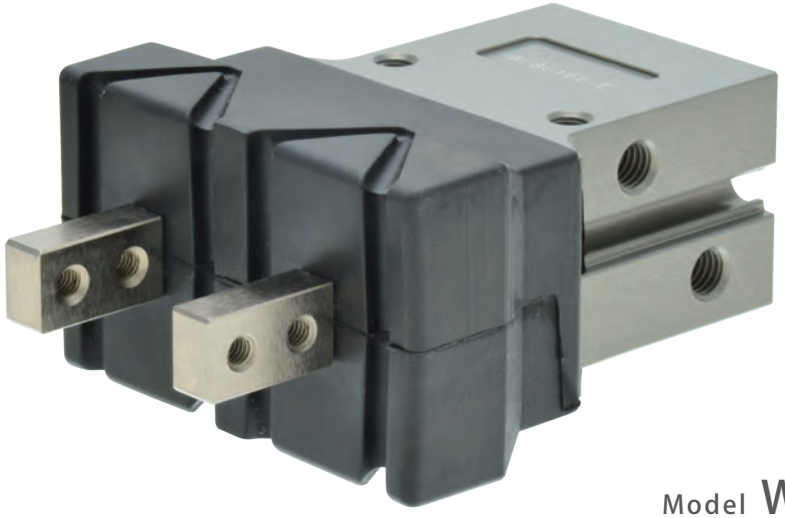
Robotic Hand

New

Compact Parallel Hand Gripper with Dust Cover



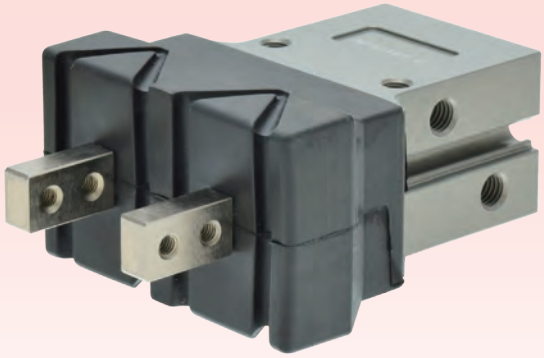
Model WPB

KOSMEK
Harmony in Innovation

Pneumatic Robotic Hand

Compact Parallel Robotic Hand Gripper with Dust Cover

Model **WPB**



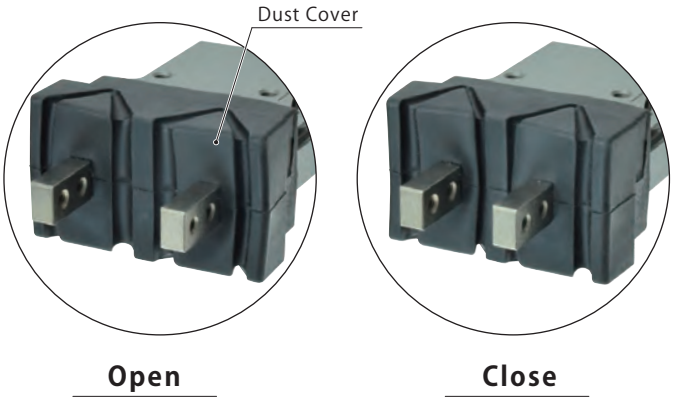
Compact Parallel Robotic Hand with High-Gripping Force !
Ability to Install Auto Switches for Gripper Detection

Wider Stroke

Wider opening and closing stroke allows for gripping various sizes of workpieces.

Equipped with Dust Cover

Dust Cover to prevent contamination from entering into the product.



High Accuracy and High Rigidity

The linear guide function allows for high rigidity opening/closing function and high accuracy.
Repeatability：±0.01mm

Light Weight

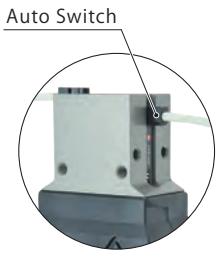
Reduced size and weight allows for best use of the robotic payload.

Long Operational Life

Solid internal features provide for excellent durability.

Auto Switch Capability

Easy to install and adjust auto switches for gripper detection.



Model No. Indication

WPB 016 0 - C - A2 S
1 2 3 4 5

※ Only 1 2 are marked on the product.
Please indicate the specifications of 4 5 if you need switches.

1 Cylinder Inner Diameter

016 : ϕ16 mm
020 : ϕ20 mm
025 : ϕ25 mm

2 Design No.

0 : Revision Number

3 Dust Cover Type

C : Polychloroprene (Color : Black)
S : Silicone Rubber (Color : Black)
F : Fluor Rubber (Color : Black)

4 Auto Switch Type

Blank : Without Auto Switch
A2 : 2-Wire Reed Auto Switch (Cable:1m)
A2L : 2-Wire Reed Auto Switch (Cable:3m)
A2V : L-Shaped 2-Wire Reed Auto Switch (Cable:1m)
A2VL : L-Shaped 2-Wire Reed Auto Switch (Cable:3m)
B2 : 3-Wire Solid State Auto Switch (Cable:1m)
B2L : 3-Wire Solid State Auto Switch (Cable:3m)
B3C : L-Shaped 3-Wire Solid State Auto Switch (Cable:1m)
B3CL : L-Shaped 3-Wire Solid State Auto Switch (Cable:3m)
B3B : L-Shaped 2-Wire Solid State Auto Switch (Cable:1m)
B3BL : L-Shaped 2-Wire Solid State Auto Switch (Cable:3m)

※ Please refer to P.15 ~ P.24 for details of auto switches.
※ When using an auto switch not made by Kosmek, check specifications of each manufacturer.

5 Number of Auto Switches※

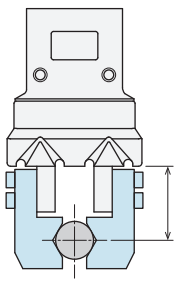
Blank : 2
S : 1

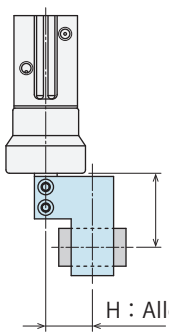
※ Only when requiring 4 Auto Switch

Specifications

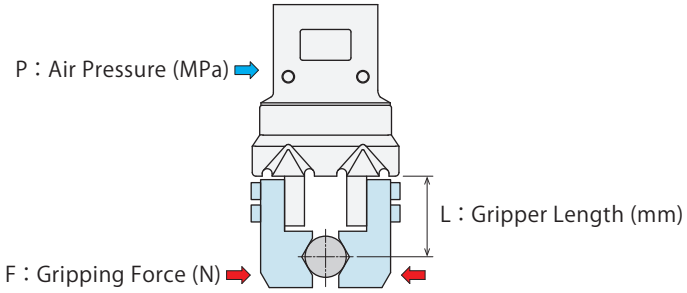
Model No.			WPB0160	WPB0200	WPB0250
Cylinder Inner Diameter		mm	16	20	25
Gripping Force ※1	Closing Side	N	79	118	197
(Air Pressure : at 0.5MPa)	Opening Side	N	92	137	235
Full Stroke		mm	8	12	16
Repeatability ※2		mm	±0.01		
Stroke Error		mm	Opened State : -0.5 ~ +1 / Closed State : -1 ~ +0.5		
Allowable Gripper Length L (Air Pressure : at 0.5MPa) ※3		mm	40	50	60
Allowable Gripper Offset Distance H (Air Pressure : at 0.5MPa) ※3		mm	15	25	35
Maximum Cycle / min.			90		
Cylinder Capacity	Closing Side	cm^3	0.8	1.8	4
(Clamping w/o Workpiece)	Opening Side	cm^3	0.9	2.1	4.7
Maximum Operating Pressure		MPa	0.7		
Minimum Operating Pressure		MPa	0.2		
Withstanding Pressure		MPa	1.05		
Operating Temperature Range		℃	5 ~ 60		
Usable Fluid			Dry Air		
Weight		kg	0.15	0.28	0.51

Notes : ※1. Gripping force indicates the calculated value based on the gripper length (L).
※2. Repeatability under the same condition (no load).
※3. L : Allowable Gripper Length (mm), H : Allowable Gripper Offset Distance (mm). (Air Pressure : at 0.5MPa)





Gripping Force Performance Curve : Closing Side



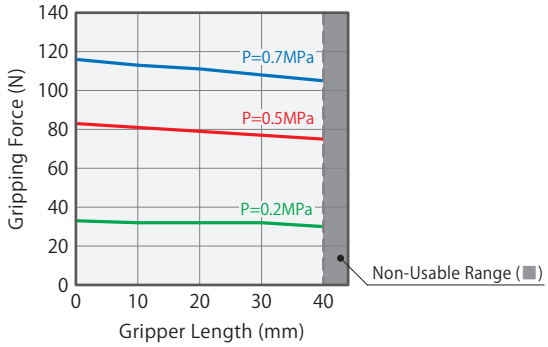
Notes :

1. This chart and graph show the relationship among : F : Gripping Force (N), P : Air Pressure (MPa) and L : Gripper Length (mm).
2. Operation in the non-usable range may cause deformation, seizure or air leakage.

