MIKI PULLEY

ELECTROMAGNETIC CLUTCH & BRAKE
SPRING－ACTUATED BRAKE
BXR LE
Instruction Manual

☆This instruction manual describes mainly installation, removal, and notes pertaining to same for standard-specification products after purchase; see the Miki Pulley website and our latest catalog for product specifications and performance.

☆Before use this product, read the instruction manual carefully and use the product safely and correctly.

☆First, please check that it is the correct product and if the product was damaged during transportation.

CONTENTS

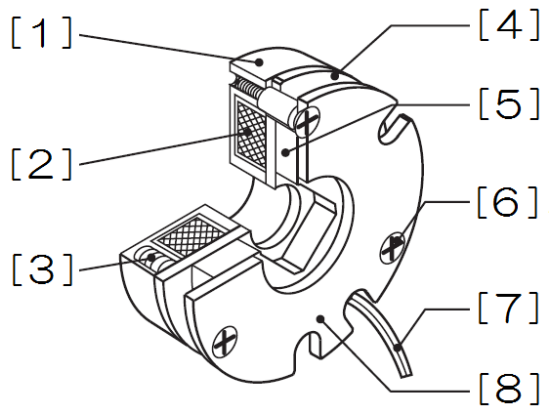
1. STRUCTURE AND PARTS

Note

This product is used for holding only. Do not use for braking.

Note

The rotor hub used to couple the shaft and rotor can either be provided by the customer or selected from the optional products.



[1]Stator [2]Coil [3]Torque spring [4]Armature [5]Rotor [6]Flat head bolt [7]Lead wires [8]Plate

2. NOTES

2. 1 SAFETY PRECAUTIONS

Please read carefully through the instruction manual and the technical information for proper use and safety.
In this manual, safety precautions are classified by "DANGER" and "CAUTION".

【CLASS】

DANGER	When death or serious injury may result by mishandling.
CAUTION	When disability or only physical damage may result by mishandling.

【FIGURE SIGN】

PROHIBITION	In the handling of the product, it indicates that prohibit the act.
CAUTION	In the handling of the product, it indicates that attention is required.
MANDATORY	In the handling of the product, it indicates that the action is compulsory on the basis of the instructions.

DANGER

Make sure that the main power of the product is off before mounting or performing maintenance/inspection.	**Set up a safety mechanism such as a safety brake to avoid any danger.**
It is extremely dangerous if the driving part starts operating by accident while handling the product.	The driven and driving sides could become completely detached if the product is damaged while in operation and not immediately halted.
Do not use in flammable environments.	**Be sure to use a safety cover.**
There is a danger of explosion due to sparks from machinery or the product in operation. In particular, explosion can occur easily in environments with oil/grease or flammable gas.	It is extremely dangerous if hands, fingers, hair, clothing, etc. get caught in the product or a rotating part while in operation.

CAUTION

Do not touch the hot brake body or power supply.	**Always use bolts specified by Miki Pulley and a calibrated torque wrench correctly to install brakes at the specified tightening torque.**
Hot while in operation; will result in burn injuries if touched. Warm surroundings will prevent brake body heat from dissipating; locate in a well-ventilated area.	Depending on the tightening adjustment of bolts or screws, exceptionally dangerous situations such as product damage or performance degradation could occur.
Be careful lifting a heavy weight. Do not lift with a bad posture.	**Use a safety glasses or gloves.**
Straining yourself to lift a heavy product or using a torque wrench, or an awkward posture when installing the product in a machine could cause back injury.	Sharp portions of product bore diameter, keyway, shaft keyway, etc. may cause injury. Wear protective equipment to also prevent burn injuries and electric shock.

