Ball Lock Cylinder

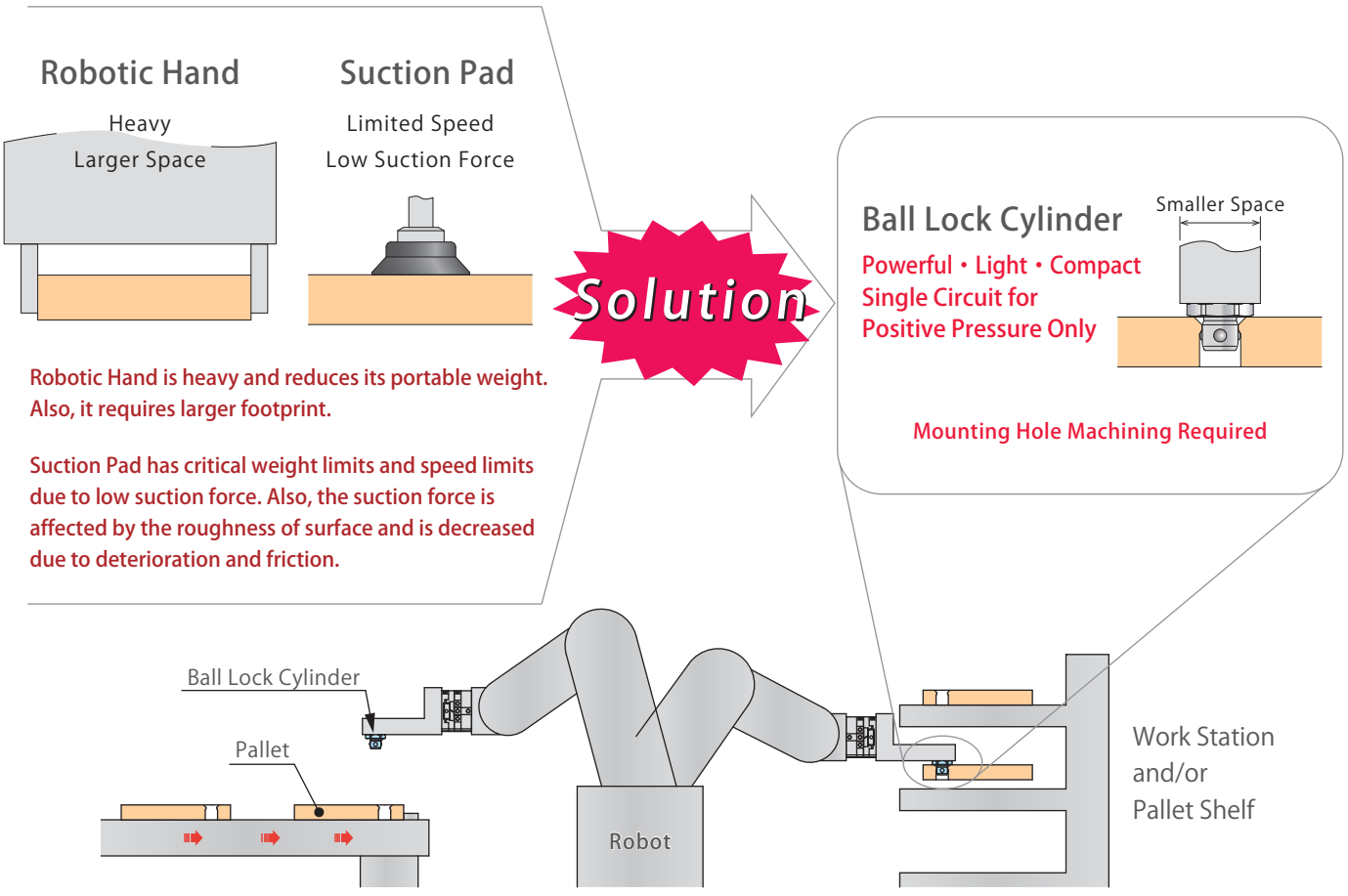
2 larger sizes added to the lineup! (April, 2019)

Model WKA

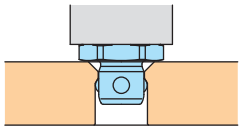
Spring Lock Design
Securely Transfers Pallets and Prevents Pallet Drops

The light weight and compact design allows for maximizing the robot's ability without reducing its portable weight.

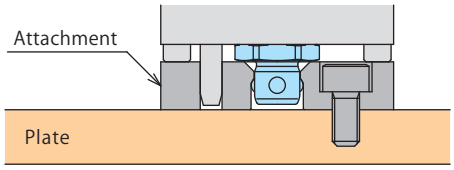
The ball lock cylinder is used for transfer pallets, plates, temporary tool stocker, etc.



Application Examples



Pallet Transfer



Install attachments for plates that cannot have workpiece holes.