WPB0160

(N)

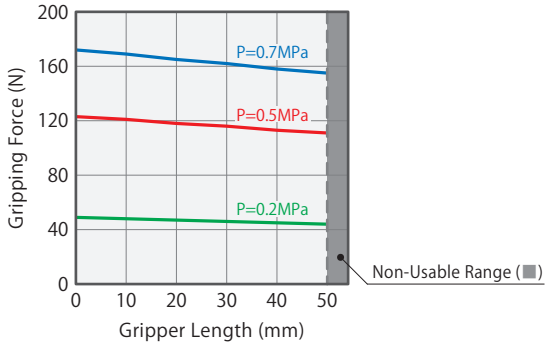
Air Pressure (MPa)	Gripper Length L (mm)			
	10	20	30	40
0.7	113	111	108	105
0.5	81	79	77	75
0.2	33	32	31	30



WPB0200

(N)

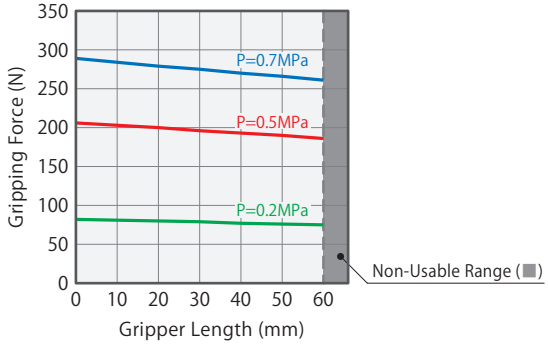
Air Pressure (MPa)	Gripper Length L (mm)				
	10	20	30	40	50
0.7	169	165	162	158	155
0.5	121	118	116	113	111
0.2	48	47	46	45	44



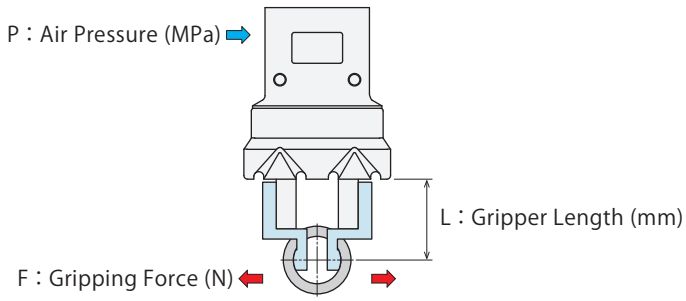
WPB0250

(N)

Air Pressure (MPa)	Gripper Length L (mm)					
	10	20	30	40	50	60
0.7	284	280	275	270	266	261
0.5	203	200	196	193	190	186
0.2	81	80	79	77	76	75



Gripping Force Performance Curve : Opening Side



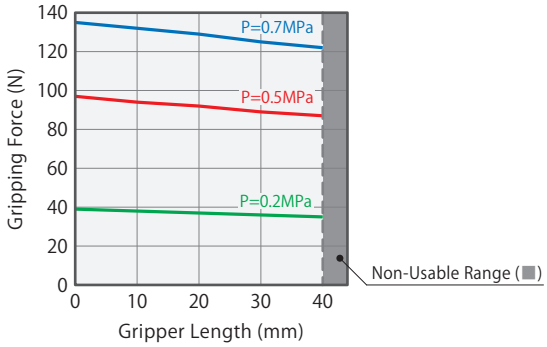
Notes :

1. This chart and graph show the relationship among : F : Gripping Force (N), P : Air Pressure (MPa) and L : Gripper Length (mm).
2. Operation in the non-usable range may cause deformation, seizure or air leakage.

WPB0160

(N)

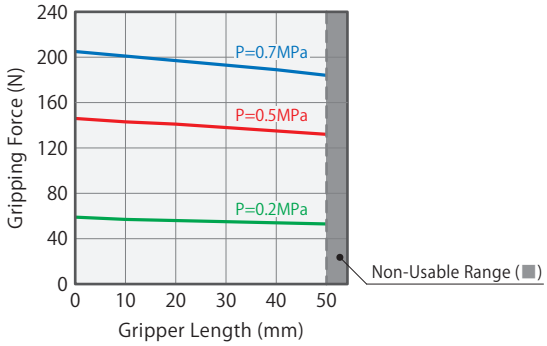
Air Pressure (MPa)	Gripper Length L (mm)			
	10	20	30	40
0.7	132	129	125	122
0.5	94	92	90	87
0.2	38	37	36	35



WPB0200

(N)

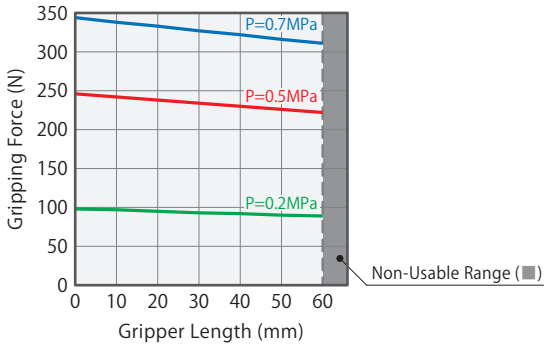
Air Pressure (MPa)	Gripper Length L (mm)				
	10	20	30	40	50
0.7	201	197	193	189	185
0.5	144	141	138	135	132
0.2	57	56	55	54	53



WPB0250

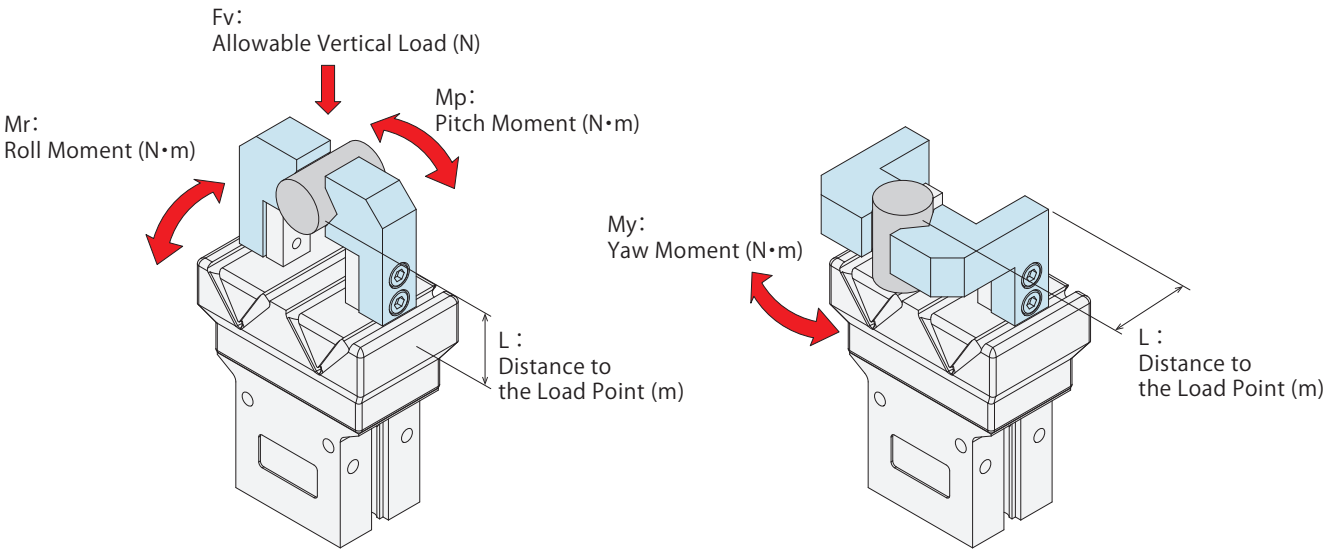
(N)

Air Pressure (MPa)	Gripper Length L (mm)					
	10	20	30	40	50	60
0.7	338	333	327	322	316	311
0.5	242	238	234	230	226	222
0.2	97	95	94	92	90	89



Allowable Load and Allowable Moment

Model No.	Fv：Allowable Vertical Load (N)	Maximum Allowable Moment (N・m)		
		Mp：Pitch Moment	My：Yaw Moment	Mr：Roll Moment
WPB0160	141	0.67	0.67	1.77
WPB0200	169	0.84	0.84	2.61
WPB0250	265	1.65	1.65	4.93



Notes：

1. The values on the above list are the static values.
2. Fv：The arrows show the direction of Fv：Allowable Vertical Load (N), Mp：Pitch Moment (N・m), My：Yaw Moment (N・m) and Mr：Roll Moment (N・m).

