

KOSAPLUS
Pneumatic actuator
User Manual

Revision

no.	data	contents	P.I.C
0	11.02.17	최초작성	노을아
1	12.01.04	액션AB명칭삽입	노을아
2	15.12.01	전체 점검	노을아
3	19.02.14	4-1/6	노을아
4	22.01.13	전체개편	노을아
5	22.03.11	ATEX 규격용 수정	노을아
6	25.03.19	1-2,3-3,4-1	노을아

Standard/CE/Ex

KOSAPLUS Co.,Ltd.
 address 294, Gongdan2daero, Siheung, Gyeonggi, 15115, Korea
 tel +82-31-433-3159 / fax +82-31-433-3151
 website <http://kosaplus.com>

- Table of Content -

1. Summary	
1-1. Model System	3
1-2. Code System	4
1-3. Label	4
	8
2. Products	
2-1. Internal Construction of Product	
	9
3. Installation	
3-1. Attachable Valve	
3-2. Selection of Actuator	10
3-3. Caution during Installation	10
	10
4. Operation	
4-1. Operation	
4-2. Angle adjustment	12
4-3. Caution during Operation	12
	13
5. Maintenance & Repair	
5-1. Self Diagnosis	
5-2. Assembling & Disassembling	14
	15
6. Customer Service Support Contact	
	16

1. Summary

KOSAPLUS Actuator allows to conveniently open & close the Valve fast in any places wherever the pneumatic pressure are connected & available. The Valve is designed to thoroughly assure the safety & convenience of users, however, please make sure to operate after reading & digesting the User Manual completely. Please check the homepage of KOSAPLUS or inquire with the Customer Service Centers of KOSAPLUS & authorized Agents for those items & subjects not described in the Manual.

- Data contained in the User Manual may be subject to change without advance notice for improvement of performance & safety of Product.

※ Have you received the KOSAPLUS pneumatic actuator?

Before operation, please be sure to check the following.

- 1) Check if the nameplate is properly attached and if the specifications on the nameplate match the order.
- 2) Check if the port is properly sealed with a sticker.
- 3) Check if there are any damaged parts.

1-1. Model System

This is the A/R integrated user manual and each model is as follows.

Model : ADx, ASx, RDy, RDz

x=50, 65, 80, 100, 125, 140, 160, 185, 210, 250, 300, 350

y=32, 40, 50, 65, 80, 90, 100, 115, 125, 140, 160, 185, 210

z=40, 50, 65, 80, 90, 100, 115, 125, 140, 160, 185, 210

※Caution※ Explosion Proof Product

KOSAPLUS pneumatic actuator subdivided into 3 stages as above, and you can place order selecting one out of four according to the condition like surrounding temperature.

For explosion-proof products, please check the ambient temperature before order, and the operating temperature grade is indicated on the product label as TX. (Refer to 1-3. Label)

1-2. Code System

KOSAPLUS pneumatic actuator has separate code for order receiving in addition to the model name specified in the label as below.

A6ND-AKK-1012C27-OP

a

b

c

d

e

f

g

h

i

j

a

Mechanism

A Scotch yoke

R Rack pinion

b

Diameter

3 3212 125

4 4014 140

5 5016 160

6 6518 185

8 8021 210

9 9025 250

10 10030 300

11 115

c

O-RING

N NBR

V VITON

E EPDM

S SILICONE

d

SPRING

D Double acting

W Weak spring

M Middle spring

S Strong spring

No. R's spring q'ty

e

Action

A Action A (Fail closed)

B Action B (Fail open)

C Action C (Fail closed/Open CW)

D Action B (Fail open/Open CW)