2. 2 IMPORTANT POINTS OF PRODUCT SPECIFICATIONS

	Do not use the product in a bad environment. **Product is for dry use; do not allow exposure to water or oil/grease.**		**Request disposal with a waste-collection company, or dispose of according to laws and regulations.**
	Operating temperature range： －10～+40℃ for brakes, －20～+60℃ for controllers Do not use the product in an environment where water, oil, or chemicals may spill (no matter how little), that is corrosive, where temperature is extremely high or low, that is dusty, where condensation forms, that is exposed to wind and rain, or that is subject to a high degree of vibration/impact; may cause product damage or performance deterioration.		When disposing of the product, request disposal with professionals, or dispose of according to law and local regulations if disposing of product by yourself. Do not dispose of or leave unattended where children play or in a public space.
	Comes as a finished product. Do not disassemble, modify, or additionally process the product.		**This product is used for holding only. Do not use for braking.**
	We do not guarantee quality nor shall we be liable for damages in the event of damage or affected performance of the product or of injury or accident occurring as a result of the product being disassembled, modified, or additionally processed by the customer.		This product releases when the coil is energized; use after checking the intended application or purpose of use.

2. 3 IMPORTANT POINTS BEFORE MOUNTING

	Do not carry with the lead wire dangling. **Do not pull or bend the lead wire forcefully.**		**Shaft tolerance depends on the type of rotor hub. Remove oil, dirt, dust, etc. from the shaft.**
	May break wire, and render the product unusable. If lead wire breaks or slips from your hand, the product may fall on and injure your foot.		Refer to the finished tolerance for the installation shaft given in this instruction manual. This will affect the accuracy of the brake attachment surface.
	Do not use any bolt or screw other than the bolts on the product.		**The product is designed to be used together with a dedicated controller. Be sure to check the wiring connection.**
	Check the strength category of the bolt or screw as well as the strength and material of where the brake is being installed. Inadequate strength will result in the product being poorly installed and may cause an accident.		Using the brake connected by the lead wire to a dedicated controller has benefits such as improved responsiveness and reduced power consumption.
	Do not connect a circuit protector (varistor).		**Make sure to keep fluctuations in power supply voltage to within ±10% of the rated voltage.**
	Circuit protectors should not be connected as they are built into the dedicated controllers.		Extreme fluctuations in power voltage may prevent the brake from reaching optimal performance. If input voltage falls to DC 21 V or lower, output voltage is cut off.

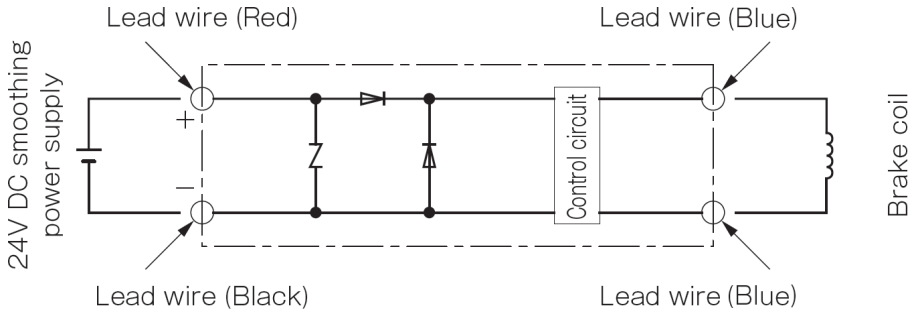
⚠	**Affix the rotor hub so that it does not come in contact with the armature or stator. Do not insert the rotor hub forcefully.**	⚠	**Implement screw-locking measures such as an adhesive thread-locking compound to bolts and screws used to install brakes.**
	Operation with the components in contact or forcefully inserting the rotor hub may damage the brake.		Loosening of the bolts or screws due to operational vibration, etc. may allow the product to detach and cause an accident.

