

New Pallet Gripper

Simplify Fixture Setup with Robot





Tool Adapter

Master Cylinder

model **WVB**



Pallet-Transfer Automation Example using Articulated Robot

For Factory Automation
Pallet Gripper

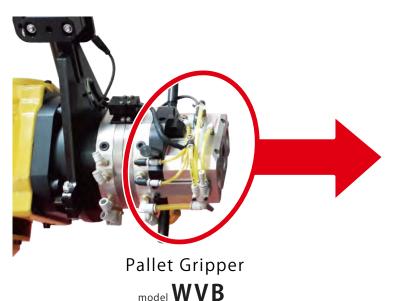
Model WVB



Moment-Resistible Pallet Gripper is suitable for pallet transfer. Side approaching enables to save space for fixture stock.

Simplify Fixture Setup with Robot

Side-Approaching Pallet Gripper



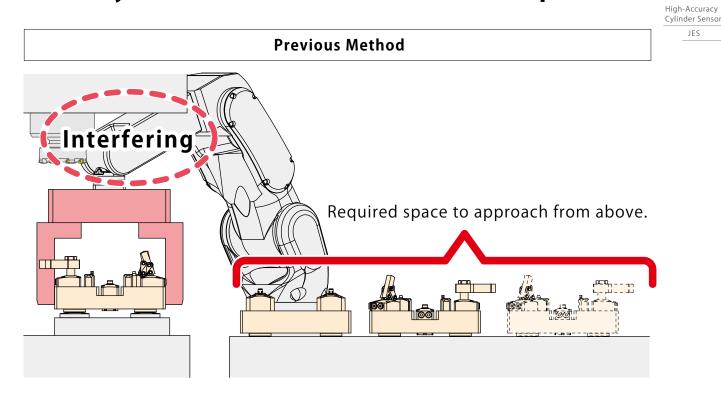


Pallet-Transfer Automation with Articulated Robot

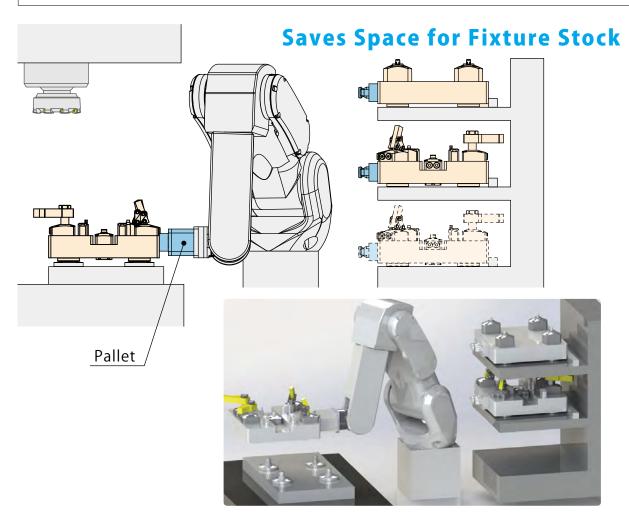
WVB in the picture is under development. The color of the actual master cylinder is red.

Features	Action Description	Model No. Indication	Specifications	Performance Curve	External Dimensions	Cautions	Accessory Cylinder Sensor	
								Pallet Gripper

Easy to Transfer into a Narrow Space



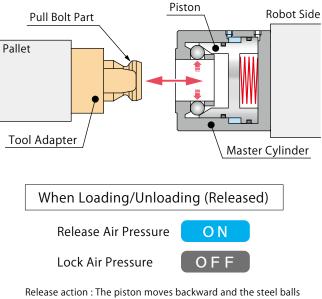
Pallet Gripper



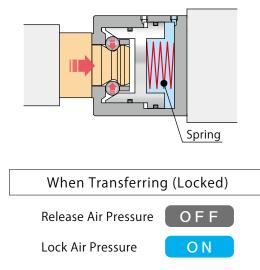
WVB

Action Description

% This is a simplified drawing. The actual part components may be different.



are set inside so that the tool adapter can be attached/detached.



Lock action : The piston moves forward with lock air pressure and built-in spring, and pulls in the pull bolt of the tool adapter via the steel balls.

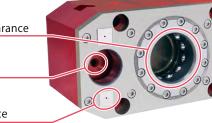
Self-locking function with spring prevents a workpiece fall even when air pressure drops to OMPa in case of a power failure. % Usually it should be connected with spring force and lock air pressure.

• Air Blow Function

By supplying air pressure to the air blow port, the air is released from the clamping clearance, the locating hole and the seating surface to prevent cutting chips and coolant from entering into the product, and to clean the seating surface.

