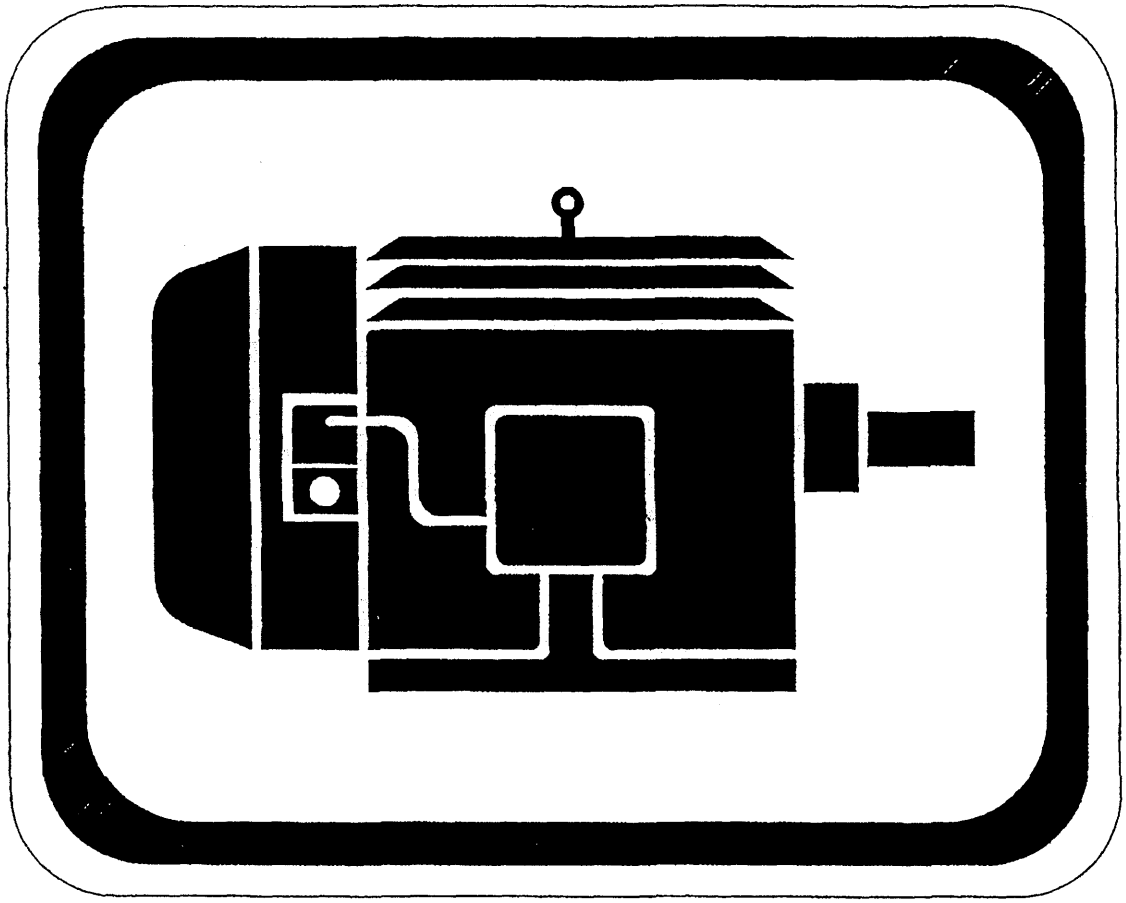
Air brake

Operation manual

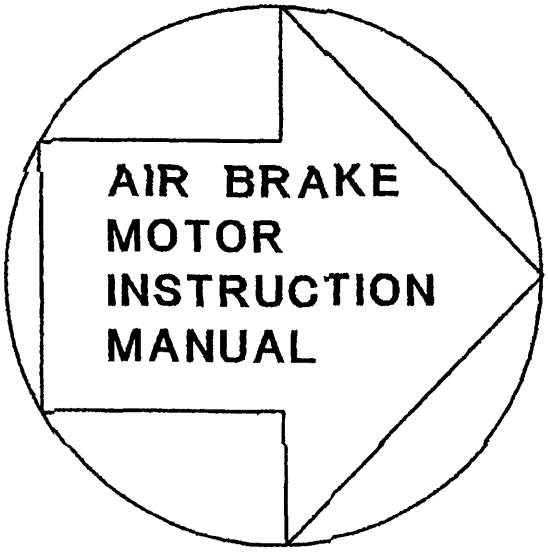


SankiCo.,Ltd.

