Sumitomo Drive Technologies

ASTERO® Brake Pack Maintenance Manual

■The gear head and motor should be handled, installed and maintained by trained technicians. Carefully read this manual and all accompanying documents before use.
■A copy of this manual should be sent to the actual user of the gear unit.
■This manual should be maintained by the user.

1. Safety and other precautions

⚠CAUTION

General
- The gear head and motor should be operated only within its name plate and catalogue ; otherwise, electric shock, injury or damage to a system may occur.
- Keep hands and all foreign objects from the internal moving part of the gear unit and motor; otherwise, electric shock, injury, fire or damage to a system may occur.
- Damaged units should be taken off-line; otherwise, injury or fire may occur.
- Do not remove the nameplate.
- Any modifications or alterations of any kind, to the unit, will void the warranty and all subsequent claims.

Transport
- Exercise ample care not to drop the unit and fall during transport.

Installation
- Do not place any inflammables around the gear head and motor; otherwise, fire may result.
- Do not place any objects that will hinder ventilation around motor; otherwise, cooling effect is reduced, and may lead to a possible fire hazard and a burn due to excessive heat built-up.
- Do not touch the key way at the shaft end or on the inside of the dear unit and motor; otherwise, injury may result.
- When the unit is used in food processing applications vulnerable to oil contamination, install an oil pan or other such device to cope with rare oil leaking. Otherwise, oil leakage may damage products.

Coupling with other machines
- Install appropriate guard devices around rotation parts ; otherwise, injury may result.
- Confirm the direction of rotation before coupling the unit with its driven machine. Difference in the direction of rotation may cause injury or damage to the system.

Wiring
- Do not touch lead wire when measuring the insulation resistance. Electric shock may result.

Daily inspection and maintenance
- Clean this product regularly. Instead of using water, detergent, or solvents for cleaning, use a brush and wipe it with a dry cloth. Also, ensure that there are no obstacles or things that may be affect-ed in the surrounding area during cleaning.

⚠ DANGER

Wiring
- Connect a power cable to the motor according to the connection diagram or maintenance manual; otherwise, electric shock or fire may result.(Without terminal box, exercise insulation in the connecting part.)
- Do not forcibly curve, pull or clamp the power cable and lead wires; otherwise, electric shock may result.
- Correctly ground the grounding bolt; otherwise, electric shock may result. Use a crimp terminal for the grounding wire. Direct connection of a bare conductor is not permitted.
- Use power source stated in the nameplate; otherwise, motor's burning or fire may result.

Operation
- Never approach or touch any rotating parts (shaft, etc.) during operation; otherwise, loose clothing caught in these rotation parts may result in severe injury.
- When the power supply is interrupted, be sure to turn off the power switch. Unexpected resumption of power may cause injury or damage to the equipment.

Daily inspection and maintenance
- Never approach or touch any rotating parts (shaft, etc.) during maintenance ; otherwise, loose clothing caught in these rotating parts may result in severe injury.

Inspection upon delivery
- Verify that the unit received is in fact the one ordered. When a different product is installed, injury or damage to the system may result.

2. Brake pack characteristics

Sumitomo's brake packs are non contact types that can instantly stop induction motors or reversible motors by electronic braking. The motor alone can be stopped in less than about 0.1 second. A braking current is applied to the motor for about 0.4 second, then the motor's input power supply is automatically shut off. Unlike electromagnetic brakes, brake packs don't store torque. Since they have no parts to generate mechanical friction, they have long lives. To control a motor using brake packs, a DC power supply for the signal is required (12~24VDC, 0.1A or larger).

3. Standard specifications

Item	BASA,BASAB	BASC,BASCB	BASD,BASDB	BAMC
Rated Voltage Frequency	Single-phase			Three-phase
	AC100V 50/60Hz,AC110V 60Hz	AC200V 50/60Hz,AC220V 60Hz	AC220V-240V 50Hz	AC200V/220V 50/60HZ
Range of Voltage	±10%			
Input signals	Non Contact Type(Photocoupler input)			Contact Type
	DC12V-DC24V(±10%)			
	CW,CCW,FREE			
Ambient temperature	-10°C-+40°C			
Ambient humidity	Under 85%RH with no condensation			
Insulation resistance	At least 100MΩ when measured with a DC500V megger between the brake pack's power terminal and signal input terminal, at nomal temperature and humidity when the brake pack has reached its rated operation.			
Insulation with stand voltage	No malfunction when a 1500V, 50/60Hz current is applied between the brake pack's power terminal and signal input terminal for 1 minute at normal temperature and humidity when the brake pack has reached its rated operation.			

