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.





C Model No. Indication



1 Body Size

016 : Released Diameter ϕ 16	Pulling Capacity (Holding Force) 200N
012 : Released Diameter ϕ 12	Pulling Capacity (Holding Force) 150N
010 : Released Diameter ϕ 10	Pulling Capacity (Holding Force) 100N
008 : Released Diameter ϕ 8	Pulling Capacity (Holding Force) 70N
006 : Released Diameter ϕ 6.5	Pulling Capacity (Holding Force) 50N

2 Design No.

0 : Revision Number

3 Operating Temperature (Sealing Material)

- Blank : Standard Temperature (Operating Temperature 0 ~ 70°C) Sealing Material: Nitrile Rubber
 - **V** : High Temperature (Operating Temperature 0 ~ 120°C) Sealing Material: Fluorine Rubber

Specifications

Model No.			WKA0060-	WKA0080-	WKA0100-	WKA0120-	WKA0160-🗆
Pulling Capacity (Ho	olding Force)	Ν	50	70	100	150	200
Release Cylinder Ca	pacity	cm ³	0.08	0.08	0.15	0.26	0.49
Max. Operating Pres	ssure	MPa	0.7				
Min. Operating Pres	sure	MPa	0.25				
Withstanding Pressure MPa			1.0				
Operating	3 Blank				0 ~ 70		
Temperature ℃	3 V		0 ~ 120				
Usable Fluid	-		Dry Air				
Weight		g	7	8	13	20	41



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 \blacklozenge area.

	External	Dimensio	ns and Ma	achining	Dimensions	for Mounting
\smile	EXection	Dimensio		a contracting	Dimensions	ior mounting

	I Dimensi			intensions		(mm)
Mod	el No.	WKA0060-	WKA0080-	WKA0100-	WKA0120-	WKA0160-
Diamatan	A (Released)	6.5 _{-0.05}	8 _0.05	10 _0.05	12 _0.05	16 _0.05
Diameter	Locked	7.7	9.3	11.5	13.8	18.2
	В	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 (Nomin	al $ imes$ 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
0-	ring	SS8.5 (NOK-made)	SS8.5 (NOK-made)	SS10.5 (NOK-made)	S12 (NOK-made)	AS568-016
A	A	10.4 +0.018	10.4 ^{+0.018}	12.4 ^{+0.018}	14.4 ^{+0.018}	19.4 ^{+0.021}
ŀ	λB	9.3 +0.07 -0.11	9.3 +0.07	11 ^{+0.15} -0.08	13 ^{+0.15} -0.08	16.5 ^{+0.17} -0.12
ŀ	AC	7.5	7.5	8	9	10.5
A	١D	2.4	2.4	2.4	2.8	3.8
AZ (Cł	namfer)	0.2	0.2	0.4	0.4	0.4
E	3A	12	12	14.5	17	23
E	3B	4.7	5	5.8	6.45	8
E	3C	6.7	8.2	10.2	12.2	16.2
E	BD		2.5	3	3.5	4.5
E	3E	3.3	3.3	4.6	4.9	6.5
E	3F	7.9	9.5	11.7	14.2	18.6

Proximity Switch JEP High-Power Pneumatic Hole Clamp SWE High-Power Pneumatic Swing Clamp WHE

WPA

WPH

WPP

WPQ Auto Switch

High-Power Pneumatic Link Clamp WCE

> Pneumatic Hole Clamp SWA

Pneumatic Swing Clamp WHA

Double Piston Pneumatic Swing Clamp

WHD

Pneumatic Link Clamp WCA

Air Flow Control Valve BZW

Manifold Block WHZ-MD

CAccessory: Attachment for WKA

Attachment for WKA

Model No. Indication





Model No.		WKAZ060-B	WKAZ080-B	WKAZ100-B	WKAZ120-B	WKAZ160-B
Correspor	nding Model No.	WKA0060-🗆	WKA0080-🗆	WKA0100-	WKA0120-	WKA0160-
	А	14	14	18	20	26
R	Attachment	12 -0.006	12 -0.006 -0.024	15 ^{-0.006} -0.024	17 ^{-0.006} -0.024	23 - 0.007 - 0.028
D	Hole	(12) ^{※1}	(12) ^{※1}	(15) ^{※1}	(17) ^{※1}	(23) **1
	С	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
١	Veight	5 g	4 g	8 g	10 g	19 g

