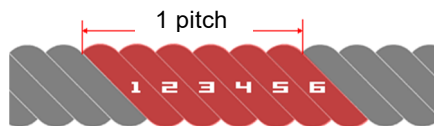
1. Waviness (wave greater than 4/3 times of nominal diameter). (Picture-12)



[Picture-12]

2. When loosened wires, deformation, or kink are found.
3. Broken wires which more than 10% of total number of wires per one pitch of wire rope.
(Picture-13 shows one pitch of 6 strands wire rope)

*Ex. Construction of wire rope is 6x19: $6 \times 19 \times 10\% = 114 \times 0.1 = 11$ wires



[Picture-13]

4. Average diameter of 5/16 in (8.0 mm) wire rope becomes

$\left\{ \begin{array}{l} \phi 0.307 \text{ in (7.8 mm) or less} \\ \phi 0.331 \text{ in (8.4 mm) or more} \end{array} \right.$

5. Average diameter of 3/8 in (9.5 mm) wire rope becomes

$\left\{ \begin{array}{l} \phi 0.346 \text{ in (8.8 mm) or less} \\ \phi 0.374 \text{ in (9.5 mm) or more} \end{array} \right.$

6. Heavily rusted and found pitting on surface.

7. Wire rope that has been exposed to temperature above 200°F (93°C).

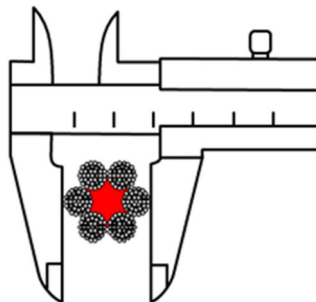
- Measure the diameter of wire rope as shown in Picture 14 and 15 below.

Measure the diameter of circumscribed circle of wire rope while load is applied. Measure 2 diameters per one circumference at different direction, and average the values.

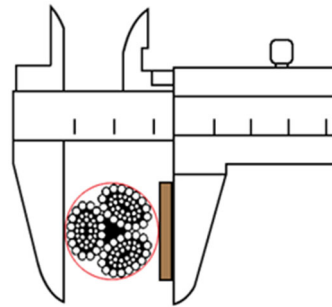
Diameter shall be measured several positions in the direction of length.

Wire rope with even number of strands shall be measured its largest cross section as shown in Picture-14.

Wire rope with uneven number of strands shall be measured with a board as shown in Picture-15. Value without thickness of the board is the diameter of wire rope.



[Picture-14]



[Picture-15]

NOTE: Worn, kinked, or deformed wire rope and wire rope with broken wires or waviness cannot be repaired, must be replaced.

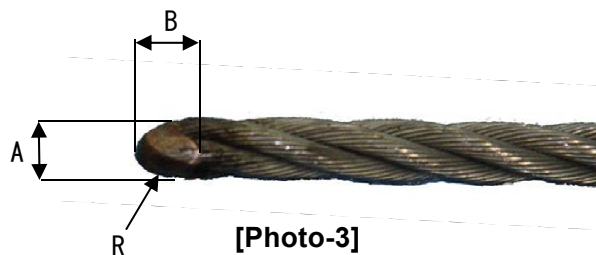
7.2.2 Shape and size of the end of wire rope

- For using with the Hoist, the end of wire rope shall be shaped as shown in the Photo-2.

NOTE: If the shape of the end of wire rope is not proper, wire rope may not be inserted to the Hoist, or may be jammed inside the Hoist and cannot be discharged.

- The end of wire rope shall be shaped as below.

Nominal Diameter	0.315 in (8.0 mm)	0.354 in (9.0 mm)
Diameter [A]	0.315-0.331 in (8.0-8.4 mm)	0.354-0.374 in (9.0-9.5 mm)
Brazed portion [B]	Within 0.315 in (8.0 mm)	Within 0.394 in (10.0 mm)
Radius of top end [R]	R0.118 in (3.0 mm)	R0.157 in (4.0 mm)



[Photo-3]

7.3 Tests and inspections: Hoist



WARNING

Do not use the Hoist if any defect is found. Authorized personnel must replace with the Hoist which inspected and passed all test.

Otherwise, malfunction may occur. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.



CAUTION

If oil is leaking from BISOMAC, stop using immediately and replace with the Hoist which inspected and passed all test.

Lacking oil cause Gear Box and Motor to overheat. This may cause burn injury to operator. Also, the overheating may cause serious damage to Gear Box and Motor. Smoke may be emitted, the Hoist may become unable to work.

Pre-operation inspection

- Ensure that bolts, nuts, and cap of operator's manual storage of the Hoist are not loosened.
- Visually inspect the appearance of the Hoist (including cables and connectors) and ensure that there are no damaged parts.
- Ensure that the Hoist is properly installed to the platform.
- Ensure that central control box is connected to power supply.
- Check circuit breaker and ensure that power is not cut off.

