

“Air-fix 22B1” Instruction Manual



This product is provided mainly for peaceful use for the manufacturing industry. If you are considering using it outside the manufacturing industry, please consult with us and exchange specifications as necessary. Please make a contract.

■Precautions



Please be sure to observe

In order to prevent harm to the user and other people, and damage to property, we explain that you must protect it as follows. When using the product, please follow the specifications, functions, and precautions described. Please keep this instruction manual in a safe place so that you can take it out and read it immediately when necessary.

■The following displays classify and explain the degree of harm or damage caused by improper use, ignoring the displayed contents.
















 Warning	The column of this display is the content that “it is assumed that there is a possibility of death or serious injury”.
 Caution	The column of this display is “It is assumed that there is a possibility of injury or only property damage”.

■The types of contents to be protected are classified and explained by the following pictograms. The following displays classify and explain the degree of harm or damage caused by improper use, ignoring the displayed contents.












	This pictorial display is a “prohibited” content that must not be done.
	This pictorial display is a “forced” content that must be executed.

Warning

	It is designed and manufactured as a general industrial part. Therefore, please handle it by a person who has basic knowledge and experience about pneumatic equipment including materials, piping, electricity, mechanism, etc. related to this product. Also, be sure to observe the following standards and other safety regulations. (International Standards (ISO / IEC), Japanese Industrial Standards (JIS)) ※1 Other safety regulations ※2 ※1) ISO 4414: Pneumatic fluid power — General rules relating to systems, ISO 4413: Hydraulic fluid power — General rules relating to systems IEC 60204-1: Safety of machinery — Electrical equipment of machines (Part 1: General requirements), ISO 10218: Manipulating industrial robots— Safety, JIS B 8370: Pneumatic system general rules, JIS B 8361: Hydraulic system general rules, JIS B 9960-1: Mechanical Safety—Mechanical Electrical Equipment (Part 1: General requirements Item), JIS B 8433: Industrial manipulator robots—safety, etc. ※2) Other safety regulations including the Industrial Safety and Health Act
	The handling is described in the text, so please read them carefully and fully understand them before using.
	This product is designed for use only in compressed air systems (including vacuum). Do not use if the pressure or temperature is out of the specified range as it may cause damage or malfunction. (Refer to the specifications) Do not use fluids other than compressed air (including vacuum). We do not guarantee any damage caused by using the product beyond the specified range.
	Never disassemble, repair or modify (including additional machining). There is a risk of injury or accident.
	Please use only on the upper surface of the surface plate. Do not stick to the side surface or back surface of the surface plate. Never use it in the reverse state of the land.
	Supply air from a source different from the air source of your CMM (Coordinate Measuring Machine).
	Do not use the lubricator.
	Do not use the vacuum circuit side where pressure of 0.1 MPa or more is constantly applied. Vacuum equipment does not have an explosion-proof structure, so there is a risk of damage to the main unit.
	Please use clean air as the supply air. If impurities such as dust, oil, and water are contained, the filter inside the ejector will be clogged and the adsorption power will decrease. Regularly perform maintenance and inspection of the filter element and plug silencer of the silencer element of the ejector. Clogged elements may cause performance degradation or trouble. The built-in ejector and plug silencer are consumables. If there is an abnormal noise or the suction force is reduced, discontinue use and clean or replace the silencer element. We recommend that you clean and replace the silencer element frequently at appropriate times.
	Please be careful about the decrease of vacuum pressure due to the trouble of the supply air and the supply power supply. There is a risk that this product will move or fall due to a decrease in adsorption power. Please take safety measures.
	Do not use in an atmosphere of corrosive gas, flammable gas, explosive gas, chemicals, seawater, water vapor or where it adheres. Also, never let it inhale.
	About compressed air used...Compressed air contains a large amount of drain (water, oxidized oil, tar, foreign matter). Drain significantly reduces the performance of the product, so dehumidify it with an aftercooler or dryer to improve the air quality.
	Rust in the piping and inflow of foreign matter may cause product failure, malfunction, and performance deterioration. Insert a more accurate filter of 5 μm (micron) or less just before the supply port. In addition, we recommend flushing (air blowing) in the piping before use and at appropriate intervals.
	Do not turn your face toward the ejector’s air exhaust port. If dust, dirt, moisture, etc. are mixed in the air, there is a risk of dust, moisture, etc. getting into your eyes. Please wear safety glasses before use. Use a filter, etc. to manage the air used, and pay sufficient attention to the quality of the air. Do not use it to block the exhaust port of the ejector or increase the exhaust resistance. It may not generate a vacuum or cause a decrease in vacuum pressure.
	About quality control of surface plate...Use a surface plate with a higher accuracy of 5 μm (micron) or less in the ground plane. Do not use on a surface plate that has damage such as scratches, distortion, chips, and deterioration. Before use, be sure to wipe the top surface of the surface plate clean so that there is no dust or dirt, and make sure that the surface plate is clean before use.
	Do not use this product for any purpose other than adsorption for measurement on a surface plate.
	The stepped edge between the adsorption surface and the escaped bottom is sharply pointed. Do not touch it with your bare hands. Be careful when handling it so as not to hurt your hands or body.
	Do not use this product to measure rotating or moving objects. There is a risk of injury.
	Do not use in a place with a lot of vibration or shock.
	Please do not use it in a hot and humid place and outdoors. Use it avoiding direct sunlight.
	Never use this product when the screws of ejector, ejector case, or plug silencer are loose.
	For the supply air, use a regulator and use clean air with a pressure of 0.4 MPa to 0.5 MPa.