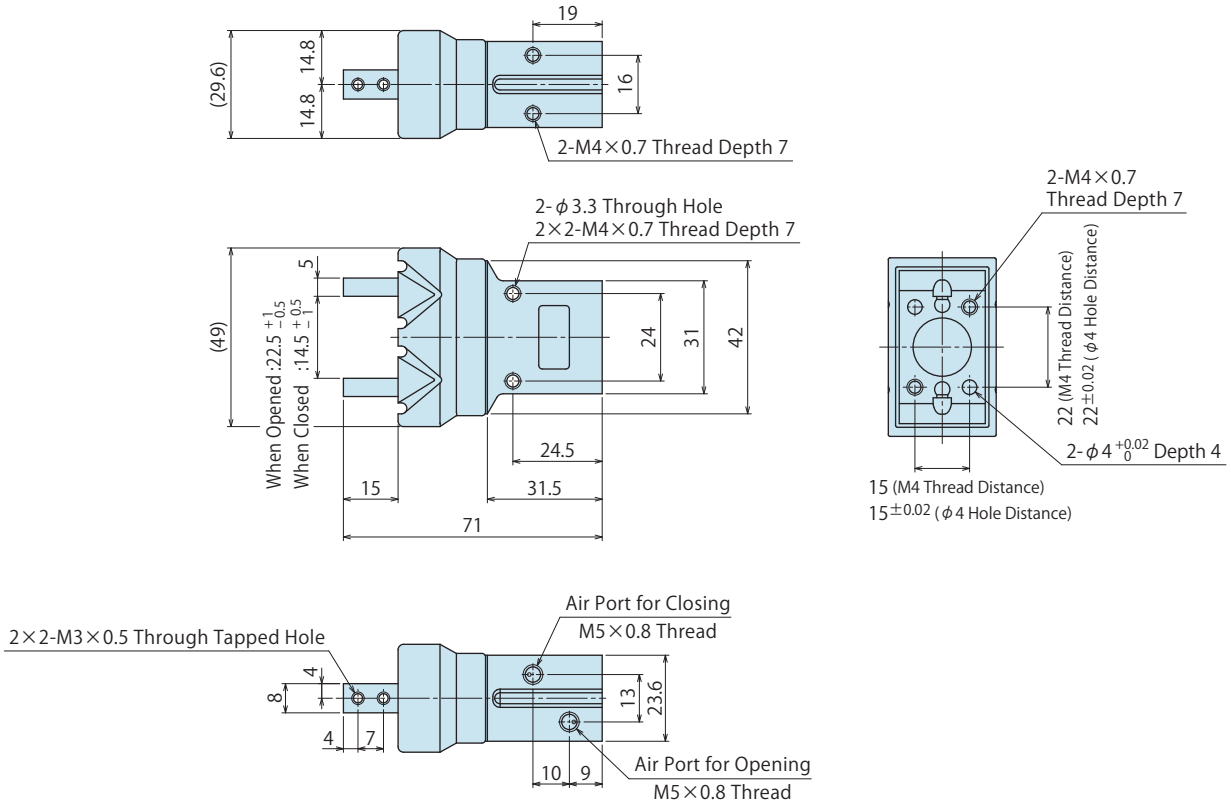
Allowable Load Calculation Formula

$$\text{F：Allowable Load (N)} = \frac{\text{M：Maximum Allowable Moment (N・m)}}{\text{L：Distance to the Load Point (m)}}$$

MEMO

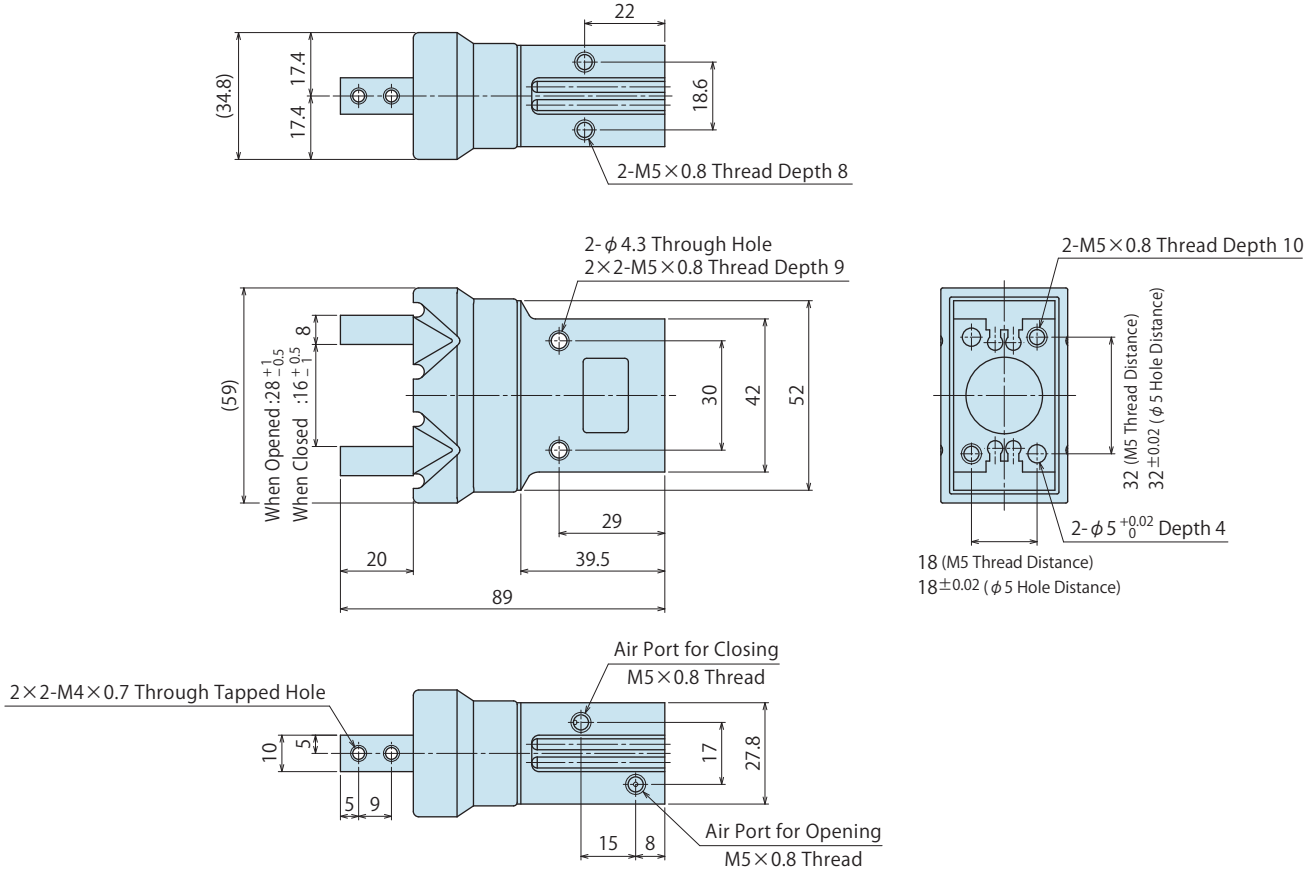
External Dimensions：WPB0160

※ The drawing shows the opened state of WPB0160.