7.3.1 Tests and inspections: Lifting the platform and emergency stop function

[WARNING: Lifting operation and emergency stop function]



WARNING

- 1. Stop operating the Hoist immediately if any defect such as abnormal noise is found. Replace with the Hoist which inspected and passed all tests.**

Do not use abnormal hoist. Parts inside the Hoist may be damaged. Continued using may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

- 2. Stop operating immediately if wire rope does not travel through the Hoist while the platform is suspended even motor is working.**

Wire rope may be jammed inside the Hoist or sheave may be slipping. Continued using may result in damage to the equipment or wire rope to cut off. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

- 3. Do not use the Hoist if Emergency stop switch does not work.**

In the event of failure in circuit, the Hoist may not be able to stop properly. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

- 4. Operate Emergency stop switch and operation switch only by hand.**

Using foreign objects to operate the Hoist may damage to switch or switch cover and allow water to get in to the Hoist. It may cause malfunction of the Hoist and the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

- 5. Stop operating immediately if the Hoist travels to wrong direction.**

This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

[Inspection procedure /Independent control]

1. Lift up the platform approximately 40 in (approx. 100 cm) from the ground and lower down to the ground again. Repeat this process several times to check if there is no abnormal vibration such as the Hoist is shaking.
2. Check if Hour meter works properly.
3. Press Emergency stop switch to cut off the power to the Hoist.
4. Confirm that red indicator lamp of the Emergency Stop Switch lights up.
5. Ensure that the Hoist does not operate even operation switch is operated.
6. Reset Emergency stop switch. Ensure that the Hoist resumes its normal operation.

[WARNING: Remote control pendant switch]

 **WARNING**

If the Hoist continue operating even Emergency Stop Switch on the remote control pendant switch is pressed, stop using immediately and replace with normal one.

Control circuit of the Hoist or remote control pendant switch may be defected. In case of emergency, the platform may not stop due to the defective remote control pendant switch. It may cause platform to fall or tilt, and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

[Inspection procedure / Remote control pendant switch]

1. Operate with UP/DOWN button of remote control pendant switch. Lift up the platform approximately 40 in (approx. 100 cm) from the ground and lower to the original position. Check if there is any vibration (shake of the Hoist) by repeating this procedure several times.
2. Confirm that Hour Meter works normally.
3. Press Emergency Stop Switch of remote control pendant switch and shut off the power to the Hoist.
4. Confirm that Emergency Stop Switch's red indicator lamp of the Hoist lights up.
5. Confirm that the Hoist does not operate even UP/DOWN button of remote control pendant switch is operated.
6. Confirm that the Hoist does not operate even UP/DOWN button of the Hoist is operated.
7. Reset Emergency Stop Switch of remote control pendant switch. Confirm that the Hoist resumes normal operation.
8. Press Emergency Stop Switch of the Hoist and shut off the power to the Hoist.
9. Confirm that Emergency Stop Switch's red indicator lamp of the Hoist lights up.
10. Confirm that the Hoist does not operate even UP/DOWN button of remote control pendant switch is operated.
11. Confirm that the Hoist does not operate even UP/DOWN button of the Hoist is operated.
12. Reset Emergency Stop Switch of the Hoist. Confirm that the Hoist operates normally.

7.3.2 Tests and inspections: Controlled descent function

 **CAUTION**

1. Disconnect power cable from central control box when operate Emergency controlled descent lever.

Otherwise, sudden movement may be induced when the power is regained. This may cause injury or damage to property.

2. Pull Emergency controlled descent lever as far as it go toward.

If lowering down without releasing the brake completely, the Hoist may get overheated or the brake gets worn down and loses braking force. In this case, the brake may not be repairable.

1. Lift up the platform approximately 40 in (approx. 100 cm) from the ground.
2. Disconnect power cable from central control box to cut off the power.
3. Release lever stopper.
4. Pull Emergency controlled descent lever gently and lower the platform.
5. Check if the platform descends at a slow, controlled speed.

NOTE: If the platform descends with increasing speed, release hand from the lever immediately and contact local distributor.

7.3.3 Tests and inspections: BISOLOCK

[WARNING: Tests and inspections of BISOLOCK]

WARNING

If BISOLOCK does not hold wire rope properly, stop using immediately and replace with normal product.

Otherwise in the event slippage or cut of wire rope, BISOLOCK may not hold wire rope and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

[Inspection procedure / BISOLOCK]

1. Lift up the platform approximately 20 in (approx. 50 cm).
2. Press Trip Button to activate BISOLOCK.
3. Pull Emergency Controlled Descent Lever and lower the platform.
4. BISOLOCK holds wire rope and stop lowering.
5. Confirm that the Hoist does not work even DOWN button is pressed.
6. Confirm that Overspeed indicator lamp lights up when DOWN button is pressed.
7. Ascend the platform and pull down Release Lever to deactivate BISOLOCK.
8. Confirm that UP/DOWN operation is operable.
Also confirm that Governor is rotating while the platform is ascending/descending.
Apply same procedure to another BISOLOCK.

NOTE: If BISOLOCK does not hold wire rope properly, contact local distributor to replace.

[CAUTION: Activation of BISOLOCK]

CAUTION

1. Trip Button must be operated only by hand.

Trip Button may be broken and cause BISOLOCK unable to be activated normally.