Clamping Clearance

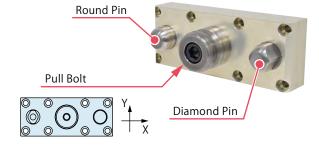
Locating Hole



Seating Surface % The hole is an air blow-out hole, not for contact confirmation.

Floating Function of Pull Bolt

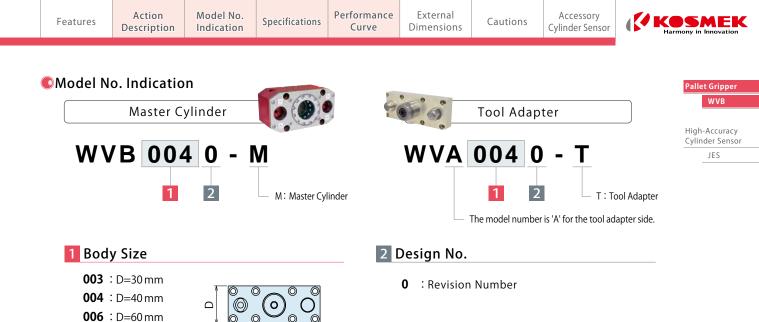
The pull bolt of the tool adapter is floatable. It allows misalignment in X direction and Y direction, prevents clamping load from applying to a robot and equipment, and simplifies teaching. Locating with the round pin and the diamond pin.



Action Confirmation with Cylinder Sensor

Able to confirm the action of Pallet Gripper with Cylinder Sensor. Refer to P.14 for further information.





Specifications

008 : D=80 mm

Model No.	Master Cylind	ler	WVB0030-M	WVB0040-M	WVB0060-M	WVB0080-M
Tool Adapter		WVA0030-T	WVA0040-T	WVA0060-T	WVA0080-T	
Holding Force				Refer to the fo	llowing graph.	
Repeatability		mm	±0).04	±c).05
Cylinder Capacity	Lock Side	cm ³	3.36	9.56	27.4	65.2
	Release Side	cm ³	0.74	3.90	9.9	23.5
	Bending	at 0.3MPa	25	86	265	610
Allowable		at 0.4MPa	33	110	340	788
Static Moment		at 0.5MPa	41	134	415	966
N∙m		at 0.6MPa	49	158	491	1144
		at 0.7MPa	56	182	566	1322
	Twisting		75	250	800	1800
Max. Operating Press	ure	MPa	0.7			
Min. Operating Pressu	ure	MPa	0.3			
Air Blow Pressure		MPa	0.2 ~ 0.3			
Withstanding Pressur	e	MPa	1.0			
Operating Temperatu	ire	°C	0~70			
Usable Fluid	Dry Air					
Product Weight	Master Cylind	ler kg	0.44	0.99	3.2	6.5
	Tool Adapter	Tool Adapter kg		0.36	1.3	3.0

Tool Adapter Side

C Holding Force

Model No.		WVB0030-M	WVB0040-M	WVB0060-M	WVB0080-M
	at 0 MPa ^{%1}	0.15	0.68	1.32	1.88
	at 0.3MPa	1.69	4.29	8.84	15.24
Holding	at 0.4MPa	2.21	5.50	11.34	19.70
Force kN	at 0.5MPa	2.72	6.70	13.85	24.15
	at 0.6MPa	3.23	7.91	16.35	28.61
	at 0.7MPa	3.75	9.11	18.86	33.06

 <sup>30
 30

 30
 25

 20</sup> WVB0080-M

 15
 WVB0060-M

 10
 WVB0040-M

 5
 0

 0
 0.3
 0.4
 0.5
 0.6
 0.7

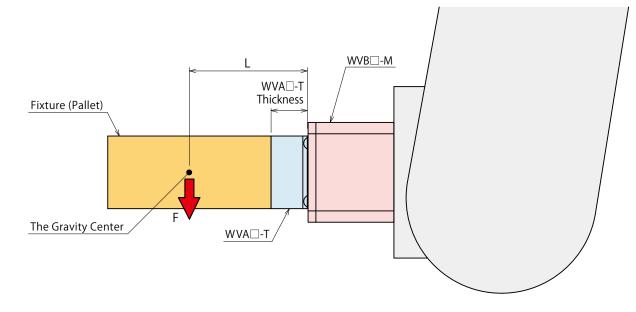
 Supply Air Pressure (MPa)

35

%1. It shows the holding force when air pressure drops to 0MPa after locking, and above number of holding force is just a reference value.

Note :

Calculation Example of Bending Moment



The model and the air pressure should be determined so as not to exceed the allowable static moment.