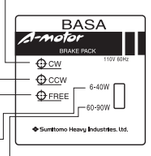
Note: When using FREE input, connect the open corrector of low leakage corrent.

4. Panel display and switches

BAMC doesn't need to turn the switch.

Input signal display

CW	Lights when CW signal is input.
CCW	Lights when CCW signal is input.
FREE	Lights when FREE signal is input.

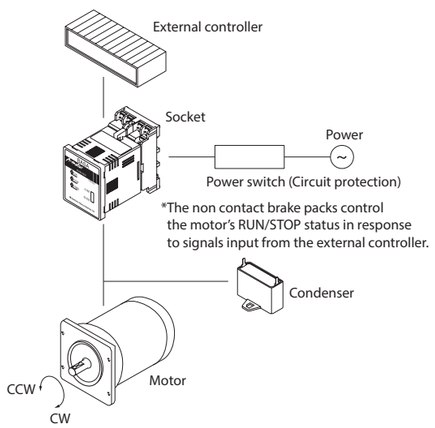


Motor output switches

6-40W 60-90W	Set to the 6-40W position when a 6, 15, 25 or 40W motor is connected.
6-40W 60-90W	Set to the 60-90W position when a 60 or 90W motor is connected.

The switch is set to the 60-90W position at shipment.

5. System configuration



Applicable Motors

Model	Power Supply / Type	Applicable Motor Types
BASA	Single-Phase 100V	Induction Motor, Reversible Motor 6-90W
BASC	Single-Phase 200V	
BASD	Single-Phase 220V-240V	
BASAB	Single-Phase 100V	Electromagnetic Brake Motor 6-90W
BASCB	Single-Phase 200V	
BASDB	Single-Phase 220V-240V	
BAMC	Three-Phase 200V/220V	Three-Phase Induction Motor 25-90W (External resistor required for 60W and 90W.)

■ Capacity of Protective Devices

When the motor is stopped instantaneously, a half-wave rectified current flows for approximately 0.2 to 0.4 seconds.
When connecting a protective device (circuit protection device) to the line carrying this brake current, select the capacity of the protective device by referring to the table below.

Unit[A]

Output	Single-Phase 100V 50Hz	Single-Phase 100V 60Hz	Single-Phase 200V 50Hz	Single-Phase 200V 60Hz	Single-Phase 220/240V 50Hz	Three-Phase 200/220V 50/60Hz
6W	1.2	1.2	0.5	0.4	0.6	-
15W	3.1	3.1	1.7	1.5	1.7	
25W	7.4	7.4	3.4	3.2	3.5	3.0
40W	12.2	12.2	5.4	4.2	6.6	
60W	14.2	11.6	8.1	6.2	8.4	
90W	17.4	16.4	10.4	8.0	10.6	

■ Motor Operating Cycle

Frequent operation of motor start/stop (instantaneous stop) will cause the temperature of the brake pack and motor to rise.
Ensure that the operating cycle is equal to or longer than the values shown. Also, use the motor with the surface temperature of the motor case kept at 90℃ or lower.

Output		Operating Cycle
Single-Phase	6-25W	2 s min.
	40-90W	4 s min.
Three-Phase	25-90W	5 s min.

* 2-second cycle: 1 s ON, 1 s OFF * 4-second cycle: 2 s ON, 2 s OFF

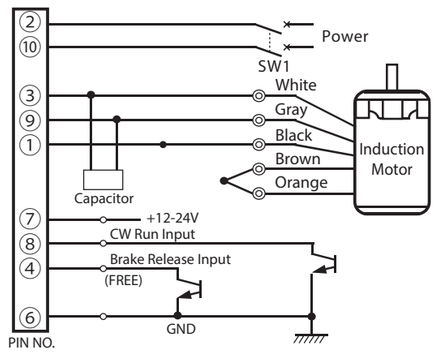
6. Wiring Diagram and Operating Instructions