2. DO NOT forcibly release BISOLOCK.

Safety pin inside Release Lever may be broken and cause BISOLOCK unable to be deactivated.

[Activation check of BISOLOCK]

1. Insert wire rope to BISOLOCK approximately 12 in (approx. 30 cm).
2. Pull out wire rope quickly.
3. Confirm that BISOLOCK holds wire rope firmly.
4. Confirm that activation indicator lamp lights up when DOWN button is pressed.
5. Reset BISOLOCK by pulling down Release Lever. (Picture-11)
6. Confirm that activation indicator lamp does not light up when DOWN button is pressed.

NOTE: If BISOLOCK is not activated and the platform continue falling, press Trip Button to manually activate BISOLOCK.

7.3.4 Tests and inspections: BISOLOCK-DL (Option)

[CAUTION: Activation check of BISOLOCK-DL (Option)]



CAUTION

1. Before tilting the platform, ensure that there are not anything easy to slip or roll.

If you have such an item, please remove it from the platform.

When the platform is tilted, such article may hit the operator and result in injury.

2. Ensure that floor of the platform is not wet or slippery.

When the platform is tilted, operator may slip and result in injury.

3. Adjusting activation angle shall be performed only by trained and authorized personnel.

Improper adjustment may cause the platform to fall or tilt and consequently operators or objects

might fall, resulting in serious injury or death to operators or passers-by.

Check if the BISOLOCK-DL overspeed detection side holds the load normally according to the procedure in Section 7.3.3.

Follow the procedure below to check if the BISOLOCK-DL slack detection side holds the load normally.

1. Lift up the platform approximately 80 in (200 cm).
2. Lower one side of the platform.
3. Slack Rope Detection Device shall be activated and hold secondary wire rope.
4. Lift the hoist on the side that grabbed the secondary wire rope and make the platform horizontal to release the Slack Rope Detection Device.
5. Perform same inspection to another BISOLOCK-DL.

NOTE: If Slack Rope Detection Device does not hold wire rope properly, contact local Distributor to replace.

8. PERIODIC MAINTENANCE

Periodic maintenance must be performed by authorized personnel if the Hoist corresponds to any of following conditions.

1. 1 year from purchase
2. 1 year from last periodic maintenance
3. 100 hours from last periodic maintenance
4. The Hoist is used in a dirty environment

NOTE: Above periods are at the latest, under proper use according to this manual. Since actual use conditions are uncertain, appropriate maintenance cycle shall be determined depending on the actual conditions and referring to above periods.

*Procedure of Periodic Maintenance, refer to Maintenance Procedure Manual of each device. (Separately issued)

WARNING

1. Repairs of component parts of the Hoist shall be performed only by authorized personnel.

Otherwise, the Hoist may malfunction or unable to operate normally. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

2. When replacing the parts, do not install any parts other than those provided or specified by NIHON BISOH., LTD.

Otherwise, the Hoist may malfunction or unable to operate normally. This may cause the platform to fall or tilt and consequently operators or objects might fall, resulting in serious injury or death to operators or passers-by.

9. TROUBLESHOOTING AT JOB SITE

[Mishandling]

This section describes possible troubles caused by mishandling and solutions for such troubles.

WARNING

If the hoist does not get back to normal condition after taking following solutions described in this section, replace it with a normal hoist or contact your local service representative.

Repairs and corrective actions shall be performed only by authorized and properly trained personnel. Improper repairs and corrective actions may cause serious accidents.

Case I The Hoist does not run.	
Possible cause	Solution
1. No input power supply. 2. Emergency Stop Switch is activated. 3. Overload protection is activated due to overloading to the platform. * When the overload protection (overcurrent, temperature protection) function is activated, the UP/DOWN button lamp is turned off.	1. Turn on main power. Connect power plug properly. 2. Reset Emergency stop switch. 3. Reduce load from the platform. provide adequate current. Use at an environment temperature within designated operating conditions. (Section 2.1)

Case II The Hoist runs and able to descend but unable to ascend or ascend but pumps.	
Possible cause	Solution
1. BISOLOAD is disconnected. 2. BISOLOAD is activated due to overloading 3. Insufficient voltage. 4. Power cable is too long or too small.	1. Connect BISOLOAD properly. 2. Check Overload indicator lamp and unload from the platform. 3. Check Voltage meter if sufficient voltage is supplied. (Section 2.1) 4. Replace power cable to shorter or thicker one.

Case III Motor runs normally but wire rope is not winded.	
Possible cause	Solution
1. Poor bullet.	1. Retouch rope end as instructed. (Section 7.2)
2. Wire rope is kinked or deformed.	2. Stop operating and replace wire rope immediately.
3. Dirt or other material is obstructing inside or rope exit of the Hoist.	3. Clean out rope exit.

Case IV The Hoist reeves wire rope but the platform is not lifted.	
Possible cause	Solution
1. Improper wire rope is used.	1. Replace with designated wire rope. (Section 2.4)
2. Defective wire rope (worn out, broken wire, deformation, etc.)	2. Replace with normal wire rope.