Notes :

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

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

Attachment Mounting Examples



[Mounting with a Cover]





Features Advantages	Action Mo Description Inc	del No. Specifications	External Dimensions	Accessori	es Cautions	
						Locating
Accessory	: Manifold Block	for WKA				Clamp
Manifold B	lock for WKA					Locating
Model No. I	ndication					Hand • Clamp
WKA	AZ 06 0 -	- MS				Support
	(Refer to the following table)	Revision Number)				Valve • Coupler
						Cautions • Others
	Manifold Block for V WKAZ 🗔 0-MS			<u></u>		Pallet Gripper WVA Locating Pin Clamp SWP
	AB ±0.05			AC ±0.05		High-Power Pull Stud Clamp
				<u> </u>		FA Pneumatic Hole Clamp WKH
	⊻ Air Por					Lifting Hole Clamp SWJ
		p.c.d. AD	1200	<u>φ ΑΑ</u>		Ball Lock Cylinder WKA
		AG		3-AE Thre	ead_	Pneumatic Robotic Hands WPW-C WPS-C WPA WPH WPP WPQ Auto Switch Proximity Switch JEP
			120	/		High-Power Pneumatic Hole Clamp
					(mm)	Swing Clamp WHE
	Model No.	WKAZ060-MS	WKAZ100-MS	WKAZ120-MS	WKAZ160-MS	High-Power Pneumatic
	Corresponding Model No.	WKA0060- WKA0080-	WKA0100-	WKA0120-	WKA0160-	Link Clamp WCE
	AA	20	22	28	32	Pneumatic
	AB	15	16	18	20	Hole Clamp
	AC	10.5	11	12	14	
	AD	15	17	21	25	Swing Clamp
	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	WHA
	Air Port	M3 Thread	M3 Thread	M5 Thread	M5 Thread	Double Piston Pneumatic
	ΔΕ	5	5	6	6	Swing Clamp
		0.5		0	0.0	WHD
	AG	0.5	0.5	U.8	0.8 4 +0.03	Pneumatic Link Clamp
	АК	2.000	3 0 0	4 0	4 0	WCA
	AH	2 10g	3 13a	4 24g	4 33a	Air Flow Control Valve
	Note :	109	159	219		BZW
	1. Material : A2017BE	-T4 Surface Finishing: Anoc	lized Aluminum Fir	nishing		Manifold Block
						WHZ-MD

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



Model	No.	WKA0060-🗆	WKA0080-	WKA0100-	WKA0120-	WKA0160-🗆
Required Releasi	ng Force F N	10	10	12	12	17
Max. Releasing F	orce F max ^{%1} N	40	40	60	60	100
	CA	6.8	6.8	8.5	10.5	13.5
Dimensions	СВ	4	4	5	6.5	9.5
Dimensions	CC	1.8	2	2.3	2.7	3.2
mm	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.



	Features Advantages	Action Description	Model No. Indication	Specifications	External Dimensions	Accessories	Cautions	K	SMEK
	Cautions								Locating + Clamp
Notes for Design					Installatio	n Notes			Locating
	1) Check Specifica	ations			1) Check the fluid	d to use.			Hand • Clamp
 Please use each product according to the specifications. 				Make sure to s	upply filtered clear	n dry air.		Support	

 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.



There is a gap. No pressing force is applied to the reference surface. Workpiece Hole Diameter $0.1 \sim 0.2$

- 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.

Appropriate Diameter when Locked



Appropriate Diameter when Locked

Insufficient Diameter due to Interference



- 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.



- 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-🗆	$M10 \times 0.75$	25
WKA0080-🗆	MITU × 0.75	2.5
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.

