New

Robotic Hand Changer

Model SWL

New Option December 2023

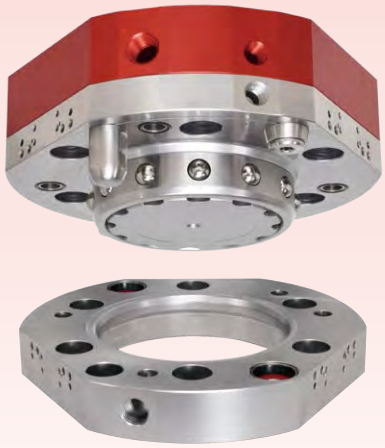
Action Confirmation Sensor

KOSMEK

Harmony in Innovation

Robotic Hand Changer

Model **SWL**



New Option : Action Confirmation Sensor

Registered Utility Model

Payload Line-up : 80kg/120kg/180kg/300kg

Applicable to ISO Mounting Pattern.

Super-Thin

[Clamped State Dimension] SWL0800 : 53mm SWL1200 : 62mm SWL1800 : 70mm SWL3000 : 83mm

Action Confirmation Sensor : SWL0800-M□: 58mm SWL1200-M□: 67mm SWL1800-M□: 75mm SWL3000-M□: 88mm

Direct Mounting on Robots

Applicable to ISO Mounting Pattern.

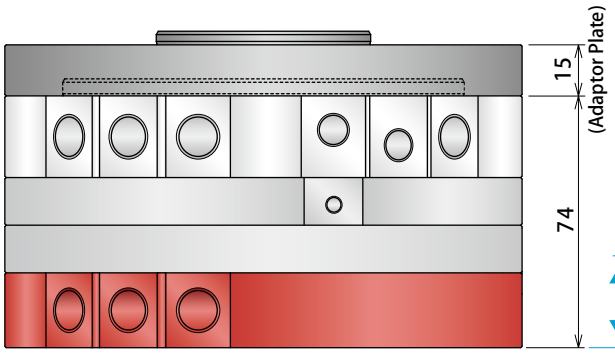
Fall Prevention

Mechanically holds connection even when air pressure is at 0MPa.

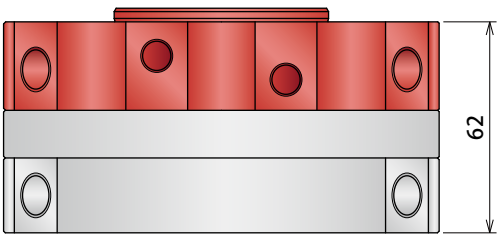
• Low Profile when Connected

Comparing to the conventional robotic hand changer, the thickness when connected has been reduced by more than 15%. Even with an adaptor, it has been reduced by more than 30%. It minimizes the moment applied to a robot.

Conventional Model **SWR1200**



NEW **SWL1200**



More than 30% Reduction
comparing to the conventional model !

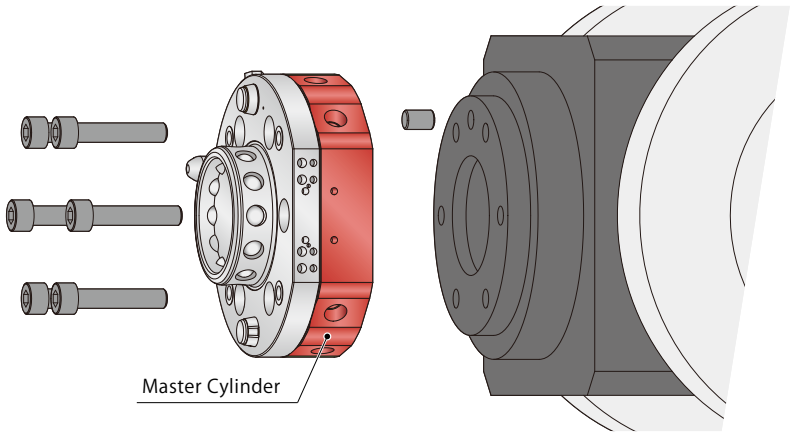
Application Examples

• Applicable to ISO Mounting Pattern

Directly mounted on a robot whose mounting dimensions of the flange based on ISO mounting Pattern.

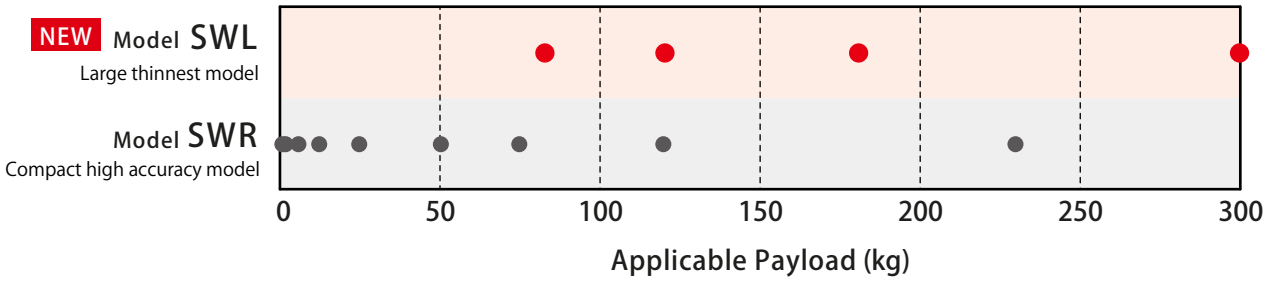
※ Bolts and pins are not included. Please check the external dimensions before use.

Model No.	SWL0800-M□-□	SWL1200-M□-□	SWL1800-M□-□	SWL3000-M□-□
Applicable Mounting Pattern No.	6	7	8	9



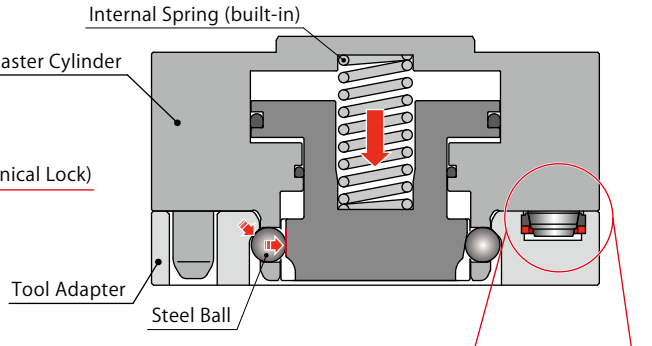
• Payload | High |

Max. Applicable Payload : 300kg.



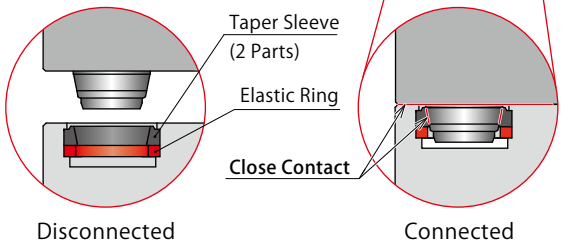
• Fall Prevention | Safety |

Two-step mechanical lock mechanism by the built-in spring and steel balls. It enables powerful holding even when air pressure is at 0MPa. It securely prevents a tool fall even with large equipment.



• No Backlash

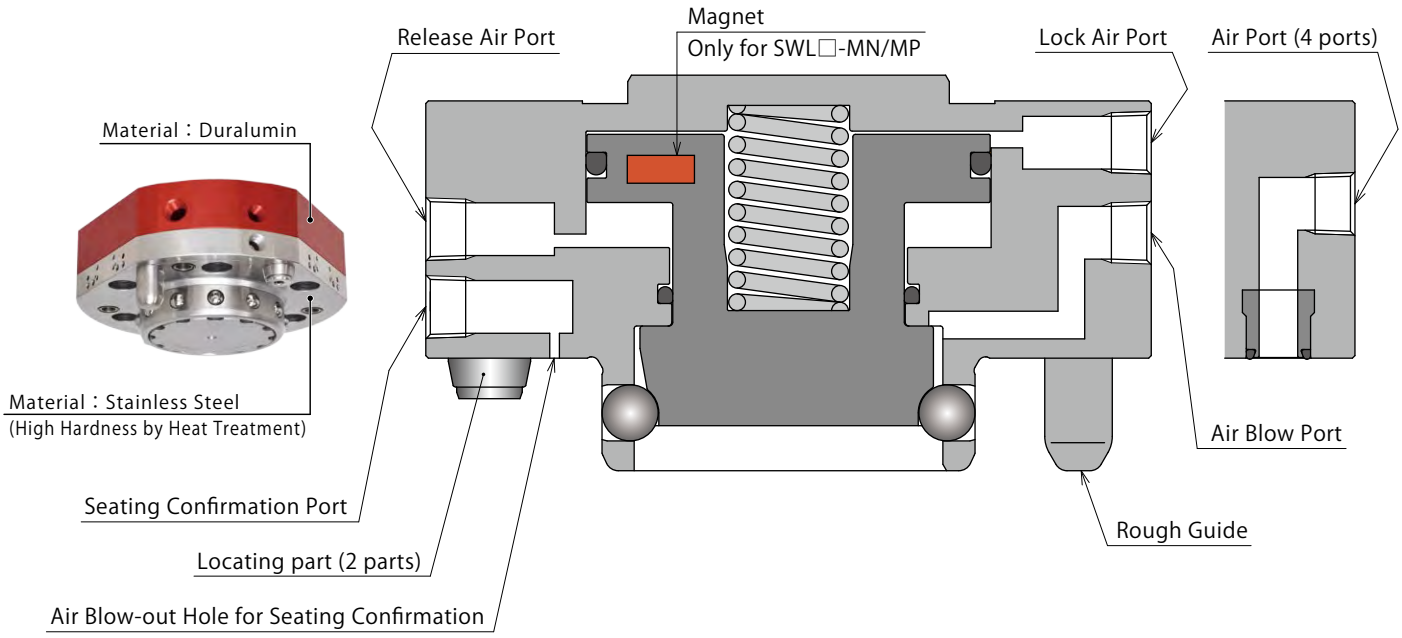
The dual surface contact by Kosmek exclusive movable taper sleeve enables metal surfaces to contact with no clearance. It makes locating with high rigility and accuracy.

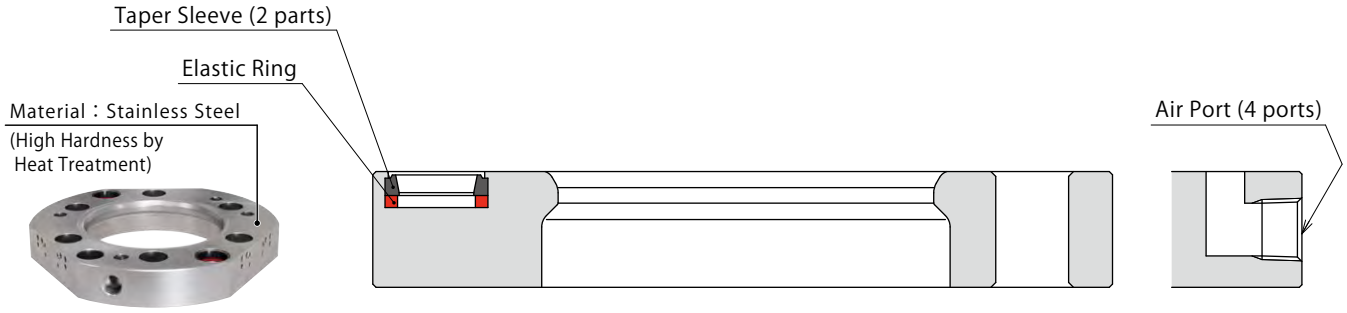


Details of Locating Part

Cross Section

Master Cylinder (SWL□0-M)

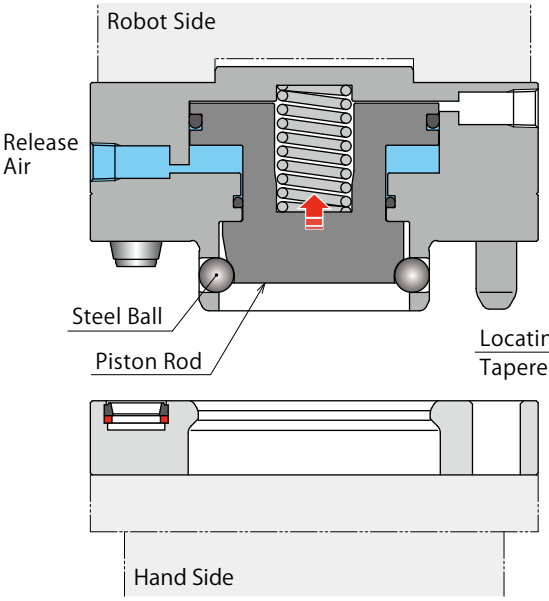




Tool Adapter (SWL□0-T)

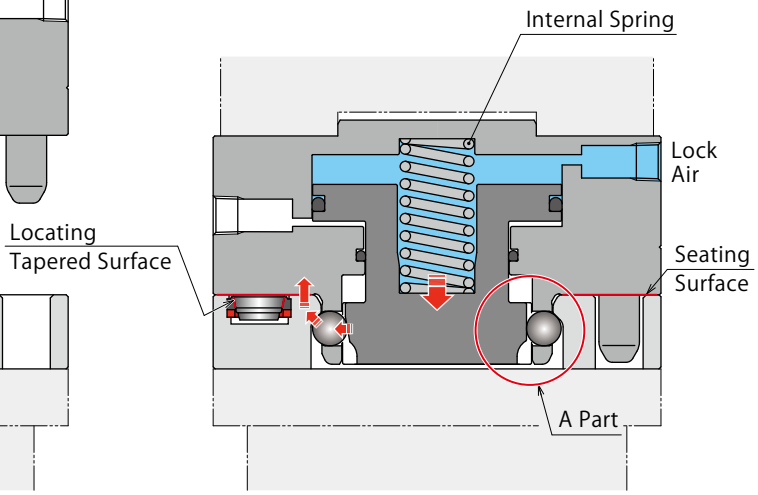
Action Description

Disconnected State (Released State)



Supply air to the release air port. The piston rod is pushed up with thrust force caused by release air. At this time, the steel balls are free to move (set inside).

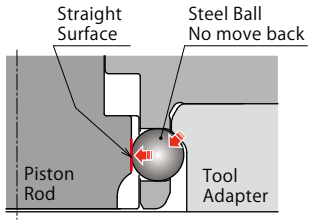
Connected State (Locked State)



Supply air to the lock port. The piston rod will be pulled down with piston thrust and an internal spring, and the tool adapter will be pulled to the seating surface by the steel balls. When the tool adapter is pulled, the locating part contacts the tapered surface, and locating is completed.

Mechanical Lock Mechanism

When lock air pressure is lost, mechanical lock mechanism is activated and prevents a tool fall.
Mechanical lock mechanism enables holding force to be 5 times of the allowable weight even when air pressure is at 0MPa.



A Part : Mechanical Lock Mechanism

Accessories Sold Separately

Safety Push Valve to prevent a tool fall during robot teaching

Able to mount directly on a Robotic Hand Changer, and prevent a tool fall caused by valve operating error during robot teaching.
Enables to limit the SWL to release only at a designated position (tool stocker).

※Please contact us for further information.

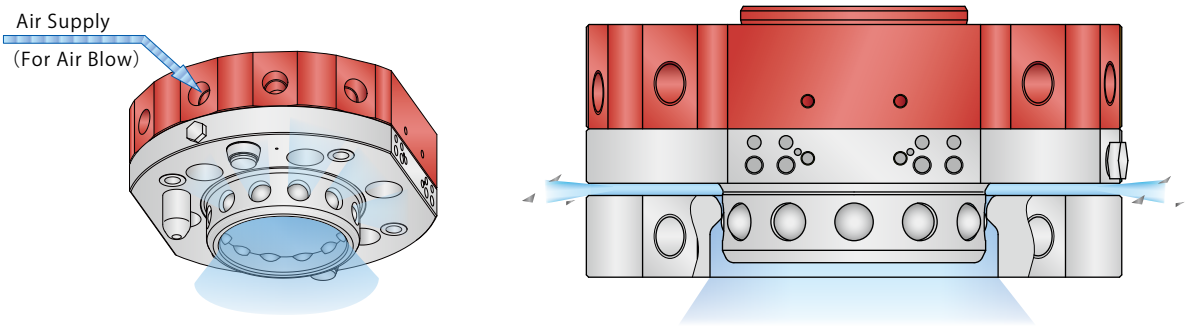
model **SWRA0R0**

model **SWRA0M0**

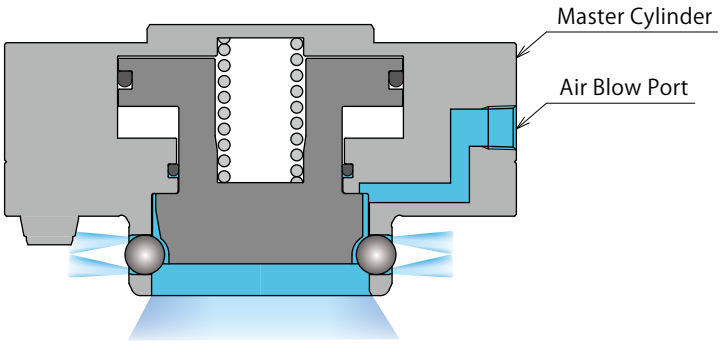
model **SWRA0A0**

Anti-Contamination：Air Blow Function

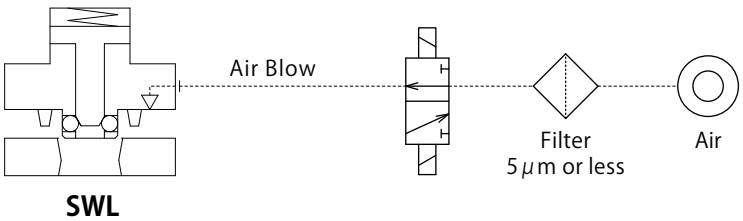
Prevents contamination by supplying air to the air blow port.



Cross Section



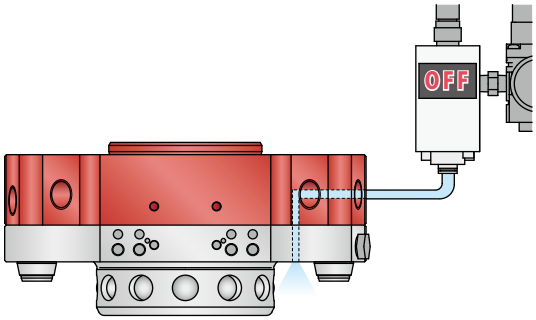
Circuit Reference



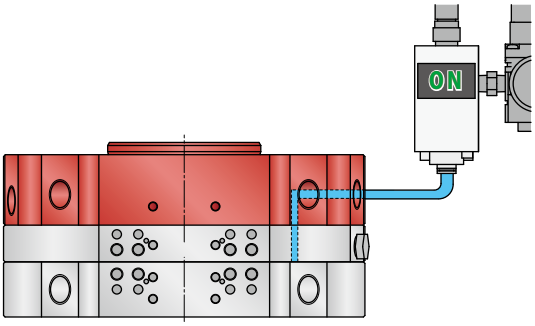
Close Contact Check：Seat Check Function

When the air sensor is connected to the seat check port, connection of the master cylinder and the tool adapter is confirmed. If they are not in contact and there is a gap on the seating surface (connection failure), air will leak. It detects the connected condition precisely since the air sensor turns on when they are connected properly.

※Air sensor must be installed separately.