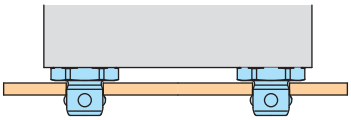
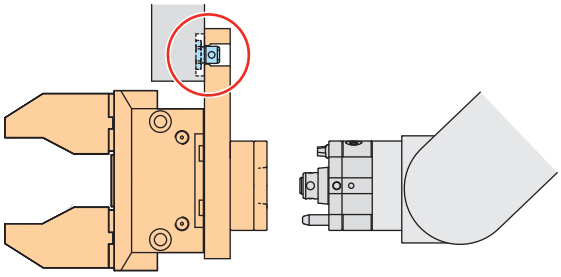
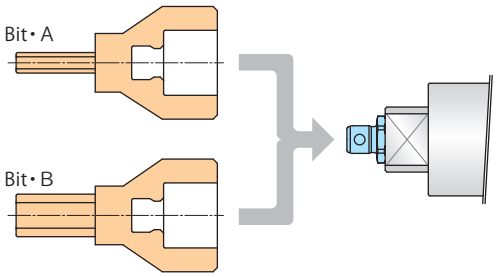


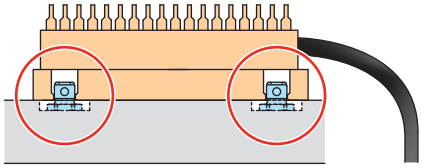
Plate Transfer



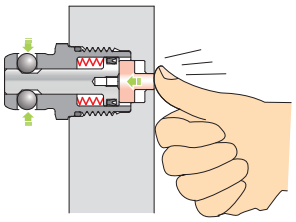
Temporary Stopper/Falling Prevention for Stocker



Bit/Tool Change



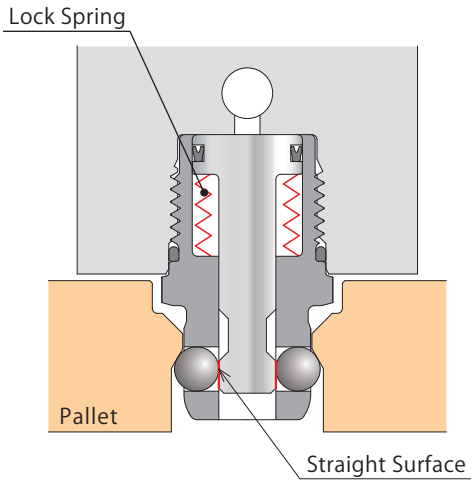
Falling Prevention for Nozzle Unit

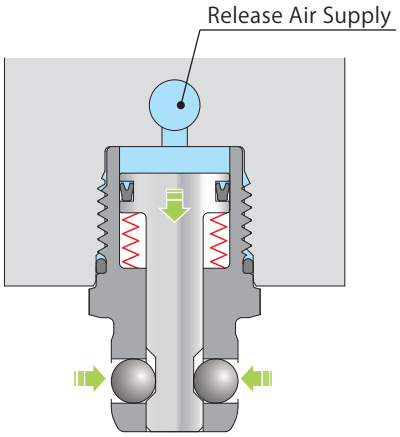


Used by Hand or Another Cylinder

Action Description

※ This is a simplified drawing. Actual components are different.





Transferring (Lock)

Release Air Pressure **OFF**

The piston is pulled down via internal spring and the steel balls will expand. The steel balls will engage with the straight surface to hold the pallet. The ball lock cylinder maintains clamping force even with air pressure loss during power failure.

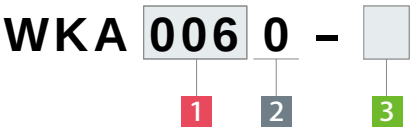
Loading/Unloading (Release)

Release Air Pressure **ON**

The piston is pushed by air pressure (positive pressure) and the steel balls will be set inside the cylinder.

Low Air Consumption and Low Running Cost.

Model No. Indication



1 Body Size

006：Released Diameter ϕ6.5 Pulling Capacity (Holding Force) 50N
008：Released Diameter ϕ8 Pulling Capacity (Holding Force) 70N
010：Released Diameter ϕ10 Pulling Capacity (Holding Force) 100N
012：Released Diameter ϕ12 Pulling Capacity (Holding Force) 150N
016：Released Diameter ϕ16 Pulling Capacity (Holding Force) 200N

2 Design No.

0 ：Revision Number

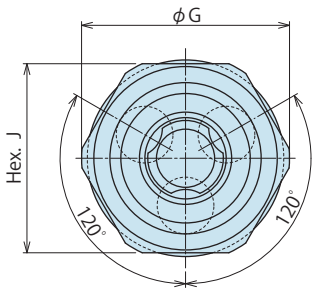
3 Operating Temperature (Sealing Material)

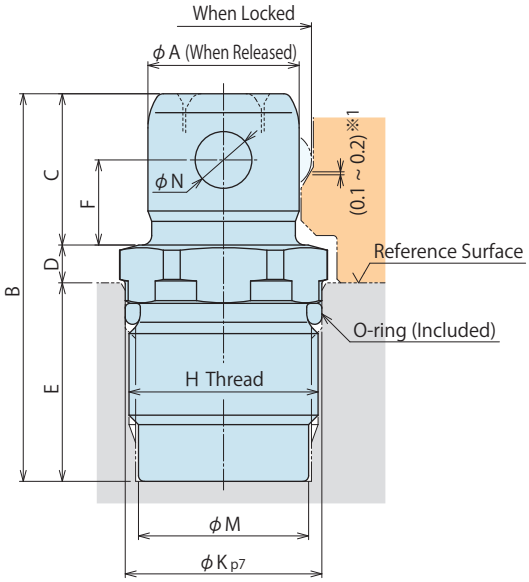
Blank ： Standard Temperature (Operating Temperature 0 ~ 70℃) Sealing Material：Nitrile Rubber
V ： High Temperature (Operating Temperature 0 ~ 120℃) Sealing Material：Fluorine Rubber