Single-Phase Motor Brake Pack

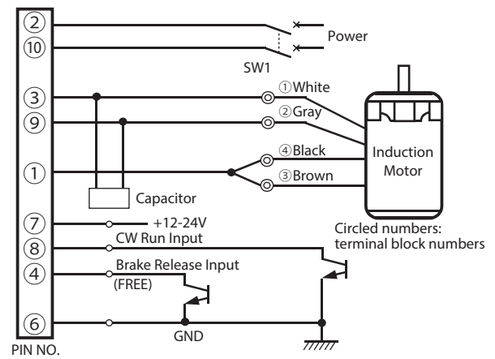
BASA (Single-Phase 100 V), BASC (Single-Phase 200 V)

Induction Motors (Excluding 220-240 V types)

◆ Lead Wire Type (15-90 W)

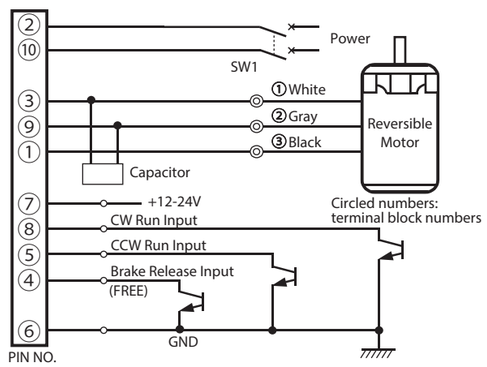


◆ Lead Wire Type (6 W) / Terminal Box Type (6-90 W)



Reversible Motors

◆ Lead Wire Type / Terminal Box Type (6-90 W)



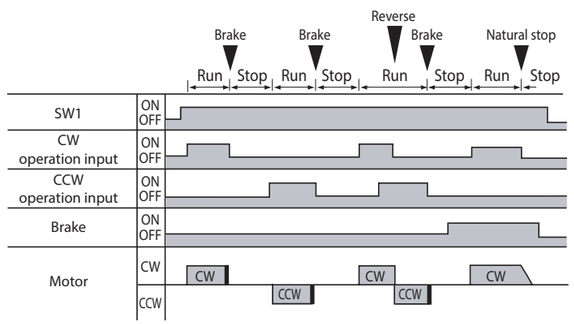
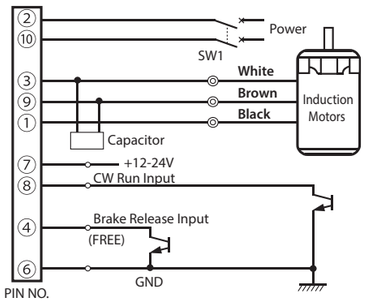


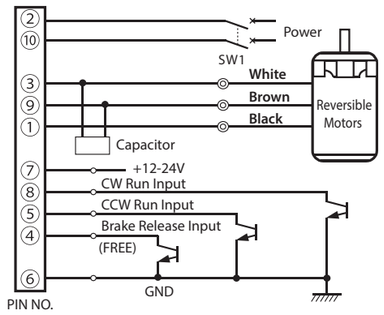
Fig.1 Example of running operation

BASD (Single-Phase 220-240 V)

Induction Motors (220-240 V Types)
◆ Lead Wire Type / Terminal Box Type (6-90 W)



Reversible Motors (220-240 V Types)
◆ Lead Wire Type / Terminal Box Type (6-90 W)



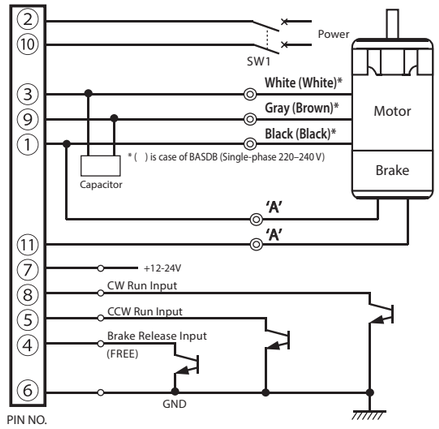
Operation of BASA, BASC, and BASD (Fig. 1)

- Clockwise (CW) operation input (induction motors)
  When the CW operation input is turned ON, the motor shaft rotates clockwise. When turned OFF, the motor stops instantly. Induction motors operate using the CW operation input. When connected as shown in the diagram, the motor operates in the clockwise direction. To operate the motor counterclockwise, switch the gray and brown motor lead wires (the white and brown wires for a 220 to 240V/50Hz motor).
- Counterclockwise (CCW) operation input (reversible motors)
  When the CCW operation input is turned ON, the motor shaft rotates counterclockwise. When turned OFF, the motor stops instantly.
  If the CW and CCW operation inputs are both turned ON at the same time, CW is given priority.
- Brake release input (induction motors, reversible motors)
  When the brake release input is turned ON, the electric brake won't operate. If the CW or CCW input is turned OFF in this condition, the motor stops naturally after losing its inertia. If the brake release input is turned OFF, the electric brake will operate. If the CW or CCW input is turned OFF in this condition, the motor stops instantly.