FA Pneumatic Hole Clamp WKH Lifting Hole Clamp SWJ all Lock WKA Pneumatic Robotic Hands WPW-C WPS-C WPA WPH WPP WPO Auto Switch Proximity Switch JEP High-Power Pneumatic Hole Clamp

Valve • Coupler

Cautions • Others

Pallet Gripper

Pin Clamp

High-Power

Pull Stud Clamp

WPT

JES

_____WVA

SWP

SWE High-Power Pneumatic Swing Clamp WHE High-Power Pneumatic

Link Clamp WCE

Pneumatic Hole Clamp SWA

Pneumatic Swing Clamp WHA

Double Piston Pneumatic Swing Clamp WHD

Pneumatic Link Clamp

WCA Air Flow Control Valve

BZW

Manifold Block WHZ-MD

※ 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.
- 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.



- 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.
- 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



Locating

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.

Clamp Locating

ocacing

Hand • Clamp

Support

Valve • Coupler

Cautions • Others

Cautions Installation Notes Maintenance/ Inspection Warranty

Company Profile Company Profile

> Our Products History

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Sales Offices



Sales Offices across the World

JAPAN Head office Overseas Sales	TEL. +81-78-991-5162 KOSMEK LTD. 1-5, 2-chome, Murotani, Nis 〒651-2241 兵庫県神戸市西区室谷2丁目1番5	FAX. +81-78-991-8787 hi-ku, Kobe-city, Hyogo, Japan 651-2241 号
United States of America	TEL. +1-630-620-7650	FAX. +1-630-620-9015
KOSMEK (USA) LTD.	650 Springer Drive, Lombard, IL 60148 US	A
MEXICO REPRESENTATIVE OFFICE	TEL. +52-442-161-2347	
KOSMEK USA Mexico Office	Av. Santa Fe #103 int 59 Col. Santa Fe Juri	quilla C.P. 76230 Queretaro, Qro Mexico
EUROPE subsidiary	TEL. +43-463-287587	FAX. +43-463-287587-20
KOSMEK EUROPE GmbH	Schleppeplatz 2 9020 Klagenfurt am Wör	thersee Austria
CHINA	TEL. +86-21-54253000	FAX. +86-21-54253709
KOSMEK (CHINA) LTD. 考世美(上海)貿易有限公司	Room601, RIVERSIDE PYRAMID No.55, Lar 中国上海市浦东新区浦三路21弄55号银亿滨江中	ie21, Pusan Rd, Pudong Shanghai 200125, China 心601室 200125
INDIA branch office	TEL. +91-9880561695	
INDIA branch office KOSMEK LTD - INDIA	TEL. +91-9880561695 F 203, Level-2, First Floor, Prestige Center	Point, Cunningham Road, Bangalore -560052 India
INDIA BRANCH OFFICE KOSMEK LTD - INDIA THAILAND REPRESENTATIVE OFFICE	TEL. +91-9880561695 F 203, Level-2, First Floor, Prestige Center TEL. +66-2-300-5132	Point, Cunningham Road, Bangalore -560052 India FAX. +66-2-300-5133
INDIA BRANCH OFFICE KOSMEK LTD - INDIA THAILAND REPRESENTATIVE OFFICE KOSMEK Thailand Representation Office	TEL. +91-9880561695 F 203, Level-2, First Floor, Prestige Center TEL. +66-2-300-5132 67 Soi 58, RAMA 9 Rd., Suanluang, S	Point, Cunningham Road, Bangalore -560052 India FAX. +66-2-300-5133 ang, Bangkok 10250, Thailand
INDIA BRANCH OFFICE KOSMEK LTD - INDIA THAILAND REPRESENTATIVE OFFICE KOSMEK Thailand Representation Office TAIWAN (Taiwan Exclusive Distributor)	TEL. +91-9880561695 F 203, Level-2, First Floor, Prestige Center TEL. +66-2-300-5132 67 Soi 58, RAMA 9 Rd., Suanluang, Suanlu TEL. +886-2-82261860	Point, Cunningham Road, Bangalore -560052 India FAX. +66-2-300-5133 ang, Bangkok 10250, Thailand FAX. +886-2-82261890