Specifications

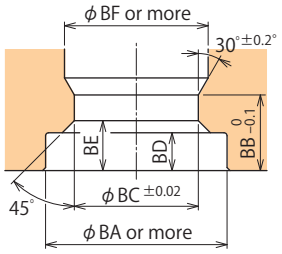
Model No.		WKA0060–□	WKA0080–□	WKA0100–□	WKA0120–□	WKA0160–□
Pulling Capacity (Holding Force) N		50	70	100	150	200
Release Cylinder Capacity cm^3		0.08	0.08	0.15	0.26	0.49
Max. Operating Pressure MPa		0.7				
Min. Operating Pressure MPa		0.25				
Withstanding Pressure MPa		1.0				
Operating Temperature ℃	3 Blank	0 ~ 70				
	3 V	0 ~ 120				
Usable Fluid		Dry Air				
Weight g		7	8	13	20	41

External Dimensions

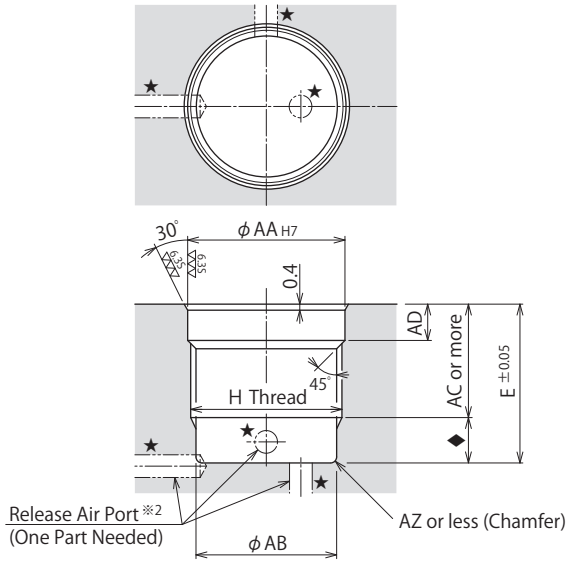




Workpiece Hole Reference Dimensions



Mounting Hole Machining Dimensions



Note :
※1. There is a gap between a workpiece hole and a cylinder when locked (when expanded).
※2. Release air pressure can be supplied from the side or the bottom surface of the mounting hole (★ part).
If machining the release air port on the side, please machine it within ◆ area.

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		WKA0060–□	WKA0080–□	WKA0100–□	WKA0120–□	WKA0160–□
Diameter	A (Released)	6.5 $^{0}_{-0.05}$	8 $^{0}_{-0.05}$	10 $^{0}_{-0.05}$	12 $^{0}_{-0.05}$	16 $^{0}_{-0.05}$
	Locked	7.7	9.3	11.5	13.8	18.2
B		19.5	20.5	22.5	25	29.5
C		7	8	9	10	11.5
D		2	2	2.5	3	4
E		10.5	10.5	11	12	14
F		4	4.5	5	5.5	6.5
G		11	11	13.5	15.5	21.2
H (Nominal × Pitch)		M10×0.75	M10×0.75	M12×1	M14×1	M18×1.5
J		10	10	12	14	19
K		10.4 $^{+0.036}_{+0.018}$	10.4 $^{+0.036}_{+0.018}$	12.4 $^{+0.036}_{+0.018}$	14.4 $^{+0.036}_{+0.018}$	19.4 $^{+0.043}_{+0.022}$
M		9	9	10.7	12.7	16.1
N		2.5	3	3.5	4	5
O-ring		SS8.5 (NOK-made)	SS8.5 (NOK-made)	SS10.5 (NOK-made)	S12 (NOK-made)	AS568-016
AA		10.4 $^{+0.018}_{0}$	10.4 $^{+0.018}_{0}$	12.4 $^{+0.018}_{0}$	14.4 $^{+0.018}_{0}$	19.4 $^{+0.021}_{0}$
AB		9.3 $^{+0.07}_{-0.11}$	9.3 $^{+0.07}_{-0.11}$	11 $^{+0.15}_{-0.08}$	13 $^{+0.15}_{-0.08}$	16.5 $^{+0.17}_{-0.12}$
AC		7.5	7.5	8	9	10.5
AD		2.4	2.4	2.4	2.8	3.8
AZ (Chamfer)		0.2	0.2	0.4	0.4	0.4
BA		12	12	14.5	17	23
BB		4.7	5	5.8	6.45	8
BC		6.7	8.2	10.2	12.2	16.2
BD		2.5	2.5	3	3.5	4.5
BE		3.3	3.3	4.6	4.9	6.5
BF		7.9	9.5	11.7	14.2	18.6

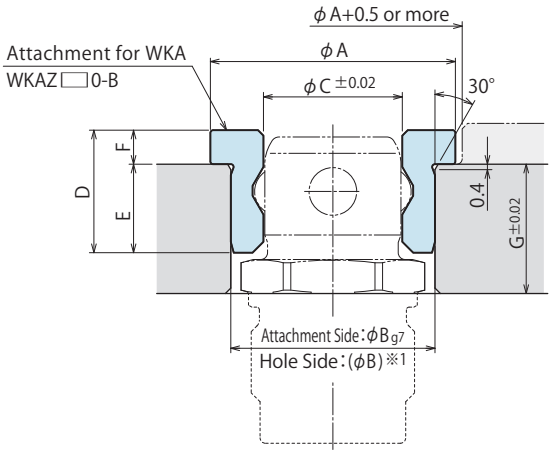
Accessory：Attachment for WKA

Attachment for WKA

Model No. Indication

WKAZ 06 0 – B

- 06: Size (Refer to the following table)
- 0: Design No. (Revision Number)