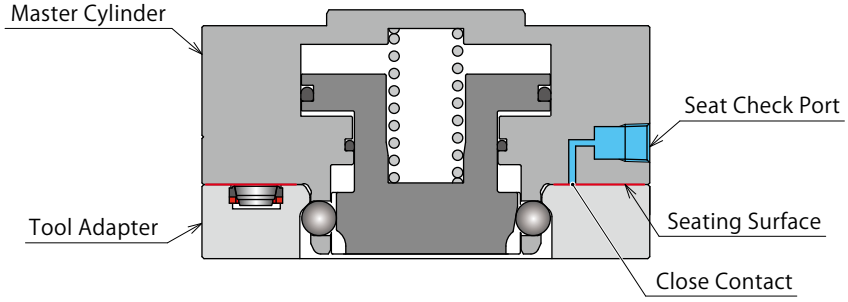


Before Connection：Air Sensor OFF

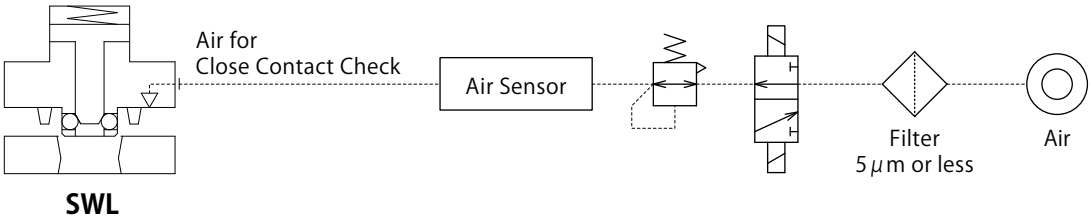


When Connected：Air Sensor ON

● Cross Section

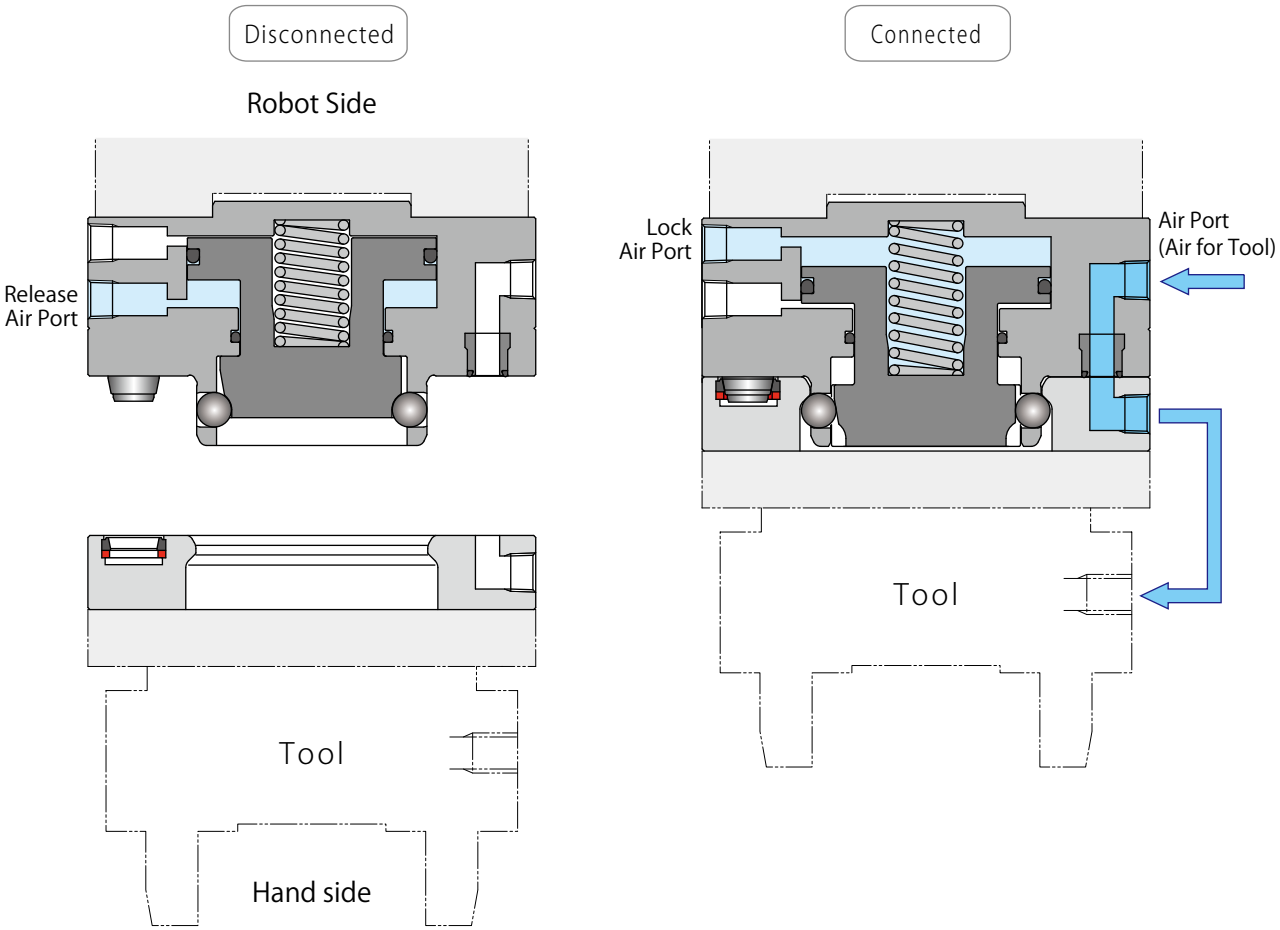


● Circuit Reference



Air Joint Function

When a master cylinder and a tool adapter are connected, air can be supplied from the robot side to the hand side through the air port. Air port can be used for the operation of the actuator (positive pressure) and the suction pad (negative pressure).



Notes:

1. If the passage area is not large enough, it can be expanded by connecting multiple air ports. It enables higher operation speed.
2. External options are available for extra air ports. Please refer to P.31 and after for further information.

Joint Option (Air Port Part)

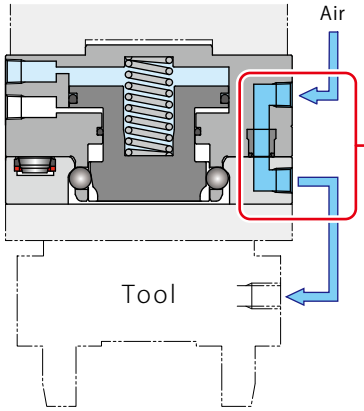
Master Cylinder Model No.

SWL □ 0 - M Blank / N / P - Blank / S

1 Payload

3 Action Confirmation Sensor

4 Joint Option
Blank : Without Check Valve (Standard)
S : With Check Valve

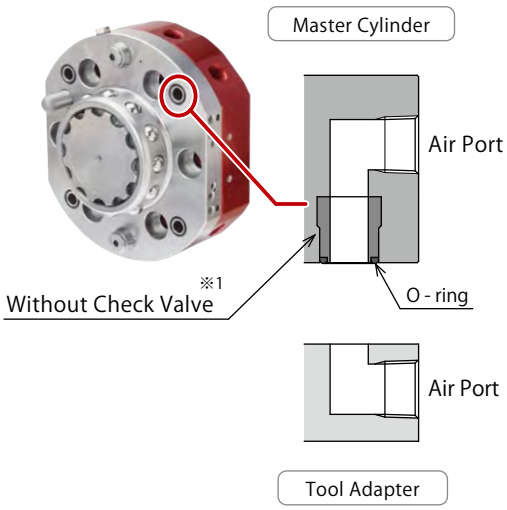


Air Joint Part

Selectable from two air port joint options.

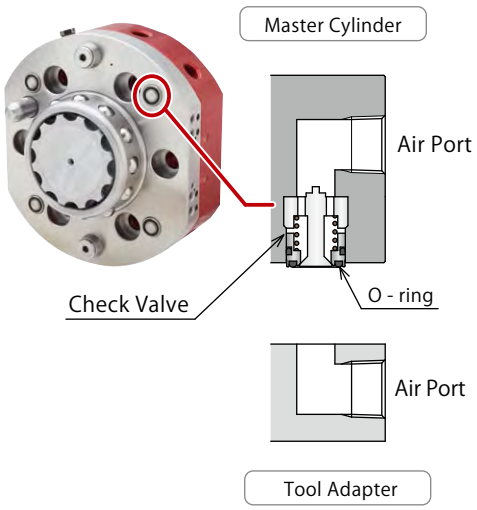
Without Check Valve (Standard) ※1

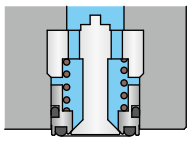
4 Joint Option **Blank**



With Check Valve

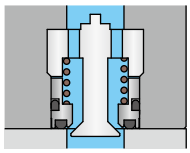
4 Joint Option **S**





Disconnected

The check valve (metal seal) is sealed off.



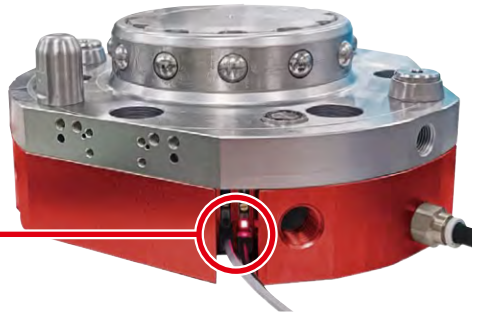
Connected

The valve is opened and air is supplied to the tool adapter.

Notes:

※1. For Without Check Valve (Standard), 3-position closed center solenoid valve is recommended since the air ports are always open.

Action Confirmation Sensor



Master Cylinder Model No.

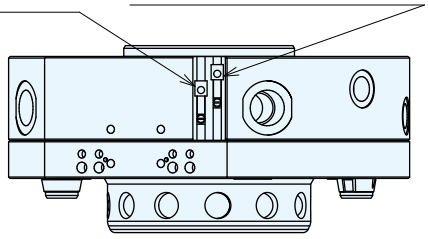
SWL [ ] 0 - M [Blank / N / P] - [Blank / S]

- [ ] Payload
- [Blank / N / P] 3 Action Confirmation Sensor
- [S] 4 Joint Option

Blank : Without Sensor
N : Sensor NPN Output (Cable 1m)
P : Sensor PNP Output (Cable 1m)

Release Confirmation Sensor
3 Option **N** : JES0000-02LGN
3 Option **P** : JES0000-02LGPN

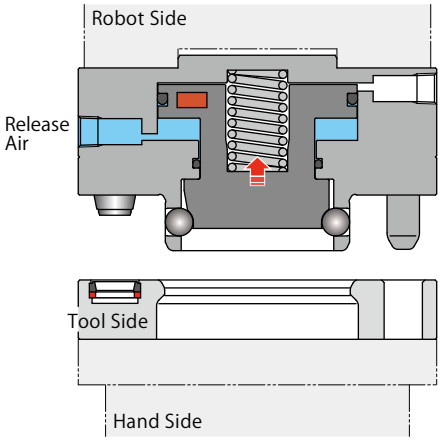
Lock Confirmation Sensor
3 Option **N** : JES0000-02LGS
3 Option **P** : JES0000-02LGPS



Sensor Signal

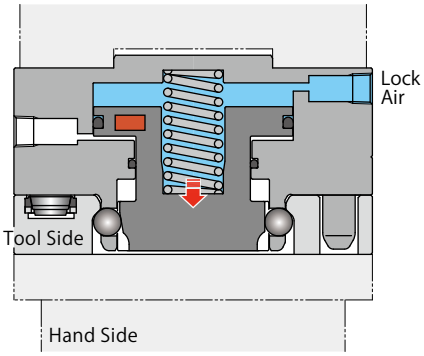
Disconnected (Released) State

Release Confirmation Sensor ON
Lock Confirmation Sensor OFF



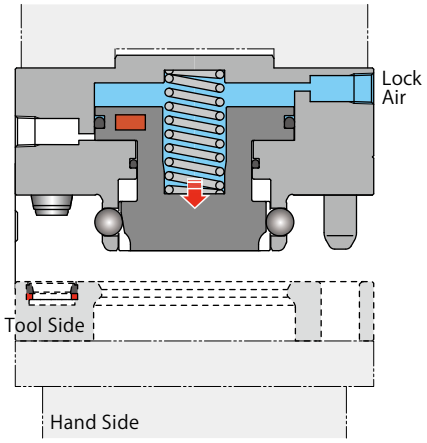
Connected (Locked) State

Release Confirmation Sensor ON
Lock Confirmation Sensor ON



Fully Stroked State※1

Release Confirmation Sensor OFF
Lock Confirmation Sensor ON



※1. It refers to the state when the tool adapter is not connected when lock air is supplied.

Sensor Specifications

Model No.		3 Sensor Option N	3 Sensor Option P
Sensor Model No.	Release Confirmation Sensor	JES0000-02LGN (Cable Color : Black)	JES0000-02LGPN (Cable Color : Black)
	Lock Confirmation Sensor	JES0000-02LGS (Cable Color : Gray)	JES0000-02LGPS (Cable Color : Gray)
Output Specification		NPN (ON when in proximity)	PNP (ON when in proximity)
Output Current		15mA Max.	80mA Max.
Current Consumption		4mA Max.	12mA Max.
Wiring Method		3-Wire	
Applicable Load		Relay, Programmable Logic Controller (PLC)	
Voltage		DC 5 ~ 24V	
Response Speed		16μsec or less	
Case Material		GF Reinforced PBT : Black	
Indicator Light		Red	
Withstand Voltage		AC1000V (for 1 minute / Packaged Charging Part / between the Case)	
Insulation Resistance		DC250V (20MΩ or more in Megohms, between the Case)	
Operating Temperature Range		−20℃ ~ +85℃ (Make sure no condensation)	
Operating Humidity Range		20 ~ 95%RH	
Protection Grade		IP67	
Cable Length		1m	

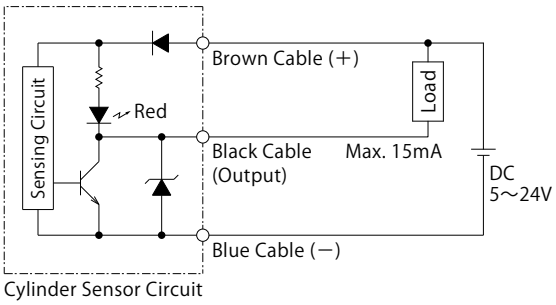
Note :
1. Refer to model JES on the catalog for further information.

Electric Circuit Diagram

3 Sensor Option N

NPN Output

JES0000-02LGN
JES0000-02LGS

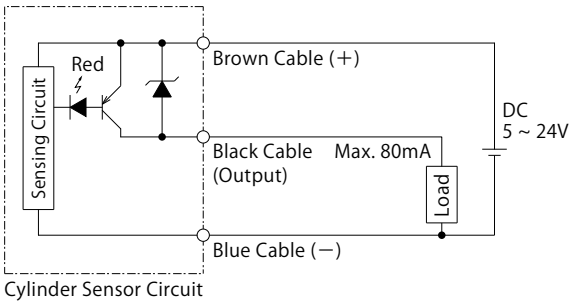


Cylinder Sensor Circuit

3 Sensor Option P

PNP Output

JES0000-02LGPN
JES0000-02LGPS



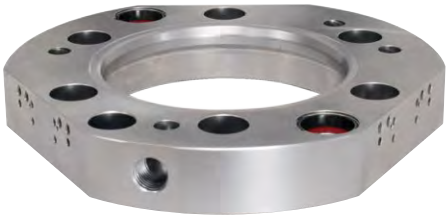
Cylinder Sensor Circuit

Model No. Indication

Master Cylinder (Robot Side)

SWL [080 / 120 / 180 / 300] 0 - M [ ] - [ ]

1 2 3 4



Tool Adapter (Tool Side)

SWL [080 / 120 / 180 / 300] 0 - T

1 2

1 Payload

080 : 50 ～ 80 kg
120 : 80 ～ 120 kg
180 : 120 ～ 180 kg
300 : 180 ～ 300 kg

2 Design No.

0 : Revision Number

3 Action Confirmation Sensor

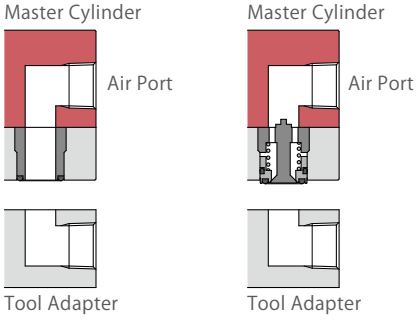
Blank : Without Sensor (Standard)
N : Sensor NPN Output (Cable 1m)
P : Sensor PNP Output (Cable 1m)

4 Joint Option (Air Port Part)

※Refer to P.8 for detail of the joint option.

Blank : Without Check Valve (Standard)
S : With Check Valve

※ Since tool adapter has no check valve, there is no joint option symbol for SWL□-T.
Tool adapter can be connected to both joint option **Blank** and **S** of master cylinder side.



Blank
Without Check Valve (Standard)

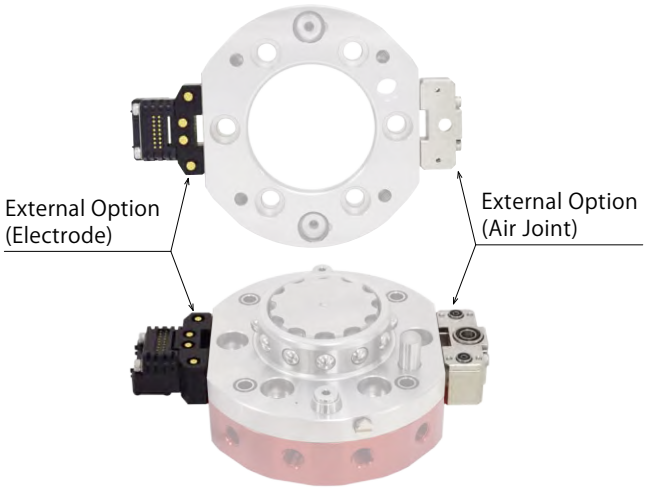
S
With Check Valve

External Option

Accessories Sold Separately

A wide variety of electrodes can connect various signals such as control signals and power signals. Additional air joints are also available for extra air ports.

※Refer to P.31 and after for further information.



Specifications

Model No.			SWL0800	SWL1200	SWL1800	SWL3000
Payload ※1		kg	50 ～ 80	80 ～ 120	120 ～ 180	180 ～ 300
Repeatability		mm	0.01			
Cylinder Capacity	Lock	cm3	21.8	37.7	69.3	146.2
	Release	cm3	14.7	25.8	50.3	109.7
Operating Air Pressure	Max. Pressure	MPa	0.7			
	Min. Pressure	MPa	0.3			
	Withstanding Pressure	MPa	1.0			
Holding Force			Refer to P.14			
Allowable ※1 Static Moment	Bending (at 0.5MPa)	N·m	450	800	1500	2900
	Bending (at 0.7MPa)	N·m	(600)	(1000)	(2000)	(4000)
	Twisting	N·m	500	850	1400	2200
Max. Load ※2 Moment	Bending (at 0.5MPa)	N·m	900	1600	3000	5800
	Bending (at 0.7MPa)	N·m	(1200)	(2000)	(4000)	(8000)
	Twisting	N·m	1000	1700	2800	4400
Operating Temperature		℃	0 ～ 70			
Usable Fluid			Dry Air			
Weight ※3 Master Cylinder	3 Sensor Option **Blank**	kg	1.8	3.4	5.3	8.4
	3 Sensor Option **N/P**	kg	1.9	3.6	5.6	8.7
Weight ※3	Tool Adapter	kg	0.9	1.7	2.6	4.1
Number of Air Ports ※4	Thread Size x Number of Ports		Rc1/8 × 4 Ports	Rc1/4 × 4 Ports	Rc1/4 × 4 Ports	Rc3/8 × 4 Ports
Air Port Minimum Passage Area	4 Joint Option **Blank**	mm2	28.3 (Equal to ϕ6)	63.6 (Equal to ϕ9)	63.6 (Equal to ϕ9)	95.0 (Equal to ϕ11)
	4 Joint Option **S**	mm2	5.4 (Equal to ϕ2.6)	13.4 (Equal to ϕ4.1)	13.4 (Equal to ϕ4.1)	21.9 (Equal to ϕ5.3)
Number of Electrode Mounting Surfaces			2	2	3	3
Applicable ISO Interface Number ※5			6	7	8	9
Allowable Offset while Teaching			Refer to P.28			

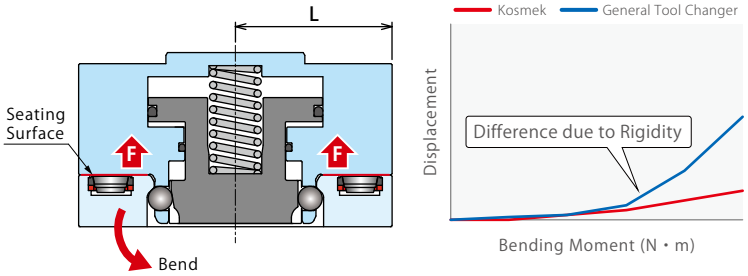
Notes:

※1. Please consider both the payload and allowable static moment when selecting the product.
※2. The product must be used within Allowable Static Moment (※1). Using within Max. Load Moment will not fill the specifications.
※3. Weight of the body without external options.
※4. Refer to P.7 for air port use.
※5. ISO Interface Number indicates the robot mounting surface that is allowed to mounted on directly.
Refer to P.26 for Standard ISO Mounting Pattern.