BASAB (Single-Phase 100 V), BASCB (Single-Phase 200 V),
BASDB (Single-Phase 220-240 V)

Electromagnetic Brake Motor

Electromagnetic Brake Motor



Voltage	Lead wire
	'A'
Single-phase100V-110V	Blue
Single-phase200V-240V	Orange

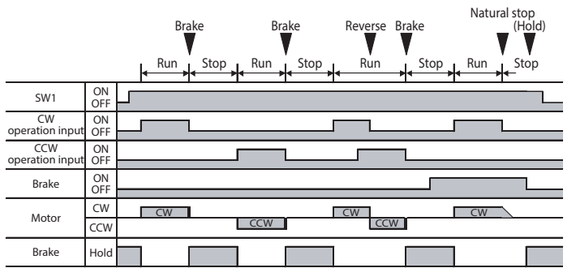


Fig.2 Example of running operation

Wiring Connection Cautions

1. Use the shortest possible wiring length when wiring the motor and brake pack, and brake pack and external controller.
2. Use 0.75 mm^2 or larger wires for motor and AC power wiring.
3. Don't bundle the motor wiring/AC power wiring (terminal Nos. 1, 2, 3, 9 and 10) with the signal wiring (terminal Nos. 4, 5, 6, 7 and 8). Install the two sets of wiring at least 10cm apart.
4. Don't solder anything to the brake pack's terminal pins directly.
5. Turn the power OFF before inserting the brake pack into the socket, insert the brake pack securely.
6. When using instant stop function, be sure to connect terminal No. 6 to the GND (negative) terminal of the external controller. Failure to do so may cause malfunction.
7. When using the brake release input, use a shielded wire for the lead to the brake release input (terminal No. 4), or take other measures to minimize the effect of noise.

Operation of BASAB, BASCB, and BASDB (Fig. 2)

1. Clockwise (CW) Run Input
Induction motors operate using the CW run input. When connected as shown in the diagram, the motor operates in the clockwise direction.
To operate the motor counterclockwise, switch the gray and brown motor lead wires (white and brown wires for 220 to 240 V 50/60Hz).

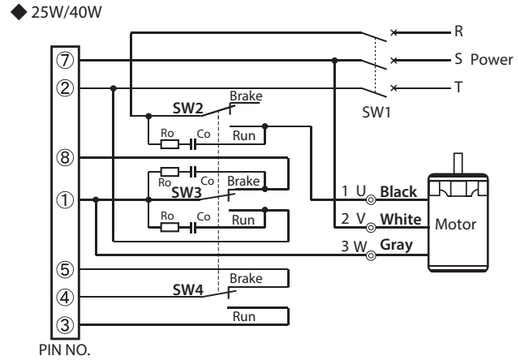
2. Counterclockwise (CCW) Run Input
When the CCW run input is turned ON, the motor shaft rotates counterclockwise. When turned OFF, the motor stops instantly.
If the CW and CCW run inputs are both turned ON at the same time, CW is given priority.

3. Brake Release Input
When the brake release input is turned ON, the electric brake and the electromagnetic brake do not operate.
If the CW or CCW input is turned OFF in this condition, the motor stops naturally due to inertia (and the motor shaft moves freely after stopping).
When the brake release input is turned OFF, the electric brake and the electromagnetic brake operate.
If the CW or CCW input is turned OFF in this condition, the motor stops instantly.
If the brake release input is turned OFF while the motor is stopped, only the electromagnetic brake operates, and the load is held.