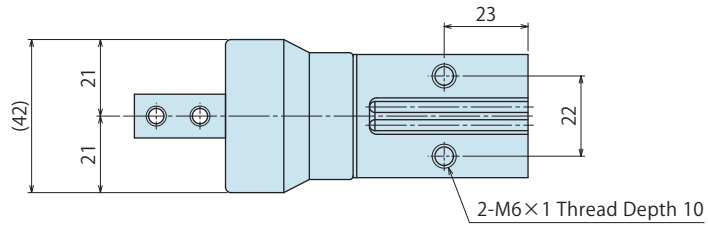
External Dimensions：WPB0200

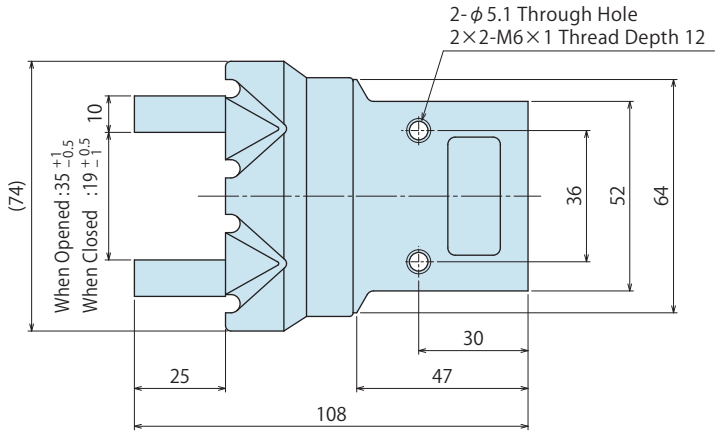
※ The drawing shows the opened state of WPB0200.

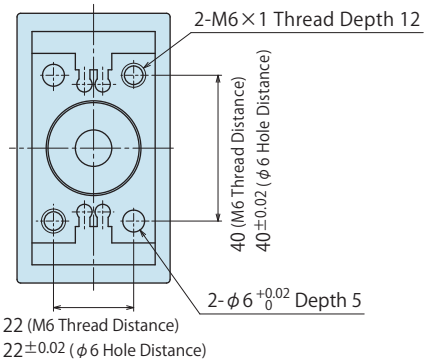


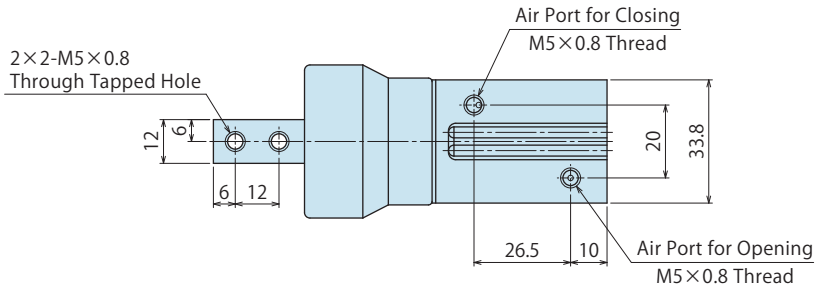
External Dimensions : WPB0250

※ The drawing shows the opened state of WPB0250.





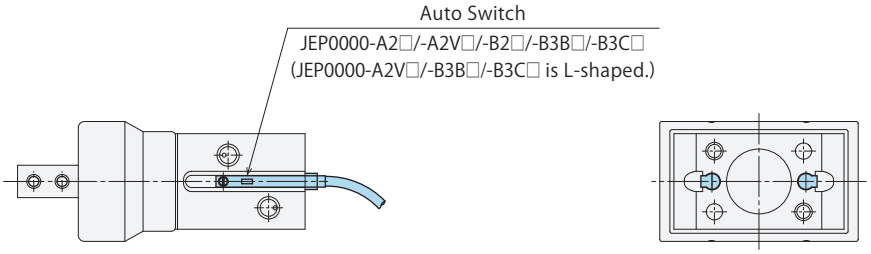




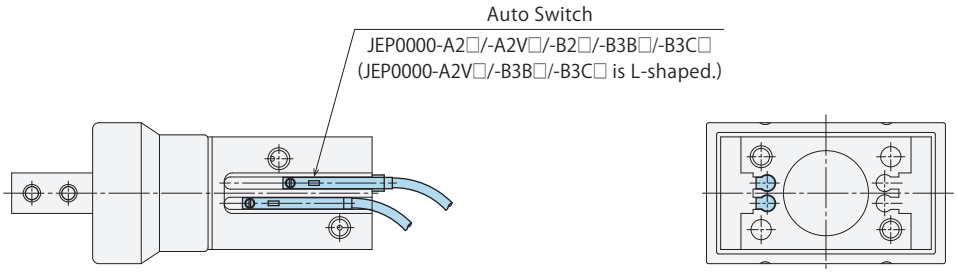
External Dimensions：Auto Switch Installation Image (Reference)

※ This drawing shows the installation image of Auto Switch JEP0000-A2□ and JEP0000-B2□.
Installation image of L-Shaped Auto Switch -A2V□, -B3B□ and -B3C□ is different from this.
Adjust installation position depending on the stroke position.
An auto switch may be stuck out of the robotic hand depending on the installation position and direction.

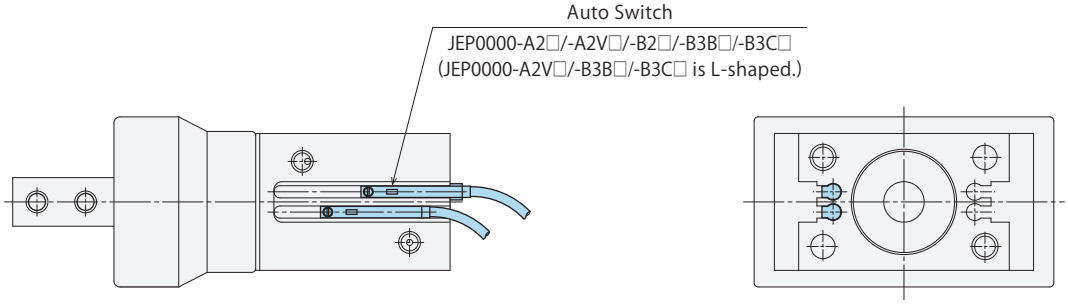
For WPB0160



For WPB0200

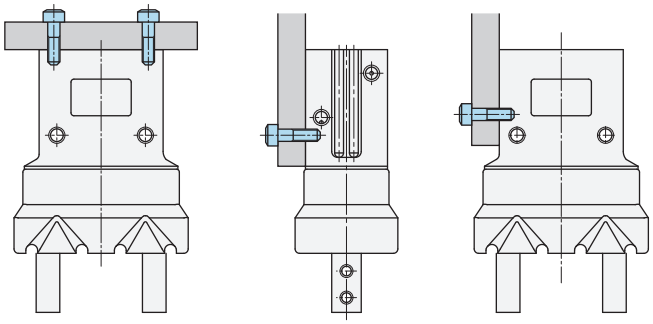


For WPB0250

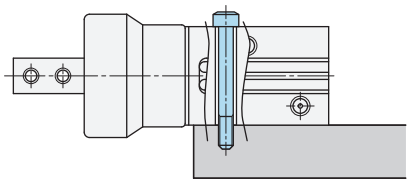


Installation Method

Tightening Torque for Cylinder Body

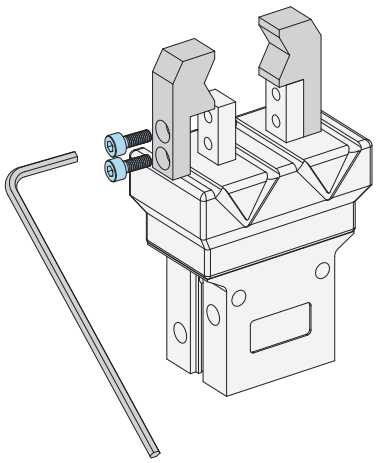


Model No.	Mounting Bolt Thread Size	Tightening Torque (N・m)
WPB0160	M4×0.7	2.5
WPB0200	M5×0.8	5.0
WPB0250	M6×1	7.9