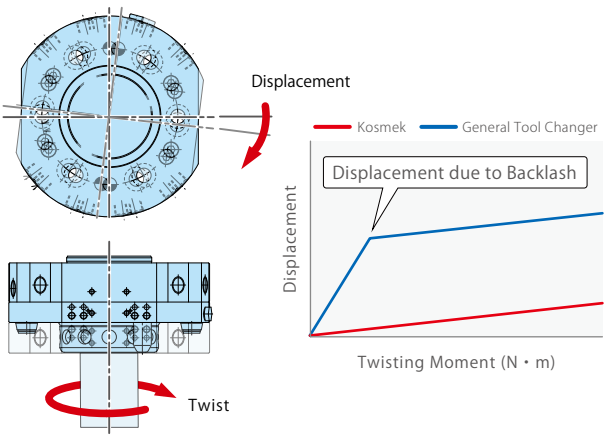
Point **The whole surface is a seating surface**
High Rigidity Possible !!

Estimated Calculation Formula

Allowable Bending Moment = L × F



Point **Kosmek Exclusive Mechanism**
Zero Backlash ! ! Strong to Twist

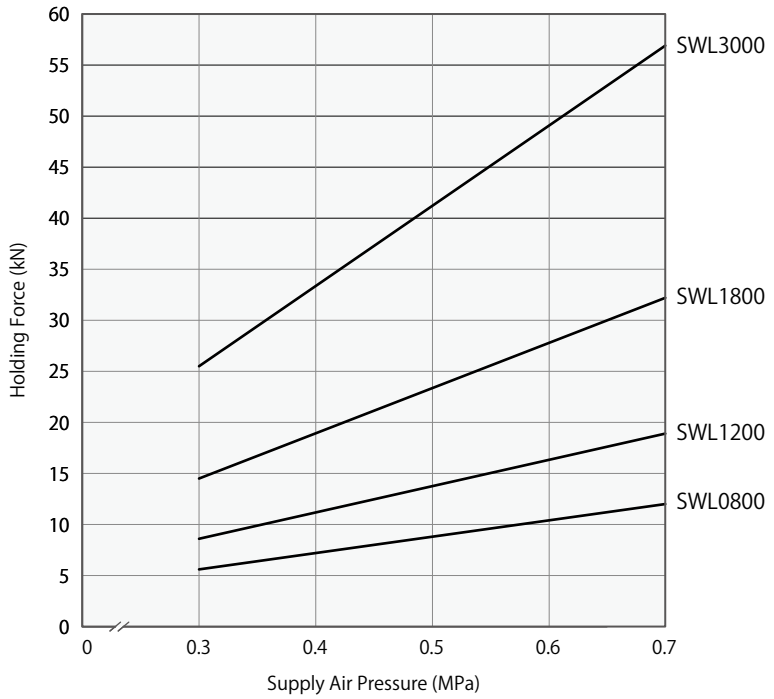


Holding Force Curve

Model No.			SWL0800	SWL1200	SWL1800	SWL3000
Holding Force	At 0MPa ※6	kN	4.0	6.0	9.0	15.0
	At 0.3MPa	kN	5.6	8.6	14.5	25.5
	At 0.4MPa	kN	7.2	11.2	18.9	33.4
	At 0.5MPa	kN	8.8	13.8	23.4	41.2
	At 0.6MPa	kN	10.4	16.4	27.8	49.1
	At 0.7MPa	kN	12.0	18.9	32.2	56.9

Note :

※6. It indicates holding force when air pressure is at 0MPa after connecting and may not fill the specification.



Note :

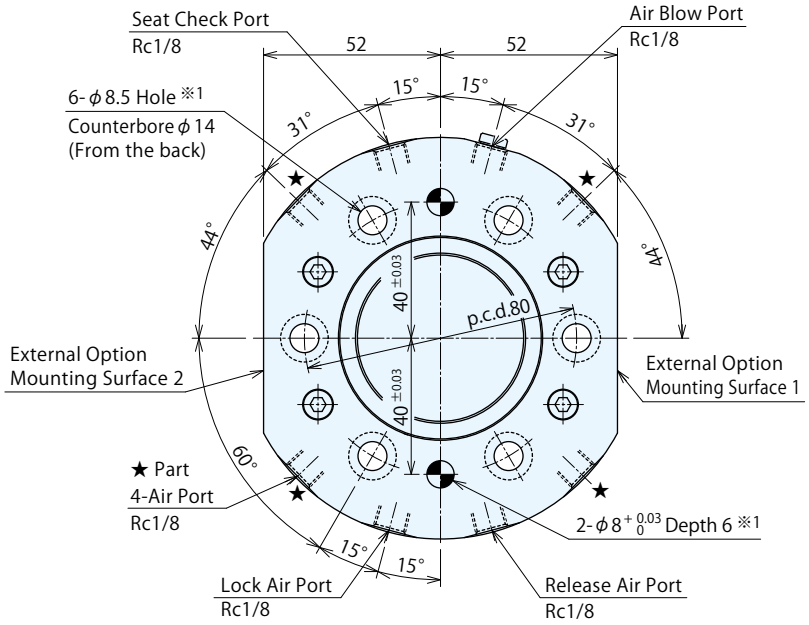
1. This graph shows the relationship between supply air pressure (MPa) and holding force (kN).

External Dimensions (SWL0800)

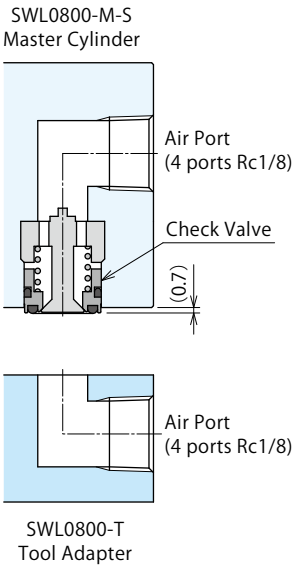
※ This drawing shows the released state of SWL0800.

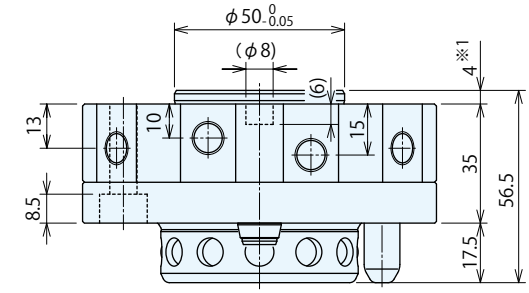
Master Cylinder (Standard / With Check Valve)
SWL0800-M / SWL0800-M-S

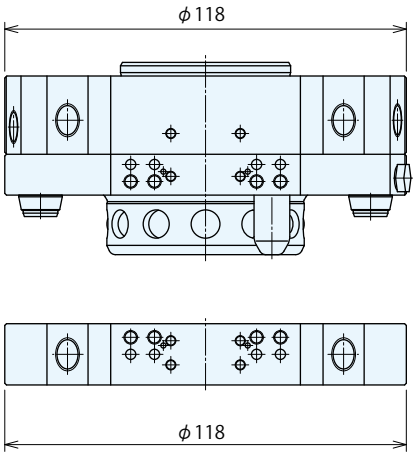
※ The difference between standard and check valve option is the joint structure only.

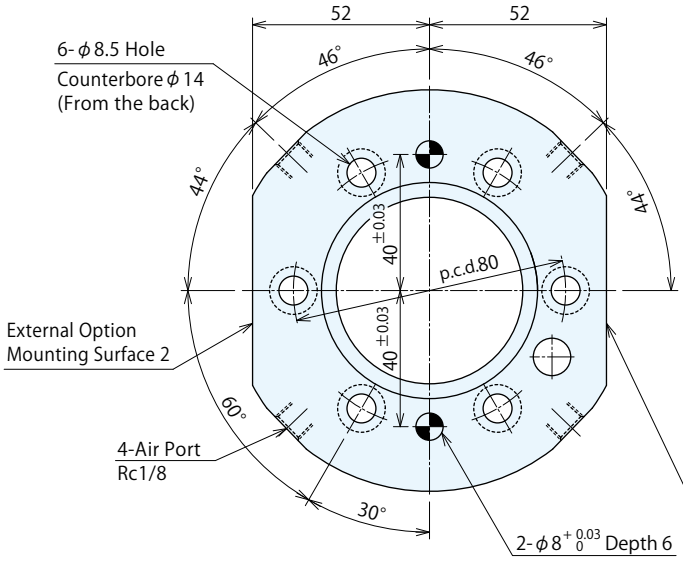


SWL0800-M-**S** (With Check Valve)
Joint Structure

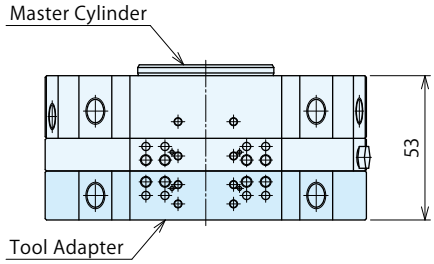








Connected State



Tool Adapter **SWL0800-T**

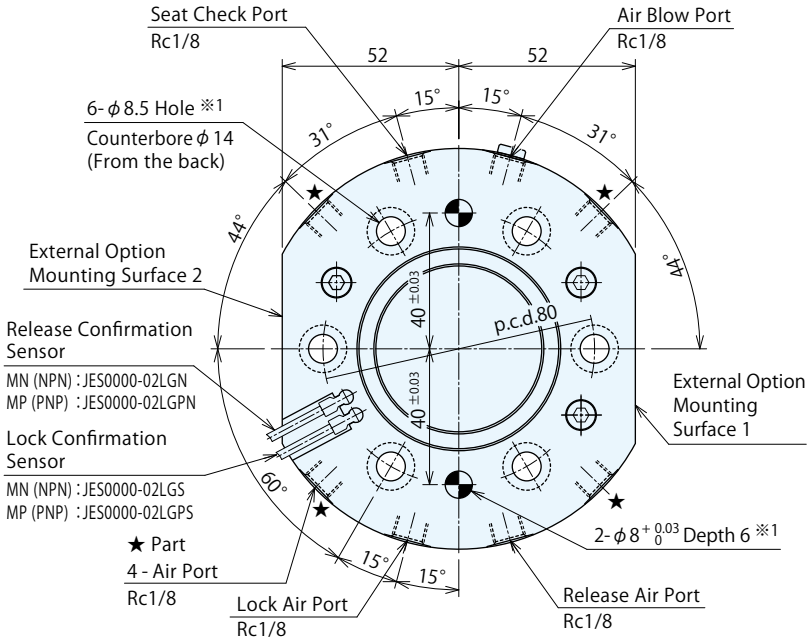
Note :
※1. There are various hole depths and thread depths for a robot. Make sure to check the external dimensions to avoid interference before use.

External Dimensions (SWL0800-MN/MP)

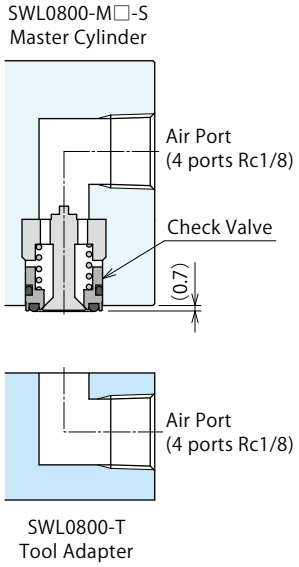
※ This drawing shows the released state of SWL0800-MN/MP.

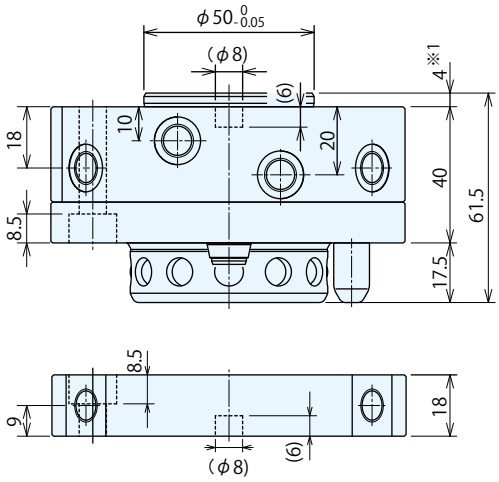
Master Cylinder (Action Confirmation Sensor)
SWL0800-MN / SWL0800-MP
SWL0800-MN-S / SWL0800-MP-S

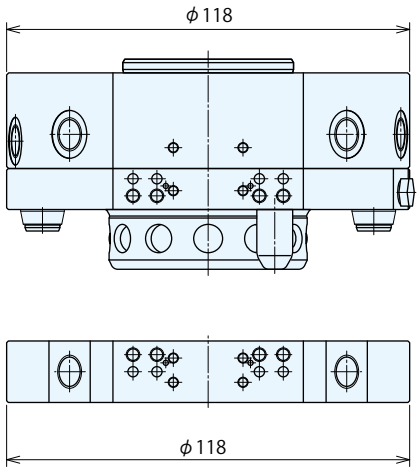
※ The difference between standard and check valve option is the joint structure only.

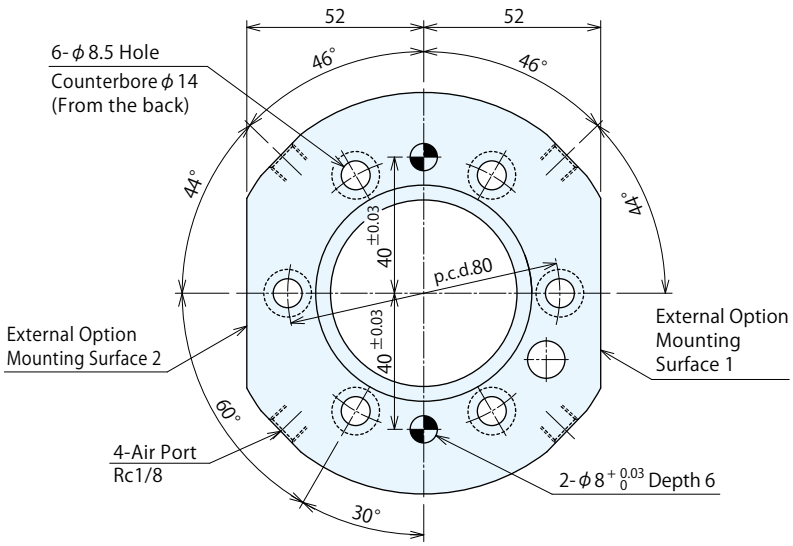


SWL0800-M□-S (With Check Valve)
Joint Structure

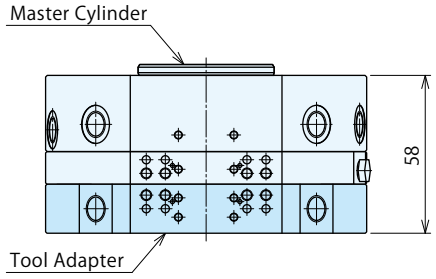








Connected State



Tool Adapter **SWL0800-T**

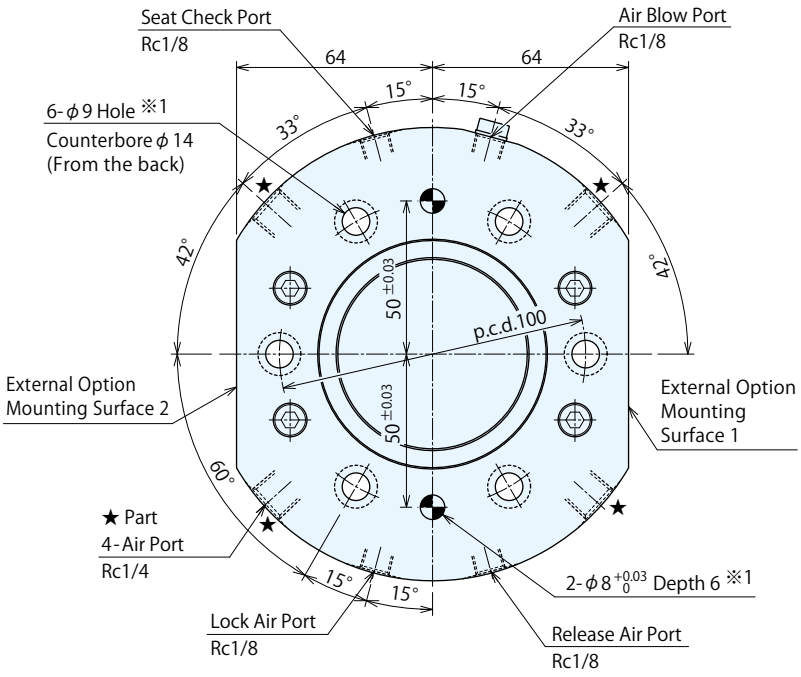
Note :
※1. There are various hole depths and thread depths for a robot. Make sure to check the external dimensions to avoid interference before use.

External Dimensions (SWL1200)

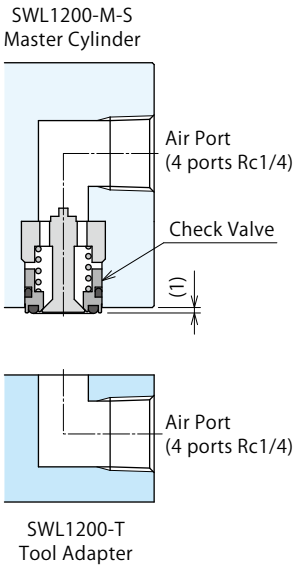
※ This drawing shows the released state of SWL1200.