Three-phase Motor Brake Pack

BAMC (Three-phase, 200/220 V)

Induction Motors
◆ 25W/40W

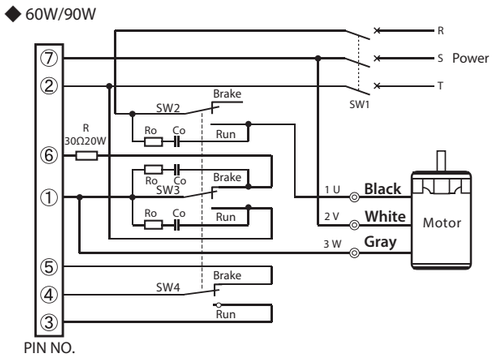


* When making the brake a short cycle of 5 sec or less, use wiring for 60W or 90W. (Using external resister for brake)

Switch No.	Capacity of switch	Remarks
SW1	AC250V 5A or more	
SW2	AC250V 7A or more	It must synchronize.
SW3	AC250V 7A or more	
SW4	DC20V 10mA	
R:External resister for brake	30Ω 20W	EABR30H20
CR circuit Ro,Co	Ro = 5-200Ω Co = 0.1-0.2μF for AC250V	EACR50

Note: CR circuit is for the surge voltage protection.

◆ 60W/90W



* Use external resister for brake(30Ω 20W).

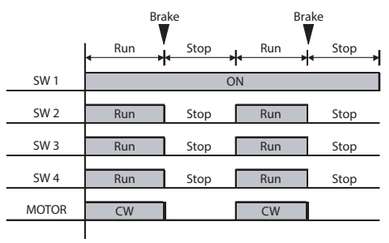


Fig.3 Example of running operation

Wiring Connection Cautions

1. Use 0.75 mm^2 or larger wires for motor and AC power wiring.
2. Don't solder anything to the brake pack's terminal pins directly.
3. Turn the power OFF before inserting the brake pack into the socket, insert the brake pack securely.

Operation of BAMC Operation (Fig. 3)

1. When switches SW2, SW3, and SW4 are set to "RUN," the motor starts rotating. When they are set to "BRAKE," the motor stops instantaneously.
2. Rotation Direction
   The wiring diagram shows clockwise (CW) rotation when viewed from the motor shaft. To change to counterclockwise (CCW), interchange the U and V phases. Do not switch the rotation direction within 0.5 seconds after braking.
3. Switch Ratings and Contact Protection
   Using relays with a narrow contact gap for switches SW2 and SW3 may cause circuit components to be damaged by arcing.
   Be sure to use power relays with a wide contact gap (contact rating: AC250V, 7A or higher). To prevent arcing, be sure to install a surge voltage suppression circuit.
4. Precautions for Continuous/Short-Time Operation
   Even when operating with short cycles such as inching, ensure that the motor case temperature does not exceed 90°C, as frequent start/stop may cause heat buildup.Use the motor within a cycle such that the surface temperature does not exceed 90°C.

7. Warranty

The scope of warranty of our delivered products is limited only to what we manufactured.
Warranty (period and description)

Warranty period	The warranty period applies only to new products and represents 18 months after the shipment or 12 months after the actual operation, whichever is shorter.
Description	If the product failed within the warranty period, during which despite a proper mounting, connection and maintenance & administration are followed according to the maintenance manual, and the product is properly run based on the specification on the catalog or under conditions agreed separately, we will repair or provide an alternative product at our discretion for free of charge, except the exclusions below. However, as far as the product is connected with customers' other devices, we will not indemnify those expenses on dismounting from/mounting on the devices, etc. and other associated construction expenses, transportation expenses and opportunity loss and operation loss the customers suffered from, and other indirect damages.
Exclusion from the warranty	The following items will be excluded from the warranty: 1. A breakdown resulting from defects in the installation of the product and coupling with other devices, etc. 2. A breakdown resulting from insufficient maintenance & administration and improper handling of the product, including a case that the product is not stored according to our defined storage manual. 3. A breakdown resulting from operation which does not fall within our specification and other operation conditions and use status we hardly can know. 4. A breakdown resulting from defects, special specification, etc. of device prepared and connected by customer. 5. A breakdown resulting from disassembly, parts replacement, and modification conducted by the customer. 6. A breakdown resulting from defects in parts supplied or specified by customers. 7. A breakdown caused by inevitable force including earthquake, fire, flood disaster, salt damage, gas damage, and lightning strike, etc. 8. Natural wear and tear, abrasion, and deterioration of such relevant consumable parts as a bearing and oil seal, etc. under normal usage. 9. A breakdown caused for reasons not attributable to each of the above item.

Specifications, dimensions, and other items are subject to change without prior notice.

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