Case V Lifting speed is too slow.	
Possible cause	Solution
1. Low input power supply voltage.	1. Replace power cable with proper one or supply sufficient voltage. (Section 2.1)
2. Defective wire rope (worn out, broken wire, deformation, etc.)	2. Replace with normal wire rope.

Case VI Unusual noises come from the Hoist.	
Possible cause	Solution
1. Insufficient oil in Gear box.	1-4. Replace the Hoist.
2. Damaged or broken gears.	
3. Contamination inside the Hoist or the devices.	
4. Defect inside the Hoist or the devices.	5. Check and tighten each bolt and nut.
5. Loosened bolts and nuts.	6. Replace with designated wire rope. (Section 2.4)
6. Improper wire rope is used.	

Case VII BISOMAC becomes very hot.	
Possible cause	Solution
1. Voltage is too high. 2. Insufficient ventilation for Motor. 3. Heavily used. 4. Excessive load to the Hoist.	1. Supply rated voltage +/-10 %. (Section 2.1) 2. Improve ventilation. 3. Keep rated operating time. (Section 6) 4. Check if the weight of the platform and applied loads are appropriate to the Hoist. If necessary, reduce the load.

Case VIII The Hoist ascends with UP button but cannot descend with DOWN button.	
Possible cause	Solution
1. BISOLOCK is disconnected. 2. BISOLOCK is activated.	1. Connect BISOLOCK properly. 2. Reset BISOLOCK. <How to reset> (1) Operate UP travel approx. 2 in (5 cm). (2) Pull down Release Lever. (3) Reset completed. *DO NOT forcibly reset BISOLOCK. Pin inside Release Lever may be broken and become unable to reset.

Case IX The wire rope cannot be inserted	
Possible cause	Solution
1. BISOLOCK is not deactivated. 2. Dust is accumulated in BISOLOCK. 3. The tip of the wire rope is deformed. 4. Improper fusion cutting of wire rope end. 5. Wire rope is not suitable.	1. Push down the BISOLOCK release lever to deactivate it. * When BISOLOCK DL is installed, push down the slack detection lever of the BISOLOCK to release it. (Refer to Section 6.2) 2. Replace with normal BISOLOCK. 3 - 5 Use a suitable wire rope for BISOLOCK. (Refer to Section 2.4 and 7.2)

Case X BISOLOCK operates unintentionally.	
Possible cause	Solution
1. Malfunction due to vibration, etc. 2. Damage to internal components of BISOLOCK. 3. Wire rope is kinked or deformed. 4. Diameter of wire rope is too thick.	1. Check if there are any safety problems, and release it if there are no problems. (Refer to Section 6.2) 2. Replace with normal BISOLOCK. 3. Stop the operation immediately and replace with normal wire rope. 4. Check the diameter of wire rope (7.2) and replace with appropriate wire rope.

Revision history

Revision 1: November 20, 2006

1. Added parts and labels
2. Corrected errors

Revision 3: February 6, 2008

1. P.19 3.3 Added WARNING
2. P.38 9. Case II Added condition
3. Added BISOLOCK Mounting Bracket
4. Reviewed whole structure

Revision 4: April 14, 2008

1. Revision due to the improvement of Electromagnetic Brake

Revision 7: August 30, 2013

1. Adopted the revision no. of Japanese ver. to English ver.
2. Added labels

Revision 8: January 14, 2014

1. Deleted use environment

Revision 9: June 9, 2014

1. Added label of safety device connection and changed label of power cable
2. Added WARNING to P.5
3. Added inspection procedure with remote control pendant switch to 7.3

Revision 10: March 18, 2016

1. Revision due to the addition of ver.2
2. Standardized the notation of CAUTION and WARNING
3. Revised attachment
4. Added Caution to installation

Revision 11: February 24, 2017

1. Revision due to the addition of 210-0750, 210-1500, 210-1000U, 210-1258U and 210-1508U
2. Revision due to the change of drawing of label location
3. Added and reviewed CAUTION and WARNING
4. Standardized

Revision 12: January 26, 2018

1. Added explanation on noise level

Revision 13: June 4, 2018

1. Added precaution
2. Added minimum working load
3. Added WARNING about remote control pendant switch

Revision 14: January 11, 2019

1. Revised precaution

Revision 15: November 30, 2020

1. Corrected errors
2. Added restriction
3. Added Emergency Controlled Descent Lever, BISOLOCK and BISOLOAD to the safety devices
4. Added use environment
5. Revised structure of sentences

Revision 16: October 15, 2021

1. Corrected errors
2. Changed page numbers
3. Standardized: 1250 lbs = 566 kg
4. Changed model name from "0750" to "750"
5. Standardized naming of wire rope (Japanese version only)
6. Standardized representation of the unit
7. Added replacement criteria of wire rope