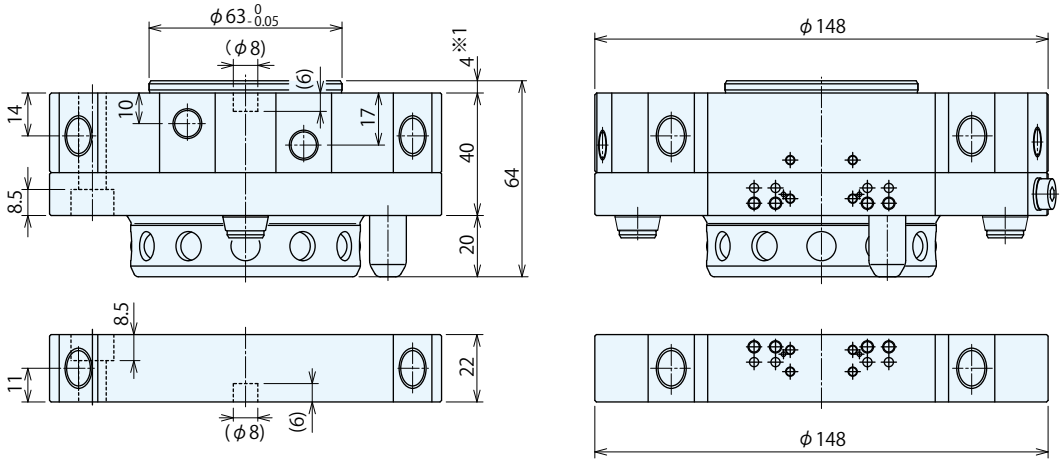
Master Cylinder (Standard / With Check Valve)
SWL1200-M / SWL1200-M-S

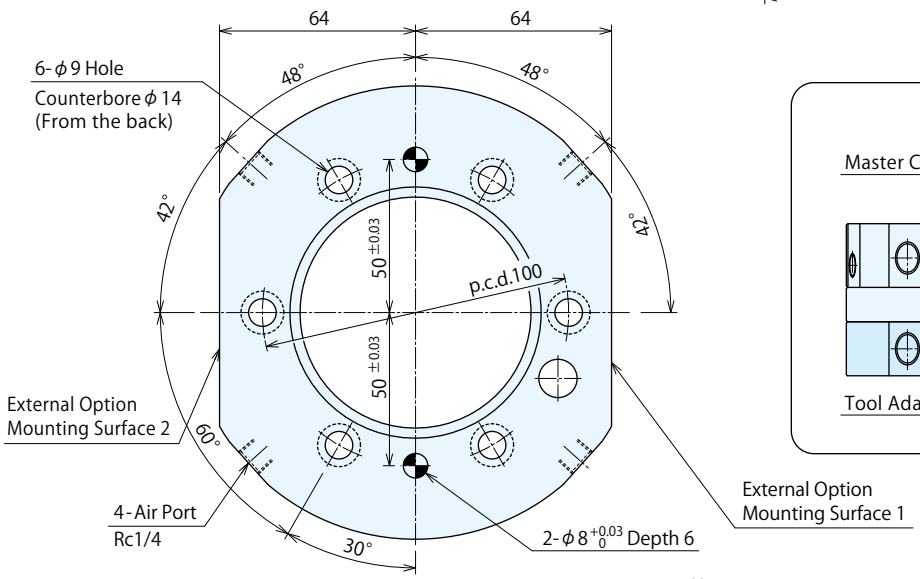
※ The difference between standard and check valve option is the joint structure only.



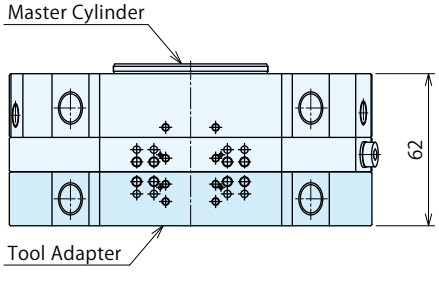
SWL1200-M-**S** (With Check Valve)
Joint Structure







Connected State



Tool Adapter **SWL1200-T**

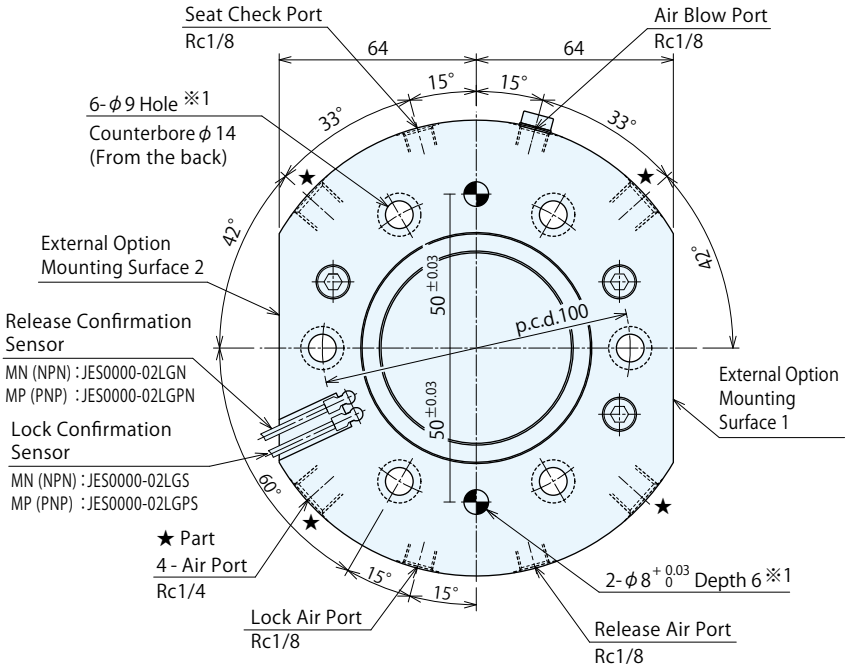
Note :
※1. There are various hole depths and thread depths for a robot. Make sure to check the external dimensions to avoid interference before use.

External Dimensions (SWL1200-MN/MP)

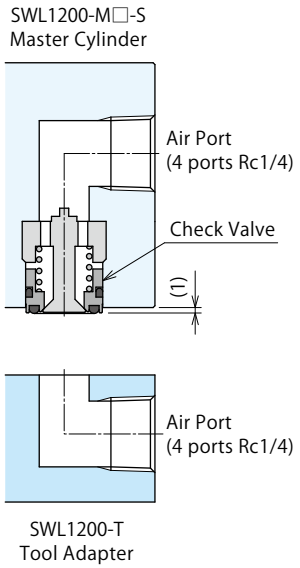
※ This drawing shows the released state of SWL1200-MN/MP.

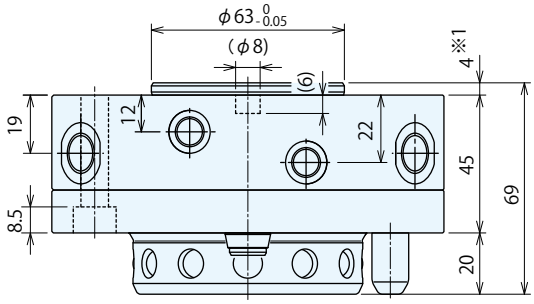
Master Cylinder (Action Confirmation Sensor)
SWL1200-MN / SWL1200-MP
SWL1200-MN-S / SWL1200-MP-S

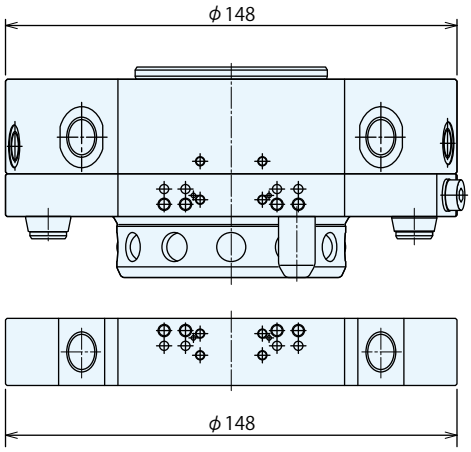
※ The difference between standard and check valve option is the joint structure only.

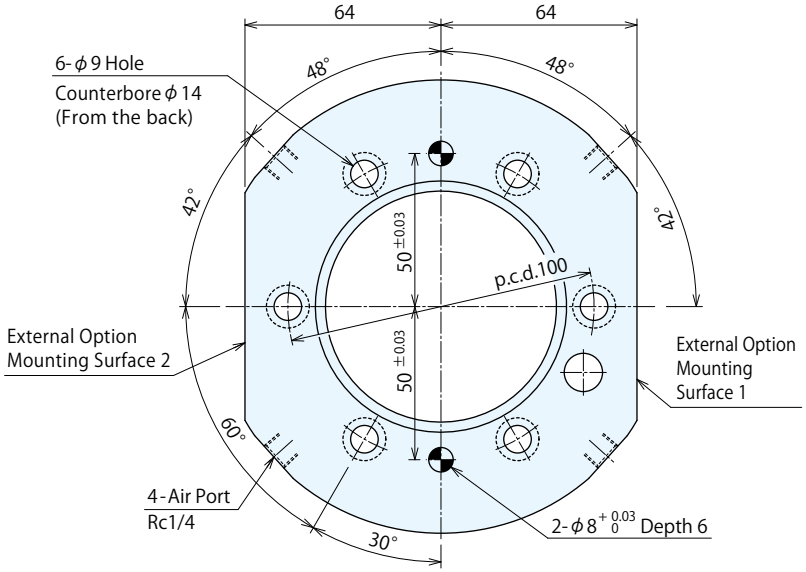


SWL1200-M□-S (With Check Valve) Joint Structure

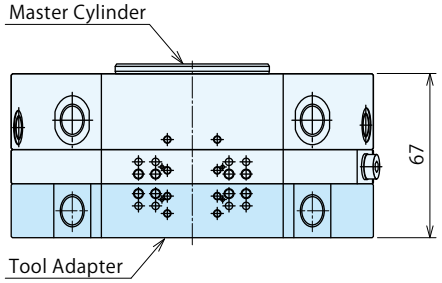








Connected State



Tool Adapter **SWL1200-T**

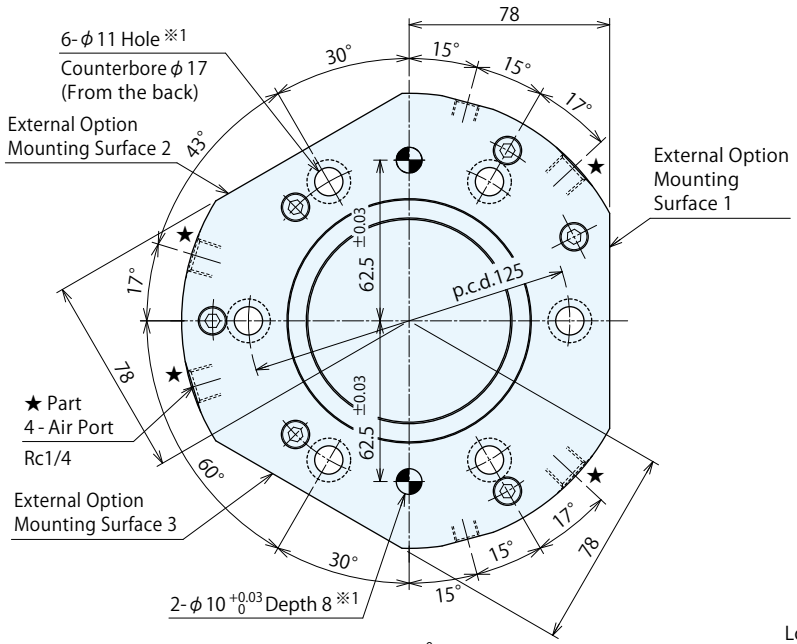
Note :
※1. There are various hole depths and thread depths for a robot. Make sure to check the external dimensions to avoid interference before use.

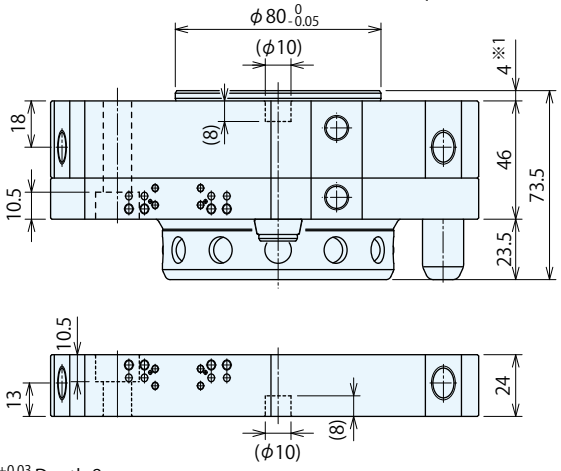
External Dimensions (SWL1800)

※ This drawing shows the released state of SWL1800.

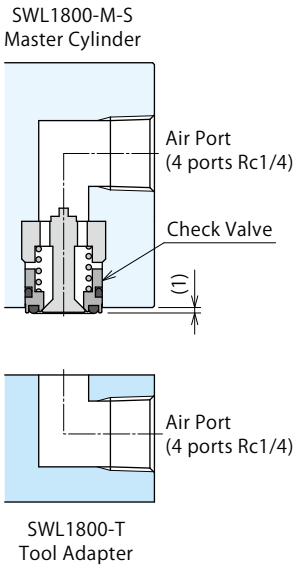
Master Cylinder (Standard / With Check Valve)
SWL1800-M / SWL1800-M-S

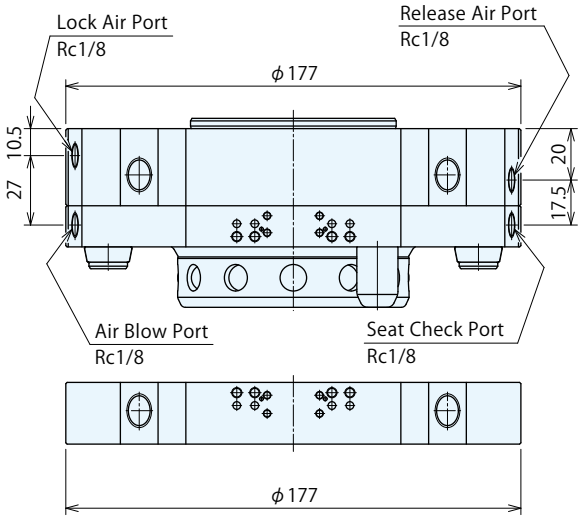
※ The difference between standard and check valve option is the joint structure only.

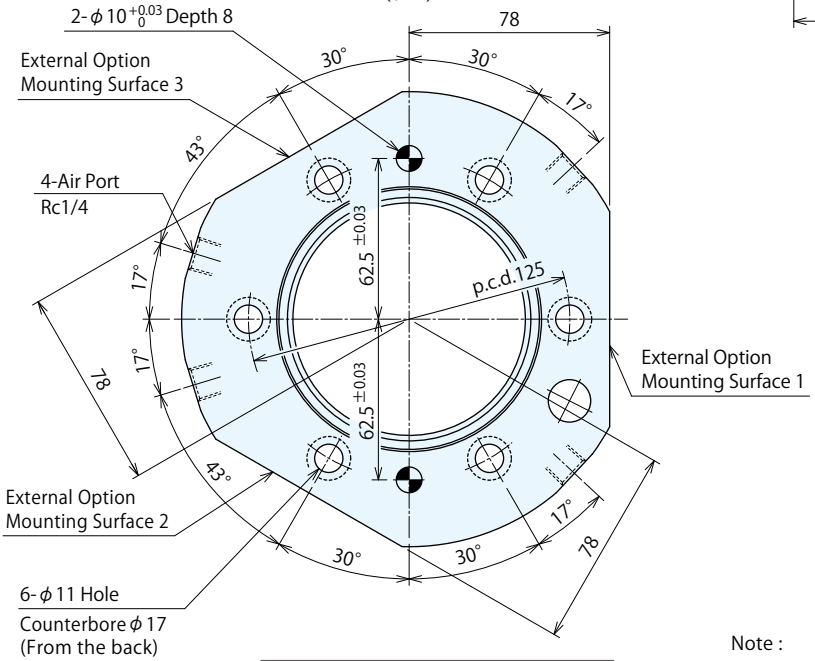




SWL1800-M-**S** (With Check Valve)
Joint Structure

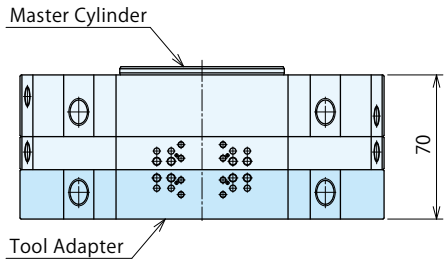






Tool Adapter **SWL1800-T**

Connected State



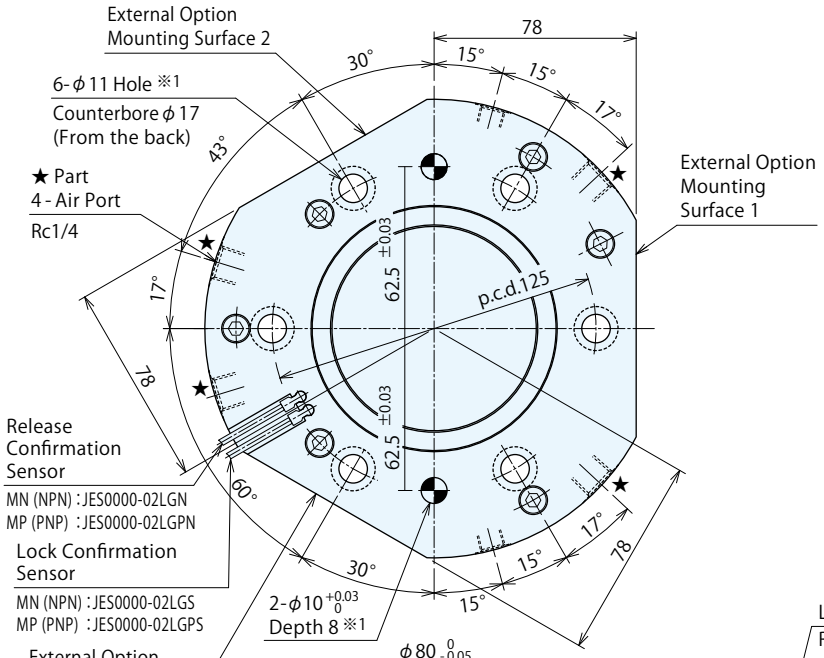
Note :
※1.There are various hole depths and thread depths for a robot. Make sure to check the external dimensions to avoid interference before use.

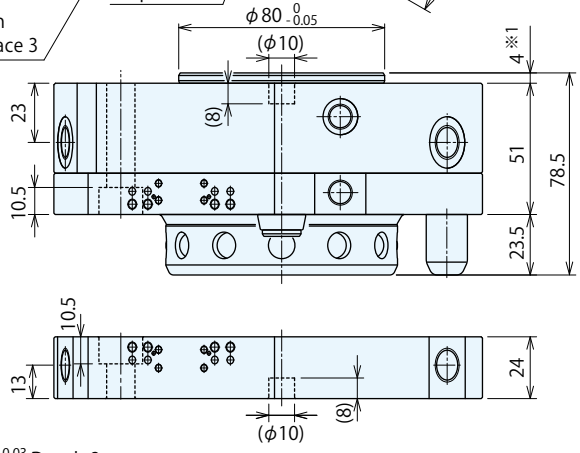
External Dimensions (SWL1800-MN/MP)

※ This drawing shows the released state of SWL1800-MN/MP.