Introduction

Thank you for choosing the Sanki's air brake motor.

We believe that you will be satisfied with our brake motor if it is properly serviced to maintain an efficient operation. Please thoroughly read this operation manual to ensure the proper use.



1 Construction

The air brake motor consists of a brake and motor. The brake consists of rotating and non-rotating members and other components are the same as that for standard motors.

(1) Rotating member

A fan-integrated brake disc (fastened to the rotating motor shaft).

Fastening means:

- Key-fastened: Special bolt (center blot fastener) and hexagonal socket head cap screw
- Clamp-fastened: Compression flange and hexagonal socket head cap screw

(2) Non-rotating members

A bracket-integrated cylinder, pistons, movable disc, lining, guide pin, shoulder bolt, O ring, release spring, stop ring, 3-port solenoid valve (provided as standard equipment)

2 Operation

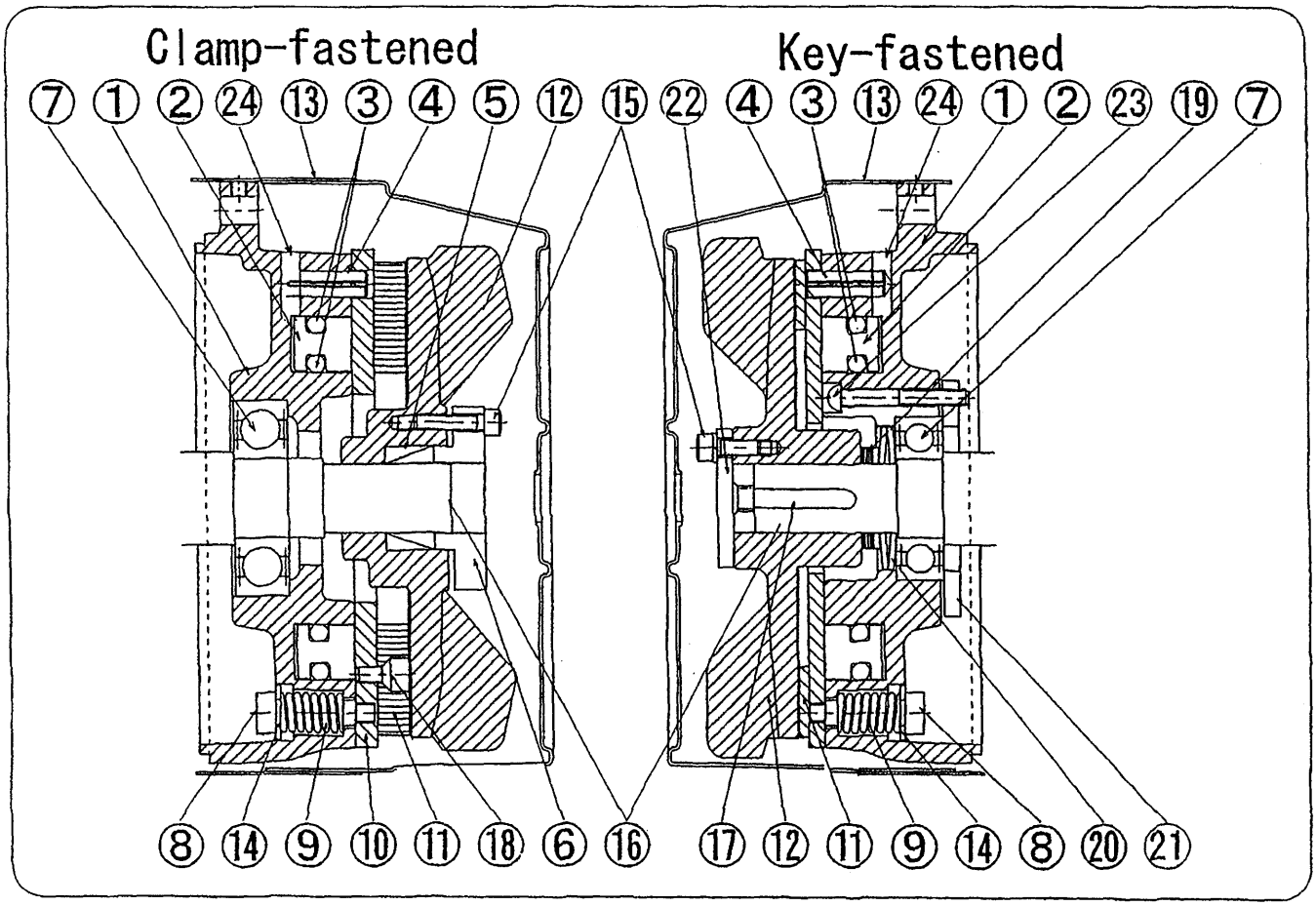
Pressing the STOP button with the motor rotating suspends the power supply and, at the same time, activates the solenoid valve to supply air into the cylinder. Then, the lining (11) (including the movable disc (10)) is pushed onto the brake disc (12) by means of the pistons (2) to apply a braking force and immediately stops the motor. Pressing the START button activates the solenoid valve to suspend the air supply into the cylinder. Then, the lining (11) is separated from the brake disc (12) by means of the release spring (9) to release the braking force and allow the motor to rotate.