3. SPECIFICATION, STRUCTURE, DIMENSIONS (CONTROLLER)

3. 1 SPECIFICATION

Model	BEM-24ESN7-120N	
Input voltage	24 V DC ± 10%	
Overexcitation voltage	24 V DC ± 10% smoothing power supply	
Overexcitation time	200 msec ±10%	
Normal excitation voltage	7 V DC (± 10%), PWM control	
Max. output current	1.0 A DC (ambient temp.: 20°C), 0.8 A DC (ambient temp.: 60°C)	
Time rating	Continuous	
Protection function	None	
Insulating resistance	500 V DC, 100 MΩ with Megger	input/output - between terminal and case
Dielectric strength voltage	1000 V AC, 50/60 Hz, 1 min.	
Ambient environment	−20 to +60° C, 5 to 95% RH, no condensation/freezing	
Vibration	Less than 29.4m/s^2	
Mass	About 30 g	

3. 2 STRUCTURE

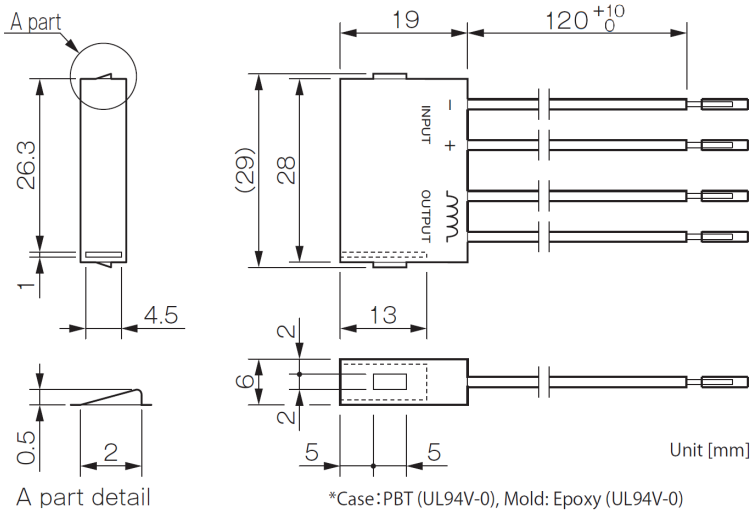


【DESCRIPTION FOR COLOR OF LEAD WIRE】

Lead wire	Function	Description	Specification
Red	Input(＋)	Connects the 24 V DC smoothing power supply (+)	UL3398 AWG26
Black	Input(－)	Connects the 24 V DC smoothing power supply (-)	
Blue (Two wires)	Output	Connects the spring-actuated brake (either pole)	

Note
Circuit protectors (varistor) should not be connected as they are built into the dedicated controllers.

3. 3 DIMENSIONS

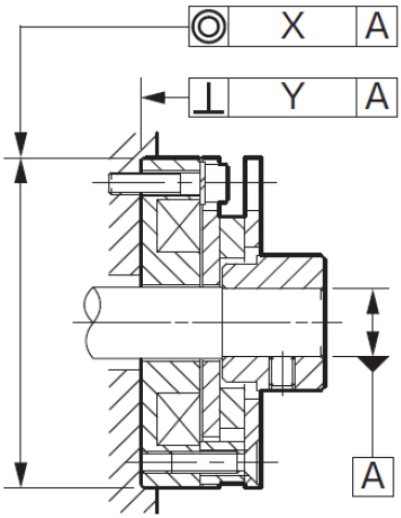


4. MOUNTING (BRAKE)

4. 1 ACCURACY OF BRAKE ATTACHMENT SURFACES

Make sure that the centering mark and shaft concentricity (X) and the shaft perpendicularity (Y) relative to the brake mounting surface do not exceed the allowable values in the table below.

A “spigot joint for positioning (fitting tolerance h9, spigot joint depth 5 mm)” is located on the outer diameter of the stator to use for center alignment.



【ACCURACY OF BRAKE ATTACHMENT SURFACES】

※Accuracy value is indicated by T.I.R.