(mm)

Model No.		WKAZ060-B	WKAZ080-B	WKAZ100-B	WKAZ120-B	WKAZ160-B
Corresponding Model No.		WKA0060-□	WKA0080-□	WKA0100-□	WKA0120-□	WKA0160-□
A		14	14	18	20	26
B	Attachment	$12^{-0.006}_{-0.024}$	$12^{-0.006}_{-0.024}$	$15^{-0.006}_{-0.024}$	$17^{-0.006}_{-0.024}$	$23^{-0.007}_{-0.028}$
	Hole	(12) ※1	(12) ※1	(15) ※1	(17) ※1	(23) ※1
C		6.7	8.2	10.2	12.2	16.2
D		7.5	7.5	9	10	11.5
E		5.5	5.5	6.5	7.5	8.5
F		2	2	2.5	2.5	3
G		8	8	9.5	11	13
Weight		5 g	4 g	8 g	10 g	19 g

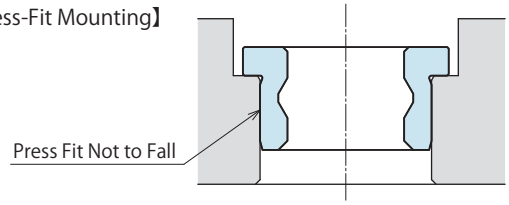
Notes :

1. Material：Martensitic Stainless Steel (HRc29 ~ 33)

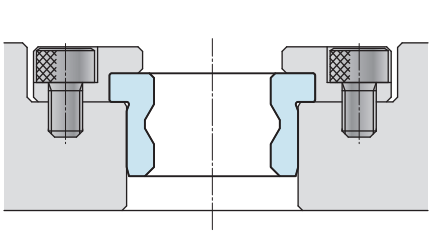
※1. Hole Side：Determine ϕB tolerance of mounting hole based on the dimensions of the attachment. (Refer to the following attachment mounting examples.)

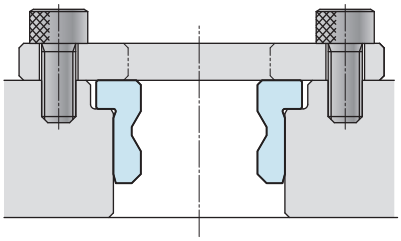
Attachment Mounting Examples

【Press-Fit Mounting】



【Mounting with a Cover】





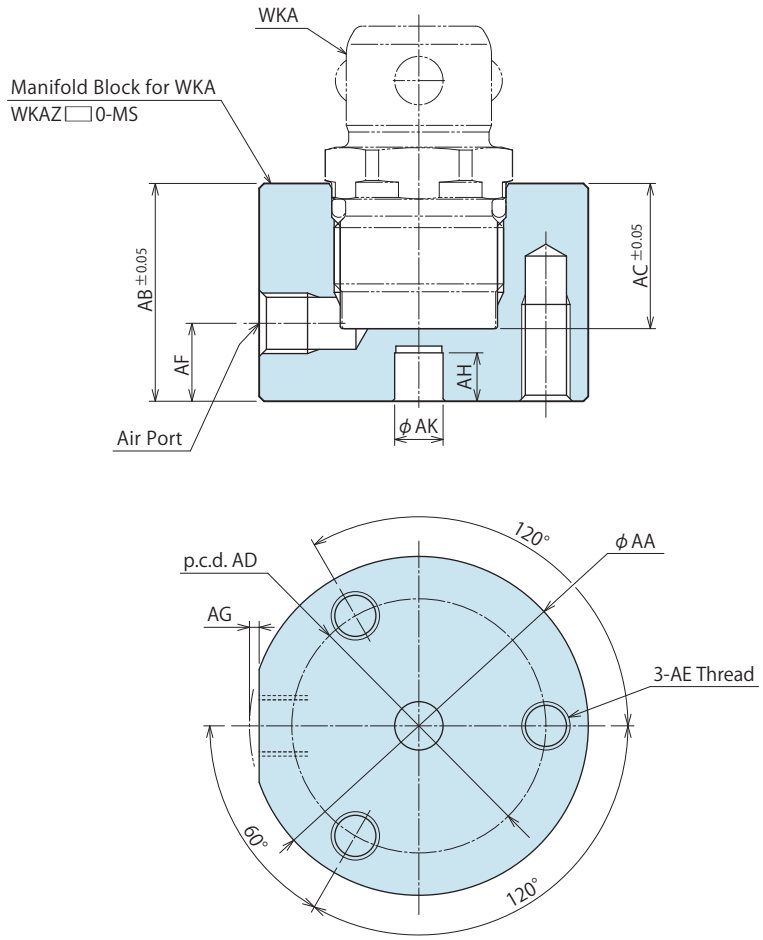
Accessory：Manifold Block for WKA

Manifold Block for WKA

Model No. Indication

WKAZ 06 0 – MS

- 06: Size (Refer to the following table)
- 0: Design No. (Revision Number)



(mm)