Model No.	Mounting Bolt Thread Size	Tightening Torque (N・m)
WPB0160	M3×0.5	1.1
WPB0200	M4×0.7	2.5
WPB0250	M5×0.8	5.0

Tightening Torque for Gripper

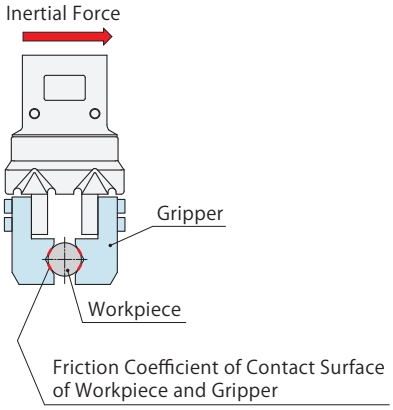


Model No.	Mounting Bolt Thread Size	Tightening Torque (N・m)
WPB0160	M3×0.5	1.1
WPB0200	M4×0.7	2.5
WPB0250	M5×0.8	5.0

Gripper Length/Workpiece Weight Graph

Inertial Force・Friction Coefficient・Safety Factor Selection List

Inertial Force		Friction Coefficient※1	Safety Factor
Low Speed	Stops after 0.1 sec at the speed of 0 ~ 100mm/sec.	Large	5 times
		Small	10 times
Middle Speed	Stops after 0.1 sec at the speed of 100 ~ 300mm/sec.	Large	10 times
		Small	15 times
	Stops after 0.1 sec at the speed of 300 ~ 500mm/sec.	Large	15 times
		Small	20 times
High Speed	Stops after 0.1 sec at the speed of 500 ~ 1000mm/sec.	–	30 times



Note：

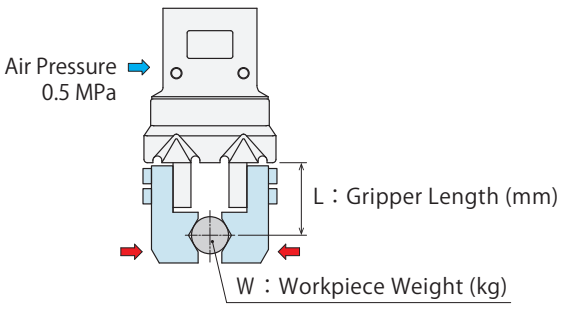
※1. Indicates the friction coefficient of contact surface of workpiece and gripper.
Refer to the condition below.
Friction Coefficient：Small (Approximately μ=0.1) ··· When contact surface is flat.
Friction Coefficient：Large (More than μ=0.15) ··· When contact surface is serration or spike shape.

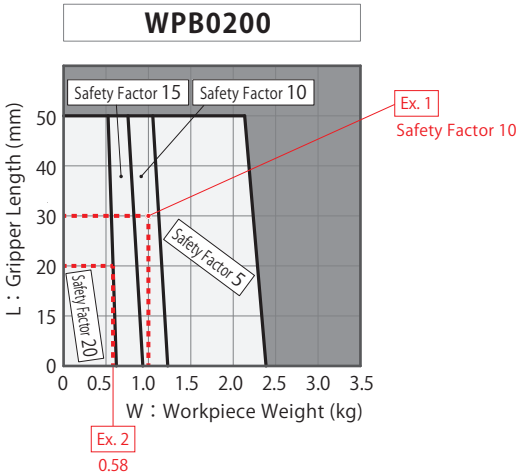
How to Read Gripper Length/Workpiece Weight Graph

The selection method is a reference. It is recommended to consider the actual conditions (environment) when selecting the product.
The graph shows when air pressure is 0.5MPa.

【Ex. 1】
When using WPB0200 (close side) with 1.0kg workpiece and 30mm gripper, the safety factor should be 10 times.
When using it with lower speed which is indicated in Inertial Force・Friction Coefficient・Safety Factor Selection List, the friction coefficient of contact surface can be small. When using it with middle speed (stops after 0.1 sec at the speed of 100~300mm/sec.), contact surface should be serration or spike shape to secure larger friction coefficient.

【Ex. 2】
When using it with middle speed (stops after 0.1 sec at the speed of 300 ~ 500mm/sec.) and when friction coefficient is small due to flat contact surface, the safety factor should be 20 times.
When using WPB0200 with 20 times safety factor and 20mm gripper, the maximum workpiece weight is 0.58kg.



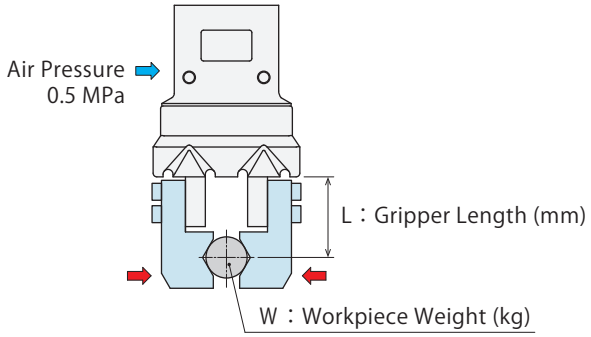


Relationship between Workpiece Weight and Robotic Hand Gripping Force

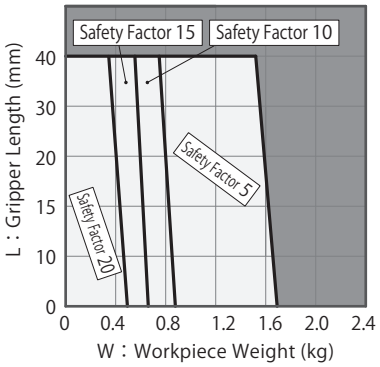
The safety factor of robotic hand gripping force to workpiece weight should be approximately 16 times for each robot manufacturer, but it differs according to the conditions. Refer to the following contents when selecting the product.

① Workpiece Gravity Center and Gripping Position
It is recommended to design the gripper so that it grips the workpiece gravity center with the center of robotic hand.
② Gripper Length
The load applied on the robotic hand body depends on the gripper length. It is recommended to design the gripper so that the workpiece gravity center is as close as possible to the robotic hand.

WPB : Close Side



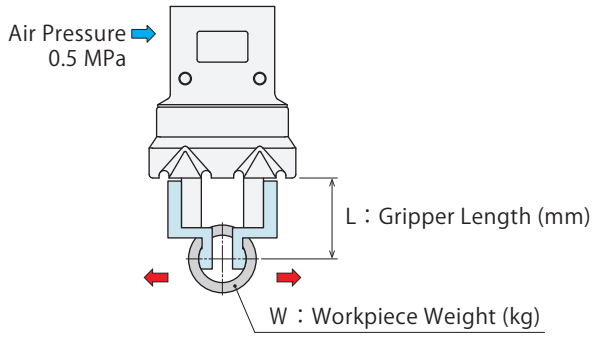
WPB0160



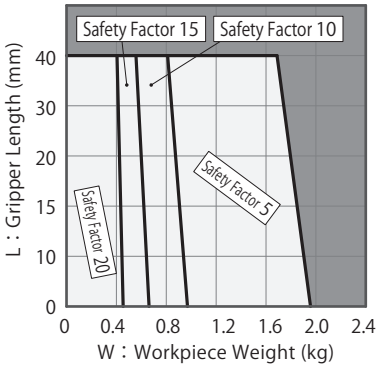
WPB0200

WPB0250

WPB : Open Side



WPB0160



WPB0200

WPB0250

Cautions

Notes for Design

1) Check Specifications
- model WPB：Maximum operating air pressure is 0.7 MPa. Minimum operating air pressure is 0.2 MPa. However, the maximum operating pressure, gripping force and holding force may change depending on the gripper length. Please provide appropriate air pressure in order to avoid deformation, seizure or air leakage caused by overload applied to the robotic hand.

2) Notes for Circuit Design
- Please design the air circuit properly and review the circuit design in advance in order to avoid malfunction or breakage of the device.

3) Protective Cover Installation
- If the moving parts of the robot or robotic hand may endanger human life, please install the protection cover.

4) Please supply filtered clean dry air.
- Oil supply with a lubricator etc. is unnecessary.

5) Adjustment of Operating Speed
- If the operating speed of the robotic hand is very fast, it leads to wear-out or malfunction of the parts. Please prepare a speed controller to adjust speed in order not to exceed the appropriate opening and closing time.