f

Body color

K Black

L Blue

W White

Y Yellow

R Red

g

End cap color

K Black

L Blue

R Red

h

ISO 5211

3 F03

5 F05

7 F07

10 F10

12 F12

14 F14

16 F16

i

STEM

C11 11*11

C14 14*14

C17 17*17

C19 19*19

C22 22*22

C27 27*27

C36 36*36

C46 46*46

j

OPTION

T4 PT1/4

T8 PT3/8

T2 PT1/2

N4 NPT1/4

N8 NPT3/8

N2 NPT1/2

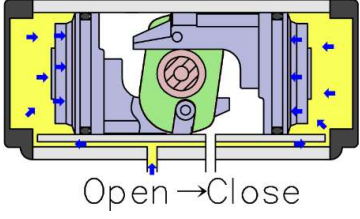
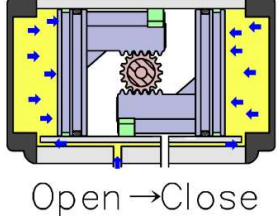
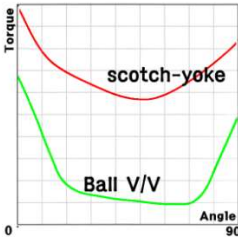
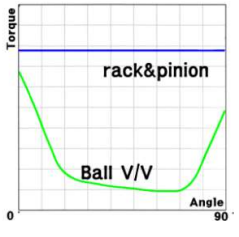
F4 PF1/4

F8 PF3/8

F2 PF1/2

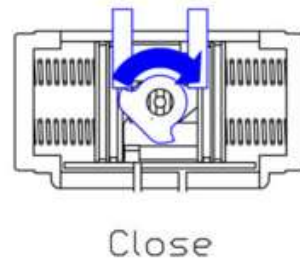
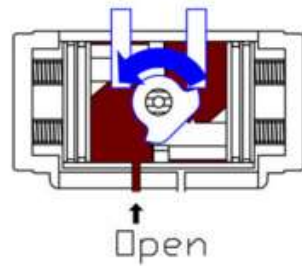
<Order code>

***<Remark-1> SCOTCH-YOKE / RACK&PINION**

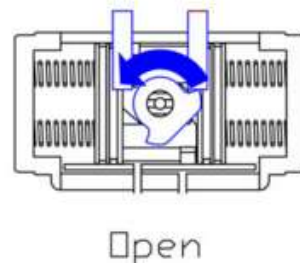
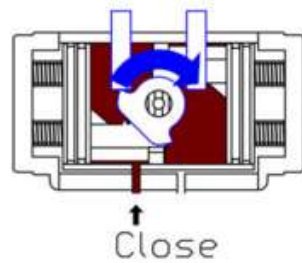
	Scotch-yoke (A series)	Rack&pinion (R series)
Operational principle	- Upon air supply, pistons move horizontally, turning the shaft by the arm connected to the pistons.  Open → Close	- Upon air supply, pistons move vertically, turning the shaft that is linked to the piston gear.  Open → Close
Major parts	piston/crank/shaft	piston/shaft
Benefits	- Smooth on/off with the torque curve synchronized with valves  - Relatively higher torque than the same model in Rack&Pinion type	- Short body length makes it easier to fit in small spaces. - The multi-spring structure enables adjustment of number of springs to suit the site requirements.
Weakness	- long length due to the piston stroke - Multi-spring disabled and therefore a jig is required for spring adjustment	- Rigid torque (not flexible) - It requires the bigger cylinder inner-dia to achieve the same torque as the Scotch-yoke type 
KOSAPLUS Model	A seires (ADx, ASx) x=50,65,80,100,125,140,160,185,210,250,300	R series (RD32, RDy,RSy) y=40,50,65,80,90,100,115,125,140,160,185,210

*<Remark-2> Operating method (Action A,B,C,D) -Based on R series

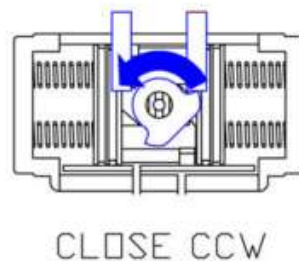
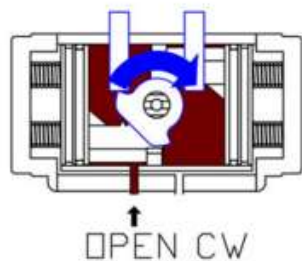
Action A (Fail closed)



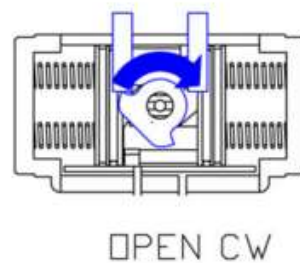
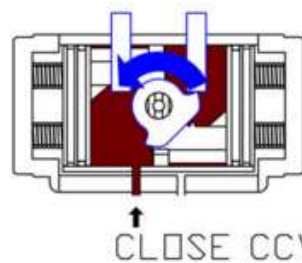
Action B (Fail open)