(Total Indicator Reading = difference in minimum and maximum runout values)

SIZE	Concentricity (X) T.I.R. [mm]	Perpendicularity (Y) T.I.R. [mm]
015	**0.05**	**0.02**
020	**0.05**	**0.02**
025	**0.05**	**0.02**
035	**0.05**	**0.02**
040	**0.10**	**0.02**
050	**0.10**	**0.02**

Note

Finished tolerance of the shaft should be “h7 class” where the rotor hub is set screw type (C) , and “r6 class” where it is press fit type (P).

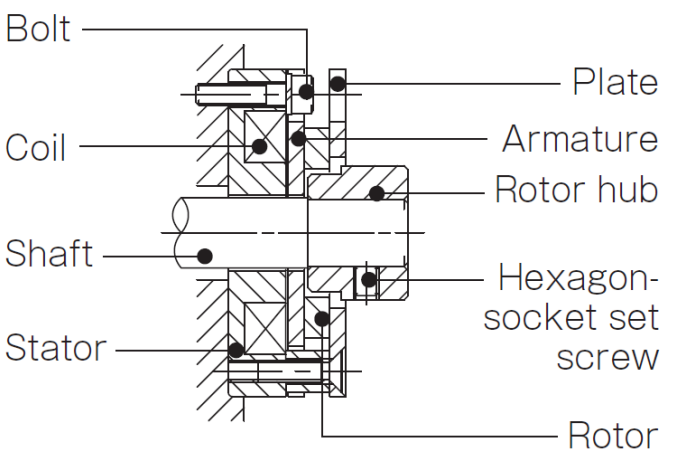
4. 2 MOUNTING

(1)

Affix the brake on the installation surface within the installation accuracy values above.

The brake can be affixed temporarily; it will be secured in place with a torque wrench at the end of the installation.

Refer to【INSTALLATION BOLT SPECIFICATIONS AND TIGHTENING TORQUES】for bolt specifications.



(2)

Affix the rotor hub on the shaft. Position the rotor hub so that it does not come in contact with the armature.
For rotor hub (set screw type (C)), affix it with hexagon socket set screws so that it does not move in the axial direction.

(3)

Insert the rotor hub in the square hole in the rotor. Do not insert into the rotor forcefully.
Installation can be made easier by pre-aligning the square hole in the rotor with the center of the inner diameter of the plate, or by installing with the brake energized and released.

Note

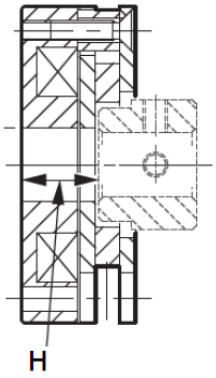
Applying excessive force when inserting to the rotor hub will crack the rotor and render the brake no longer able to work.

(4)

Check the distance from the extreme surface of the rotor hub to the installation surface of the brake with【RECOMMENDED ROTOR HUB INSTALLATION LOCATION DIMENSIONS】(dimension H in catalog).

【RECOMMENDED ROTOR HUB INSTALLATION LOCATION DIMENSIONS】

SIZE	H [mm]
015	9.5 ～ 10.0
020	9.5 ～ 10.0
025	9.5 ～ 10.0
035	9.5 ～ 10.0
040	9.9 ～ 10.4
050	14.0 ～ 14.4



(5)

Affix the brake by tightening the bolts evenly to the tightening torque values in【INSTALLATION BOLT SPECIFICATIONS AND TIGHTENING TORQUES】using a calibrated torque wrench correctly.
Also implement screw-locking measures such as an adhesive thread-locking compound at the same time. Never allow adhesive, etc. to adhere anywhere other than the bolts. Adhesive adhering to the brake may inhibit brake operation.

【INSTALLATION BOLT SPECIFICATIONS AND TIGHTENING TORQUES】

※Bolts should be hexagon socket head cap screws, using 3 bolts, with a strength category of 10.9.

※Select the bolt length according to your design specifications.