6) For Use of Auto Switch
- Select an auto switch depending on the environment.
- An auto switch may be stuck out of the robotic hand depending on the installation position and direction.

Installation Notes

1) Check the Fluid to Use
- Please supply filtered clean dry air. (Install 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. (In case of using secondary lubricant, please supply the lubricant continuously.)

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

3) Installation of the Robotic Hand and the Gripper
- Please tighten the robotic hand/gripper with the tightening torque listed on P.10.

4) Trial Operation Method
- Avoid supplying large air flow right after the installation. The operating time will be very fast and the robotic hand may be seriously damaged. Please install the speed controller near the air source and gradually supply air pressure.

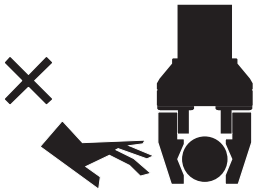
5) Adjustment of Operating Speed
- If the operating speed of the robotic hand is very fast, it leads to wear-out or malfunction of the parts. Please prepare a speed controller to adjust speed in order not to exceed the appropriate opening and closing time.

Notes on Handling

1) It should be operated by qualified personnel.
- Machines and devices with hydraulic and pneumatic equipment 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 the robotic hand or the robot while it is operating. Otherwise, your hands may be injured.



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

Maintenance and Inspection

1) Removal of the Product and Shut-off of Pressure Source
- Before the product is removed, 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 circuit.
- Make sure there is no trouble/issue in the bolts and respective parts before restarting.

2) Regularly clean the product.
- If the product is used when it is contaminated with dirt, it may lead to damage on the product and a workpiece fall due to insufficient gripping force, malfunctioning and etc.

3) 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 product should be stored in the cool and dark place without direct sunshine or moisture.

6) 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 If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
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 Others 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.

Auto Switch Model No. Indication

JEP 000 0 - A2 L

1 2 3

1 Design No.

0 : Revision Number

2 Switch Type

A2 : 2-Wire Reed Auto Switch
A2V : 2-Wire L-Shaped Reed Auto Switch
B2 : 3-Wire Solid State Auto Switch
B3C : 3-Wire L-Shaped Solid State Auto Switch
B3B : 2-Wire L-Shaped Solid State Auto Switch

3 Electric Cable Length

Blank : 1m
L : 3m

Application Table

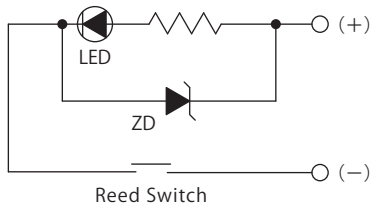
Switch Type	2-Wire Reed Auto Switch	3-Wire Solid State Auto Switch	2-Wire Solid State Auto Switch
Model No.	**JEP0000-A2□** **JEP0000-A2V□**	**JEP0000-B2□** **JEP0000-B3C□**	**JEP0000-B3B□**
WPB0160-□	●	●	●
WPB0200-□	●	●	●
WPB0250-□	●	●	●

JEP0000-A□□ (2-Wire Reed Auto Switch)

Specifications

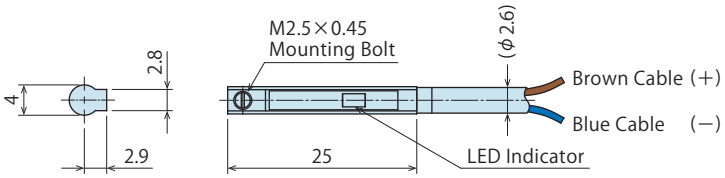
Model No.	JEP0000-A2	JEP0000-A2L	JEP0000-A2V	JEP0000-A2VL
Name	Reed Auto Switch			
Wiring Type	2-Wire			
Applicable Load	Relay, Programmable Logic Controller (PLC)			
Load Voltage / Load Current	Less than DC24V / 40mA Less than AC100V / 20mA			
Internal Voltage Drop	Less than 3V			
Operating Time	1ms			
Ambient Temperature	−10 ~ 60℃			
Withstand Voltage	AC1500V (There should be no abnormalities in 1 min. application.)			
Leakage Current	0			
Shock Resistance	30G			
Protection Circuit	None			
Protection Grade	IP67 (IEC Standard)			
Indicator Light	Red LED illuminates when turned ON			
Electric Cable Length	**1m**	**3m**	**1m**	**3m**

Electric Circuit Diagram

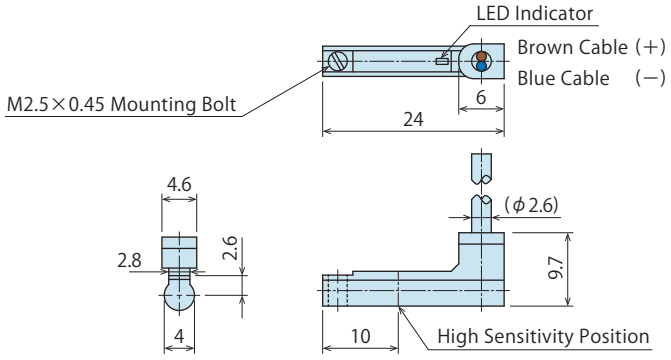


Note :
1. Auto switch will instantly break due to over loading current if turning on the auto switches without connecting the load. (Refer to Notes on Wiring 4) and 5) on P.23.)

External Dimensions : JEP0000-A2□



External Dimensions : JEP0000-A2V□

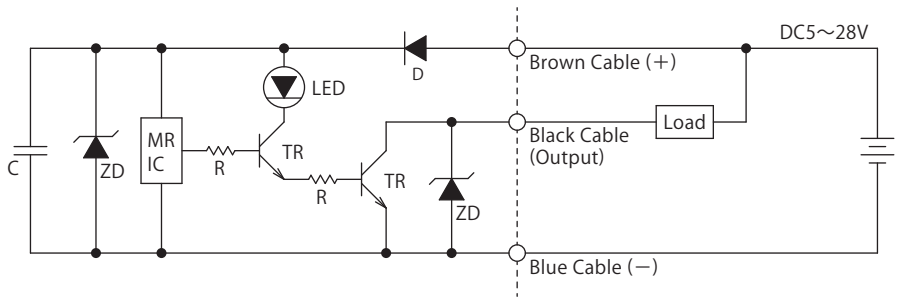


JEP0000-B2/B2L (3-Wire Solid State Auto Switch)

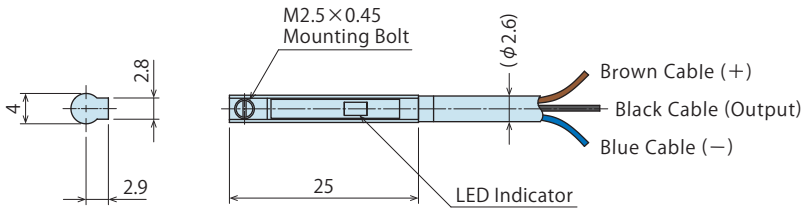
Specifications

Model No.	JEP0000-B2	JEP0000-B2L
Name	Solid State Auto Switch	
Wiring Type	3-Wire	
Applicable Load	Relay, Programmable Logic Controller (PLC)	
Output Type	NPN	
Load Voltage / Load Current	Less than DC5 ~ 28V / 50mA	
Internal Voltage Drop	Less than 0.8V	
Leakage Current	Less than 0.1mA	
Current Consumption	Less than 10mA	
Operating Time	Less than 1ms	
Ambient Temperature	-10 ~ 60℃	
Withstand Voltage	AC1500V (There should be no abnormalities in 1 min. application.)	
Insulation Resistance	More than 50MΩ / DC500V (Between the Case and Signal Cable)	
Shock Resistance	30G	
Protection Grade	IP67 (IEC Standard)	
Indicator Light	Red LED illuminates when turned ON	
Electric Cable Length	**1m**	**3m**