Note that this air brake motor does not function after the air pressure source is shut down.

■Component names

No.	Component name	No.	Component name
1	Bracket-integrated cylinder	13	Fan cover
2	Piston	14	Stop ring
3	O ring	15	Hexagonal socket head cap screw (equipped with a switch for the key-fastened type)
4	Guide pin		
5	Clamp element	16	Motor shaft
6	Compression flange	17	Key
7	Bearing	18	Cross-recessed pan head machine screw
8	Shoulder bolt	19	Gap adjustment shim washer
9	Release spring	20	Conical spring
10	Movable disc	21	Bearing retainer
11	Lining (integrated with the movable disc for the key-fastened type)	22	Brake disc lock bolt
		23	Cross-recessed pan head machine screw
12	Brake disc	24	Compressed air intake port

■Sectional view



3 Inspection, installation, wiring and piping before use

(1) Inspection

- Check that the product is as specified.
- If any missing or deformed accessory, loose screw or nut or another doubtful condition is found, please contact the distributor from which you purchased the product or our S-COLS Center or nearest sale office.

(2) Installation

Install in the same manner as for standard motors.

(3) Wiring and piping (see the figure)

※Auxiliary pneumatic unit

Compressed air with a less pressure variation as cleaned with a filter regulator, which is not included in the standard equipment, should be supplied into the air brake. The cylinder and O ring have been coated and lubricated and do not require re-lubrication. The use of a lubricator is not necessary, rather, it may lead to a malfunction. The standard operating air pressure is 0.4 MPa although a variation between 0.15 MPa and 0.6 MPa is acceptable.

4 Inspection, adjustment, and servicing

The product should be regularly inspected, adjusted, and serviced to extend the useful life.

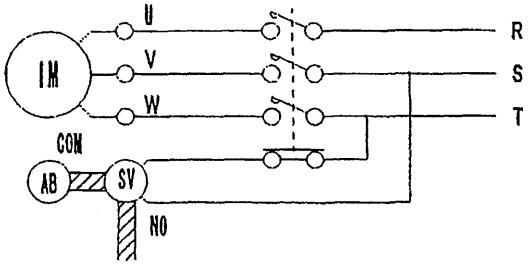
(1) Inspection

- Check that the brake is normally operating.
- Check for excessive lining wear.
- Check for loose screws.
- Remove particles coming from the worn lining if sticking to the frame and/or brake.
- Check the bearing.
- Check for air leakage.