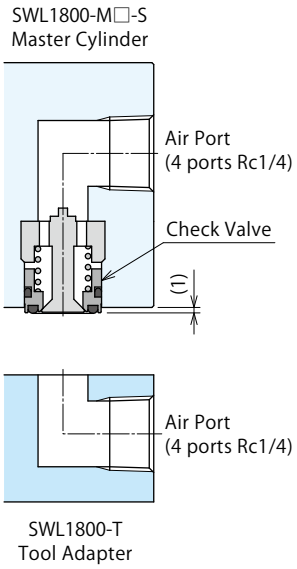
Master Cylinder (Action Confirmation Sensor)
SWL1800-MN / SWL1800-MP
SWL1800-MN-S / SWL1800-MP-S

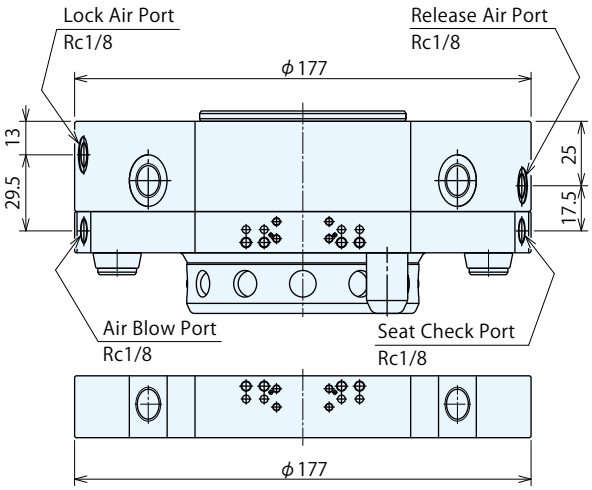
※ The difference between standard and check valve option is the joint structure only.

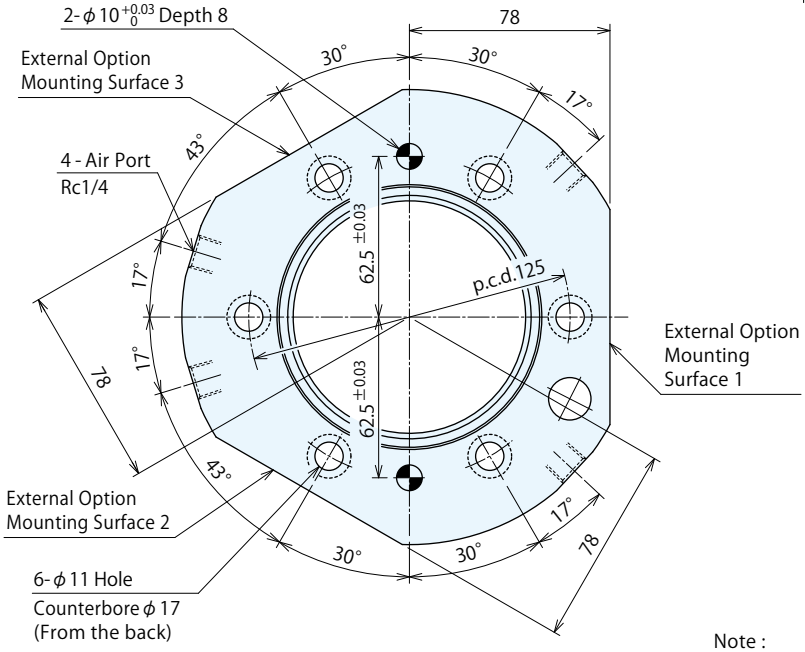




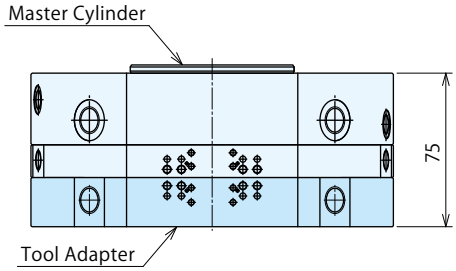
SWL1800-M□-S (With Check Valve) Joint Structure







Connected State



Tool Adapter **SWL1800-T**

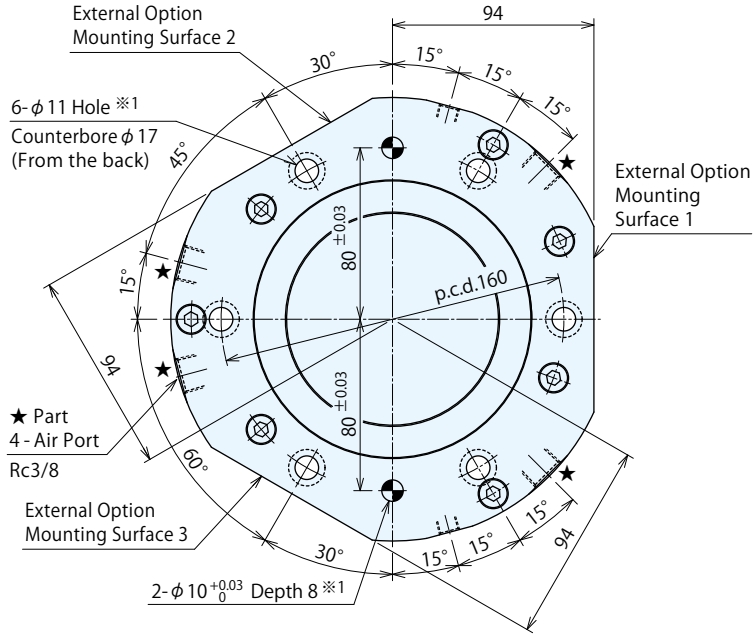
Note :
※1. There are various hole depths and thread depths for a robot. Make sure to check the external dimensions to avoid interference before use.

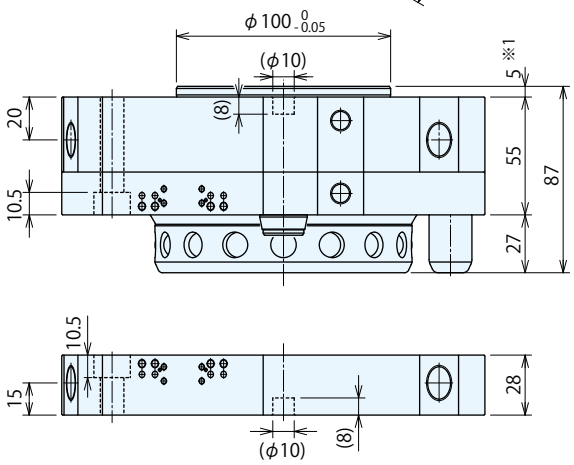
External Dimensions (SWL3000)

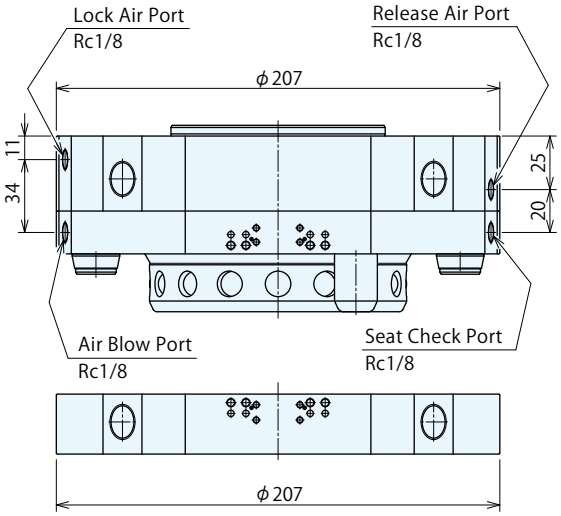
※ This drawing shows the released state of SWL3000.

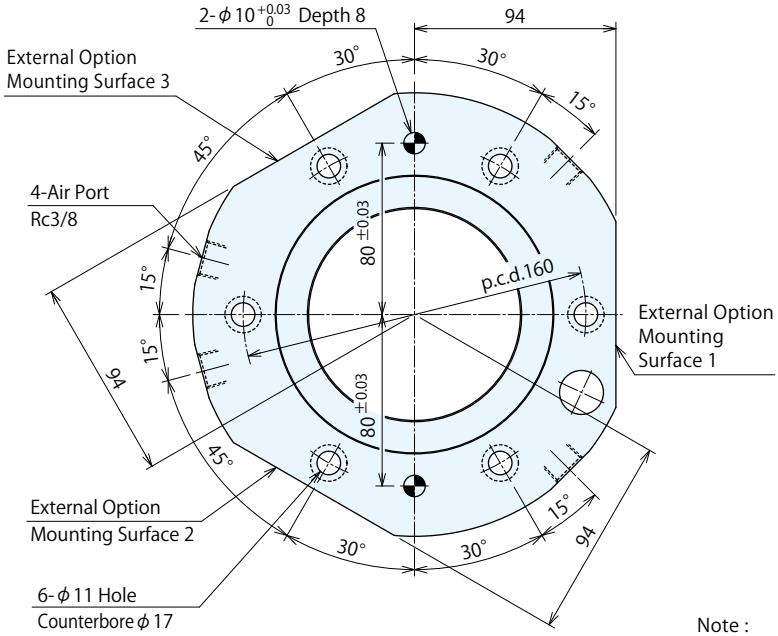
Master Cylinder (Standard / With Check Valve)
SWL3000-M / SWL3000-M-S

※ The difference between standard and check valve option is the joint structure only.



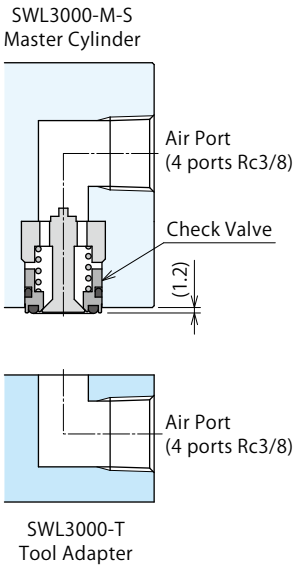




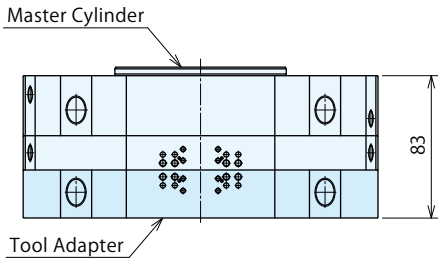


Tool Adapter **SWL3000-T**

SWL3000-M-**S** (With Check Valve) Joint Structure



Connected State



Note :

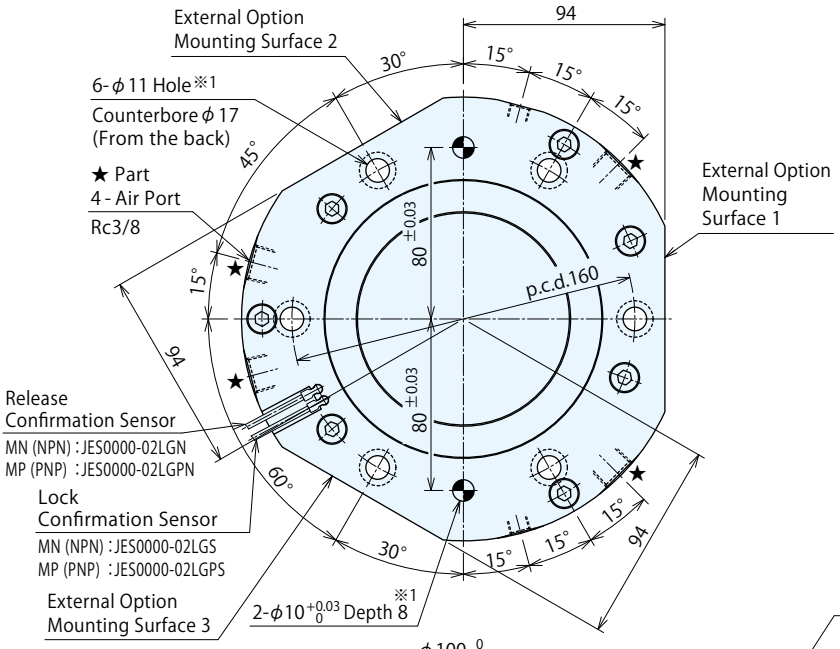
※1. There are various hole depths and thread depths for a robot. Make sure to check the external dimensions to avoid interference before use.

External Dimensions (SWL3000-MN/MP)

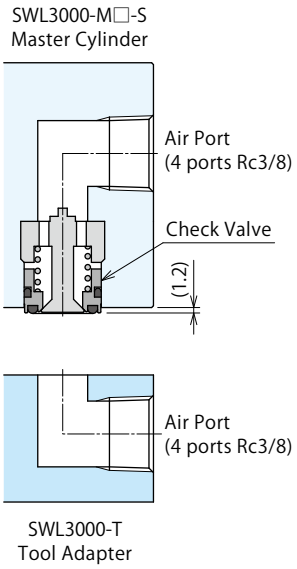
※ This drawing shows the released state of SWL3000-MN/MP.

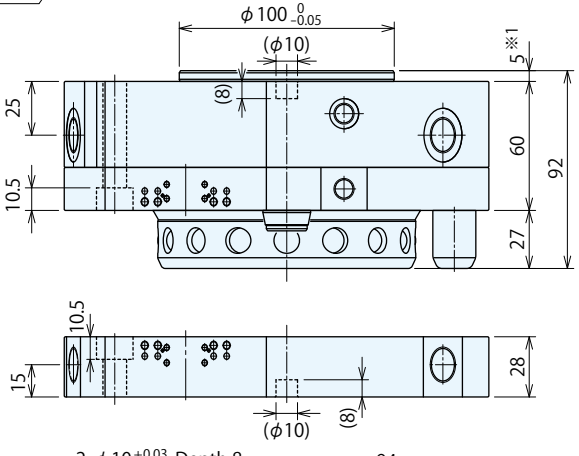
Master Cylinder (Action Confirmation Sensor)
SWL3000-MN / SWL3000-MP
SWL3000-MN-S / SWL3000-MP-S

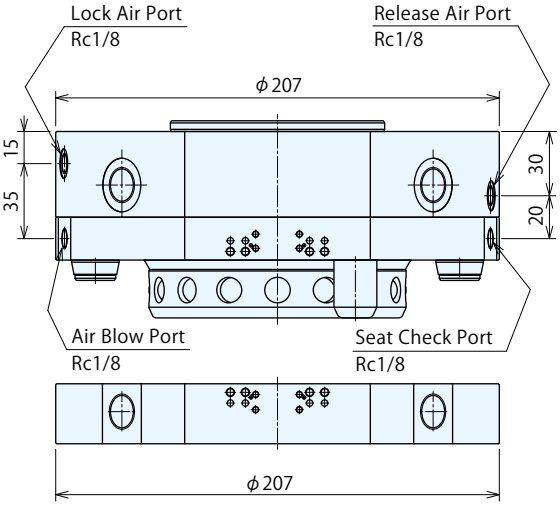
※ The difference between standard and check valve option is the joint structure only.

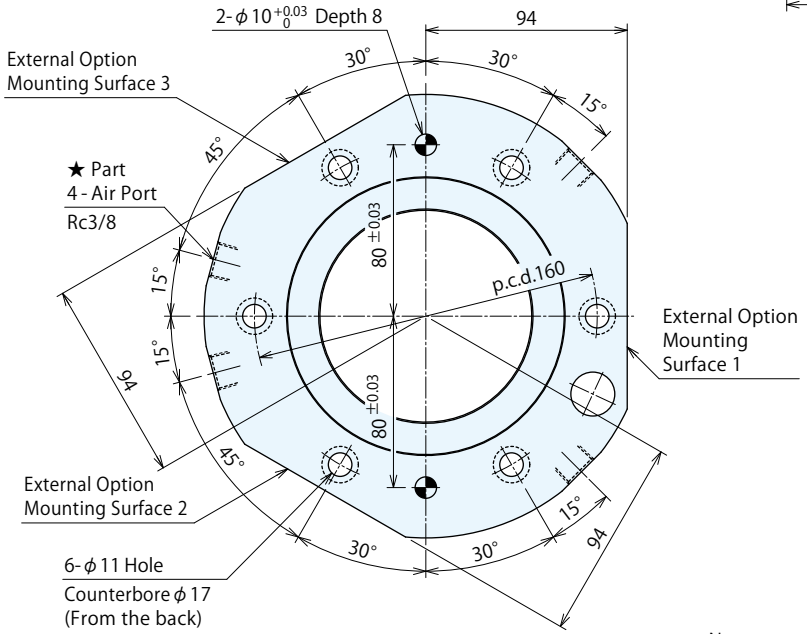


SWL3000-M□-**S** (With Check Valve)
Joint Structure

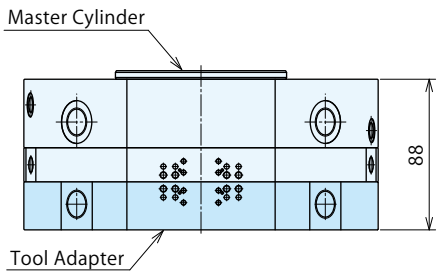








Connected State



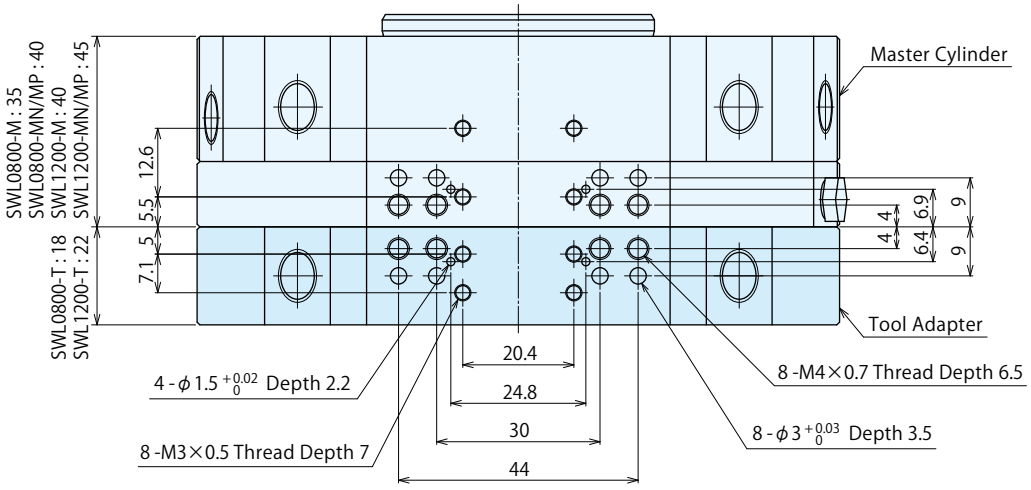
Tool Adapter **SWL3000-T**

Note :
※1. There are various hole depths and thread depths for a robot. Make sure to check the external dimensions to avoid interference before use.

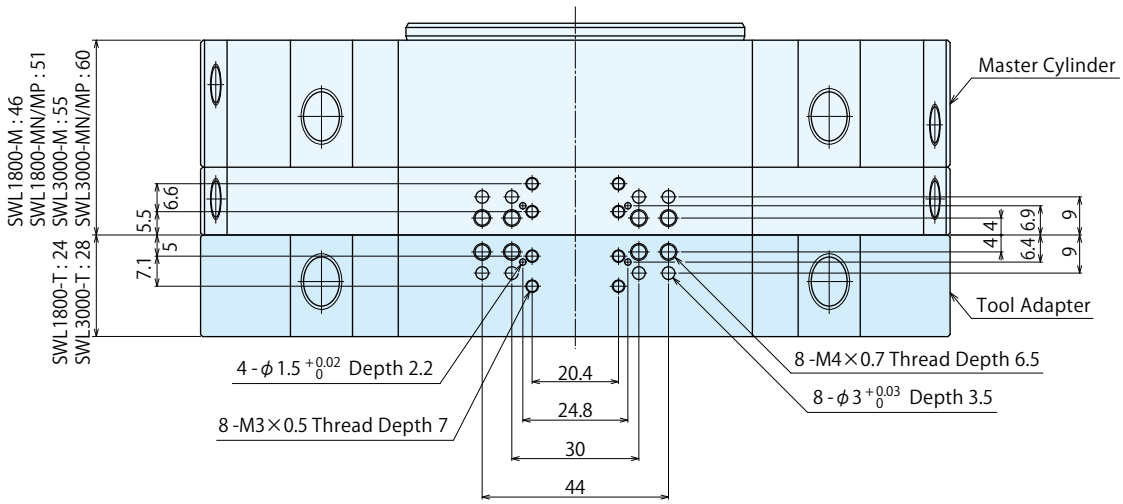
External Option Mounting Dimensions

Electrodes and fixtures provided by other than Kosmek, can be mounted with option mounting bolts.
This drawing shows the connected state of the master side and tool side.