Electric Circuit Diagram



External Dimensions : JEP0000-B2/B2L

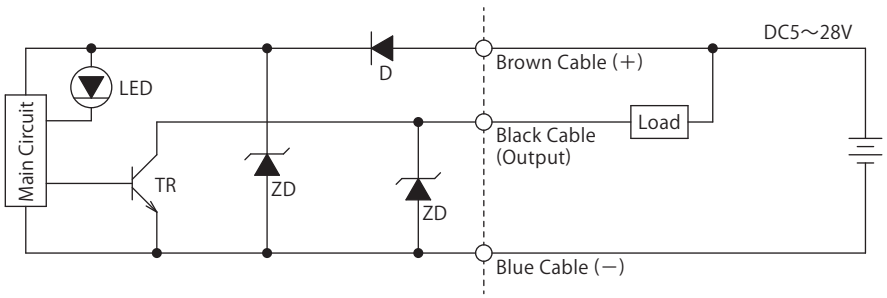


JEP0000-B3C/B3CL (3-Wire L-Shaped Solid State Auto Switch)

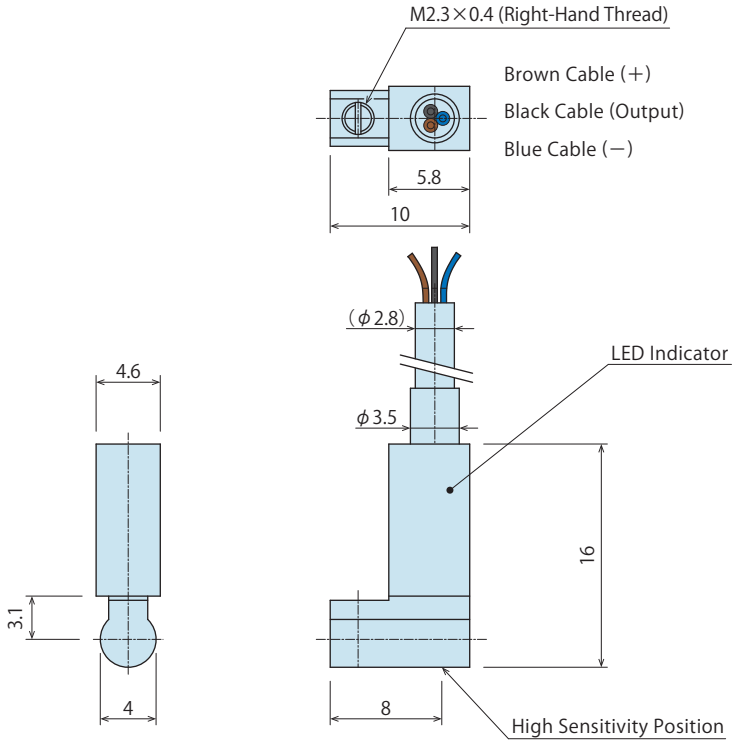
Specifications

Model No.	JEP0000-B3C	JEP0000-B3CL
Name	Solid State Auto Switch	
Wiring Type	3-Wire	
Applicable Load	Relay, Programmable Logic Controller (PLC)	
Output Type	NPN	
Load Voltage / Load Current	DC5 ~ 28V / 50mA	
Internal Voltage Drop	Less than 0.8V	
Leakage Current	Less than 0.1mA	
Current Consumption	Less than 10 mA	
Operating Time	Less than 1ms	
Ambient Temperature	−10 ~ 60℃	
Withstand Voltage	AC1500V (There should be no abnormalities in 1 min. application.)	
Insulation Resistance	More than 100MΩ / DC500V (Between the Case and Signal Cable)	
Shock Resistance	30G	
Protection Grade	IP67(IEC Standard)	
Indicator Light	Red LED illuminates when turned ON	
Electric Cable Length	**1m**	**3m**

Electric Circuit Diagram



External Dimensions：JEP0000-B3C/B3CL

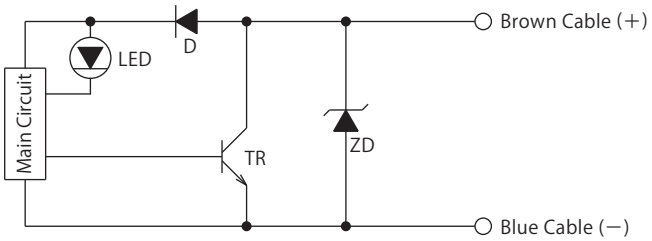


JEP0000-B3B/B3BL (2-Wire L-Shaped Solid State Auto Switch)

Specifications

Model No.	JEP0000-B3B	JEP0000-B3BL
Name	Solid State Auto Switch	
Wiring Type	2-Wire	
Applicable Load	Relay, Programmable Logic Controller (PLC)	
Load Voltage / Load Current	Less than DC10～28V / 50mA	
Internal Voltage Drop	Less than 5V	
Leakage Current	Less than 1mA	
Current Consumption	Less than 10 mA	
Operating Time	Less than 1ms	
Ambient Temperature	−10～60℃	
Withstand Voltage	AC1500V (There should be no abnormalities in 1 min. application.)	
Insulation Resistance	More than 50MΩ / DC500V (Between the Case and Signal Cable)	
Shock Resistance	30G	
Protection Grade	IP67 (IEC Standard)	
Indicator Light	Red LED illuminates when turned ON	
Electric Cable Length	**1m**	**3m**

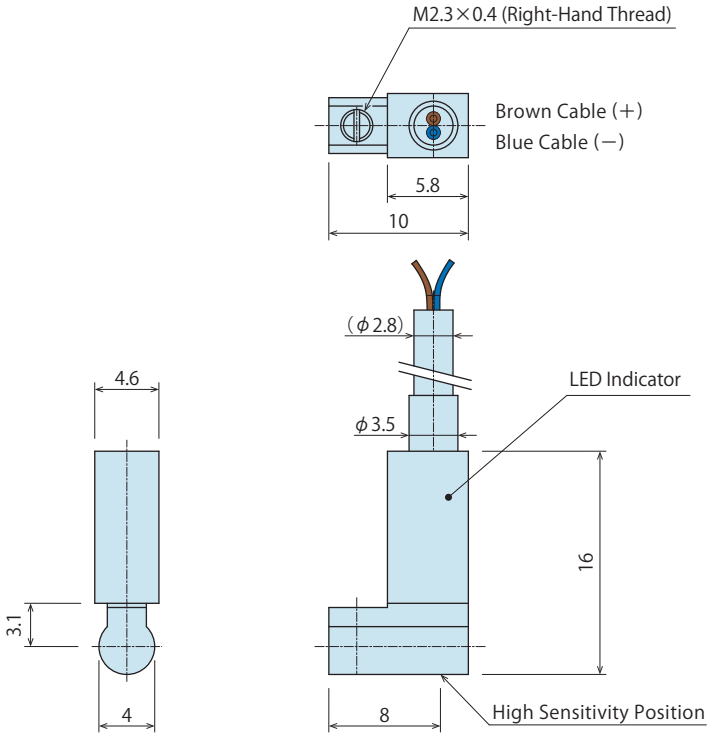
Electric Circuit Diagram



Note :

1. Auto switch will instantly break due to over loading current if turning on the auto switches without connecting the load.
(Refer to Notes on Wiring 4) and 5) on P.23.)

External Dimensions：JEP0000-B3B/B3BL



MEMO

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 auto switch 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 safety switch (sensor) together with the auto switch. Also, please perform periodic maintenance and confirm proper operation.

3) Wiring should be prepared as short as possible.
- For the reed auto switch, if the wiring length to the load is excessively long, inrush current to the auto switch increases and the operational life span will be shortened. (Remains ON)
- If the wiring length of the solid state auto switch is long, we recommend installing the ferrite core on both ends of the electric cable for noise control.

4) Notes when connecting to a load that generates surge voltage.
- When connecting a load that generates surge voltage such as relay, please use the auto switch equipped with junction protective circuit or use a junction protective element connecting to the auto switch in parallel.
- If surge voltage is repeatedly generated even with the auto switch equipped with junction protective circuit, it may damage the contact. In this case, please reduce the surge voltage by connecting a surge-absorption element to a surge-generating source (load) in parallel.

5) Notes when connecting auto switches in series.
- Due to voltage drop (refer to internal voltage drop on the specifications) caused by LED, voltage drop of n auto switches connected in series will be multiplied by n times. As a result, in some cases the load will not activate even if the auto switch drives properly.

6) Be careful with the polarity when wiring.
- When connected reversely, the auto switch may malfunction or be damaged.