Action C (Fail closed/open CW)



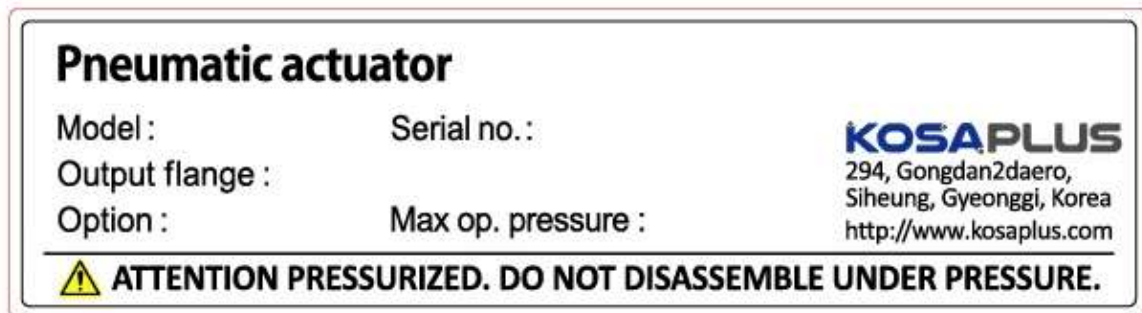
Action D (Fail open/open CW)



1-3. Label

KOSAPLUS product can be identified by following model names and the label containing product serial number (S/N).

► General Product



▶※Caution※ Explosion Proof Product

Related content is written on the label for explosion proof product.

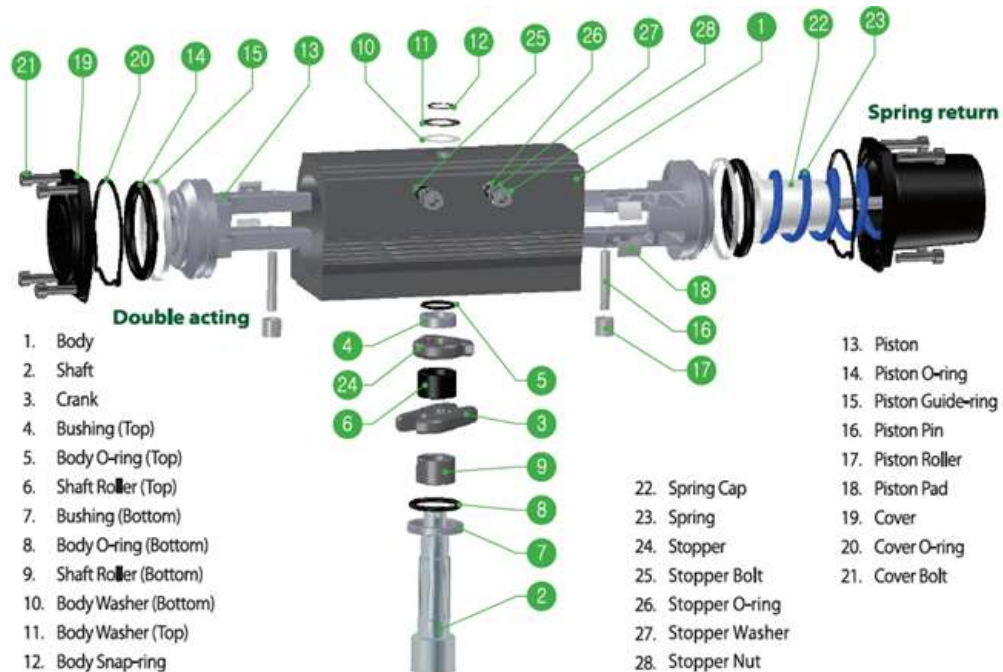


The KOSAPLUS pneumatic actuator with above ATEX label is a Group II category 2 equipment and intended for use in areas in which explosive atmospheres caused by mixtures of air or gases, vapours, mists or by air/dusts are likely to occur. Therefore it may be used in ATEX classification (Gases) Zones 1, 2 and/or (Dust) Zones 21, 22.