SWL0800 / SWL1200



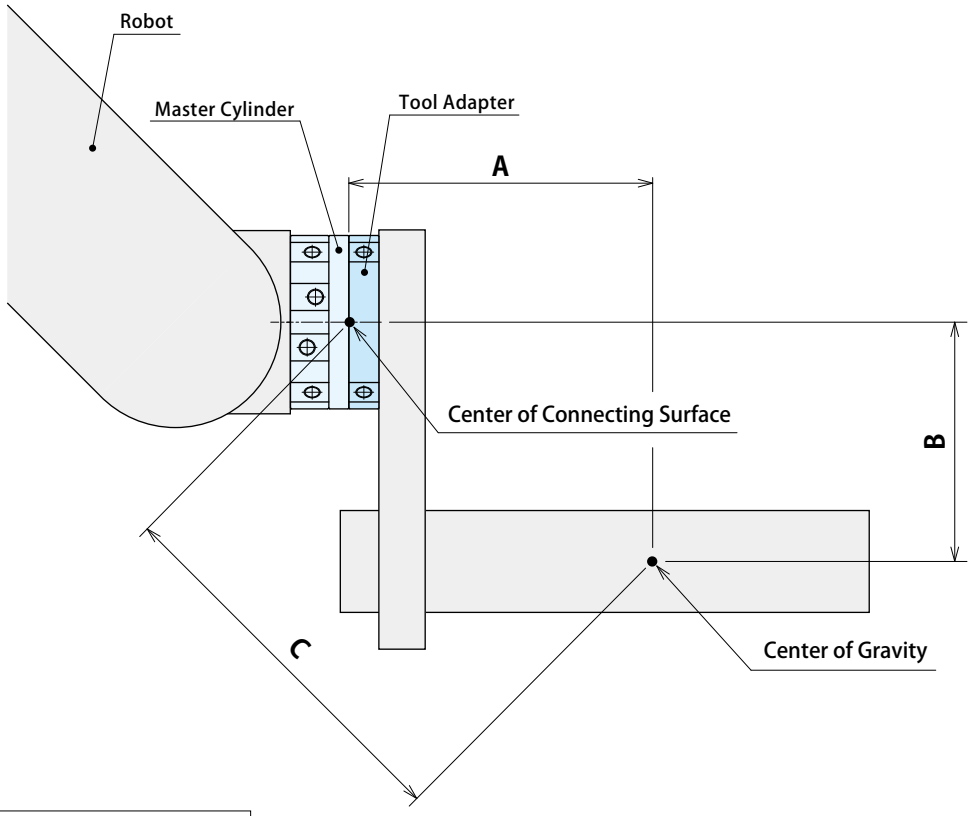
SWL1800 / SWL3000



MEMO

Selection Conditions

- The model should be determined so as not to exceed the allowable twisting and bending moment while the robot is operating at the maximum acceleration.
  Also, please select the size sufficient for the moment.
  ※Acceleration varies depending on the robot. Please refer to each manufacturer's specifications.



Calculation Formula

- Twisting Moment : Tool Weight (kg) × Dimension C (m) × Max. Acceleration (m/s^2)
- Bending Moment : Tool Weight (kg) × Dimension B (m) × Max. Acceleration (m/s^2)

Selection Example

Reference in case of the following conditions ;

Weight of Tool Side=100kg , Dimension A=0.4m , Dimension B=0.3m , C=$\sqrt{0.4^2+0.3^2}$ = 0.5 ,

Max. Acceleration＝2G(2×9.8m/s^2)

Bending Moment ＝100×$\sqrt{0.4^2+0.3^2}$ ×(2×9.8)= **980(N・m)**

Twisting Moment ＝100×0.3×(2×9.8)= **588(N・m)**

→ Reffering to allowable static moment, select **SWL1800**.

Allowable Static Moment

Model No.		SWL0800	SWL1200	SWL1800	SWL3000
Bending (at 0.5MPa)	N・m	450	800	1500	2900
Twisting	N・m	500	850	1400	2200

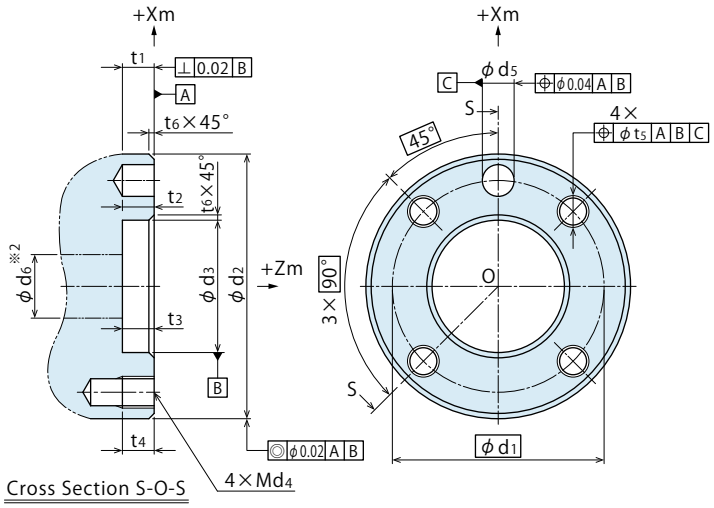
Note :

1. Please select an appropriate model with sufficient allowance within the range of specification before use.

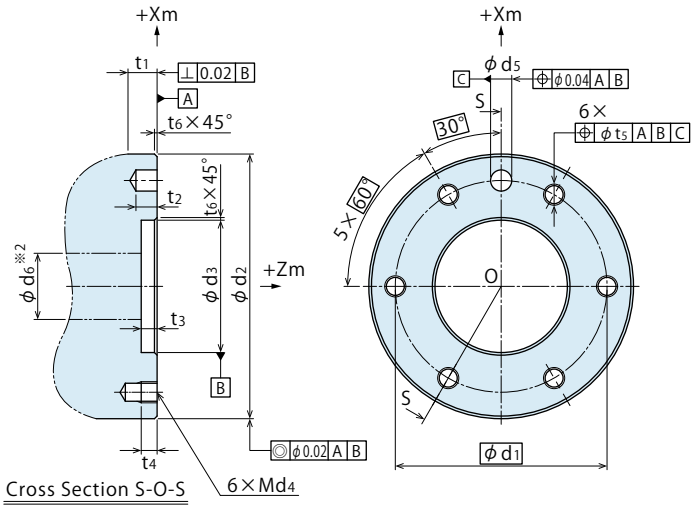
Reference：Standard Dimensions of ISO Mounting Pattern

Extracted from JIS B 8436：2005 (ISO9409-1：2004)

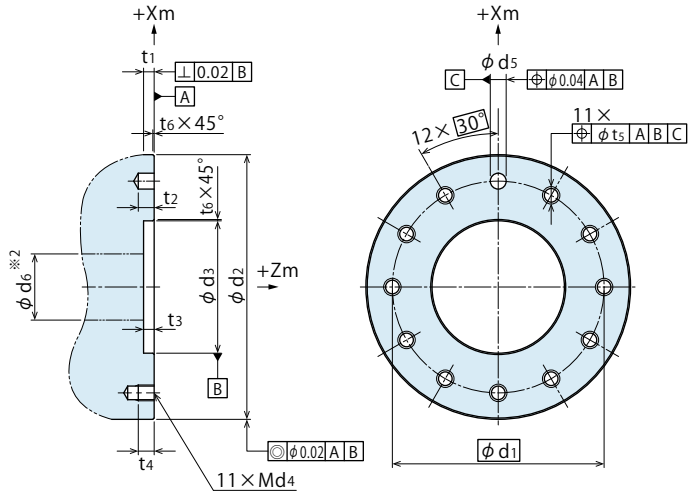
Number：1 ~ 5



Number：6 ~ 9, 11



Number：10



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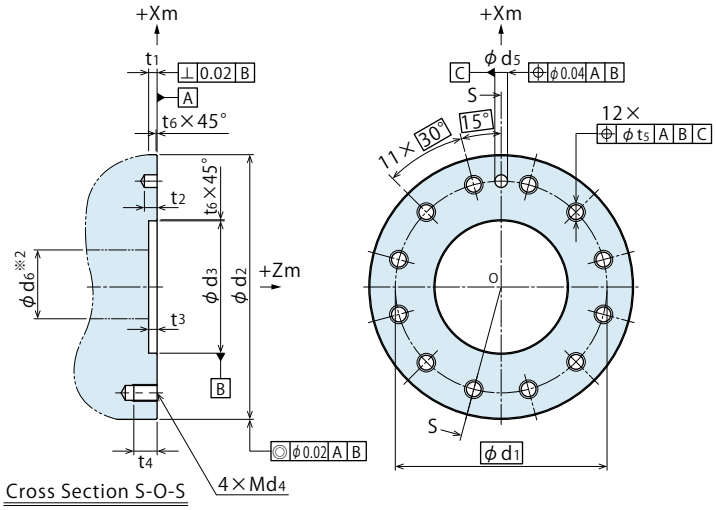


Dimensions of Flange Mounting Pattern

Unit：mm

Number	Pitch Circle Diam.※1 d_1 Series 1	d_2 h8	d_3 H7	d_4	d_5 H7	t_1 Min.	t_2 Min.	t_3 Min.	t_4	t_5	t_6 Min.	Number of Tapped Holes N
1	25	34	16	M4	4	6	4	4	※1	0.2	0.5	4
2	31.5	40	20	M5	5	6	5	4	※1	0.2	0.5	4
3	40	50	25	M6	6	6	6	6	※1	0.2	1	4
4	50	63	31.5	M6	6	6	6	6	※1	0.2	1	4
5	63	80	40	M6	6	6	6	6	※1	0.2	1	4
6	80	100	50	M8	8	6	8	6	※1	0.4	1	6
7	100	125	63	M8	8	6	8	6	※1	0.4	1	6
8	125	160	80	M10	10	8	10	8	※1	0.4	1	6
9	160	200	100	M10	10	8	10	8	※1	0.4	1	6
10	160	200	100	M12	12	8	12	8	※1	0.4	1	11
11	200	250	125	M12	12	8	12	8	※1	0.4	1	6
12	200	250	125	M16	12	8	12	8	22	0.4	1	11

Notes：

※1. Please determine the minimum depth of a tapped hole (t_4) considering the material of the end effecter mounting part.

※2. Preparation for wiring and piping of dimension (d_6)：A through hole can be machined at the center of the flange. Diameter of the center hole (d_6) should be less than d_3.

1. Please refer to JIS B 8436：2005 (ISO 9409-1：2004) for further information.
2. There are various hole depths and thread depths for a robot. Make sure to check the external dimensions to avoid interference before use.

Cautions

Notes for Design

1) Check Specifications

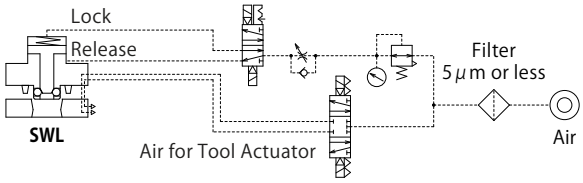
- Please use each product according to the specifications.
- Operating Air Pressure is Max. 0.7 MPa and Min. 0.3MPa.

2) Air Pressure Circuit Reference

- During normal use, make sure to supply air pressure to the lock circuit. Even if the air pressure becomes zero due to power failure, the self-lock function with a spring prevents the tool from falling.

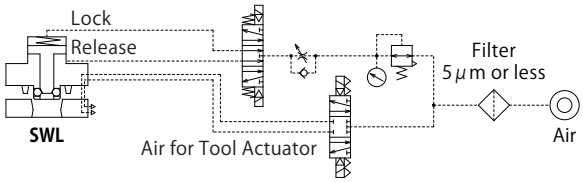
【When using a 2-Position Solenoid Valve】

Please use a 2-position double solenoid valve. In case of using a 2-position single solenoid valve, for safety, connect the piping so that air is supplied to the lock side when the power is turned off. If air is supplied to the release side, it is dangerous as it may cause the tool (hand) to drop. Also, in the case of 2-position single, please note that if the power is turned off in the release state, it will lock.



【When Using a 3-Position Solenoid Valve】

Please use the valve with a 3-position exhaust center. When the power is turned off due to emergency stop, please be aware that the robotic hand changer will perform locking operation even in the released state due to the fall prevention function.



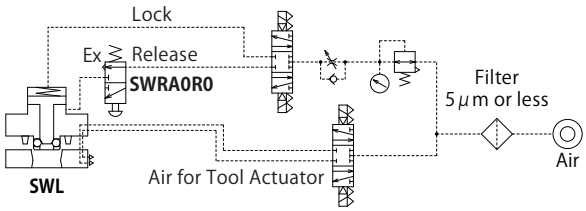
【When Selecting Other Valves】

When using a 3-position closed-center solenoid valve for controlling the robotic hand changer, which is the same as the tool actuator, please use the fall prevention valve (**SWRA0R0**).

※ **SWRA0R0** Fall Prevention Valve

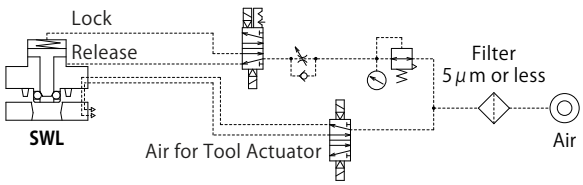
It supplies air to the release side only at a designated position.

Refer to the **SWRA** catalog for detailed specifications and cautions.



【Solenoid Valve for Tool Actuator】

When using a 2-position solenoid valve for the control valve of the tool actuator, select the joint option **S** (with check valve) for the robotic hand changer.



3) Combination of Master Cylinder and Tool Adapter

- Please refer to the below table for combination of Master Cylinder and Tool Adapter.

Master Cylinder	Tool Adapter
SWL0800-M□	**SWL0800-T**
SWL1200-M□	**SWL1200-T**
SWL1800-M□	**SWL1800-T**
SWL3000-M□	**SWL3000-T**

4) Allowable static moment

- The allowable static moment should be within the range of the bending moment and the twisting moment. (Please refer to P.25 for further information.)

5) Note for Single Use of SWL Robotic Hand Changer

- Applying withstanding pressure without mounting on a robot or a plate leads to damage on the product. Make sure to supply air after setting SWL on a robot or a plate.

6) Hand Changing (Attaching/Detaching) in a Horizontal Position

- When connecting/disconnecting the Robotic Hand Changer in a horizontal position, make sure not to apply excessive moment on master cylinder. Please select an appropriate size of model considering robot payload with allowance fully taken into consideration. When connecting, make sure the tool side has no lifting or tilting that is larger than the allowable position offset range. Also, do not fix it completely on the tool stand, and make a margin (clearance) within the allowable position offset range. Otherwise, this will affect repeatability.

7) Refer to model **JES** on the catalog for further information.

Installation Notes

1) Please supply filtered clean dry air.
- Make sure to supply filtered clean dry air.
- Oil supply with a lubricator etc. is unnecessary.

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
- When using sealing tape, wrap with it 1 to 2 times following the screwing direction.
  When piping, be careful that contaminant such as sealing tape does not enter in products. Pieces of the sealing tape can cause air leaks and malfunction.

4) Installation/Removal of Master Cylinder/Tool Adapter
- Please follow the tightening torque below.
  When mounting, tighten with bolts evenly not to incline the master cylinder and tool adapter.

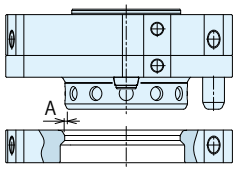
Model No.		Bolt Size	No. of Bolts	Tightening Torque (N・m)
Master Cylinder	**SWL0800-M□**	M8×1.25	6	25
	SWL1200-M□	M8×1.25	6	25
	SWL1800-M□	M10×1.5	6	50
	SWL3000-M□	M10×1.5	6	50
Tool Adapter	**SWL0800-T**	M8×1.25	6	25
	SWL1200-T	M8×1.25	6	25
	SWL1800-T	M10×1.5	6	50
	SWL3000-T	M10×1.5	6	50

5) Test Run Method
- If supplying a large amount of air just after installation, action time will be extremely fast leading to severe damage on robotic hand changer. Set the speed controller (Meter-in) and gradually supply air pressure.

6) Allowable Offset while Teaching
- Allowable offset of the master cylinder and tool adapter while teaching should be within the range shown below.
  Tool adapter and tool placing stand should have space within the range of allowable offset.

① Allowable Position Offset in Horizontal Direction

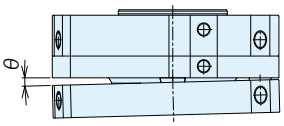
Model No.	Allowable Offset Amm
SWL0800	±1.8 mm
SWL1200	±2.0 mm
SWL1800	±2.2 mm
SWL3000	±2.4 mm



① Horizontal Position Offset

② Allowable Position Offset in Tilt Direction

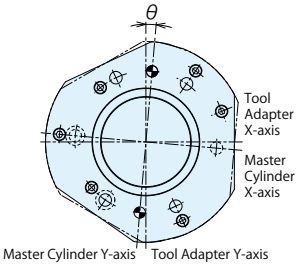
Model No.	Allowable Offset θ
SWL0800	θ=1.2 deg
SWL1200	θ=1.0 deg
SWL1800	θ=0.8 deg
SWL3000	θ=0.6 deg



② Tilt Position Offset

③ Allowable Position Offset in Rotation Direction

Model No.	Allowable Offset θ
SWL0800	θ=±3 deg
SWL1200	θ=±2.5 deg
SWL1800	θ=±2 deg
SWL3000	θ=±1.5 deg



③ Rotation Position Offset

7) Most Suitable Gap between Master Cylinder and Tool Adapter When Connecting
- The gap between master cylinder and tool adapter when connecting should be within the range of 0 ~ 1mm.
  It may not be able to connect with the gap more than 1mm.

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 safety protocols are ensured.

① The machine and equipment can only be inspected or prepared when it is confirmed that the safety devices are in place.

② Before the product is removed, make sure that the above-mentioned safety devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.

③ After stopping the product, do not remove until the temperature drops.

④ Make sure there is no trouble/issue in the bolts and respective parts before restarting the machine or equipment.

3) Do not touch a master cylinder or a tool adapter while it is working. Otherwise, your hands may be injured.

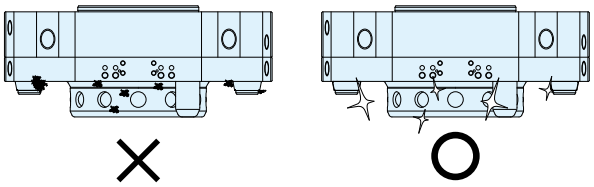
4) When the robot is in operation, make sure the safety of environment in case of a tool or workpiece detachment.

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・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) Cleaning of Master Cylinder・Tool Adapter
- If using the product when the seat check surface of master cylinder/tool adapter are contaminated with dirt, it may lead to locating accuracy failure, malfunction or air leakage.



3) Regularly examine and retighten piping, mounting bolts and wires to ensure proper use.

4) Make sure to supply filtered clean dry air.

5) Make sure there is smooth action and no air leaks.
- Especially when it is restarted after left unused for a long period, make sure it can be operated properly.
  If there is air leak while connecting, please contact us for overhaul and repair.

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

7) Please contact us for overhaul and repair.