Revision 17: February 9, 2023

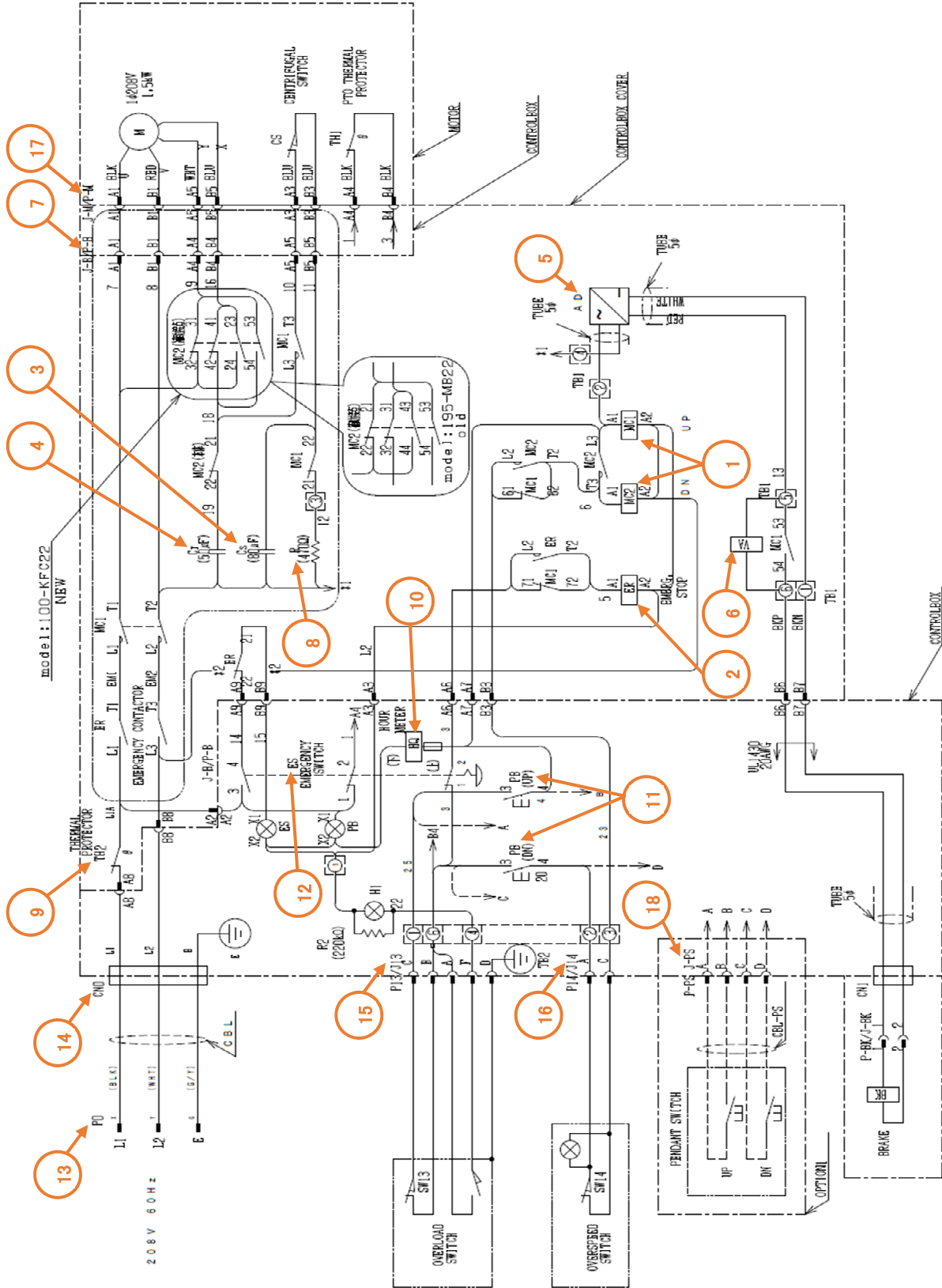
1. Corrected errors
2. Change of some expressions
3. Added Storage procedure
4. Added Warranty exemption conditions
5. Added label of BISOLOCK
6. Added BISOLOCK-DL
7. Changed Photo-2
8. Addition to troubleshooting

Attachment: Electric diagram and description of electrical components

[Version I.I]

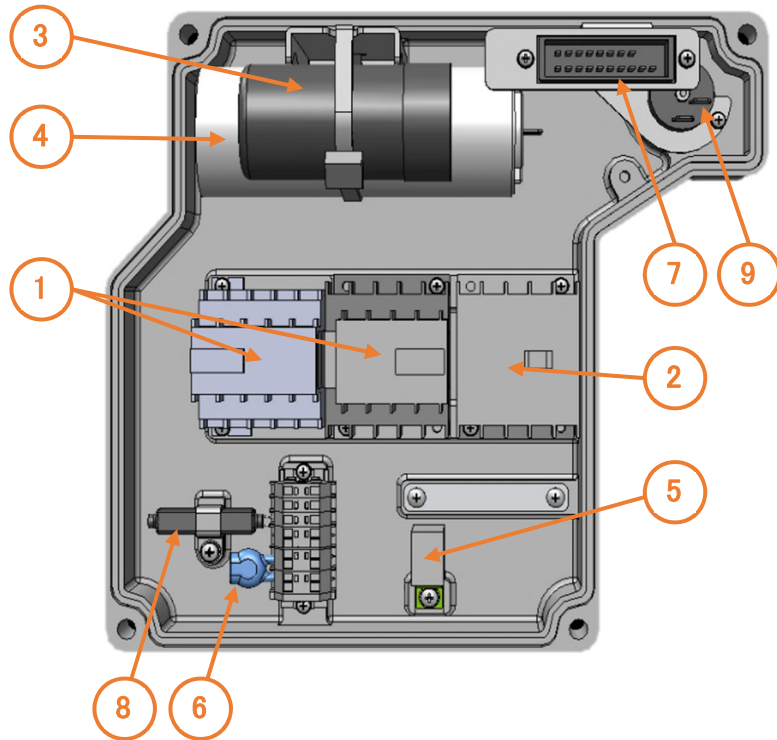
Applicable models: BISOMAC210-750 / BISOMAC210-1000 / BISOMAC210-1500

