

COMPULSORY Deliver this manual to those who actually use MINIDEX. Thank you very much for purchasing our product. Read this manual carefully to use MINIDEX properly. After reading, keep this manual properly. If you have any question, feel free to contact us.

1 Note for Safety.

1.1 Description of signs

The manual includes notices marked by signs in order to prevent accident from being occurred due to incorrectly using the device.

Warning This sign means that there is a possibility of getting damaged or fatally injured if used incorrectly by ignoring the warning.

Caution This sign means that there is a possibility of getting injured or doing damage on other material if used incorrectly by ignoring the caution.

* Noted that the sign designated by **Caution** involves a grave consequences. Since all precautions are important, be sure to observe them.

What symbols mean

pictograph	meaning
	This sign includes content which notifies to force and instruct to do.
	This sign notifies to prohibit to do.

1.2 Carriage

Caution Hold firmly during carriage.

- Since MINIDEX is a precision instrument, do not have a strong impact on it or drop it.
 - Otherwise, breakdown could be caused.
- If MINIDEX is dropped, it could cause an injury to your hand, foot or other body part. Before carrying it, confirm its model and weight.

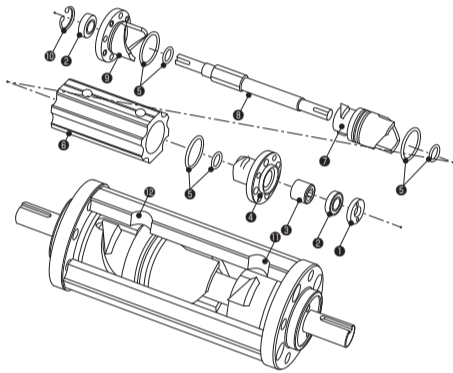
weight table of MINIDEX

Model	MDF20	MDF30
Weight	0.5kg	0.9kg

2 Composition of MINIDEX

2.1 Composition and components

* Reverse rotation is impossible due to the internal one-way clutch operation.



- Bearing nut
- Deep groove ball bearing
- One-way clutch
- Follower cap
- O-ring
- Tube
- Cam piston
- Shaft
- Cam cap
- Circlip
- Air port
- Air port

3.2 Installation

Caution Fix firmly.

- Mount MINIDEX by using the method that can satisfy the operating conditions and support the main body weight, and then fix it firmly.
 - Otherwise, MINIDEX may drop during the operation, causing a secondary disaster.
- Do not mount broken MINIDEX.
 - Otherwise, an injury or a secondary disaster may be caused.

Protect the main body.

- Since MINIDEX is not waterproofed or dustproofed, be sure to protect the main body with a cover or the like depending on the operating environment. (Waterproof and dustproof specifications are also available as a special-purpose product.)
- When mounting the main body, observe the threaded depth and bolt tightening torque as per the below table.

Model	Mounting screw dia.	Threaded depth mm		Tightening torque N · m (kgf · m)
		Min.	Max.	
MDF20	M4	8	10	2.8 ± 0.15 (0.28 ± 0.015)
MDF30	M5	10	12	5.6 ± 0.3 (0.57 ± 0.03)

3.3 Load mounting

Caution Do not apply overload.

- Do not apply load heavier than the permitted.
 - Otherwise, the inside may be broken.
- When mounting laterally (with the shaft horizontally), balance the load right and left against the rotating direction.
 - In case of one-sided load such as the arm, the load may be lopsided in the rotating direction.
- In mounting the load, confirm that the key and shaft have no looseness, and firmly fix the load with the set bolt.
 - Otherwise, the key or the shaft may come off during the operation, causing an injury or a secondary disaster.
- When mounting laterally, provide a prop or the like to minimize the direct load, if any, on the shaft.
 - Otherwise, the shaft may be broken.

3.4 Precautions for piping

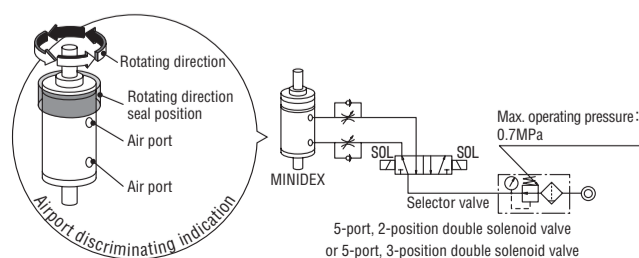
Caution Provide correct piping.