Warranty

1) Warranty Period

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

2) Warranty Scope

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

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

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

Accessories Sold Separately

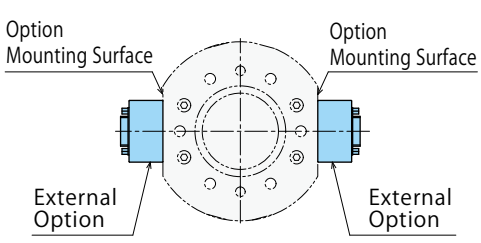
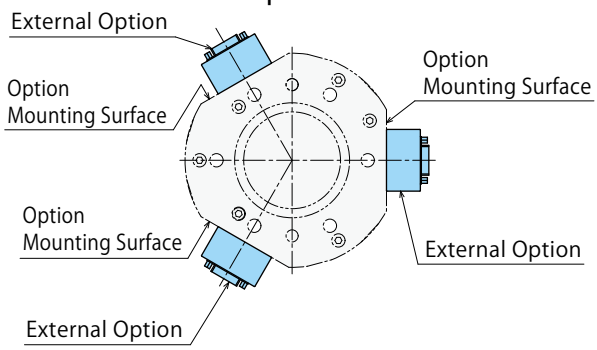
External Options for SWL
Electrical Connection / Air Ports

A wide variety of electrodes can connect various signals such as control signals and power signals.
Additional air joints are also available for extra air ports.

80kg Payload Installation Image

180kg Payload Installation Image

Electrical connectors are sold separately. Please mount on applicable mounting surfaces shown below.

Model No.	**SWL0800** **SWL1200**	**SWL1800** **SWL3000**
Option Mounting Surface	Option Mounting Surface : 2 parts 	Option Mounting Surface : 3 parts 

This mark means :
Able to mount two options together.

DC24V

Recommended

Resin Connector

Solder Terminal

Solder Terminal
with Cable

Simple Waterproof Electrode
Only when connected : IP54

D-sub Connector

Circular Connector

AC / DC200V

Compact Electric Power Transmission Option
5A 4 Poles
(Total Current Capacity 12A)

Power Transmission Option
5A 8 Poles
(Total Current Capacity 24A)

High Current Transmission Option
13A 10 Poles
(Total Current Capacity 57A)

AC / DC240V + DC24V Servo Electrode

Servo Electrode
20A 6 Poles for Power Supply + 17 Poles for Signal

Ground Electrode for Welding

Ground Electrode
Rated Capacity 500A (Activity Ratio 50%)

Noncontact Waterproof Electrode (IP67)

Noncontact Waterproof Electrode Compact Model
Number of Signals : 4

Noncontact Waterproof Electrode
Number of Signals : 12

Ethernet Electrode

Ethernet Electrode
Transmission Speed : 100Mbps
Connector : M12 D-code 4 Poles

Air Joint (For Extra Air Ports)

3 Ports
Equal to ϕ6 x 1 Port
Equal to ϕ2 x 2 Ports

4 Ports
Equal to ϕ2 x 4 Ports

2 Ports
Equal to ϕ4 x 2 Ports

Model No. Indication

SWLZ0 J 0 - M

2 M：for Master Cylinder / T：for Tool Adapter and Cable Length

1 External Option Symbol

• Electrode

Rated Voltage	Rated Current	External Options (Detail Page)	Number of Poles		Model No. Master Cylinder	Model No. Tool Adapter
DC24V	※1 2A/1A	Resin Connector P.35 	16 Poles		SWLZ0J0-M	SWLZ0J0-T
	3A ※1	Solder Terminal P.37 	15 Poles		SWLZ0B0-M	SWLZ0B0-T
		Solder Terminal with Cable P.39 	15 Poles	Cable 1m	SWLZ0C0-M01	SWLZ0C0-T01
				Cable 2m	SWLZ0C0-M02	SWLZ0C0-T02
				Cable 5m	SWLZ0C0-M05	-
		Simple Waterproof Electrode Only when connected：IP54 P.41 	16 Poles	Cable 1m	SWLZ0U0-M01	SWLZ0U0-T01
				Cable 2m	SWLZ0U0-M02	SWLZ0U0-T02
				Cable 5m	SWLZ0U0-M05	-
		D-sub Connector P.43 	15 Poles		SWLZ0D0-M	SWLZ0D0-T
		Circular Connector (Connector Based on JIS C 5432) P.44 	15 Poles		SWLZ0G0-M	SWLZ0G0-T
AC200V DC200V	5A ※1	Compact Electric Power Transmission Option P.45 	4 Poles		SWLZ0K0-M	SWLZ0K0-T
		Power Transmission Option (Connector Based on MIL-DTL-5015) P.47 	8 Poles		SWLZ0E0-M	SWLZ0E0-T
	13A ※1	High Current Transmission Option (Connector Based on MIL-DTL-5015) P.48 	10 Poles		SWLZ0H0-M	SWLZ0H0-T
for Power AC/DC240V for Signal DC24V	for Power 20A for Signal 3A	Servo Electrode P.49 	6 Poles for Power Supply 17 Poles for Signal + 1 Pole for Functional Ground	Cable 1m	SWLZ0F0-M01	SWLZ0F0-T01
				Cable 2m	SWLZ0F0-M02	SWLZ0F0-T02
				Cable 5m	SWLZ0F0-M05	SWLZ0F0-T05
Noncontact Waterproof Electrode IP67 Compact Model P.51 			Number of Signals : 4	NPN	SWLZ0W0-M	SWLZ0W0-T For both NPN and PNP
				PNP	SWLZ0WX0-M	
Noncontact Waterproof Electrode IP67 P.53 			Number of Signals : 12	NPN Cable 2m	SWLZ0V0-M	SWLZ0V0-T Cable 1m For both NPN and PNP
				NPN Cable 5m	SWLZ0V0-M05	
				PNP Cable 2m	SWLZ0VX0-M	
				PNP Cable 5m	SWLZ0VX0-M05	
Ground Electrode Rated Capacity 500A (Activity Ratio 50%) P.55 			1 Pole		SWLZ0T0-M	SWLZ0T0-T
Ethernet Electrode P.57 			–		SWLZ0L0-M	SWLZ0L0-T

Note :

※1. For the electrode options, check the total current capacity and contact resistance shown in the specifications of each option.

• Air Joint

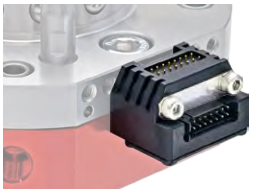
No. of Ports (Min. Passage Area)	External Options (Detail Page)	Model No. Master Cylinder	Model No. Tool Adapter
3 Ports (Equal to ϕ6×1 port, Equal to ϕ2×2 ports)	Air Joint (Able to extend electrodes **J**/**B**/**C**) P.59 	**SWLZ0R0-M**	**SWLZ0R0-T**
4 Ports (Equal to ϕ2)	Air Joint (Able to extend electrodes **J**/**B**/**C**) P.61 	**SWLZ0P0-M**	**SWLZ0P0-T**
2 Ports (Equal to ϕ4)	Air Joint P.62 	**SWLZ0Q0-M**	**SWLZ0Q0-T**

External Option：Resin Connector

Able to add an external option. Refer to P.63 for details.

External Option Symbol：**J**

Model No. for Master Cylinder Side
model **SWLZ0J0-M**



Model No. for Tool Adapter Side
model **SWLZ0J0-T**

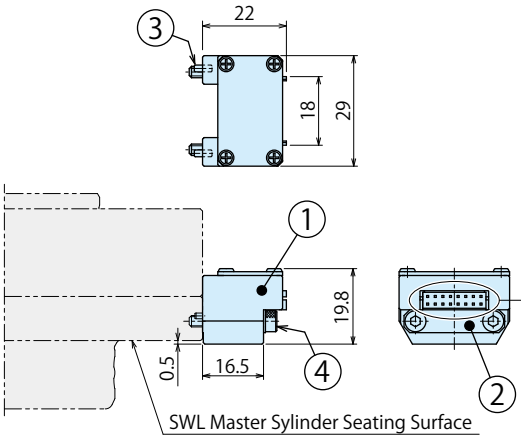
Specifications

Rated Value (per contact)		DC 24V 2A：Pin 1,3,5,7,9,11,13,15 1A：Pin 2,4,6,8,10,12,14,16
Resin Connector		DF11-16DP-2DS(52) (HIROSE ELECTRIC)
Contact Resistance (Initial Value)		30mΩ or less
Total Current Capacity		10A
Number of Poles (per electrode)		16
Connector Pin Coating		Gold Coating
Weight※1	Master Cylinder Side	13g
	Tool Adapter Side	11g
Cable with Applicable Connector (Sold Separately)		SWZ0J0-CL□ (Refer to P.36)

※1. Weight per kit.

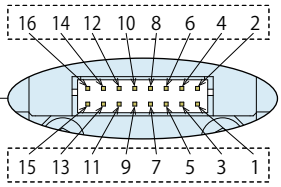
External Dimensions

Master Cylinder Side

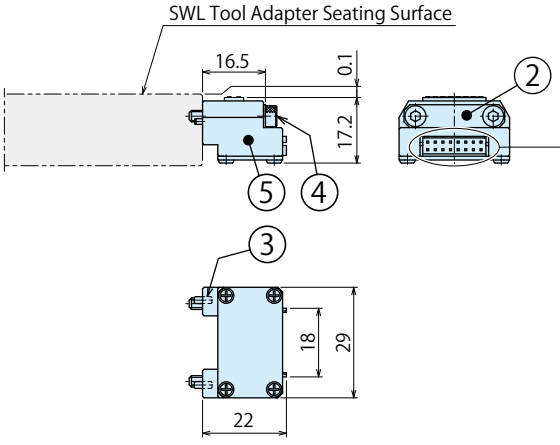


Model No.	No.	Name	Quantity
SWLZ0J0-M	①	Electrode (Master Side)	1
	②	Spacer	1
	③	Parallel Pin ϕ1.5×4 B Type(SUS)	2
	④	Hexagon Socket Bolt M3×0.5×20(SUS)	2

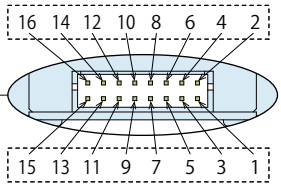
Pin Number



Tool Adapter Side



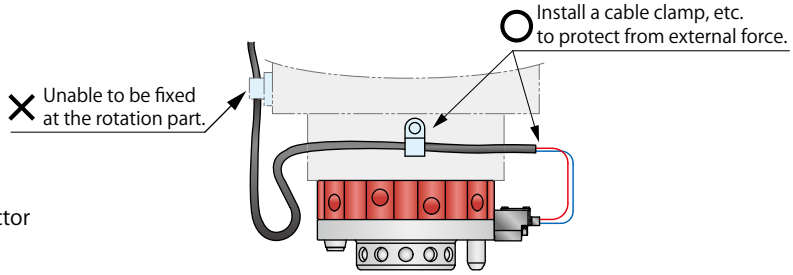
Pin Number



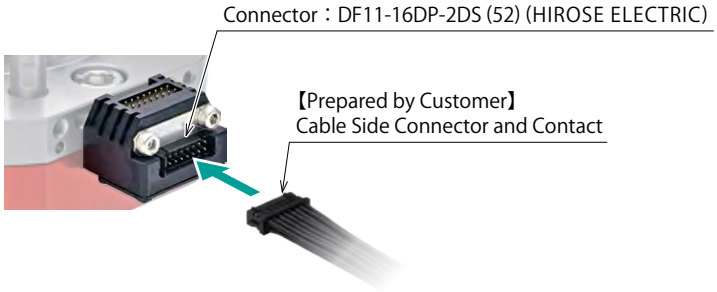
Model No.	No.	Name	Quantity
SWLZ0J0-T	⑤	Electrode (Tool Side)	1
	②	Spacer	1
	③	Parallel Pin ϕ1.5×4 B Type(SUS)	2
	④	Hexagon Socket Bolt M3×0.5×20(SUS)	2

Notes on Wire/Cable Procedure and Wiring

- Make sure to fix the wire and cable so that they are not pulled while a robot is moving or turning around. External force should not be applied on the connector part since it leads to breaking of wire, detaching of connector and contact failure.



Connecting Cable



The cable side (connecter, contact, cable) is not included.
Please prepare the cable with applicable connector (SWZ0J0-CL□), or design them yourself referring to the following list.

Cable Side Connector Model No.	Cable Side Contact Model No.	Recommended Wire Size	Protective Tool: Manual Crimping Tool	Protective Tool: Contact Removal Tool	Maker
DF11-16DS-2C	DF11-22SCA	AWG22	DF11-TA22HC	DF-C-PO(B)	HIROSE ELECTRIC
	DF11-2428SCA	AWG24 ～ 28	DF11-TA2428HC		

Notes： 1. Refer to HIROSE ELECTRIC catalogs for the detailed specifications and the rated current based on wire size.
2. The model number of connector required for the master cylinder and the tool adapter is the same.

External Option：Cable with Connector for Resin Connector

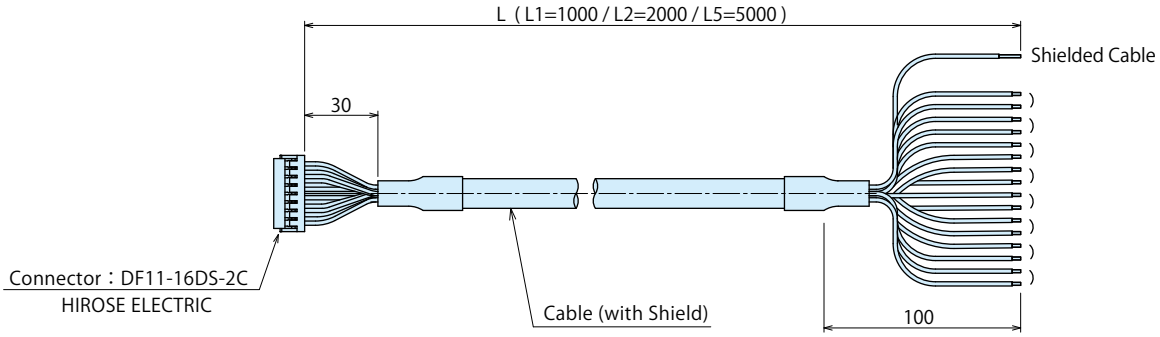
This cable is an optional cable applicable to the Resin Connector Electrode (SWLZ0J0-M/T External Option Symbol：**J**).

Model No. Indication

SWZ0J0-C **L1 L2 L5**

Cable Length
L1：1m
L2：2m
L5：5m

Design No.
(Revision Number)



Pin Numbers and Wire Colors

HIFLON SD-SB/20276 Black AWG24X8P (with Shield)
NISSEI ELECTRIC
Conductor Cross-Sectional Area：0.2mm² (AWG24)
Number of Cores：16
Weight：76g /m (Weight per meter)

Rated Current	2A								1A							
Pin Number	1	3	5	7	9	11	13	15	2	4	6	8	10	12	14	16
Wire Color	Black	White	Red	Green	Yellow	Brown	Blue	Orange	Gray	Violet	Light Blue	Pink	White/ Black	White/ Red	White/ Blue	Yellow/ Black
	Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair	

External Option：Solder Terminal

Able to add an external option.
Refer to P.63 for details.

External Option Symbol：**B**

Model No. for Master Cylinder Side
model **SWLZ0B0-M**

Model No. for Tool Adapter Side
model **SWLZ0B0-T**

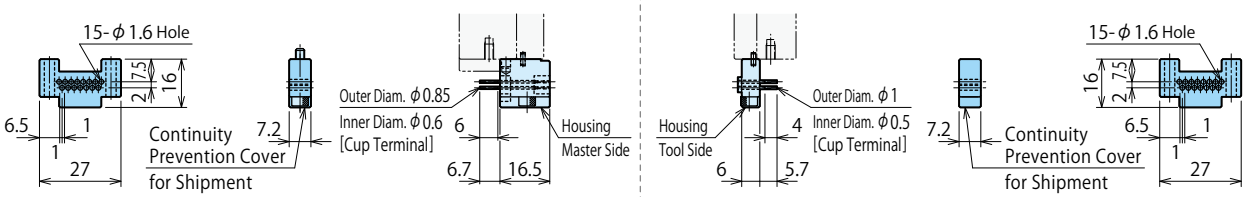
Specifications

Rated Value (per contact)		DC 24V 3A
Contact Resistance (Initial Value)		100mΩor less
Total Current Capacity		10A
Number of Poles (per electrode)		15
Weight ※1	Master Cylinder Side	19g
	Tool Adapter Side	15g

※1. Weight per kit

External Dimensions：Electrode

Master Cylinder Side | Tool Adapter Side

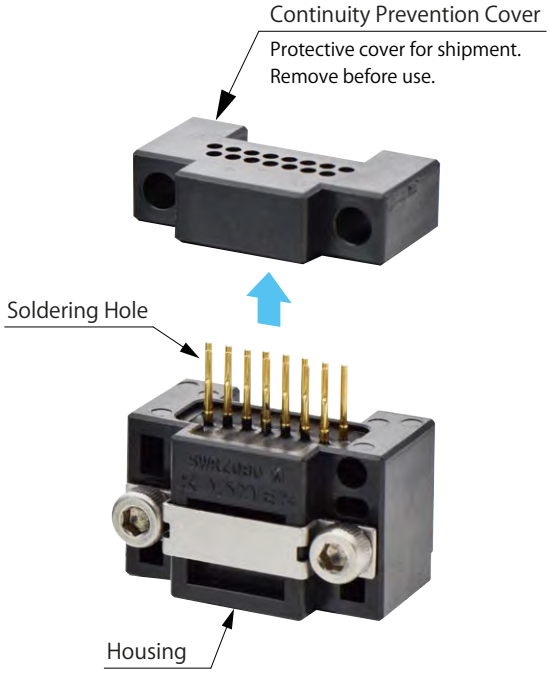


Connection Method for Solder Terminal

For solder terminal option, the electric signal pin, wire and cable of both master cylinder and tool adapter are connected with soldering. If required, insulate them with a thermal contraction tube etc.
（Remove the continuity prevention cover before soldering.）

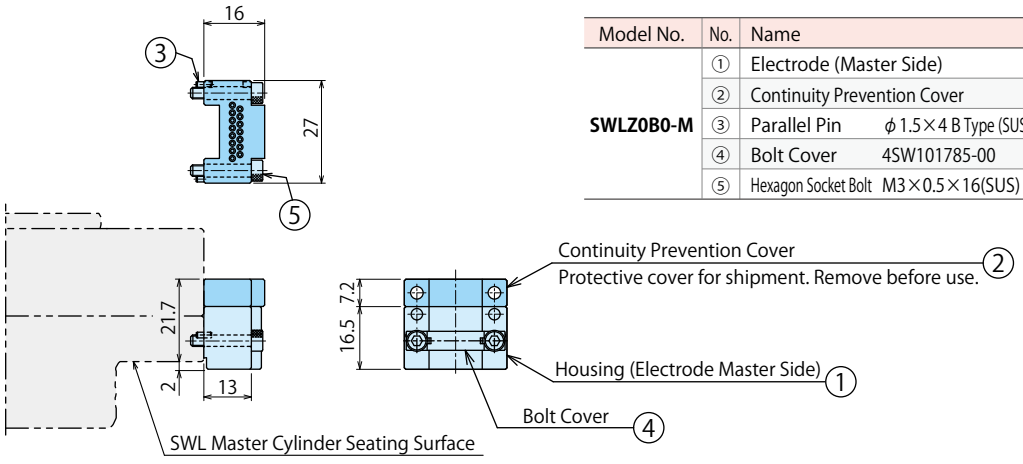
Soldering condition should be：280℃, within 3 seconds.
Make sure the outer diameter is φ1.6mm after soldering.

【Recommended Wire Diameter】
Use wires with AWG26 size or smaller diameter. If you need electric current more than allowable flowing current of AWG26, use wires within the rated value of electrode. At this time, soldering hole cannot be used.