Allowable Static Moment $M(N \cdot m) > Load F(N) \times The Gravity Center L(m) \times S(Safety Factor)$ (Bending Moment)

WVB Body Size, Pallet Size and Fixture Weight (Reference)

The Gravity Center : The Pallet Center, Pallet Material : Aluminum, Safety Factor = 2)							
Model No. Master Cylinder Tool Adapter		Pallet Size	Fixture Weight	Bending Moment	Allowable Static Moment (Bending Moment at 0.5MPa)		
WVB0030-M	WVA0030-T	□200mm	18kg	41N•m	41N•m		
WVB0040-M	WVA0040-T	□300mm	40kg	134N•m	134N•m		
WVB0060-M	WVA0060-T	□400mm	90kg	412N•m	415N•m		
WVB0080-M	WVA0080-T	□500mm	165kg	955N•m	966N•m		

(Reference in case of the following conditions;

* The above is just a reference. Please calculate according to an actual fixture.

(Calculation Example : In case of WVB0040)

L (m) = (Half Length of the Pallet (\Box 300) 150mm + Dimension of WVA0040-T 20mm) \times 0.001 = 0.17m

Load F (N) = (Fixture Weight 40kg + The Weight of WVA0040-T 0.36kg) \times 9.8 = 395 N

Safety Factor S = 2 \times Safety Factor = 2 is an example when considering the robot maximum increasing speed to be 2G.

 $_{ imes}$ Safety Factor S Load F (N) Gravity Center L (m) Bending Moment = X 395 N 0.17 m 2 134 N • m

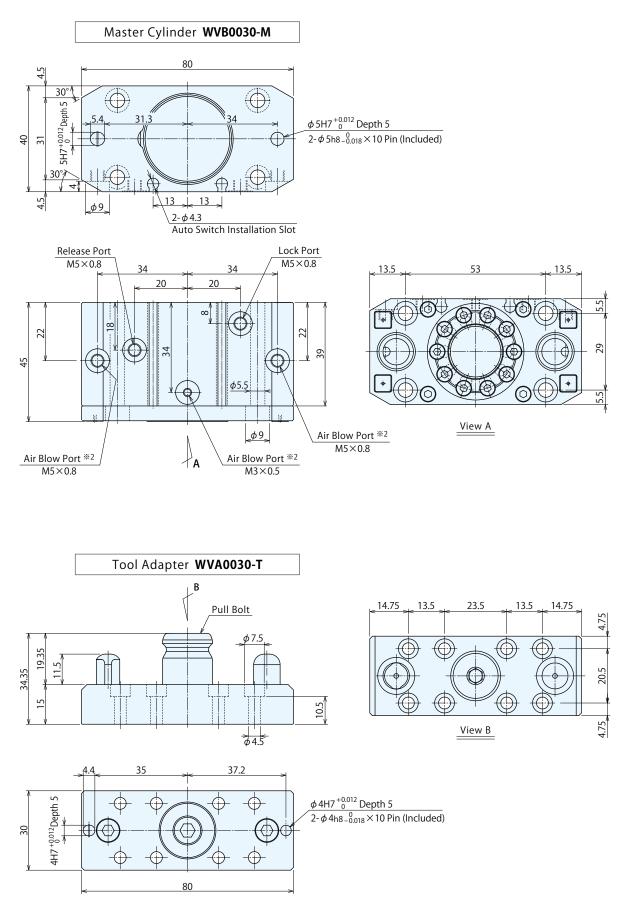
Features	Action Description	Model No. Indication	Specifications	Performance Curve	External Dimensions	Cautions	Accessory Cylinder Sensor	