BISOMAC210-1000U / BISOMAC210-1508U

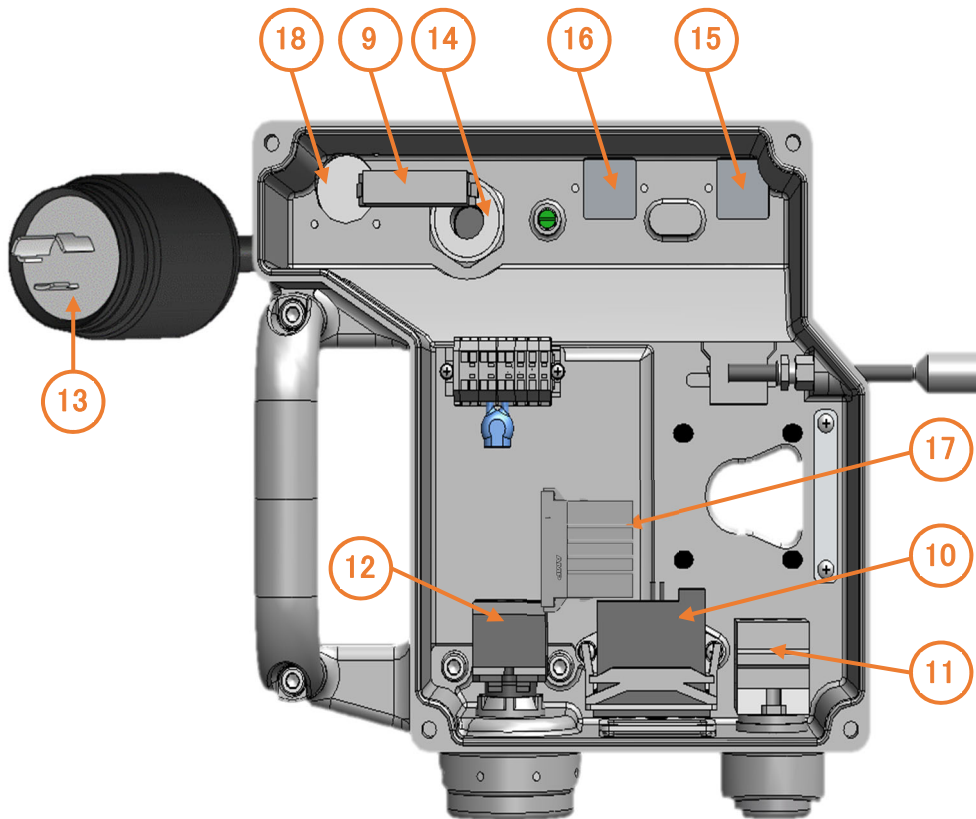


Control Box and Control Box Cover

[1P Control Box Cover]



[1P Control Box]



[1P Control Box Cover]

No.	Tag	Description	Function
1	MC1 & MC2	Electromagnetic contactor for UP/DOWN operation	Turn ON/OFF power supply to the motor.
2	ER	Electromagnetic contactor for emergency stop	Cut off main power supply.
3	Cs	Starting condenser	Supply starting torque to the motor.
4	Cr	Running condenser	Supply running torque to the motor. Control descent speed when primary brake manually released.
5	AD	Rectifier	Supply power to electromagnetic brake.
6	VA	Varistor	Prevent damage to contacts due to surge voltage
7	P-B/J-B	Connector between Control Box and Control Box Cover	Connect Control Box and Control Box Cover.
8	R	Discharge resistor	Prevent damage to contacts due to surge voltage
9	TH2	Thermal relay (overcurrent detection)	Detect overcurrent and cut off power.