Examples of wiring

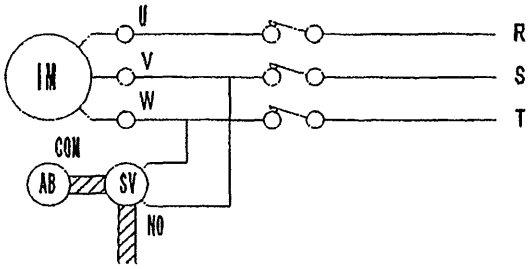
①

To keep the brake active even in the case of accidental power failure
(if compressed air remains after the power failure)



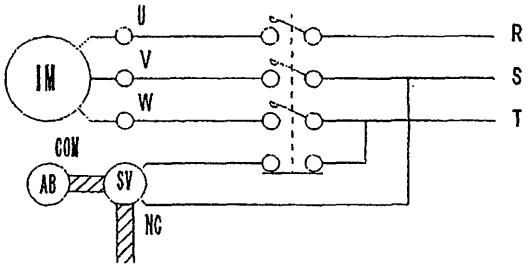
②

The same behavior with (1) except a delay in brake response
(3.7kW : 35ms→100ms)



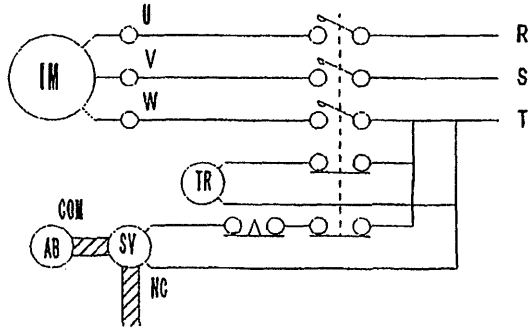
③

To make the brake inactive when de-energized
(the opposite behavior to (1))

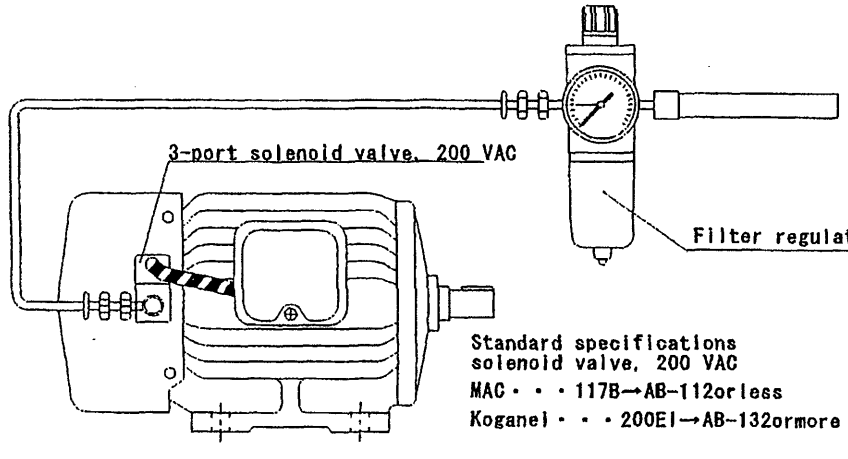


④

The same behavior with (1) except that the brake is released after timer count-up



Examples of piping



Standard specifications
solenoid valve, 200 VAC
MAC・・・117B→AB-112orless
Koganei・・・200EI→AB-132ormore

NC=port A
NO=port C
COM=port B

(2) Adjustment

The lining is worn after an extended service. If the gap reaches the maximum, it should be adjusted to maintain the braking performance.

Remove the fan cover ⑬ and measure the gap between the lining ⑪ and brake disc ⑫. If the gap nearly reaches the maximum, it should be adjusted (see the following table).