C MEMO



High-Accuracy Cylinder Sensor JES

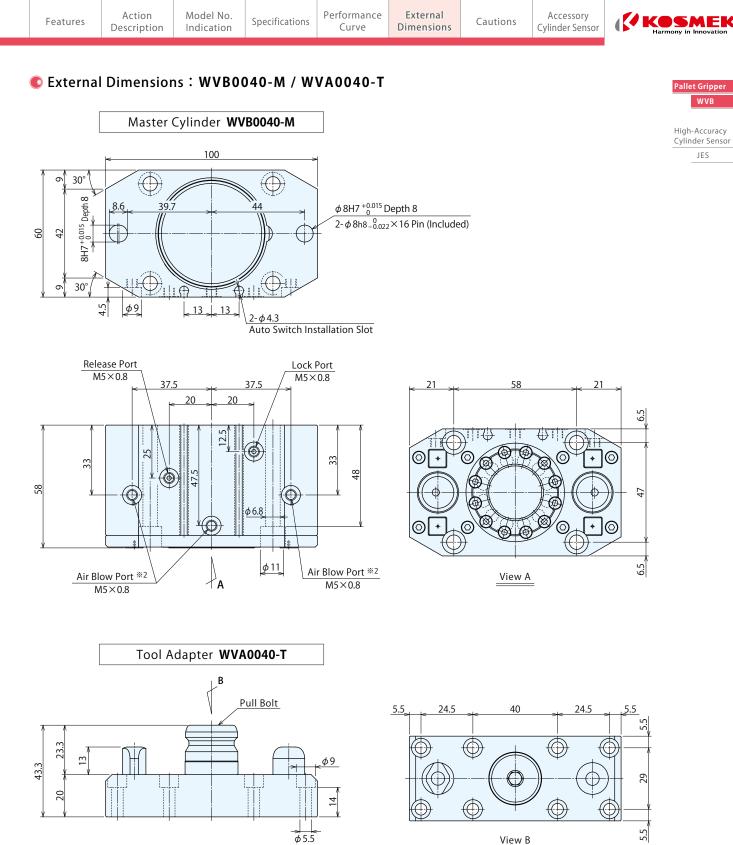
© External Dimensions : WVB0030-M / WVA0030-T

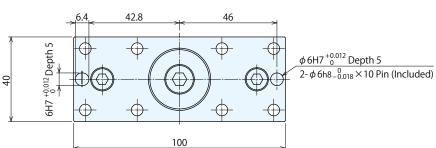


Notes :

1. Mounting bolts are not provided. Please prepare them separately.

*2. The master cylinder is equipped with air blow ports to prevent contamination and to clean the seating surface. When conducting air blow, connect an air circuit to all three air blow ports from outside. (Not connected internally.)





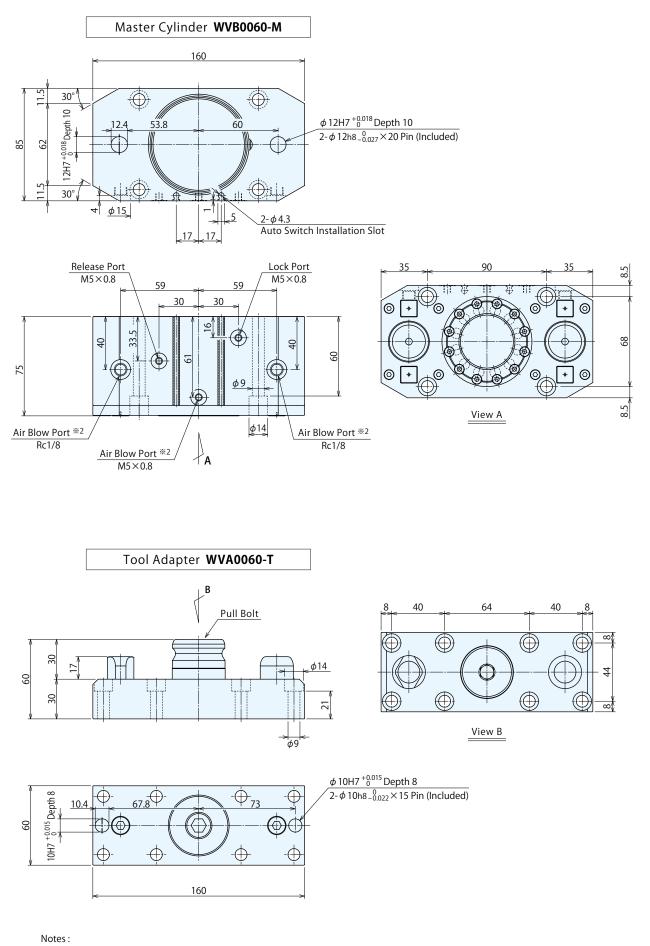


Notes :