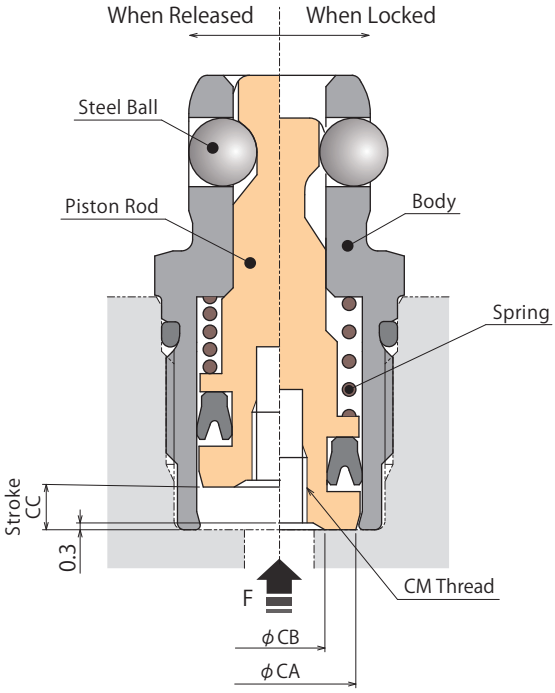
Model No.	WKAZ060-MS		WKAZ100-MS	WKAZ120-MS	WKAZ160-MS
Corresponding Model No.	WKA0060-□	WKA0080-□	WKA0100-□	WKA0120-□	WKA0160-□
AA	20		22	28	32
AB	15		16	18	20
AC	10.5		11	12	14
AD	15		17	21	25
AE	M3×0.5 Thread Depth 6		M3×0.5 Thread Depth 6	M4×0.7 Thread Depth 8	M4×0.7 Thread Depth 8
Air Port	M3 Thread		M3 Thread	M5 Thread	M5 Thread
AF	5		5	6	6
AG	0.5		0.5	0.8	0.8
AK	$2^{+0.03}_{0}$		$3^{+0.03}_{0}$	$4^{+0.03}_{0}$	$4^{+0.03}_{0}$
AH	2		3	4	4
Weight	10g		13g	24g	33g

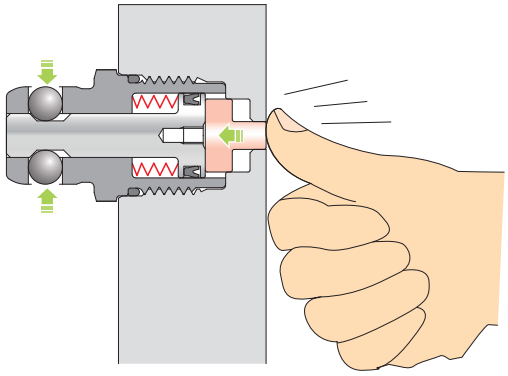
Note :
1. Material：A2017BE-T4　Surface Finishing：Anodized Aluminum Finishing

Releasing Force and Dimensions when Operated by External Force

WKA is released by air pressure. It also can be operated by applying external force to the piston rod in such cases :

- Unable to supply air pressure directly
- Unable to secure sealing ability due to high temperature environment
- Operating manually





Example

Part	Material
Body	Martensitic Stainless Steel
Piston Rod	
Steel Ball	
Spring	Stainless Steel

Model No.		WKA0060–□	WKA0080–□	WKA0100–□	WKA0120–□	WKA0160–□
Required Releasing Force F N		10	10	12	12	17
Max. Releasing Force F max ※1 N		40	40	60	60	100
Dimensions mm	CA	6.8	6.8	8.5	10.5	13.5
	CB	4	4	5	6.5	9.5
	CC	1.8	2	2.3	2.7	3.2
	CM (Nominal×Pitch×Depth)	M2.5×0.45×3	M2.5×0.45×3	M3×0.5×4	M4×0.7×6	M5×0.8×8

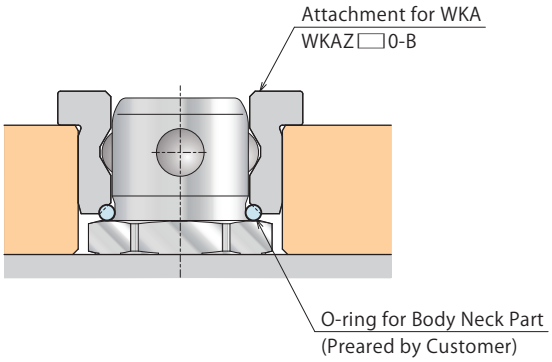
Note :

※1. External force F (applying when releasing) should be more than the required releasing force and less than the maximum releasing force. External force greater than the maximum releasing force will damage the product.

Backlash Prevention with O-ring (Reference)

There is a clearance between a workpiece hole and WKA when locked.

Simple backlash prevention is possible by mounting an o-ring to the neck part of WKA if necessary.