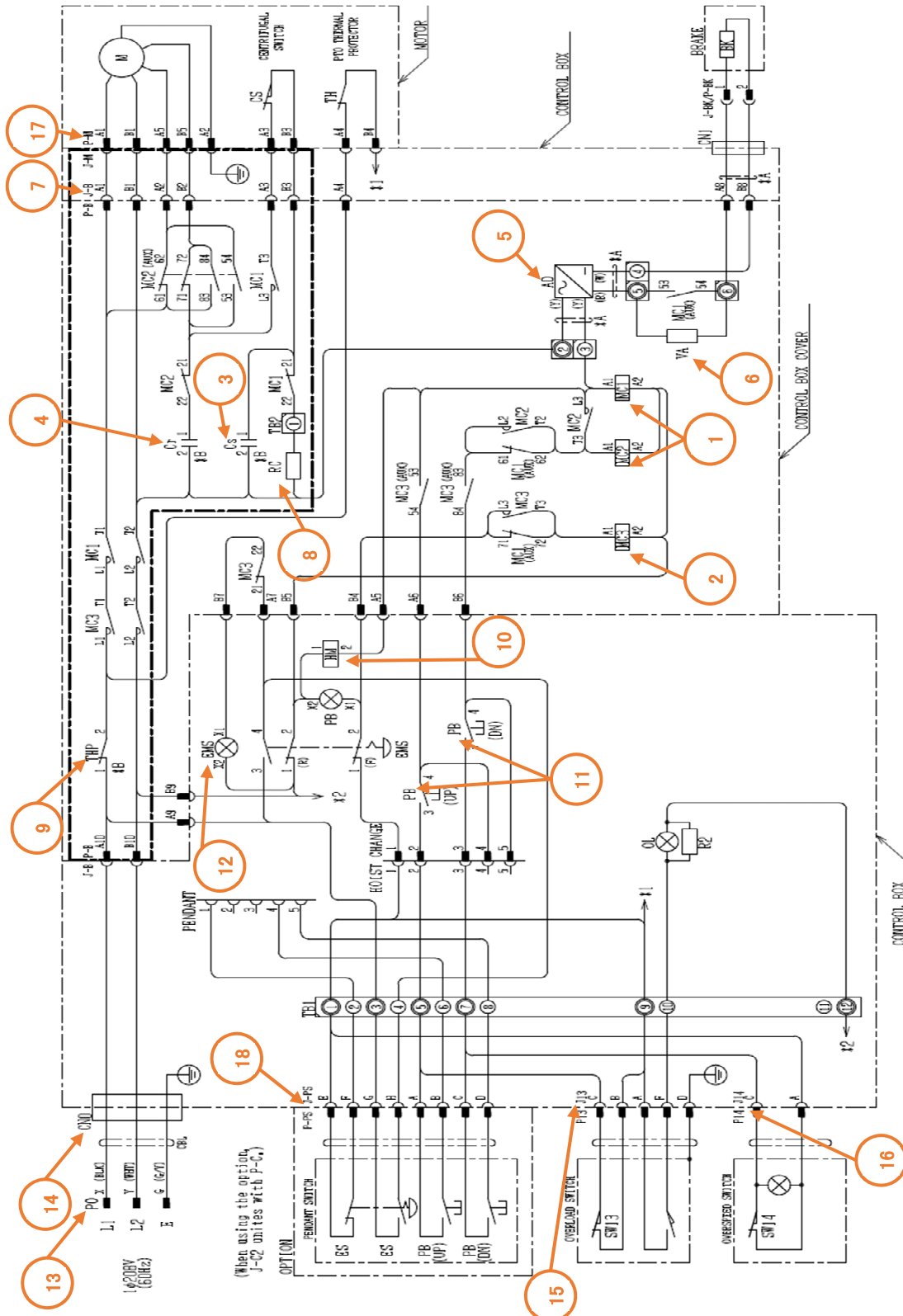
[1P Control Box]

No.	Tag	Description	Function
10	HQ	Hour meter	Display accumulated operation hours.
11	PB	UP/DOWN switch	Control Electromagnetic contactors and Electromagnetic brake.
12	ES	Emergency stop switch	Cut off power to control circuit.
13	P0	Main power plug	Connect power plug to power source.
14	CN0	Cable gland for power cable	Fix power cable.
15	J13	Socket for BISOLOAD	Connect interlock.
16	J14	Socket for BISOLOCK	Connect interlock.
17	J-M/P-M	Motor connector	Connect motor to Control Box.
18	J-PS	Socket for pendant switch (optional)	Connect optional remote control pendant switch.

[Version II]

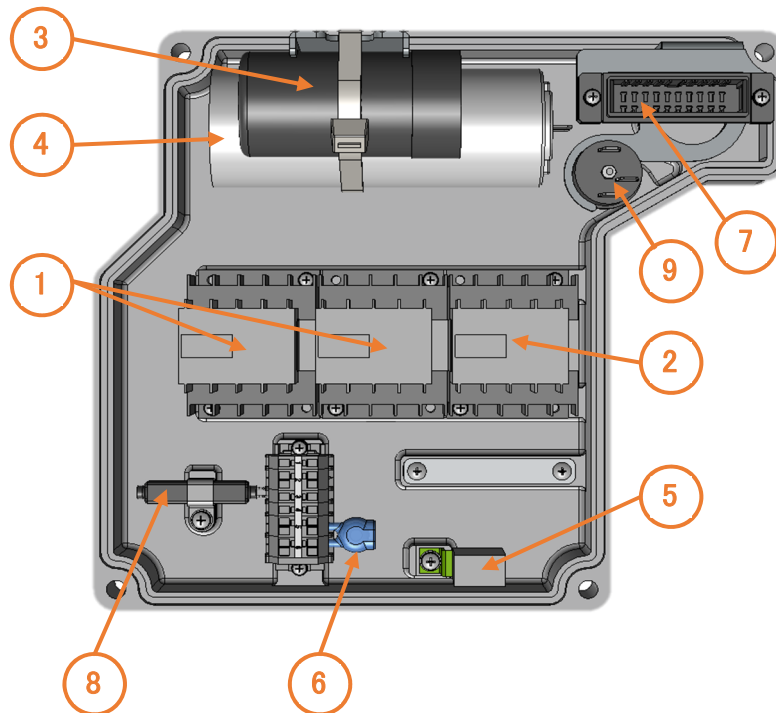
Applicable models: BISOMAC210-750 / BISOMAC210-1000 / BISOMAC210-1500