1. Mounting bolts are not provided. Please prepare them separately.

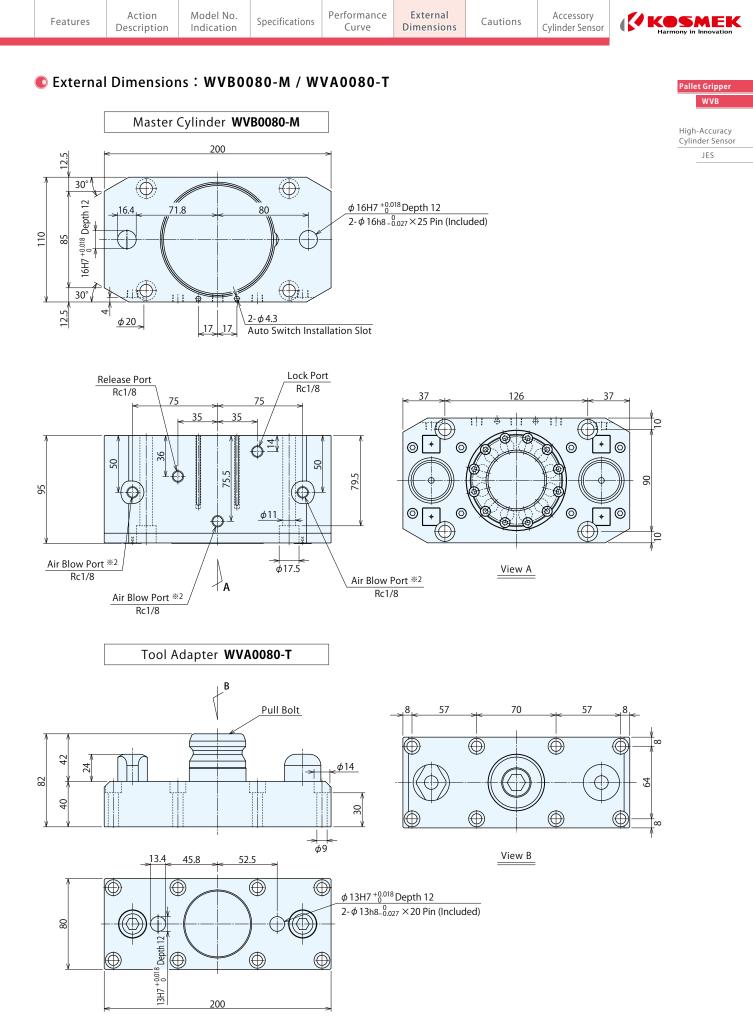
*2. The master cylinder is equipped with air blow ports to prevent contamination and to clean the seating surface. When conducting air blow, connect an air circuit to all three air blow ports from outside. (Not connected internally.)

© External Dimensions : WVB0060-M / WVA0060-T



1. Mounting bolts are not provided. Please prepare them separately.

*2. The master cylinder is equipped with air blow ports to prevent contamination and to clean the seating surface. When conducting air blow, connect an air circuit to all three air blow ports from outside. (Not connected internally.)



Notes :

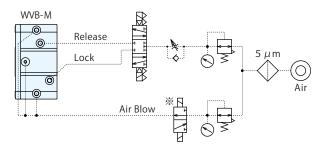
1. Mounting bolts are not provided. Please prepare them separately.

※2. The master cylinder is equipped with air blow ports to prevent contamination and to clean the seating surface. When conducting air blow, connect an air circuit to all three air blow ports from outside. (Not connected internally.)

Cautions 🔍

- Notes for Design
- 1) Check Specifications
- Maximum Operating Pressure : 0.7MPa Minimum Operating Pressure : 0.3MPa Applying excessive load to the Pallet Gripper will cause deformation, seizure, air leakage and breakage of the product.
- 2) Do not apply impact to a workpiece or a pallet that is connected to the Pull Bolt.
- Applying impact to a pallet or others connected with the tool adapter will damage the product.
- 3) Air Pressure Circuit Reference
- WVB maintains the locked state to hold the tool adapter with the mechanical lock function (holding spring) even when air is cut off. However, for safety, when using a 2-position solenoid valve, make sure to select the solenoid valve for operating WVB that supplies air pressure to the lock port side when it is not magnetized. If air is supplied to the release port when the switch of solenoid valve is turned off, WVB may drop the tool adapter (pallet) and it is extremely dangerous.

Air Blow Function : Air is released from the seating surface, the locating hole and the clamping clearance to prevent cutting chips and coolant from entering into the Pallet Gripper and to clean the seating surface.



- % Cushioned by air before pallet gripper connection (locking) is completed. Make sure to turn OFF the air blow before connection is completed.
- 4) Please supply filtered clean dry air.
- Oil supply with a lubricator etc. is unnecessary.
- 5) Insertion of Pull Bolt
- Please insert the Pull Bolt to the end (to prevent clamping failure and damage to the Pull Bolt.)
- 6) Protective Cover Installation
- If the moving parts of the robot or robotic hand may endanger human life, please install the protection cover.
- 7) Fall Prevention Measures
- In case of accident such as detachment of a pallet, please prepare fall prevention measures for safety.

- 8) Connection and Transfer of Pallet Gripper
- Do not apply excessive moment on the Pallet Gripper during connection, detachment and transfer.
 Please select an appropriate size of the Pallet Gripper considering moment fully taken into consideration.
 During connection, do not fix a pallet of the tool adapter side on the tool stand, and make a margin (clearance).
- 9) For Use of Auto Switch
- In order to ensure stable detections, please use the 3-wire sensor of the high accuracy sensor for air cylinder "model JES0000-02 "".