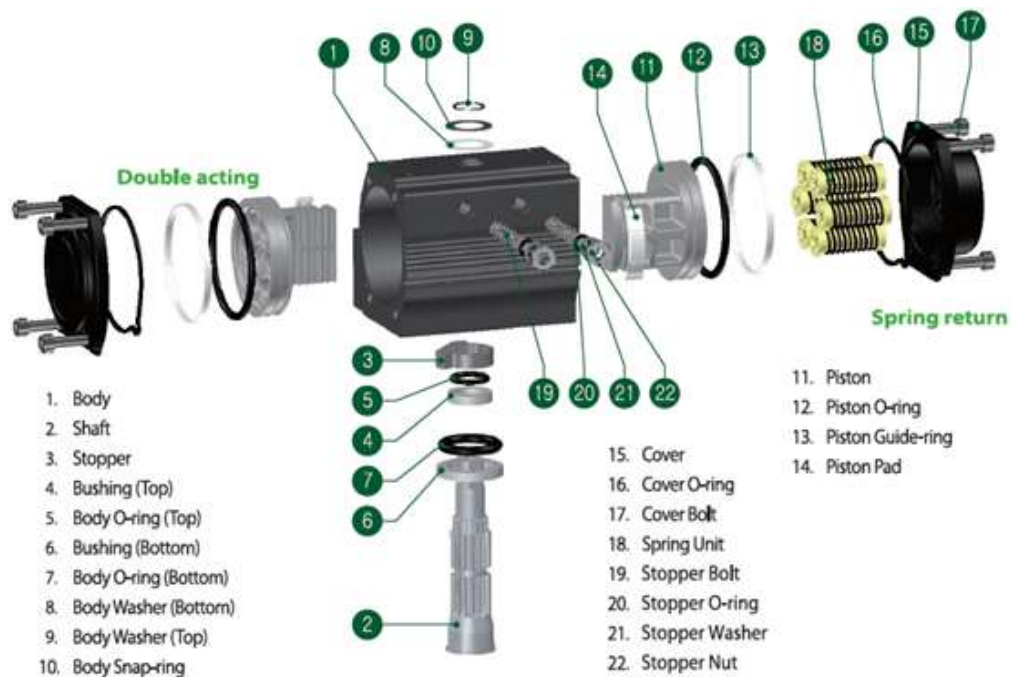
2. Products

2-1. Internal Construction of Product

Internal construction of the Product is illustrated as following.



<A series (AD65/AS65)>



<R series (RD65, RS65)>

3. Installation

User should execute the product installation after thoroughly digesting the following content.

3-1. Attachable Valve

The KOSAPLUS product can be applied to all the Rotary Type Valve executing opening & closing actions rotating 90°.

- a. Major Component ; Ball Valve (2 way, 3 way), Butterfly Valve

3-2. Selection of Actuator

Check the following items in advance when selecting the model of Actuator.

- a. Required torque to open & close the Valve
- b. Air pressure flowing into the Actuator
- c. Fluid Characteristic
- d. Operating Condition (Extremely Low Temperature, Extremely High Temperature)
- e. Other items to consider to operate the Actuator

▷ Users can receive the following product information through a catalog or our staff for selecting a product.

- a. actuator torque.
- b. exterior drawing for the valve connection.
- c. air volume.

▷ User may attach the following Valve accessories as required.

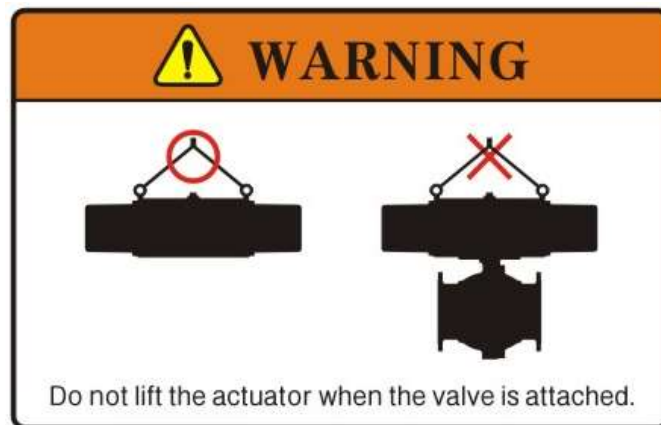
- a. solenoid valve
- b. valve positioner (positioner indicator)
- c. limit switch box
- d. quick valve
- e. declutch gear box
- f. Other accessories that may be used to control the Valve.

▶ **※Caution※** If you want to install it in an explosion-proof area, you must use an approved product with a grade higher than that required for accessories including actuators.