SIZE	Nominal size	Tightening torque [N ・ m]
015	M2	0.36
020	M2	0.36
025	M2.5	0.78
035	M2.5	0.78
040	M3	1.44
050	M4	3.40

5. CONNECTION

5. 1 CONTROLLER

The product is designed to be used together with a dedicated controller. Connect the lead wire with a crimp terminal, etc.

However, when extending the lead wire, ensure that both the INPUT and OUTPUT lengths are 1000 mm or less.

The product is comprised of electronic components; in particular, check again that the environment is free of strong magnetic fields, high-level of noise, and high temperatures.

Make sure to keep fluctuations in voltage supplied to the controller to with ±10%.

Note

If input voltage falls to DC 21 V or lower, output voltage is cut off.

5. 2 SWITCHING

The control function is operated by the ON/OFF switch on the input side.

Be sure to set switching to the primary side (INPUT side) of the dedicated controller. Switching will not work normally on the secondary side.

Set the minimum energization time to the primary control (INPUT side) to at least 1.0 second. Also, set the OFF time after energization to at least 1.0 second.

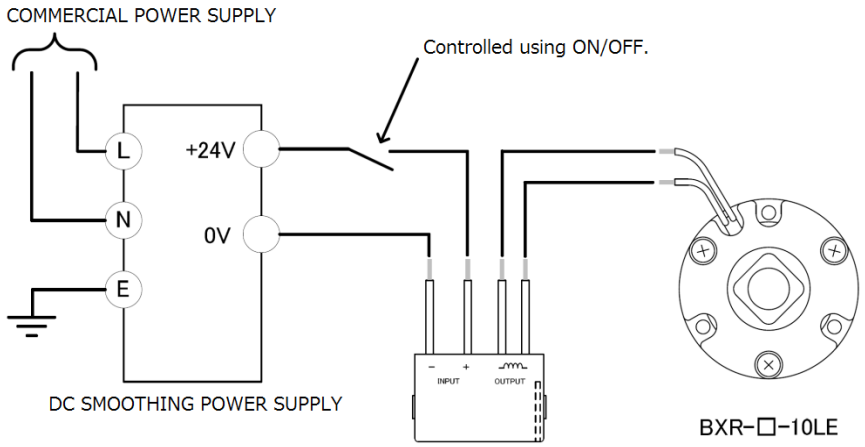
Note

Repeated energization at less than 1.0 second may prevent the brake and controller from operating properly.

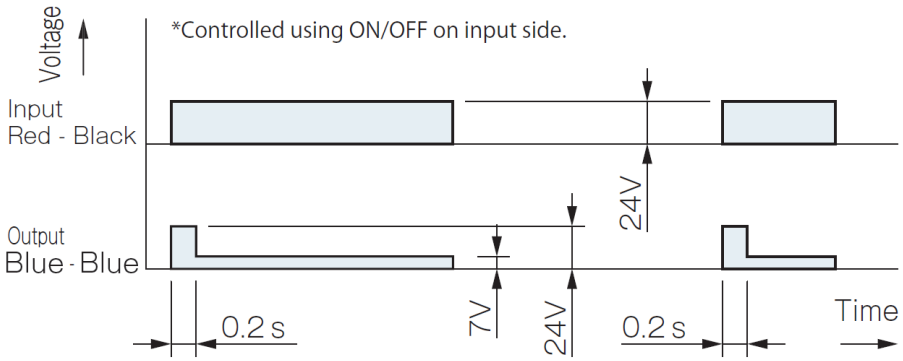
5. 3 CIRCUIT PROTECTORS(VARISTOR)

Circuit protectors should not be connected as they are built into the dedicated controllers（BEM-24ESN7-120N）.

■WIRING



■TIMING CHART



6. OPERATION CHECK

6. 1 BRAKE OPERATION CHECK

After completing installation and wiring, first operate the brake without transmitting power to check that it operates normally.
If operation is normal, engage the brake with the driving side. Use caution, as fingers can be caught with only the operation of the brake.