Features	Action Description	Model No. Indication	Specifications	Performance Curve	External Dimensions	Cautions	Accessory Cylinder Sensor	

Installation Notes

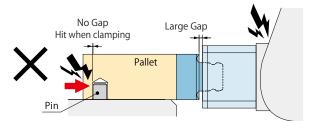
- 1) Check the fluid to use.
- Please supply filtered clean dry air. (Please install a drain removing device.)
- Oil supply with a lubricator, etc. is unnecessary.
 Oil supply with a lubricator may cause loss of the initial lubricant.
 The operation under low pressure and low speed may be unstable.
 (When using secondary lubricant, please supply lubricant continuously.)
- 2) Preparation for Piping
- The pipes, piping connectors and fixture circuits should be cleaned and flushed thoroughly. The dust and cutting chips in the circuit can lead to fluid leakage and malfunction.
- There is no filter provided with this product to prevent contamination in the air circuit.
- 3) Applying Sealing Tape
- Wrap with tape 1 to 2 times following the screwing direction. In order to prevent contamination during the piping work, it should be carefully cleaned before working.
 Pieces of the sealing tape can lead to air leakage and malfunction.
- 4) Installation of the Master Cylinder and the Tool Adapter
- Installation of the master cylinder : use four hexagonal socket bolts (with tensile strength of A2-70 or more) and tighten them with the following torque.
- Installation of the tool adapter : use eight hexagonal socket bolts (with tensile strength of A2-70 or more) and tighten them with the following torque.

Model No.	Thread Size \times Length	Tightening Torque (N • m)
WVB0030-M	M5×0.8×50 or more	6.3
WVA0030-T	M4×0.7×20 or more	3.2
WVB0040-M	M6 \times 1 \times 60 or more	10
WVA0040-T	M5×0.8×25 or more	6.3
WVB0060-M	M8×1.25×75 or more	20
WVA0060-T	M8×1.25×35 or more	20
WVB0080-M	M10×1.5×95 or more	40
WVA0080-T	M8×1.25×45 or more	20

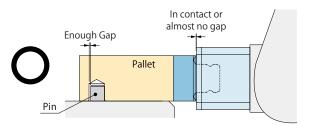
 Installation failure will cause air leakage, deformation and breakage of the gripper. 5) Allowable Offset while Clamping

The gap between the seating surface of the Master Cylinder and the Tool Adapter should be 0.2mm or less when clamping. If operated when the gap is more than 0.2mm, clamping cannot be done due to interference with a locating pin of a stocker. Or, excessive load will be applied leading to damage of a robot and other equipment.

Please insert the Pallet Gripper vertical to the Pull Bolt. After clamping, the Pull Bolt is pulled in and the tool adapter comes in contact with the seating surface.



When clamping, the pallet is pulled to the robot side and hits the pin due to the large gap on the seating surface. Excessive load will be applied to the product leading to damage to the robot and equipment.



The pallet will not be pulled to the robot side or hit by the pin because there is no gap on the seating surface. Also, it is safe with the enough gap at the pin part. t Gripp

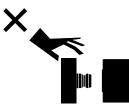
High-Accuracy

Cylinder Sensor

JES

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 removing the product, make sure that the abovementioned 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 the pallet gripper while it is working. Otherwise, your hands may be injured.



Maintenance and Inspection

- 1) Removal of the Product and Shut-off of Pressure Source
- Before removing the product, make sure that safety devices and preventive 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 product.
- Using the product contaminated with dirt causes insufficient gripping force and malfunction leading to damage of the product or detachment of a workpiece.
- Regularly tighten pipes, mounting bolts and others to ensure proper use.
- 4) 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.
- 5) The products should be stored in the cool and dark place without direct sunshine or moisture.
- 6) Please contact us for overhaul and repair.Built-in spring is very strong and can be dangerous.
- in case of a workpiece detachment.
- 5) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

4) When a robot is in operation, make sure the safety of environment

Built-in spring is very strong and can be dangerous.

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.)

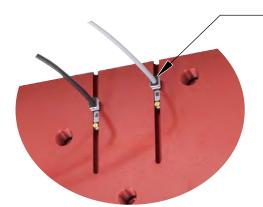
Damages excluding from direct result of a product defect shall be excluded from the warranty.

FeaturesAction DescriptionModel No. IndicationSpecificationsPerformance CurveExternal DimensionsCautionsAccessory Cylinder Sensor	KOSM Harmony in Innova	
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CACTION Confirmation Method : Sensor for Air Cylinder

This product (model WVB) is able to detect the locking action and releasing action with Sensor for Air Cylinder (sold separately).