Brake model	Maximum gap (mm)
AB-63	2.0 mm
AB-71	2.0 mm
AB-80A	3.0 mm
AB-H080	3.0 mm
AB-H090	3.5 mm
AB-H100	3.5 mm
AB-100S	3.5 mm
AB-H112	4.5 mm
AB-112S	4.5 mm
AB-H132	4.5 mm
AB-160S	4.5 mm
AB-180	4.5 mm

(3) Gap adjustment

Either of the following gap adjustment procedures should be used depending on how the motor shaft ⑯ and brake disc ⑫ are fastened.

a. Key-fastened type

- Loosen and remove the hexagonal socket head cap screw ⑮ from the brake disc lock bolt (22).
- Loosen and remove the brake disc lock bolt (22).
- Remove the brake disc ⑫ and key ⑰.
- Remove the number of gap adjustment shim washers ⑲ as required to reduce the gap to the initial level (0.5 mm).
- Drive the key ⑰ into the motor shaft and install the brake disc ⑫.
- Tighten the brake disc lock bolt (22) to obtain the specified gap.

At this time, put a gap gage (dedicated for the specified gap) into the gap and

tighten until the specified gap is obtained. Then, tighten the hexagonal socket head cap screw (w/switch) with the drilled hole on the brake disc lock bolt (22) aligned with the threaded hole on the brake disc ⑫.

b. Clamp-fastened type

- Loosen the hexagonal socket head cap screw ⑮ securing the clamp element. Apply a slight impact to the brake disc ⑫ to loosen the clamp element ⑤ to move the brake disc ⑫.
- Push the brake disc ⑫ toward the motor body to obtain the specified gap.
- Tighten the hexagonal socket head cap screw securing the clamp element by a few even turns with an increasing torque until an adequate torque is reached.

Tighten the hexagonal socket head cap screw to the torque specified below.

Hexagonal socket head cap screw with strength class 12.9	Adequate tightening torque
M4	4N·m
M5	8N·m
M6	13N·m
M8	32N·m

A tightening torque about 10% higher than the above level is acceptable.

Note that, with a smaller gap, the motor shaft is pulled to cause the brake to drag due to a belt tension or another force.

The gap cannot be adjusted more than once.

The lining should be replaced with a new one when the gap reaches the maximum again. Prepare a new lining in advance.

For the key-fastened type, the lining cannot be replaced by the customer.

(4) Replacement of lining

The lining ⑪ should be replaced with a new one when its thickness nearly reaches the value specified below. Adjusting the gap again for reuse will damage the brake disc ⑫ with the cross-recessed pan head machine screw and disable the replacement of the lining.

For the key-fastened type, the lining cannot be replaced by the customer. Return the product to the nearest service center (see the back cover).

Brake model	Remaining lining thickness
AB－63	1．0 mm
AB－71	1．0 mm
AB－80A	4．0 mm
AB－H080	4．0 mm
AB－H090	4．0 mm
AB－H100	4．0 mm
AB－100S	4．0 mm
AB－H112	7．0 mm
AB－112S	7．0 mm
AB－H132	7．0 mm
AB－160S	7．0 mm
AB－180	7．0 mm

The replacement procedure is described below (see the sectional view).

Remove the fan cover ⑬.

Loosen the hexagonal socket head cap screw securing the clamp element. Then, the clamp element ⑤ is loosened and the brake disc ⑫ can be removed.

Remove the cross-recessed pan head machine screw ⑱ from the lining and remove the lining ⑪. Install a new lining with the opposite procedure of disassembly. (See subsection b of "Gap adjustment.")

(5) Replacement of O ring and replenishment of lubricant

The piston ② may poorly function due to wear of the O ring and/or deteriorated lubrication effect after an extended service. In this case, return the product to the nearest service center (see the back cover) for repair.

(6) Troubleshooting

Although the product has been manufactured under strict quality control, it may have a problem. In this case, check according to the following table.