	Be sure to stop the supply air and check that there is no residual pressure before removing or replacing the air tube.
	Since this product is basically not a means of moving a workpiece but a means of fixing a workpiece, floating or moving a workpiece while using multiple products at the same time may cause injury and it is prohibited.
	Be sure to remove the workpiece before moving this product. Never levitate or move the product while the work is placed on it. It can cause injury.
	About applicable air tube... Depending on the outer diameter accuracy, wall thickness, and hardness of the air tube, it may come off or leak. Please use the air tube specified by us. Use the following for the air tube outer diameter accuracy. Nylon, soft nylon tube: within $\phi 4 \pm 0.1$ mm, Polyurethane tube: $\phi 4 + 0.1-0.2$ mm or less, New urethane tube: within $\phi 4 + 0.1-0.2$ mm Before piping, flush the inside of the pipe (air blow) to remove foreign matters and chips inside the pipe.
	After inserting and removing the air tube 50 times, cut the tube about 20 mm and insert the undamaged part.
	Use the air tube with a minimum bending radius or more and with as much margin as possible. Small bending radii can damage fittings and break or crush tubes.
	During use, the tube may come off from the fitting and the tube may run wild due to deterioration of the air tube or damage to the fitting. Install a protective cover or fix the air tube so that the air tube does not run wild. Be sure to wear safety glasses when using.
	Use an air tube that supplies air with an outer diameter of $\phi 4$ mm. Be careful of your surroundings so that you do not catch or pull the air tube. Do not use if the tube comes into direct contact with other structures as it may wear or break.
	Insert the air tube securely to the end of the tube, and pull the tube to make sure that it does not come off before using it. If it is not inserted all the way in, it may cause the tube to come off or air to leak.
	Be sure to cut the tube at a right angle with a special cutter before use.
	When inserting the piping and air tube, remove chips and foreign matter inside and outside the air tube before use.
	When attaching a measuring instrument such as a column or dial gauge to the M6 screw part, attach this product to the surface plate and check that it is firmly attached before mounting. When removing it, release the adsorption after removing it. If you do not follow this order, the columns may lose their balance and fall.
	When attaching measuring instruments such as columns and dial gauges to the M6 screw part, use the conversion adapter from M6 to M8 (sold separately).
	Do not place anything weighing more than 3 kg on the top surface of this product. Also, do not place anything higher than 180 mm above the surface of the platen.
	Do not subject this product to excessive vibration or shock. It may cause damage to the product or deterioration of performance.

Caution

	Use an air tube that has not deteriorated.
	When inserting or removing the air tube, do not use your hands wet with oil or water.
	Be sure to remove the air tube before cleaning.
	Do not spill liquids such as tea, water or oil on the product.
	Do not use the product if it is damaged by dropping or hitting something, such as dents, scratches, distortion, deformation, or loosening of screws.
	If you hear any abnormal noise from the product or the ejector, stop using it.
	When handling this product, be sure to operate it with both hands and never wear gloves such as work gloves.
	Do not throw away the packing box for this product. A sticker with the serial number is affixed.
	Our products cannot be used as legal measuring instruments. The products manufactured and sold by us are not measuring instruments or measuring instruments that have undergone type approval tests or certifications related to the Measurement Law of each country. Therefore, our products cannot be used for purposes such as transactions or certification stipulated by the Measurement Law of each country.
	Do not remove the packaging bag until just before piping. If the packaging bag is removed before the piping connection work, foreign matter may enter from the piping port and cause a malfunction.
	Depending on the fixing method, contact of the probe or vibration of the measuring machine may occur, causing movement of the workpiece, the main body of the Air-fix, the support, etc., resulting in abnormal measurement values.