Model No.	WKA0060–□	WKA0080–□	WKA0100–□	WKA0120–□	WKA0160–□
O-ring for Body Neck Part	SS6.5 (NOK-made)	SS8 (NOK-made)	SS10 (NOK-made)	S12 (NOK-made)	A568-015 ~ 016

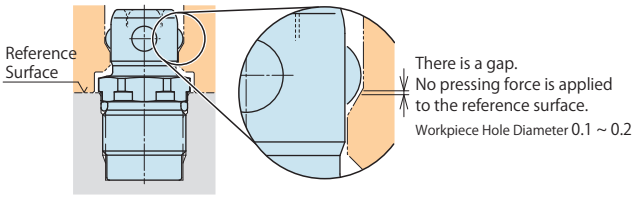
Cautions

Notes for Design

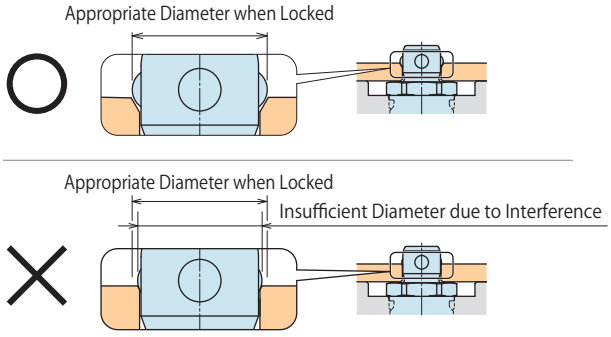
1) Check Specifications
- Please use each product according to the specifications.
- The steel balls of WKA will be set within the cylinder by supplying air and it allows for loading and unloading the pallet (workpiece). By stopping air supply and releasing the supplied air, the steel balls will be expanded via internal spring to lock (prevent falling of) the pallet (fixture) or workpiece.

2) Do not use the product in the environment with cutting chips and coolant.

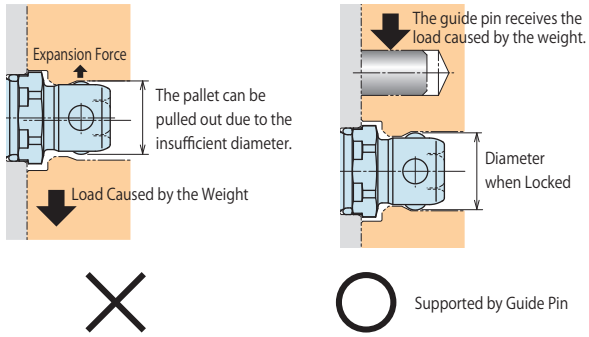
3) WKA fixes the workpiece hole with the steel balls (when locked).
- There is a gap between the workpiece hole and cylinder when locked.
- There is no locating function or pressing force applied to the reference surface.



4) Workpiece Hole
- When temporarily locking the hole with the external dimensions other than shown on P.320, make sure to design so that the steel balls expand till the proper locked diameter. Otherwise, WKA can be released even with low pull-out force.



5) Mounting/Removing Pallet (Workpiece)
- If needed, please apply a guide pin (rough guide) separately to avoid increasing the force which exceeds allowable thrust load when mounting/ removing pallet (workpiece).
- The steel balls have only a slight expansion force when locking. If the pallet is heavy and/or the position of the product and pallet hole is dislocated, the steel balls may not expand properly. Please install a guide pin (rough guide) to ensure proper lock action.



Installation Notes

1) Check the fluid to use.
- Make sure to supply filtered clean dry air.

2) Preparation for Piping
- The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly. The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
- There is no filter provided with this product for prevention of contaminants in the air circuit.

3) Applying Sealing Tape (Sealing Tape for Piping etc.)
- Not required to apply sealing tape for the thread of the ball lock cylinder.
- Wrap with tape 1 to 2 times following the screwing direction. Wrapping in the wrong direction will cause leaks and malfunction.
- Pieces of the sealing tape can lead to air leaks and malfunction.
- When piping, be careful that contaminant such as sealing tape does not enter in products.

4) Mounting the Product
- When mounting, make sure there are no scratches or damage on the O-ring or the seals, and tighten the product according to the torque shown in the table below.

Model No.	Thread Size (mm)	Tightening Torque (N·m)
WKA0060-□	M10×0.75	2.5
WKA0080-□		
WKA0100-□	M12×1	4.0
WKA0120-□	M14×1	6.0
WKA0160-□	M18×1.5	10.0

- Apply an adequate amount of grease to the O-ring.
- If it is mounted under dry state, the O-ring may have twisting or be defective.
- If it is tightened with an excessive torque, it may lead to malfunction or damage to the product.

5) Please avoid repetitive operation of WKA without a workpiece.

※ Please refer to P.715 for common cautions.
・Notes on Handling ・Maintenance/Inspection ・Warranty

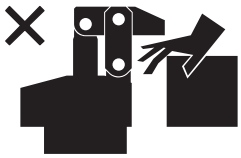
Cautions

Notes on Handling

1) It should be operated by qualified personnel.
- The hydraulic machine and air compressor should be operated and maintained by qualified personnel.

2) Do not operate or remove the product unless the safety protocols are ensured.
① The machine and equipment can only be inspected or prepared when it is confirmed that the safety devices are in place.
② Before the product is removed, make sure that the above-mentioned safety devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
③ After stopping the product, do not remove until the temperature drops.
④ Make sure there is no trouble/issue in the bolts and respective parts before restarting the machine or equipment.

3) Do not touch a clamp (cylinder) while it is working.
Otherwise, your hands may be injured.