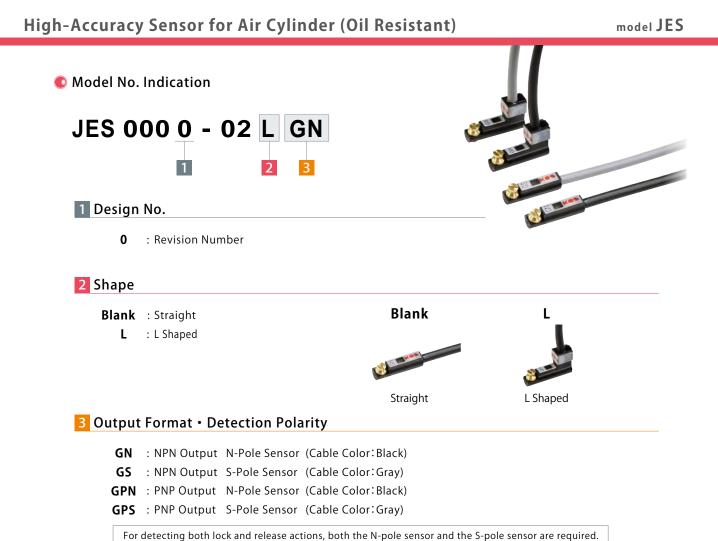


Sensor for Air Cylinder model JES

Due to the small stroke amount of the internal piston of Pallet Gripper (model WVB), we recommend the 3-wire sensor of the high-accuracy sensor for air cylinder (model JES0000-02

Refer to P.15 for detailed specifications of JES.

Mounting position and direction of the sensor for air cylinder vary depending on the individual product differences and the magnetic flux change due to the surrounding environment. Please adjust the position of the actual product before use.



Application Table

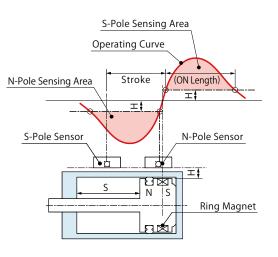
Model No.	JES0000-02G JES0000-02GP	JES0000-02LG JES0000-02LGP
WVB0030-M	•	•
WVB0040-M	•	•
WVB0060-M	•	•
WVB0080-M	•	•

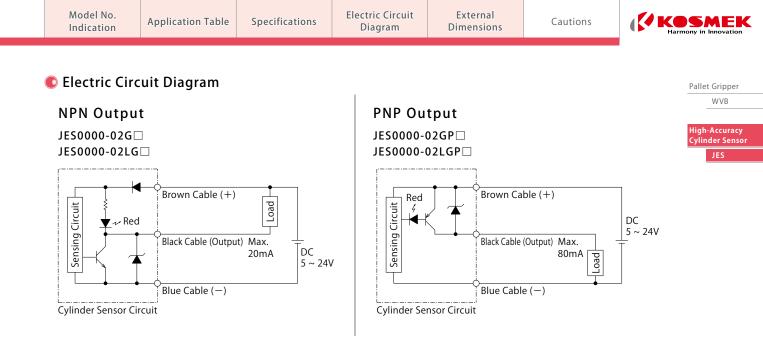
Specifications

Model No.	JES0000-02G	JES0000-02GP			
	JES0000-02LG	JES0000-02LGP			
Wiring Method	3-W	/ire			
Applicable Load	Relay, Programmable	Logic Controller (PLC)			
Voltage	DC 5	~ 24V			
Output Specification	NPN (ON when in proximity)	PNP (ON when in proximity)			
Output Current	20mA Max.	80mA Max.			
Current Consumption	8mA Max.	8mA Max.			
Response Speed	16 µ sec	c or less			
Material	Case: GF Reinforced PB	FBlack Set Screw : Brass			
Indicator Light	Red				
Withstand Voltage	AC1000V (for 1 minute, Packaged Charging Part, b/w the case)				
Insulation Resistance	DC250V (20M Ω or more in Megohms, b/w the case)				
Operating Temperature Range	-20° ~ $+85^{\circ}$ (Make sure no condensation)				
Operating Humidity Range	20 ~ 95%RH				
Protection Grade	IP67				
Cable Length	1m				

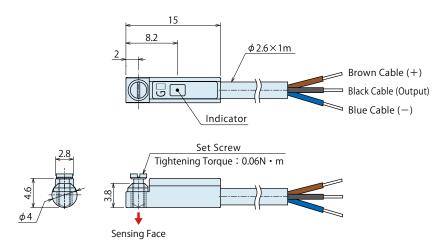
Performance Curve

JES detects only the magnetic force that is vertical to the detection surface. The operating curve is shown below. Operating point is on the steep part of the operating curve, so even small stroke can be surely detected.