Air-fix holding power test data and common precautions for vacuum system equipment are available on our website.

■ Precautions regarding overseas relocation

When exporting to overseas, be sure to follow the laws and regulations (Foreign Exchange and Foreign Trade Law) and procedures established by the Ministry of Economy, Trade and Industry.

■ Before use

1. Items to be prepared before using this product (Please prepare ① to ⑥ by yourself.)

- ① Clean compressed air source... Please use compressor (with regulator and mist separator) between 0.4 MPa and 0.5 MPa (pressure when ejector operates)
- ② Surface plate... Use a more accurate one with a flatness of 5 μ m or more. No damage such as scratches, distortion, chipping, deterioration, etc.
- ③ Air tube... Please use $\phi 4$ mm, JIS standard products.
- ④ Open / close valve... A valve for opening and closing air that is attached to the tip of a $\phi 4$ mm air tube.
- ⑤ Supports and washers (if necessary): Necessary when installing dial gauges and pick gauges.
- ⑥ Other items required depending on the purpose of use of the user

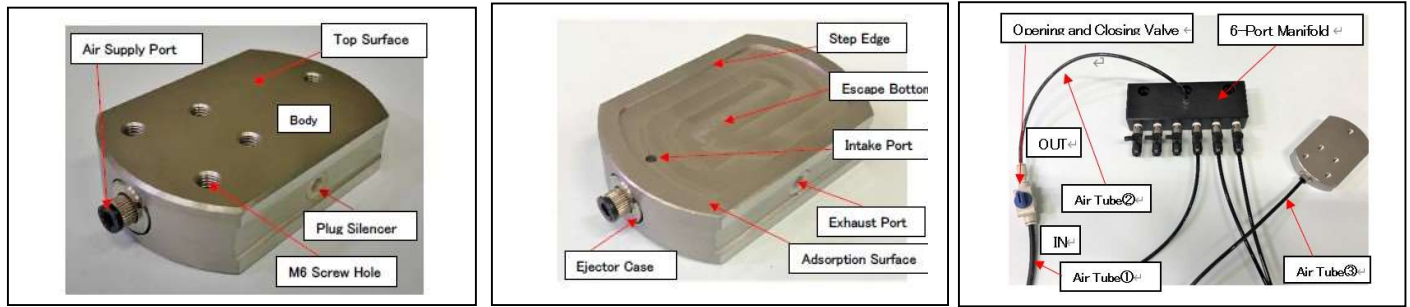
Following items are not included in this product. Straight pins, spring clips, location pins, receiver brackets, adjustable location pins, straight pins with screws, expansion parts such as flat top, stopper element, back square, V block, spherical surface, and conical receiver. Please use the "Eco-fix" clamping tool expansion set (sold separately) by Mitutoyo Co., Ltd.

2. Check that there are no dents, scratches, distortions, deformations, etc. on the adsorption Surface of this product.

3. Check that there are no dents, scratches, dents, distortions, deformations, etc. on the suction part of this product.

■ Name and usage of each part

1, Carefully check the surroundings so that the air tube and piping are not caught or caught.



- 2, Make sure that the surface plate you are using is not damaged, such as scratches, distortion, chips, or deterioration, and wipe off dust, dirt, water, oil, etc. on the surface plate with a clean cloth.
- 3, Wipe off the adsorption surface with a clean cloth to prevent dust from entering between the surface plate and the adsorption surface.
- 4, After confirming that the air from the compressor is closed, connect the air supply side of the air tube ① to the compressor, and check the state that the opening and closing valve is closed.
After checking, connect the opposite side of the air tube ① to the air supply side IN of the opening and closing valve.
- 5, Connect one side of the air tube ② to the OUT side of the opening and closing valve. Connect the other side of the air tube ② to the ejector air supply port or manifold. If it is connected into the manifold, insert the air tube ③ from the port of the manifold into the air supply port of the Air-fix main unit.
- 6, After opening the air of the compressor, open the opening and closing valve and let it stick to the surface plate.
- 7, When moving this product on the surface plate, close the opening and closing valve to release the residual pressure inside the main body before moving.
- 8, When pulling out the air tube, turn off the air and then hold the body firmly so that it does not move, push in the plastic flange part of air supply port, and then pull out the air tube.

Care instructions

	When cleaning, be sure to release the residual pressure in the air tube and pull out the air tube.
	When cleaning the product, secure enough space for cleaning and inspection.

Cleaning the body

Wipe dirt off the suction surface with a clean, dry cloth. Dip a cloth in anti-rust oil and apply a thin layer to the entire body. Especially apply it to the suction surface. If you forget to apply anti-rust oil, the main body will rust.