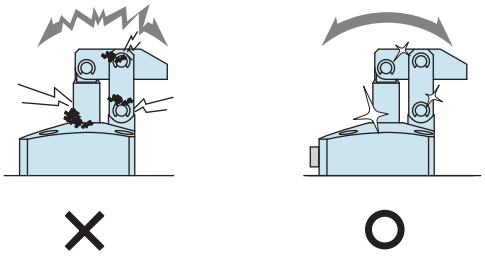


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

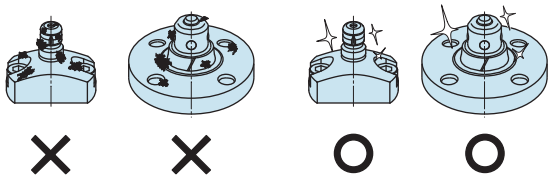
Maintenance and Inspection

1) Removal of the Machine and Shut-off of Pressure Source
- Before removing the product, make sure that the safety devices are in place. Shut off the pressure and power source and make sure no pressure exists in the air and hydraulic circuits.
- Make sure there is no trouble/issue in the bolts and respective parts before restarting.

2) Regularly clean the area around the piston rod and plunger.
- If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning, fluid leakage.



3) Regularly clean the reference surfaces (taper reference surface and seating surface) of locating products (SWT/SWQ/SWP/VRA/VRC/VX/VXE/VXF/WVS/VWH/VWM/VWK).
- Locating products (except VRA/VRC/VX/VXE/VXF and SWR without air blow port) can remove contaminants with the cleaning function. When installing a workpiece or a pallet, make sure there are no contaminants such as thick sludge.
- Continuous use with dirt on components will lead to locating failure, fluid leakage and malfunction.



4) Regularly tighten pipe, mounting bolt, nut, snap ring, cylinder and others to ensure proper use.

5) Make sure the hydraulic fluid has not deteriorated.

6) Make sure there is a smooth action without an irregular noise.
- Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

7) The products should be stored in the cool and dark place without direct sunshine or moisture.

8) Please contact us for overhaul and repair.

Warranty

1) Warranty Period

- The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense.
  Defects or failures caused by the following are not covered.

① If the stipulated maintenance and inspection are not carried out.
② Failure caused by the use of the non-confirming state at the user's discretion.
③ If it is used or operated in an inappropriate way by the operator.
(Including damage caused by the misconduct of the third party.)
④ If the defect is caused by reasons other than our responsibility.
⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
⑥ Other caused by natural disasters or calamities not attributable to our company.
⑦ Parts or replacement expenses due to parts consumption and deterioration.
(Such as rubber, plastic, seal material and some electric components.)

Damages excluding from direct result of a product defect shall be excluded from the warranty.