7) When multiple cylinders or robotic hands are placed close together.
- Please provide enough space when using multiple actuators such as cylinders or robotic hands equipped with auto switches. (If allowable distance of each actuator is specified please follow specified instructions.) If they are too close, auto switches may malfunction due to magnetic interference.

8) Secure space for maintenance and inspection
- Please secure space for maintenance and inspection of auto switches when setting actuators such as cylinders and robotic hands equipped with auto switches.

Notes on Operating Environment

1) Never use the product in an atmosphere with explosive gases.
- Auto switches are not designed to prevent explosion. Do not use the product in an atmosphere with explosive gases since it may cause serious explosions.

2) Do not use the product in an area where a magnetic field is generated.
- Auto switches may malfunction, or internal magnet actuators, such as cylinders or robotic hands, equipped with auto switches will be demagnetized.

3) Do not use the product in an environment where the auto switches are continuously exposed to water or coolant.
- Although IEC standard IP67 structure is satisfied, please avoid using auto switches in an environment where continuously exposed to water or coolant. This may cause insulation failure or malfunction.

4) Do not use the product in an environment with oil or chemicals.
- If auto switches 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.

5) Do not use the product in an environment subject to large temperature cycle.
- Heat cycles other than ordinary changes in temperature may adversely affect the internal structure of auto switches.

6) Avoid accumulation of steel dust and close connection of magnetic materials.
- An amount of steel chips or steel dusts, such as sputters of welding accumulate around an actuator. Cylinders, robotic hand equipped with auto switches and or magnetic materials (those attracted by magnet) are gathered closely to the actuator. These can weaken internal magnet actuators.

7) Do not use the product in an environment with excessive impact.
- Under the condition of the excessive impact of more than 30G, the contact of the reed auto switch will malfunction and the indicator light may signal or may be disconnected.

Installation Notes

1) Do not drop or bump.
- Do not drop, bump or apply excessive impact on auto switches. The auto switches may be damaged and cause malfunction.

2) Tighten auto switches with appropriate tightening torque.
- Please follow the tightening torque below.
Excessive tightening torque may damage the mounting screw, fitting or main body of the auto switch.
Also, mounting position may be shifted due to insufficient tightening torque.

Mounting Screw Size	Tightening Torque (N·m)
M2.3×0.4	0.15
M2.5×0.45	0.25

3) Do not carry cylinders or robotic hands by holding the electric cable of the auto switch.
- It may break the electric cable or damage the internal element.

4) Do not fix auto switches with the mounting screws other than attached in main body of the auto switches.
- Using non-designated screws may damage auto switches.

5) Install the auto switches at the center of the operating area.
- Installation position of auto switches should be adjusted so that a detected object (piston etc.) stops at the center of operating range. (Installation position shown in the catalog indicates the most suitable fixed position of stroke end.) Please refer to P.9.
If the auto switches are installed at the edge of operating range (near the boundary of ON and OFF), output movement may be unstable.

6) Installation position of the auto switches should be adjusted by checking actual operating state.
- Depending on the installation environment, actuators such as cylinders and robotic hands may not operate properly even if they are installed to the appropriate position.
Make sure to check the operating condition even when mounting them at the middle of the stroke.

Cautions

Notes on Wiring

1) Check the insulation of wiring.
- Insulation failure (interference with other circuit, ground fault, and insulation failure between terminals) may send excessive voltage or current to the auto switches causing damage.

2) Do not place wires and auto switch cables close to other cables and high voltage cables.
- Otherwise, surge voltages will be induced creating noise and leading to malfunctions.

3) Repeated bending stress or stretching force should be avoided on electric cables.
- Wiring with bending stress or stretching force repeatedly applied on electric cables will prematurely breakdown.
  Bending stress or stretching force applied on the connecting area of electric cables and main body of the auto switches will damage the electric cables.
  Auto switches or wires should not be moving especially near the connecting areas.

4) Make sure to check the load state (connection and current value) before turning on the power.
- For 2-Wire Type
  Auto switches will instantly break due to over loading current if turning on the auto switches without connecting the load (Shorted Load Circuit). The above statement is also applied to the condition when the brown cable (+, output) of 2-wire type is directly connected to the (+) power terminal of a fixture and etc.

5) Avoid shorted load circuit.
- Reed Auto Switch
  Auto switches will instantly break due to over loading current if turning on the auto switch in load short circuit condition.
- Solid State Auto Switch
  Be aware of auto switch breakages when products with PNP output is not equipped with short-circuit protection.

6) Avoid wrong wiring
- Reed Auto Switch
  The electric circuit has polarities. The reed switch can operate even with reversed connection, but LED light will not illuminate. Also, flowing excessive current will damage LED and it will not operate properly.
- Solid State Auto Switch
  In case of 2-wire type, even if connected reversely, the auto switch will not be damaged due to protection circuit, but it is always ON.
  If reversely connected under short circuit condition, the auto switch will be damaged.
  In case of 3-wire type, even if the connections are reversed (power supply line "+" and "−"), the auto switch will be protected by a protection circuit.
  However, if connecting the power supply "+" to the blue cable and "−" to the black cable, the auto switch will be damaged.

Notes on Handling

1) It should be operated by qualified personnel.
- Machines and devices with hydraulic and pneumatic equipment 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 disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

Maintenance・Inspection

Conduct the below maintenances and inspections periodically in order to avoid unintended malfunctions and to ensure the safety.

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 circuits.
- Make sure there is no trouble/issue in the bolts and respective parts before restarting.

2) Never touch terminals while the power is on.
- It will cause electric shock, malfunction and damage to the auto switches.

3) Retightening of Mounting Screws
- Retighten the screws after adjusting the mounting position when the mounting position of the auto switches is shifted due to the looseness of the mounting screws.

4) Check if the electric cable is damaged or not.
- Damaged cables may cause insulation failure. Exchange the auto switch or repair the reed if there is damage on the electric cable.

5) Check the setting position of the detector.
- Confirm the set position is stopped at the center of the detecting range (the area that red LED illuminates).

6) Cleaning Auto Switches
- The auto switch should be clean. Do not use benzene, paint thinner or alcohol for cleaning. Doing so will cause scratches on the product and indications may be erased. If it is hard to remove stains from the product, wipe it out with a cloth soaked in a neutral detergent diluted with water. Wipe with a dry cloth to remove wet residue.

7) Product Storage
- Keep the product out of direct sunlight in a cool area where it is protected from water and humidity.

8) Please contact us for auto switch replacements.

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 If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
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 Others 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.

KOSMEK
Harmony in Innovation

KOSMEK LTD.

http://www.kosmek.com/

HEAD OFFICE 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241
TEL.+81-78-991-5162 FAX.+81-78-991-8787

United States of America SUBSIDIARY
KOSMEK (USA) LTD.
650 Springer Drive, Lombard, IL 60148 USA
TEL. +1-630-620-7650 FAX. +1-630-620-9015

MEXICO REPRESENTATIVE OFFICE
KOSMEK USA Mexico Office
Av. Santa Fe 103, Int. 59, col. Santa Fe Juriquilla, Queretaro, QRO, 76230, Mexico TEL. +52-1-55-3044-9983

EUROPE SUBSIDIARY
KOSMEK EUROPE GmbH
Schleppeplatz 2 9020 Klagenfurt am Wörthersee Austria
TEL. +43-463-287587 FAX. +43-463-287587-20

CHINA SUBSIDIARY
KOSMEK (CHINA) LTD.
Room601, RIVERSIDE PYRAMID No.55, Lane21, Pusan Rd, Pudong Shanghai 200125, China TEL. +86-21-54253000

INDIA BRANCH OFFICE
KOSMEK LTD. - INDIA
4A/Old No:649, Ground Floor, 4th D cross, MM Layout, Kavalbyrasandra, RT Nagar, Bangalore -560032 India TEL.+91-9880561695

THAILAND REPRESENTATIVE OFFICE
KOSMEK Thailand Representation Office
67 Soi 58, RAMA 9 Rd., Phatthanakan, Suanluang, Bangkok 10250, Thailand
TEL. +66-2-300-5132 FAX. +66-2-300-5133

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

ISO 9001
JQA-QMA10823
KOSMEK HEAD OFFICE

JAB
MS
CM009

CAT.NO. SBR-WPB001-02-G1B
Printed in Japan

2021/12 First 0Ry
2023/04 2nd 0Ry