INDIA BRANCH OFFICE KOSMEK LTD - INDIA THAILAND REPRESENTATIVE OFFICE KOSMEK Thailand Representation Office TAIWAN (Taiwan Exclusive Distributor) Full Life Trading Co., Ltd. 盈生貿易有限公司	TEL. +91-9880561695 F 203, Level-2, First Floor, Prestige Center TEL. +66-2-300-5132 67 Soi 58, RAMA 9 Rd., Suanluang, Suanlua TEL. +886-2-82261860 16F-4, No.2, Jian Ba Rd., Zhonghe District, New 台湾新北市中和區建八路2號 16F-4 (遠東世紀)	Point, Cunningham Road, Bangalore -560052 India FAX. +66-2-300-5133 ang, Bangkok 10250, Thailand FAX. +886-2-82261890 Taipei City Taiwan 23511 _{賃場})
INDIA BRANCH OFFICE KOSMEK LTD - INDIA THAILAND REPRESENTATIVE OFFICE KOSMEK Thailand Representation Office TAIWAN (Taiwan Exclusive Distributor) Full Life Trading Co., Ltd. 盈生貿易有限公司 PHILIPPINES (Philippines Exclusive Distributor)	TEL. +91-9880561695 F 203, Level-2, First Floor, Prestige Center TEL. +66-2-300-5132 67 Soi 58, RAMA 9 Rd., Suanluang, Suanlua TEL. +886-2-82261860 16F-4, No.2, Jian Ba Rd., Zhonghe District, New 台湾新北市中和區建八路2號 16F-4 (遠東世紀) TEL. +63-2-310-7286	Point, Cunningham Road, Bangalore -560052 India FAX. +66-2-300-5133 ang, Bangkok 10250, Thailand FAX. +886-2-82261890 Taipei City Taiwan 23511 _{實場}) FAX. +63-2-310-7286
INDIA BRANCH OFFICE KOSMEK LTD - INDIA THAILAND REPRESENTATIVE OFFICE KOSMEK Thailand Representation Office TAIWAN (Taiwan Exclusive Distributor) Full Life Trading Co., Ltd. 盈生貿易有限公司 PHILIPPINES (Philippines Exclusive Distributor) G.E.T. Inc, Phil.	TEL. +91-9880561695 F 203, Level-2, First Floor, Prestige Center TEL. +66-2-300-5132 67 Soi 58, RAMA 9 Rd., Suanluang,	Point, Cunningham Road, Bangalore -560052 India FAX. +66-2-300-5133 ang, Bangkok 10250, Thailand FAX. +886-2-82261890 Taipei City Taiwan 23511 實場) FAX. +63-2-310-7286 g, Brgy. 186, North Caloocan City, Metro Manila, Philippines 1427
INDIA BRANCH OFFICE KOSMEK LTD - INDIA THAILAND REPRESENTATIVE OFFICE KOSMEK Thailand Representation Office TAIWAN (Taiwan Exclusive Distributor) Full Life Trading Co., Ltd. 盈生貿易有限公司 PHILIPPINES (Philippines Exclusive Distributor) G.E.T. Inc, Phil. INDONESIA (Indonesia Exclusive Distributor)	TEL. +91-9880561695 F 203, Level-2, First Floor, Prestige Center TEL. +66-2-300-5132 67 Soi 58, RAMA 9 Rd., Suanluang, Suanlua TEL. +886-2-82261860 16F-4, No.2, Jian Ba Rd., Zhonghe District, New 台湾新北市中和區建八路2號 16F-4 (遠東世紀) TEL. +63-2-310-7286 Victoria Wave Special Economic Zone Mt. Apo Building TEL. +62-21-29628607	Point, Cunningham Road, Bangalore -560052 India FAX. +66-2-300-5133 ang, Bangkok 10250, Thailand FAX. +886-2-82261890 (Taipei City Taiwan 23511 赛場) FAX. +63-2-310-7286 g, Brgy. 186, North Caloocan City, Metro Manila, Philippines 1427 FAX. +62-21-29628608

KOSMEK

Sales Offices in Japan

Head Office Osaka Sales Office Overseas Sales	TEL. 078-991-5 〒651-2241	5162 兵庫県神戸市商	FAX. 078-991-8787 西区室谷2丁目1番5号
Tokyo Sales Office	TEL. 048-652-8	3839	FAX. 048-652-8828
	〒331-0815 :	埼玉県さいたき	ま市北区大成町4丁目81番地
Nagoya Sales Office	TEL. 0566-74-8	3778	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. 092-433-0)424	FAX. 092-433-0426
	〒812-0006	福岡県福岡市†	博多区上牟田1丁目8-10-101

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