Cleaning the ejector

Replacement of the silencer element of the ejector will be a paid replacement. Please contact our customer service.
Customer contact email : info@sasaki-koki.co.jp

How to store

Place the product in a static-proof paper or anti-corrosion bag, put it in the packing box, and store it in a dry place out of direct sunlight.

Warranty and Disclaimer/Conditions of Suitable Use

When using this product, the following "Warranty and Disclaimer" and "Conditions for Compatibility" apply. Please use our products after confirming and agreeing to the following contents.

【Warranty and Disclaimer】

- ① The warranty period for our products is one year from the date of purchase. In addition, some products have specified durability, mileage, replacement parts, etc.
- ② In the event that failure or damage caused by our responsibility is found during the warranty period, we will provide a substitute or necessary replacement. Note that the warranty here means the warranty for our product alone, and any damage caused by the failure of our product is excluded from the scope of the warranty.
- ③ We do not take any responsibility for damage such as damage or scratches due to dropping of the workpiece (object to be measured) caused by using this product.

Is this a malfunction ?

Please check according to the following table, and if the problem persists, be sure to remove the location pin, etc., stop the air supply, pull out the air tube, and contact your sales representative.

No adsorb ?

Check the followings

➔

1. Is clean air at the correct pressure supplied from an air supply source such as a compressor?
2. Is the on-off valve open?
3. Is your surface plate damaged?
4. Is the adsorption surface damaged?
5. Is the air tube clogged with foreign matter?
6. Is the air tube damaged?

Specification

◆Body specifications

Dimensions	Body 21 mm x 58 mm x 85 mm (91 mm including ejector)	Used air tube dimensions	φ 4
Weight	630 g	Supply air	0.4 MPa~0.5 MPa
Adsorption Retention	200 N (20.4 kgf) <vertical direction> 65 N (6.6 kgf) (spring plate tip)	Quietness (Operating Sound)	50dB (The standard of operating sound is 50dB, which is about a quiet office.)
Loading Weight	Max 10kg for φ 12mm location pin up to 50mm length, max 1kg for over 50mm up to 100mm For details, please refer to the load table examples below.		

◆The table below summarizes the load on the Air-fix location pin for Mitutoyo CMMs. (Load table examples)

①When using $\phi 12$ location pin

Unit : kg			
Required accuracy L(mm)	CRISTA < 3 μm	STRATO < 1 μm	LEGEX < 0.3 μm
13	100	100	100
25	100	100	80
50	70	25	10
100	9	3	1

②When using $\phi 20$ location pin

Unit : kg			
Required accuracy L(mm)	CRISTA < 3 μm	STRATO < 1 μm	LEGEX < 0.3 μm
13	100	100	100
25	100	100	100
50	100	100	75
100	70	25	10

◆Ejector basic specifications







Working fluid	Air
Maximum operating pressure MPa	0.7
Minimum operating pressure MPa	0.15
Operating temperature limit $^{\circ}\text{C}$	0~60
Refueling	Unnecessary

◆Ejector characteristics

Model number	Nozzle diameter (mm)	Rated supply pressure (MPa)	Ultimate vacuum pressure (kPa)	Suction flow (l/min(ANR))	Air consumption flow (l/min(ANR))
SVCH04-M54-MDF	0.4	0.5	-90	4	8

Item	Content
Performance	High vacuum type
Nozzle diameter	$\phi 0.4$
Vacuum port	M5 \times 0.5
Air supply port	$\phi 4$ One-touch fitting
Exhaust port	Atmospheric release with silencer

◆Other Ejector Precautions

	Do not use in corrosive gas, flammable gas, explosive gas, chemicals, seawater, water vapor atmosphere or in a place where it adheres. Also, never inhale it.
	Check each port of the ejector with the indication on the main body and the text before piping. Incorrect piping may cause damage to the main unit.
	The ejector supply pressure is the value when the ejector is in operation. Consider the pressure drop and secure the specified value in the text. If the specified value is not satisfied, the ejector will make a strange noise at a specific supply pressure, the characteristics will become unstable, and it may affect the sensor, etc. and cause trouble.
	The effective cross-sectional area on the ejector supply pressure side should be three times the nozzle diameter cross-sectional area as a guide when selecting piping and equipment. Insufficient supply flow rate may cause performance degradation.
	Make the vacuum side piping as short as possible and make the inner diameter thick. If the piping is long or has a narrow inner diameter, the response time may be delayed during adsorption or detachment, and the required suction flow rate may not be secured.
	For other common precautions for vacuum system equipment, please refer to our website.

●Specifications and appearance described in this document are subject to change without notice for improvement.