Sales Offices

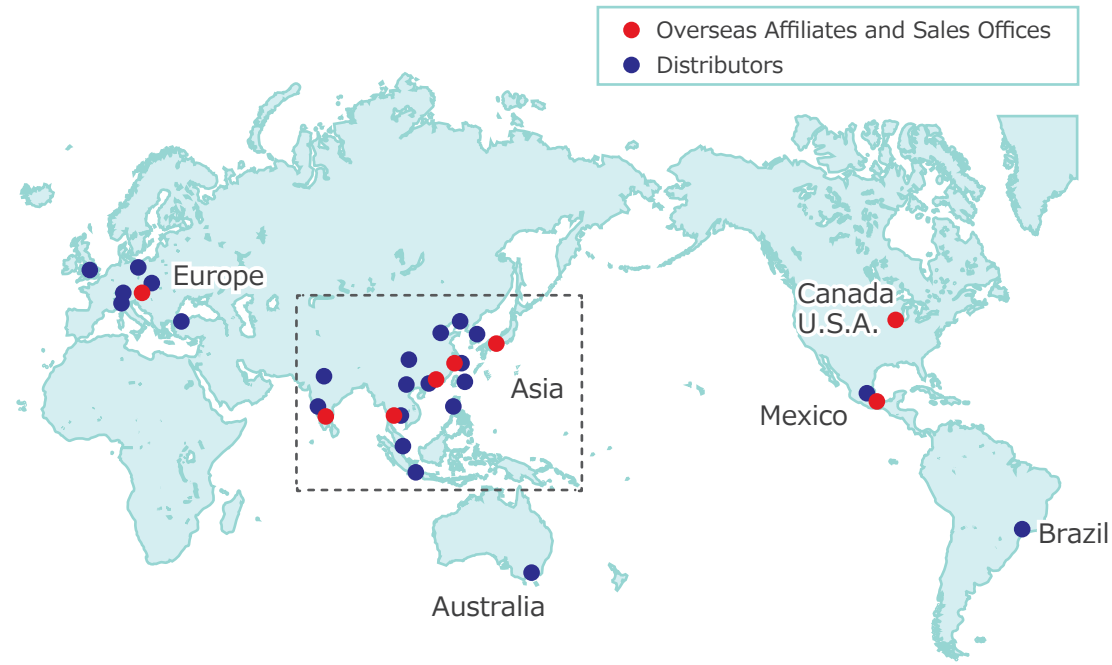
Sales Offices across the World

JAPAN HEAD OFFICE Overseas Sales	**TEL. +81-78-991-5162**	FAX. +81-78-991-8787 KOSMEK LTD. 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241 〒651-2241　兵庫県神戸市西区室谷2丁目1番5号
United States of America SUBSIDIARY KOSMEK (USA) LTD.	**TEL. +1-630-620-7650**	FAX. +1-630-620-9015 650 Springer Drive, Lombard, IL 60148 USA
MEXICO REPRESENTATIVE OFFICE KOSMEK USA Mexico Office	**TEL. +52-442-161-2347**	Av. Santa Fe #103 int 59 Col. Santa Fe Juriquilla C.P. 76230 Queretaro, Qro Mexico
EUROPE SUBSIDIARY KOSMEK EUROPE GmbH	**TEL. +43-463-287587**	FAX. +43-463-287587-20 Schleppeplatz 2 9020 Klagenfurt am Wörthersee Austria
CHINA KOSMEK (CHINA) LTD. 考世美(上海)貿易有限公司	**TEL. +86-21-54253000**	FAX. +86-21-54253709 Room601, RIVERSIDE PYRAMID No.55, Lane21, Pusan Rd, Pudong Shanghai 200125, China 中国上海市浦东新区浦三路21弄55号银亿滨江中心601室 200125
INDIA BRANCH OFFICE KOSMEK LTD - INDIA	**TEL. +91-9880561695**	F 203, Level-2, First Floor, Prestige Center Point, Cunningham Road, Bangalore -560052 India
THAILAND REPRESENTATIVE OFFICE KOSMEK Thailand Representation Office	**TEL. +66-2-300-5132**	FAX. +66-2-300-5133 67 Soi 58, RAMA 9 Rd., Suanluang, Suanluang, Bangkok 10250, Thailand
TAIWAN (Taiwan Exclusive Distributor) Full Life Trading Co., Ltd. 盈生貿易有限公司	**TEL. +886-2-82261860**	FAX. +886-2-82261890 16F-4, No.2, Jian Ba Rd., Zhonghe District, New Taipei City Taiwan 23511 台湾新北市中和區建八路2號 16F－4（遠東世紀廣場）
PHILIPPINES (Philippines Exclusive Distributor) G.E.T. Inc, Phil.	**TEL. +63-2-310-7286**	FAX. +63-2-310-7286 Victoria Wave Special Economic Zone Mt. Apo Building, Brgy. 186, North Caloocan City, Metro Manila, Philippines 1427
INDONESIA (Indonesia Exclusive Distributor) PT. Yamata Machinery	**TEL. +62-21-29628607**	FAX. +62-21-29628608 Delta Commercial Park I, Jl. Kenari Raya B-08, Desa Jayamukti, Kec. Cikarang Pusat Kab. Bekasi 17530 Indonesia

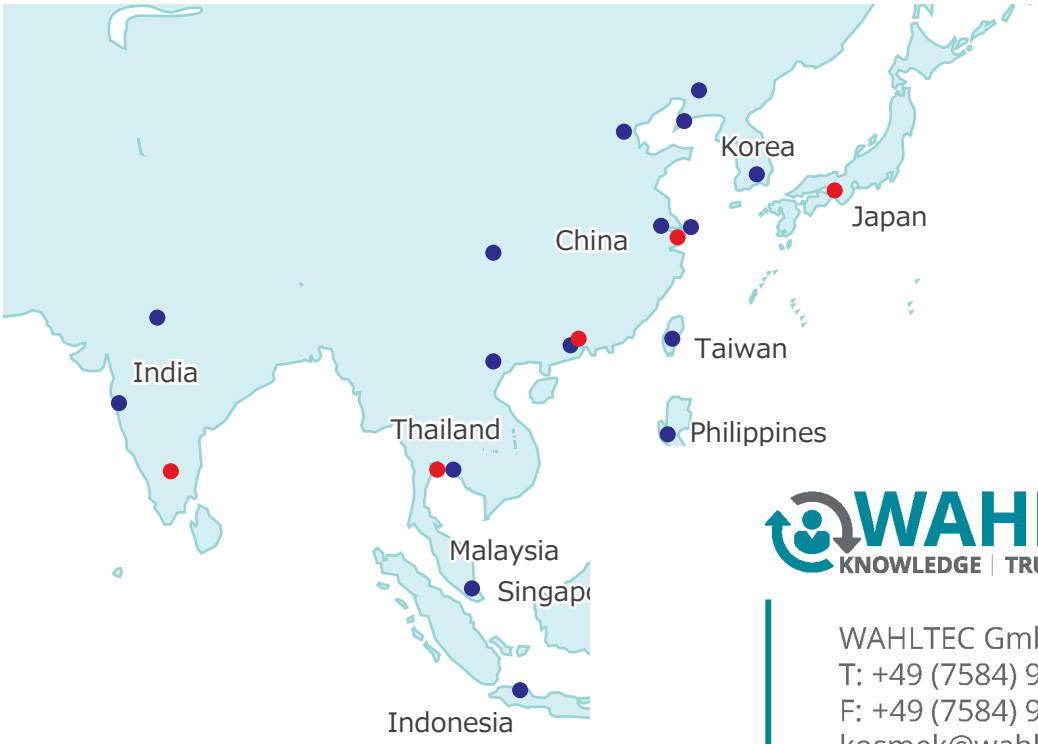
Sales Offices in Japan

Head Office Osaka Sales Office Overseas Sales	**TEL. 078-991-5162**	FAX. 078-991-8787 〒651-2241　兵庫県神戸市西区室谷2丁目1番5号
Tokyo Sales Office	**TEL. 048-652-8839**	FAX. 048-652-8828 〒331-0815　埼玉県さいたま市北区大成町4丁目81番地
Nagoya Sales Office	**TEL. 0566-74-8778**	FAX. 0566-74-8808 〒446-0076　愛知県安城市美園町2丁目10番地1
Fukuoka Sales Office	**TEL. 092-433-0424**	FAX. 092-433-0426 〒812-0006　福岡県福岡市博多区上牟田1丁目8-10-101

Global Network



Asia Detailed Map



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