3-3. Caution during Installation

- a. When installing the Product, execute the installation after either removing the potentially hazardous elements or mounting the safety devices considering the accidents & danger that may be happen during the installation works.

- b. KOSAPLUS Product can be used in any indoor & outdoor places except with the explosive environments, while the rust may be processed a little fast in case of installation in sea shore locations.
- c.  **WARNING** Do not inject air until the Product is completely mounted on the Valve during the installation process.
- d. Ample space allowing the free movement of installation tools is required when installing the Product.
- e. When attaching the Accessories, install after checking the Jointing Method & Joint Section.
- f.  **WARNING** The tab on the top of the product is a crane tab for the actuator unit, so it cannot be used for valve assembly.



- g.  **WARNING** If there is no separate mark, non-explosion proof product will be shipped and you should not operate or store the product under the environment that uses hazardous materials. Hazardous materials mean environmentally harmful materials such as materials that cause explosion or fire, flammable materials, corrosive materials, etc. If you operate or store the product at such environment, you need to order the product that satisfies such environment.
- h.  **WARNING** For explosion-proof products, before the actuator and all its accessories is put into operation into a potentially explosive atmosphere it must comply with relevant requirement according to ATEX directive and harmonized standards.

4. Operation

User of Product should operate upon fully recognizing the potential danger caused by the inappropriate management.

4-1. Operation

▷ Operating medium: Compressed dry air

-  It is recommended to use separate dehumidified filter since the water inside the product may cause corrosion or failure of the product.
- It is recommended to use purified air after filtering foreign substances up to less than 40 μ in order to prolong the life of the product.
- Do not use anything except the designated medium since they were not verified.

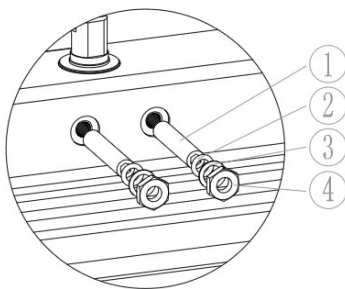
min. max. pressure	3~8 Bar
recommended pressure	4~6 Bar
design pressure	10 Bar

▷ If the pressure is too low, smooth operation may be difficult, and if the pressure is too high, the durability will be significantly reduced. It is recommended to use within the appropriate pressure.

▷ For single-acting (spring return) products, it is recommended not to add air to the spring side (B port).

4-2. Angle adjustment

In case of the A/R models, there is an adjusting bolt which adjusts the open/close angle at the back of the products.



①	Headless wrench bolt
②	O-ring
③	Washer
④	Nut

▷ Angle adjustment method (In case of standard-fail close)

- When you want to adjust the open position, put air in the left port or, if air is not available, rotate the shaft counterclockwise with a spanner to make it open. (when you want to adjust the close position, do it the other way round) ⇒ If you omit this process, you can not adjust

a correct angle and therefore it cannot be assembled correctly, thus causing a breakdown as the headless wrench bolt becomes bent.

- The left bolt is used to adjust the open position and the right bolt is used to adjust the close position. (When it is in the fail-open position, do it the other way round.)
- Using a spanner or monkey wrench, unfasten the ④ nut slightly which you want to adjust.
- If you want to open or close it less, use a wrench to fasten the ① bolt clockwise as required while checking the position of the valve.
- If you want to open or close it more, use a wrench to unfasten the ① bolt slightly counterclockwise and check the angle while turning the shaft with a spanner from time to time. ⇒ Even in case you want to make this product closed completely to the maximum, it is safe to insert the bolt 1~2 threads more when the bolt touches the stopper. (Do not pull the bolt out completely.)
- If you get the angle you want, fasten the ④ nut tightly by turning it clockwise.
- Put air in the left port and check if air leaks by pouring soapy water at the washer part before using it.

4-3. Caution during Operation

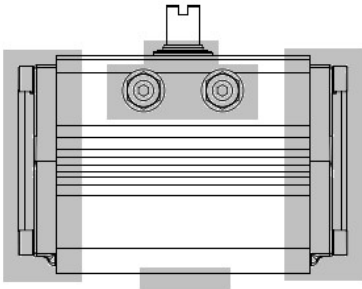
- a. KOSAPLUS Product is designed to open & closed the Valve. Do not use the Product on the purposes other than specified applications.
- b. Ensure not to have the unskilled labors user the Product at own discretion.
- c. Ensure to approach after completely securing the safety when the access to the Product under operation is desired.
- d. When not using the Product over the long period of time, conceal the Air Injection Inlet in order to prevent the infiltration of moisture.