BISOMAC210-1000U / BISOMAC210-1508U

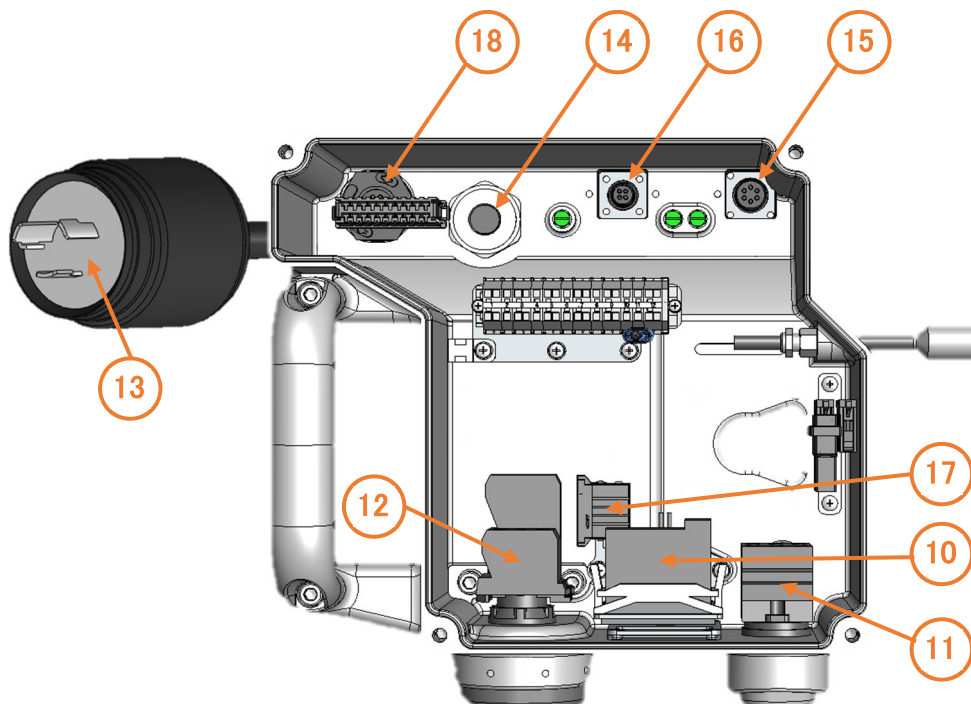


Control Box and Control Box Cover

[1P Control Box Cover]



[1P Control Box]



[1P Control Box Cover]

No.	Tag	Description	Function
1	MC1 & MC2	Electromagnetic contactor for UP/DOWN operation	Turn ON/OFF power supply to the motor.
2	MC-3	Electromagnetic contactor for emergency stop	Cut off main power supply.
3	Cs	Starting condenser	Supply starting torque to the motor.
4	Cr AD	Running condenser Rectifier	Supply running torque to the motor. Control descent speed when primary brake manually released. Supply power to electromagnetic brake.
5	VA	Varistor	Prevent damage to contacts due to surge voltage
6	P-B/J-B	Connector between Control Box and Control Box Cover	Connect Control Box and Control Box Cover.
7	MC1 & MC2	Electromagnetic contactor for UP/DOWN operation	Turn ON/OFF power supply to the motor.
8	RC	Discharge resistor	Prevent damage to contacts due to surge voltage
9	THP	Thermal relay (overcurrent detection)	Detect overcurrent and cut off power.

[1P Control Box]

No.	Tag	Description	Function
10	HQ	Hour meter	Display accumulated operation hours.
11	PB	UP/DOWN switch	Control Electromagnetic contactors and Electromagnetic brake.
12	EMS	Emergency stop switch	Cut off power to control circuit.
13	P0	Main power plug	Connect power plug to power source.
14	CN0	Cable gland for power cable	Fix power cable.
15	J13	Socket for BISOLOAD	Connect interlock.
16	J14	Socket for BISOLOCK	Connect interlock.
17	J-M/P-M	Motor connector	Connect motor to Control Box.
18	J-PS	Socket for pendant switch (optional)	Connect optional remote control pendant switch.

BISOMAC210 Specifications for North America 1P model
Electric Traction Hoist
Operator's Manual
[with Overload Detection Device]

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