If you want further information, please contact the distributor from which you purchased the product or our S-COLS Center or nearest sale office.

●Troubleshooting

		Cause(s) of failure	Remedy
Brake does not work (does not perform well)	Brake does not work or takes a longer time to perform.	Insufficient air pressure	Adjust to adequate air pressure.
		Malfunction of solenoid valve	Replace solenoid valve with a new one.
		〃	Check solenoid valve power circuit.
		Wear of O ring (air leak)	Replace O ring with a new one.
		Wear of lining	Adjust gap.
		Oils and/or greases sticking to lining	Remove oils and/or greases.
		Excessive load	Use a brake frame with a larger No.
Motor does not rotate	Brake cannot be released.	Malfunction of solenoid valve	Replace solenoid valve with a new one.
		〃	Check solenoid valve power circuit.
		Malfunction of release spring	Check release spring.
	Brake is released.	Faulty motor electric circuit	Check electric circuit.
		Burned bearing	Replace bearing with a new one.
		Burned motor winding	Return product to repair shop.

○ Information to be attached to the returned product

a. Information shown on the motor nameplate

b. Symptom

c. How the brake motor has been used

* Motor load factor
* Frequency of use (cycles/minute and running/rest times)
* Moment of inertia as converted for the motor shaft (in J ($kg\text{-}m^2$))

d. Other useful information

Bearing Number of AB Brake-motor			
Brake model	Motor Frame	Bearing Number	
		L.S	O.S
AB-63	63M	6202ZZ	6202ZZ
AB-71	71M	6203ZZ	6203ZZ
AB-80A	80M	6204ZZC3	6304ZZ
AB-H080		6204ZZ	6304ZZ
AB-H090	90L	6205ZZC3	6305ZZ
AB-H100	100L	6206ZZC3	6305ZZ
AB-100S		6206ZZC3	6205ZZ
AB-H112	112M	6207ZZC3	6306ZZ
AB-112S		6207ZZC3	6206ZZ
AB-H132	132S	6308ZZC3	6308ZZ
AB-H132	132M	6308ZZC3	6308ZZ
AB-160S	160M	6310ZZC3	6208ZZ
AB-160S	160L	6310ZZC3	6208ZZ
AB-180	180M	6310ZZC3	6310ZZ

SANKI CO., LTD.

Headquarters 8-122, Kiba-cho, Minato-ku, Nagoya
455-0021 〈TEL〉 052-691-1147 〈FAX〉 052-692-1915

Minato Factory
FS Division 8-122, Kiba-cho, Minato-ku, Nagoya
455-0021 〈TEL〉 052-691-1147 〈FAX〉 052-692-1915

Mie Factory
MS Division 647-213, Akasaka, Tengeiji, Ureshino-cho, Ichishi-gun, Mie, Japan
515-2302 〈TEL〉 0598-42-6770 〈FAX〉 0598-42-6773

S-COLS Center647-213, Akasaka, Tengeiji, Ureshino-cho, Ichishi-gun, Mie, Japan
515-2302 〈TEL〉 0598-42-6770 〈Fax No. for ordering〉 0120-4940-82

Nagoya
FS Division 8-122, Kiba-cho, Minato-ku, Nagoya
455-0021 〈TEL〉 052-691-1147 〈FAX〉 052-692-1915
MS Division 〈TEL〉 052-691-1828 〈FAX〉 052-692-1915

Tokyo 2-6-15, Oosaki, Shinagawa-ku, Tokyo
141-0032 〈TEL〉 03-3493-6187 〈FAX〉 03-3493-6195

Sendai 1-10-32, Ichiban-cho, Aoba-ku, Sendai, Miyagi,
980-0811 〈TEL〉 022-263-8345 〈FAX〉 022-263-8354

Osaka 5-9-6, Nishinakajima, Yodogawa-ku, Osaka,
532-0011 〈TEL〉 06-6304-3031 〈FAX〉 06-6304-2406