- Read the piping procedures carefully, and provide correct piping.
 - Otherwise, operation error, break or damage may be caused.
- Do not damage the piping, impose excessive stress on the piping, or pinch the piping.
 - Otherwise, break may be caused to the piping.
- Do not use any 3-position valve for the emergency stop circuit.
 - Otherwise, the operation start speed may be unstable, causing break to the inside.
- Be sure to pipe the speed controller near the main body in the meter-out mode.
 - Otherwise, the normal operation may not be achieved.
- Before starting the piping work, be sure to flush the inside of the pipes.
 - Otherwise, operational failure may be caused.

3.5 Piping procedures

● MINIDEX has a built-in piston. One-way motion of this piston makes one indexing. Therefore, piping of this piston is exactly the same as that of double-acting air cylinders.

- Set the speed controller to each port in the meter-out circuit.
- Use such peripheral units that can satisfy the specifications.

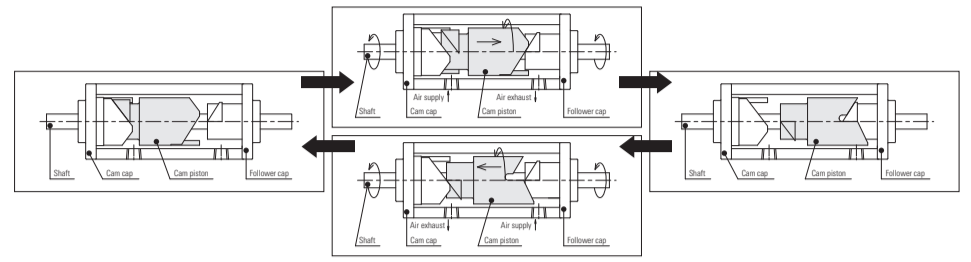


2.2 Operation

- Indexing in one direction (Refer 3.5)
 - Indexing is made counterclockwise when viewed the shaft from the rotating direction specifying seal
 - To change the rotating direction, reverse the mounting direction of the main body.

2.3 Operational state

MINIDEX makes indexing by supplying and exhausting compressed air under the control of the solenoid valve, etc. When the shaft rotation stops, the positioning is completed. According to the switching of the solenoid valve, the operation state changes as follows:



- The cam piston and the cam cap are in engagement.
- When the solenoid valve is switched, the cam piston moves directly to the right (left). When the cam piston is disengaged from the cam cap (follower cap), the cam piston starts engagement with the follower cap (cam cap), and rotates. The rotation of the cam piston is transmitted to the shaft.
- The cam piston and the follower cap become in complete engagement, and complete one indexing.

3 Setting

3.1 Handling

Caution

Do not allow foreign objects to mix in.

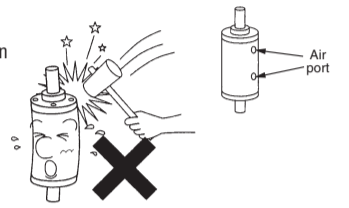
- Do not allow metal pieces or other foreign objects to mix in through the air port.
 - Otherwise, the inside may be broken.

Do not force the rotation.

- Do not apply external force to the shaft for rotation.
 - Otherwise, the inside may be broken.

Do not have a shock.

- Do not have a shock on MINIDEX. Particularly when the load is mounted, for example, watch out for shock.
 - Otherwise, the inside may be broken, or precise indexing may be impossible.
- Our products including MINIDEX have been coated with rust preventing agent on the shaft to prevent rust temporarily. When mounting MINIDEX to the machine, remove the rust preventing agent.
 - Rust preventing agent type : Oil-based varnish
 - 【How to remove the rust preventing agent】
 - Wipe with a cloth or the like soaked with alcohol for coating or white kerosene.



4 Control Method

4.1 Precautions for electric control

Warning

Provide an emergency stop circuit.

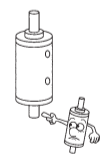
- Design the emergency stop circuit with an emphasis on safety so that the air and power supply can be cut off instantaneously in an emergency.
 - Otherwise, the stopping in an emergency may be impossible very dangerously.

Caution

Provide correct wiring.

- Mount limit switches, etc. correctly and exactly.
 - Otherwise, runaway may be caused.
- Set the air switch timing correctly.
 - Otherwise, the normal indexing operation may be impossible.

4.2 Electric control method



- The control method is the same as that of general double-acting air cylinders, requiring valve-switching signals.
- The sensor dog, corresponding to the forward end switch of the air cylinder, can be used by one shaft.
- If the limit switch is not used, control the time by using a timer.
- Note with care in the case of low-speed operation that the switch is activated immediately before the complete indexing, and the valve is switched instantaneously, but the next indexing may not be achieved.
 - In this case, take a little time by using the timer after the switch is turned on, and then switch the valve.