6. 2 TEST RUN

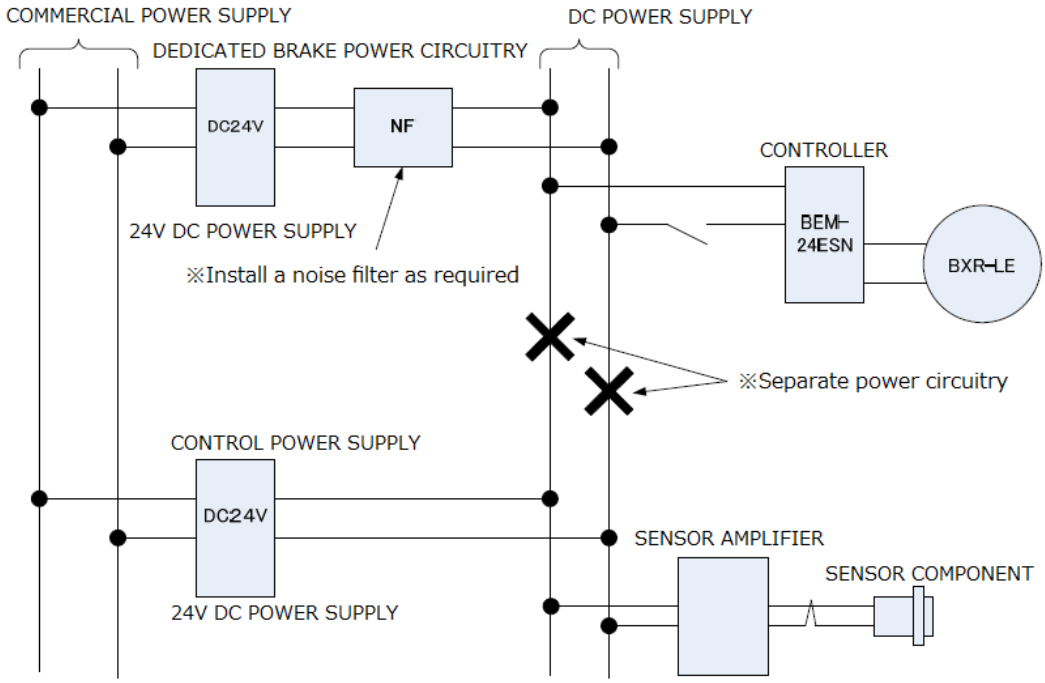
Test run the brake. If abnormal noise or vibration is generated, stop the brake immediately and remedy the cause.
Also check that the brake is running “below the allowable braking energy rate” and “below the maximum rotation speed”.

■Steps if a proximity switch, opto-electronic switch, etc. misoperates

◇Separate the power circuitry for the sensor and for the brake.

◇Use shielded twisted pair wire for sensor signal wiring, and connect the shield to the signal common.

◇Avoid using parallel wiring or a shared raceway for the sensor signal wire (incl. power supply wire) and spring-actuated brake wiring.



7. MAINTENANCE & INSPECTION

Although the product requires almost no maintenance during its life when used under normal operating conditions, periodically inspection will allow longer and better performance of its function.
Also be sure to carry out routine maintenance and inspection according to any items specified separately for the machinery or apparatus with which the brake is combined.

Periodic check points:

① Normal on-off operation
② Abnormal noise generation
③ Abnormal heat generation
④ Friction parts and revolving parts for entering or sticking of foreign objects, water, oil, grease.
⑤ Widening of friction part clearance
⑥ Large amounts of rust
⑦ Proper supply of exciting voltage
⑧ Broken lead wire or poor connection
⑨ Operating temperature range

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http://www.mikipulley.co.jp/

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Please contact us using the inquiry form and be aware that support for inquiries received on Saturdays, Sundays, holidays, New Year's, and summer business holidays will be provided on the next business day.

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