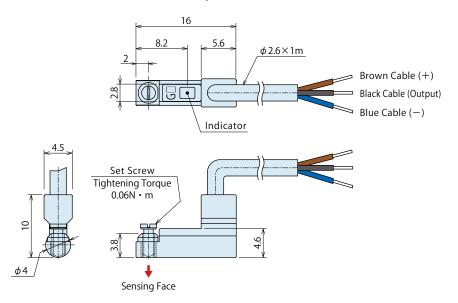




€ External Dimensions (Straight) : JES0000-02G□, JES0000-02GP□



External Dimensions (L Shaped) : JES0000-02LG□, JES0000-02LGP□



Cautions

Notes for Design

- 1) Check the Specifications
- Please use each product according to the specifications. The product may be damaged or malfunction if used outside the range of load or specifications.
- 2) Notes on Use in the Interlock Circuit
- When the sensor is used for an interlock signal that requires high reliability, please use a double interlock system by providing a mechanical protection function. Or by using another sensor together with the product. Also, please perform periodic maintenance and confirm proper operation.
- 3) Please avoid using loads that generate surge voltage.
- If driving a relay, put a Zener diode in parallel for surge protection.

Notes on Operating Environment

- 1) Never use the product in an atmosphere with explosive gases.
- Sensor for Air Cylinder is not designed to prevent explosion.
 Do not use the product in an atmosphere with explosive gases since it may cause serious explosions.
- 2) The product may malfunction if an intense magnetic field is applied to a pole body.
- 3) Make sure to prepare shield measures when using in the following environments.
- Where large current and/or strong magnetic field are generated.
- Where noise occurs due to static electricity, etc.
- Where magnetic powder or dust such as iron powder occurs or scatters.
- 4) Do not use the product in an environment where it is continuously exposed to coolant or chemical liquid.
- Although IEC standard IP67 structure is satisfied, please avoid using sensors in an environment where continuously exposed to coolant or chemical liquid. This may cause insulation failure or malfunction.
- 5) Do not use the product in an environment with oil or chemicals.
- If sensors are used in an environment with coolant or cleaning solvent, even in a short time, they may be adversely affected by improper insulation, malfunction due to swelling of potting resin and or hardening of electric cable.
- 6) Do not use the product in an environment with excessive vibrations or impacts.

Installation Notes

- 1) Electric Wiring Reverse Connection Protection
- Follow the electric circuit diagram on P.16 and make sure to connect electric circuits properly. Never connect the power reversely.
- 2) Tighten the cylinder sensor with appropriate tightening torque.
- Use the set screw mounted on the sensor body and tighten it with the following torque.
 JES0000 : 0.06N • m
- 3) Wiring
- Do not damage the cables. Damaged, forcibly bended, stretched, winded, load applied or pinched cables will cause fire, electric shock, and/or malfunction due to electric leakage and/or continuity failure.
- Do not apply excessive stress on the cable port of the sensor.
- Minimum bending radius of the cable port is R7.
- If cables are to move, fix the middle of the cables so that no stress is applied to the cable port.
- Mounting position of the sensor should be adjusted by checking actual operating state.

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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.

Application Table

- 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 abovementioned 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 disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.
 Never modify the product as it contains a powerful magnet.
- Keep more than one meter away from this product if you have a heart pacemaker, etc. It may be malfunctioned by strong magnetism.
- This sensor is made by ASA Electronics Industry Co. Ltd.
 Please contact us or ASA Electronics Industry for further inquiries.

Maintenance and Inspection

- 1) Removal of the Product and Shut-off of Pressure Source
- Before removing the product, make sure that safety devices and preventive 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 abnormality in the bolts and respective parts before restarting.
- 2) Never touch terminals while the power is on.
- Otherwise it will cause electric shock, malfunction and damage to the sensor for air cylinder.
- 3) Retightening of Set Screw
- When mounting position of the sensor for air cylinder is shifted due to looseness of set screw, retighten it after adjusting the mounting position.
- 4) Check if the electric cable is damaged or not.
- Damaged cables may cause insulation failure. Replace a sensor for air cylinder or repair the reed if the electric cable is damaged.
- 5) Product Storage
- The products should be stored in the cool and dark place without direct sunshine or moisture.

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.

Cautions

External

Dimensions

- 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.



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Specifications

Pallet Gripper

WVB

h-Accuracy

nder Senso



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For Further Information on Unlisted Specifications and Sizes, Please call us. Specifications in this Leaflet are Subject to Change without Notice.



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