5 Adjustment and Reference Circuit

5.1 Precautions for adjustment

Warning

Be sure to conduct operation.

- Check each control before conducting the operation.
 - Some machines move unexpectedly and very dangerously.

Caution

Be sure to conduct adjustment.

- Raise the speed gradually from a low speed to prevent a shock or fluttering at the stop end.
 - High-speed operation from scratch may cause shaft damage or other trouble.

6 Usage Precautions

6.1 During usage



Do not contact during operation.

- During operation, do not contact the rotating part by hand. Also, watch out your clothes, etc. for catching.
- Otherwise, your body or clothes may be caught very dangerously.



Do not use overpressure.

- Be sure to observe the specified air (oil) pressure by all means.
- Overpressure above the specified may cause burst very dangerously.



Do not restart from the load side.

- If MINIDEX stops, do not restart it from the load side.
- Forced rotation may damage the inside, and spoil the normal operation, causing breakdown.

7 Check and Maintenance

7.1 How to cope with abnormal situation



- Make sure to cut off electrical power source circuit when power failure occurs or dangerous situation is supposed.
- Otherwise, it may be very dangerous if runaway or the like is induced when power failure is recovered.
- Be careful that device does not cease immediately at emergency stop.
- It may be very dangerous if get injury when mistakenly touch device with hand.
- Make sure not to approach device when operated again.
- Otherwise, it may unexpectedly move depending on device, and invite very dangerous situation.



- Contact our company when abnormal situation arises under influence of overload, impact or the like.
- It may invite unexpected secondary disaster.

7.2 Check and maintenance



Take safety measure when storing device.

- Upon storing unused machines and accessories in a place, don't keep them in the following places.



Where is accessed by child, where they are easily taken out, where temperature and humidity change abruptly, where is in high humidity environment, where admits direct sunshine, and where volatile liquid substance is deposited.



Disassemble and remodeling are prohibited.

- Don't disassemble and improve the device.
- If otherwise, we can't guarantee normal operation of the device.
- Make sure to interrupt air, and release rest of air upon mounting and removing device.
- Otherwise, it may invite injury or runaway.
- Note with care that wiping the coated surfaces of the main body and the seals with a cloth soaked with any organic solvent may thinning out the coating or peel off the seals.



8 Other notice

8.1 Guarantee (Check the terms & contents of guarantee)

- On the understanding that the device (MINIDEX) is used in accordance with our specification, we guarantee the period to repair the device free of charge until a time which earlier relapses after operating 2500 hours on delivery or within one year after delivery.
- If trouble or defect appears with in the guaranteed period of time obviously due to deteriorated quality of MINIDEX, we guarantee to repair the device free of charge. Note that we charge device-related expenditures and expenses arisen from steps of detaching parts from and attach parts to the device.
- If the device is repaired, disassembled or improved at customers' side, Repair free of charge should be outside our guaranteed requirements.
- We don't have oversea maintenance and technological support in connection with the device.

8.2 After-Sales-Service

- For the sake of quality improvement, the specification may be subject to change without notice.
- As for our catalogue and other technological documents, contact sales department of our company.
- We are always ready to arrange technological inquiry and meeting, feel free to contact us by telephone.

8.3 Repair and trouble

- In case of trouble or inquiry for repair, contact sales department of our company or sales shop where you purchased the device.
Sales department TEL +81-565-76-0029 FAX +81-565-76-0023
(* We hope that the catalogue will be of your help. Your inquiries and information would be highly appreciated. We always wait and welcome your direct contact.)

8.4 Disposal

- Dispose the device as general industrial wastes.



KAMO SEIKO CORPORATION

HEAD OFFICE
1166 Kamevari, Mitsukuri-cho, Toyota-city, Aichi-prefecture 470-0424, JAPAN
Tel. +81-565-76-0029
URL www.kamo.co.jp

KOREA
KAMO FA 1Dong-216Ho IT Castle' Gasan-dong, Gaumcheon-gu, Seoul, Rep of KOREA
Tel. +82-2-761-5621
URL www.kamofa.co.kr E-mail kamofa@kamofa.co.kr

CHINA
KAMO DT RM0901, BLK3, North Ocean Int'l Center, 166 South Taijing Road, Nanjing,
China ZIP 210001
Tel. +86-25-5223-0890
URL www.kamosia.com E-mail ztc@kamosia.com

Yes We can! Yes I can!