5. Maintenance & Repair

5-1. Self Diagnosis

All the KOSAPLUS Actuators, going through the high pressure test from the development stage, are to be individually & fully tested prior to the shipment from factory. However, in the event the Product oftentimes does not operate with normal condition, execute the Self Diagnosis referring the below table. Nevertheless, if the trouble occurred is not still resolved, contact the KOSAPLUS or authorized Agents for customer service support.

▷ Valve Not Working At All

Check	Result	Cause of Trouble	Troubleshooting
Remove Actuator & inject air.	Working.	Torque of Valve is higher than that of Actuator.	Install higher capacity model Actuator.
		Injection air pressure too low.	Increase the Injection air pressure.
	Not working.	Check Actuator; 1. Paste the soapy water with brush on the shadowy area of the following, and check the presence of air leakage to outside. 2. Paste the soapy water on Section B of flowing injecting air into Inlet A, and check the presence of bubble.. 	If the air is leaked or bubble is generated, contact the Customer Service Center of KOSAPLUS to replace the O-Ring or receive the Post Order Service.
		Check the Air Injecting Pipe; Possibility of clogging with foreign substances or leaks.	Remove the foreign substances or contact the Customer Service Center of corresponding manufacturer for service.
		Check the Solenoid Valve or electrical devices; Possibility of disconnect or unsuitable voltage.	Contact the Customer Service Center of corresponding manufacturer for service.

▷ When Valve is Closed Stopping the Opening Process.

Check Item	Cause of Trouble	Troubleshooting
Check the Actuator.	Angle Adjusting Bolt turned inside too excessively.	Use by properly adjusting the Bolt per User's need.
	Injecting Air Pressure too low.	Increase the Injecting Air Pressure.
	Torque of Valve is higher than that of Actuator.	Install higher capacity model Actuator.
	Force of Spring too weak for Spring Return Model.	Contact the Customer Service Center of KOSA ^{PLUS} or authorized Agents.
	Actuator Check; Refer to page 10.	In case of Air Leakage or presence of bubble, contact the Customer Service Center of KOSAPLUS to receive the Post Order Service.
Check Other Connecting Sections.	Check the Air Injecting Pipe.; Possibility of clogging with foreign substances or leaks.	Remove the foreign substances or contact the Customer Service Center of corresponding manufacturer for service.
	Check the Solenoid Valve or electrical devices; Possibility of disconnect or unsuitable voltage.	Contact the Customer Service Center of corresponding manufacturer for service.

5-2. Assembling & Disassembling

The assembling & disassembling of Product should be executed by the Skilled Labors of KOSAPLUS or authorized Agents to secure the safety of Users and life cycle of Product in principle. However, in the event the indispensable assembling & disassembling of Product at site is desired due to unavoidable reasons, make sure to execute the works only after consulting with the persons in charge of Product of KOSAPLUS or authorized Agents to receive sufficient instructions through e-mail or telephone communications.

▷ Skilled Labor ; Persons who have received the professional trainings of KOSAPLUS or authorized Agents and recognizes all the potentially dangerous situations. Further, the Skilled Labor must possess all the required knowledge on app applicable laws & regulations with regard to the occurrence of unexpected accidents and other special job site conditions.

※ In the event the addition or variation from the original design of Product are to be desired, make sure to execute the works after consulting with KOSAPLUS or authorized Agents to receive sufficient instructions. KOSAPLUS does not assume the responsibility for any property damages or personal injuries caused by the User's operating faults or arbitrary design change & improper maintenance works.

6. Customer Service Support Contact

Address: 294, Gongdan2daero, Siheung, Gyeonggi, 15115, Korea

Telephone: +82-31-433-3159

Fax: +82-31-433-3151

e-mail: (overseas) oversea@kosaplus.com (domestic) kosaplus@kosaplus.com

The User Manual is made to allow the operation & convenience of Purchaser, User & Skilled Labor of Product, and the KOSAPLUS duly reserves the right of operating instruction & guides contained in the Manual. As such, any sorts of revisions & sales by copying of entire or part of the Manual without securing the written consent of KOSAPLUS in advance should be absolutely prohibited.