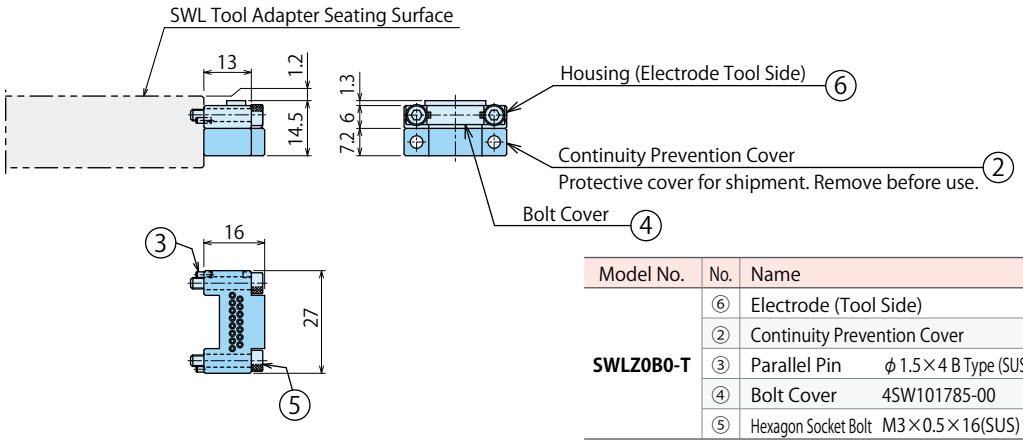
External Dimensions

Master Cylinder Side



Model No.	No.	Name	Quantity
SWLZ0B0-M	①	Electrode (Master Side)	1
	②	Continuity Prevention Cover	1
	③	Parallel Pin ϕ1.5×4 B Type (SUS)	2
	④	Bolt Cover 4SW101785-00	1
	⑤	Hexagon Socket Bolt M3×0.5×16(SUS)	2

Tool Adapter Side



Model No.	No.	Name	Quantity
SWLZ0B0-T	⑥	Electrode (Tool Side)	1
	②	Continuity Prevention Cover	1
	③	Parallel Pin ϕ1.5×4 B Type (SUS)	2
	④	Bolt Cover 4SW101785-00	1
	⑤	Hexagon Socket Bolt M3×0.5×16(SUS)	2

External Option：Solder Terminal with Cable

Able to add an external option. Refer to P.63 for details.

External Option Symbol：**C**

Model No. for Master Cylinder Side
model **SWLZ0C0-** **M01 M02 M05**

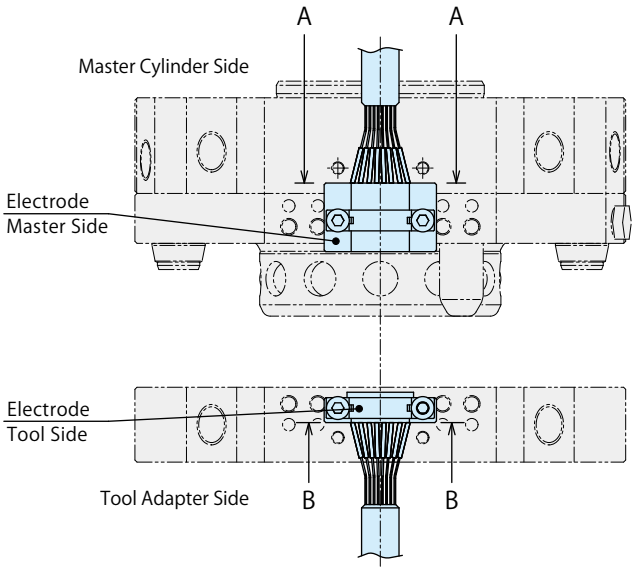
Model No. for Tool Adapter Side
model **SWLZ0C0-** **T01 T02**

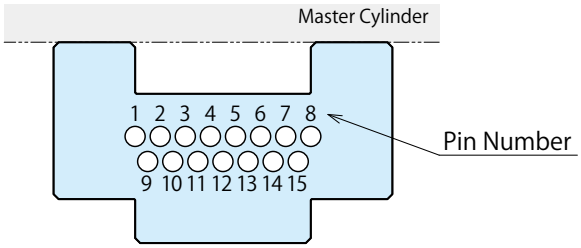
Specifications

Rated Value (per contact)			DC 24V 3A
Contact Resistance (Initial Value)			100mΩ or less
Total Current Capacity			10A
Number of Poles (per electrode)			15
Lead Wire Size			Refer to the table below
Lead Wire Length	−M01/T01		1m
	−M02/T02		2m
	−M05		5m
Weight※1	Master Cylinder Side	-M01	Electrode 20g + Cable 80g
		-M02	Electrode 20g + Cable 160g
		-M05	Electrode 20g + Cable 400g
	Tool Adapter Side	-T01	Electrode 15g + Cable 80g
		-T02	Electrode 15g + Cable 160g

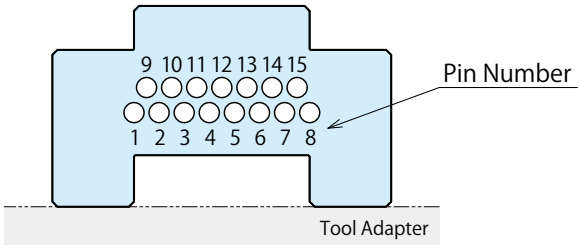
※1. Weight per kit.

Pin Numbers and Wire Colors





View A-A



View B-B

Cable

HIFLON SD-SB/20276 Black AWG24X8P (with Shield)

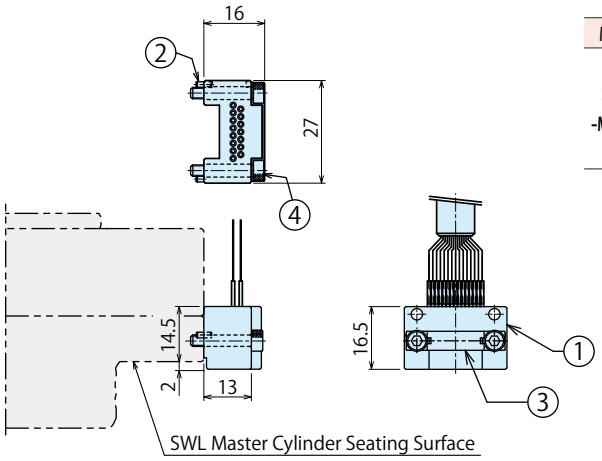
NISSEI ELECTRIC　　Weight：76g /m (Weight per meter)
Conductor Cross-Sectional Area：0.2mm² (AWG24)
Number of Cores：16

Outer Diameter ϕ7.1

Pin Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Not Used
Wire Color	Black	White	Red	Green	Yellow	Brown	Blue	Orange	Gray	Violet	Light Blue	Pink	White/ Black	White/ Red	White/ Blue	Yellow/ Black
	Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair	

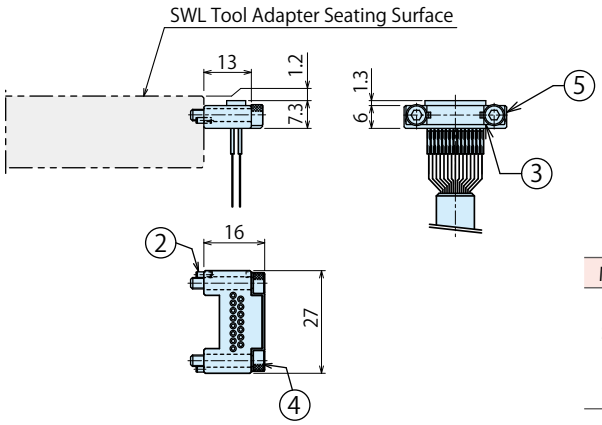
External Dimensions

Master Cylinder Side



Model No.	No.	Name	Quantity
SWLZ0C0 -M01/M02/M05	①	Electrode (Master Side)	1
	②	Parallel Pin ϕ1.5×4 B Type (SUS)	2
	③	Bolt Cover 4SW101785-00	1
	④	Hexagon Socket Bolt M3×0.5×16 (SUS)	2

Tool Adapter Side



Model No.	No.	Name	Quantity
SWLZ0C0 -T01/T02	⑤	Electrode (Tool Side)	1
	②	Parallel Pin ϕ1.5×4 B Type (SUS)	2
	③	Bolt Cover 4SW101785-00	1
	④	Hexagon Socket Bolt M3×0.5×16(SUS)	2

Notes : 1. The connected part of the solder terminal and lead wire is isolated with a thermal contraction tube.
2. For SWLZ0C0-□01/02/05 the lead wire length is different from its shown in the specifications.
(SWLZ0C0-□01 : Lead Wire Length 1m, SWLZ0C0-□02 : Lead Wire Length 2m, SWLZ0C0-M05 : Lead Wire Length 5m)

External Option：Waterproof Electrode (Simple Waterproof Option)

Able to add an external option.
Refer to P.63 for details.

External Option Symbol：**U**

Model No. for Master Cylinder Side

model **SWLZ0U0-** **M01** **M02** **M05**

Model No. for Tool Adapter Side

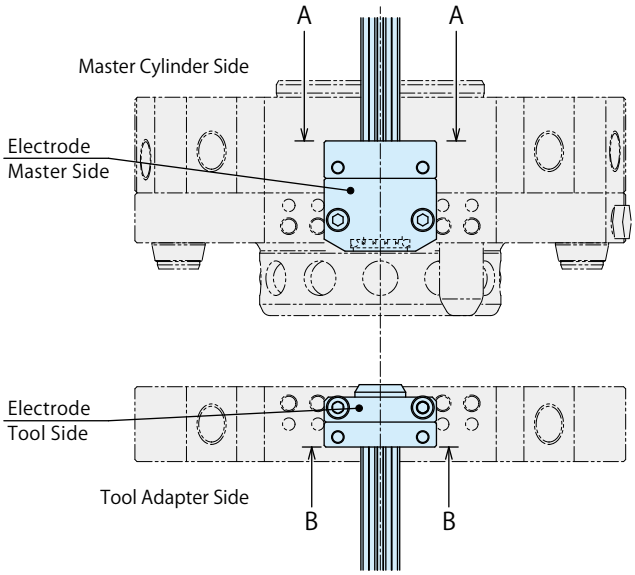
model **SWLZ0U0-** **T01** **T02**

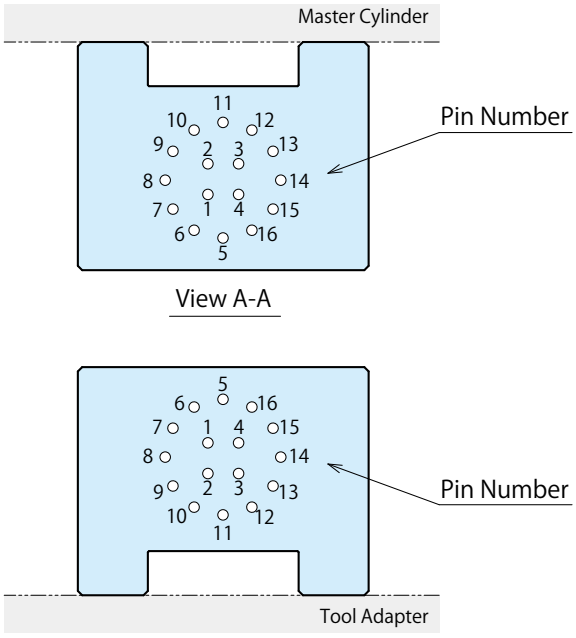
Specifications

Rated Value (per contact)			DC 24V 3A
Contact Resistance (Initial Value)			100mΩ or less
Total Current Capacity			10A
Number of Poles (per electrode)			16
Lead Wire Size			Refer to the table below
Lead Wire Length	−M01/-T01		1m
	−M02/-T02		2m
	−M05		5m
Weight※1	Master Cylinder Side	-M01	Electrode 35g + Cable 80g
		-M02	Electrode 35g + Cable 160g
		-M05	Electrode 35g + Cable 400g
	Tool Adapter Side	-T01	Electrode 35g + Cable 80g
		-T02	Electrode 35g + Cable 160g
Protection Grade※2			Equivalent to IP54

※1. Weight per kit.
※2. The protection grade is equivalent to IP54 at connected state (fit state) of the master cylinder and tool adapter.

Pin Numbers and Wire Colors





Cable

HIFLON SD-SB/20276 Black AWG24X8P (with Shield)

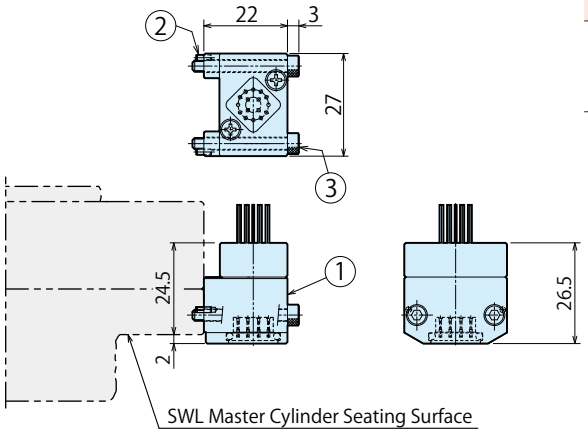
NISSEI ELECTRIC Weight：76g /m (Weight per meter)
Conductor Cross-Sectional Area：0.2mm² (AWG24)
Number of Cores：16

Outer Diameter φ7.1

Pin Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Wire Color	Black	White	Red	Green	Yellow	Brown	Blue	Orange	Gray	Violet	Light Blue	Pink	White/ Black	White/ Red	White/ Blue	Yellow/ Black
	Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair	

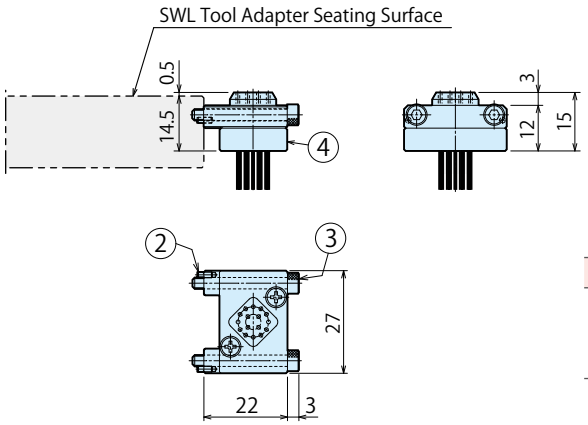
External Dimensions

Master Cylinder Side



Model No.	No.	Name	Quantity
SWLZ0U0 -M01/M02/M05	①	Electrode (Master Side)	1
	②	Parallel Pin φ1.5×4 B Type(SUS)	2
	③	Hexagon Socket Bolt M3×0.5×25(SUS)	2

Tool Adapter Side



Model No.	No.	Name	Quantity
SWLZ0U0 -T01/T02	④	Electrode (Tool Side)	1
	②	Parallel Pin φ1.5×4 B Type(SUS)	2
	③	Hexagon Socket Bolt M3×0.5×25(SUS)	2

Note : 1. For SWLZ0U0-□01/02/05 the lead wire length is different from its shown in the specifications.
(SWLZ0U0-□01 : Lead Wire Length 1m, SWLZ0U0-□02 : Lead Wire Length 2m, SWLZ0U0-M05 : Lead Wire Length 5m)

External Option：D-SUB Connector

External Option Symbol：**D**

Model No. for Master Cylinder Side
model **SWLZ0D0-M**

Model No. for Tool Adapter Side
model **SWLZ0D0-T**

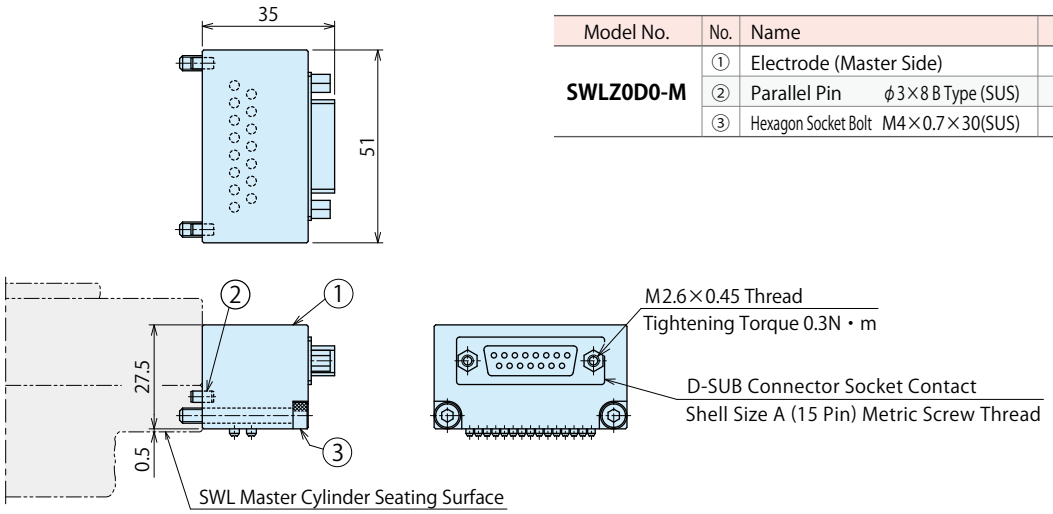
Specifications

Rated Value (per contact)		DC 24V 3A
Contact Resistance (Initial Value)		100mΩ or less
Total Current Capacity		10A
Number of Poles (per electrode)		15
Weight※1	Master Cylinder Side	80g
	Tool Adapter Side	70g

※1. Weight per kit.

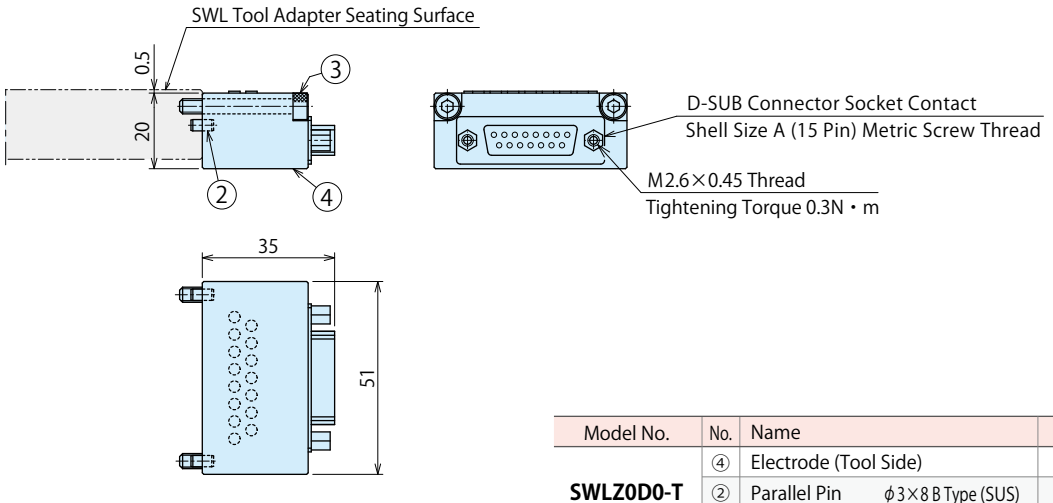
External Dimensions

Master Cylinder Side



Model No.	No.	Name	Quantity
SWLZ0D0-M	①	Electrode (Master Side)	1
	②	Parallel Pin φ3×8 B Type (SUS)	2
	③	Hexagon Socket Bolt M4×0.7×30(SUS)	2

Tool Adapter Side



Model No.	No.	Name	Quantity
SWLZ0D0-T	④	Electrode (Tool Side)	1
	②	Parallel Pin φ3×8 B Type (SUS)	2
	③	Hexagon Socket Bolt M4×0.7×30(SUS)	2

External Option：Circular Connector (Connector Based on JIS C 5432)

External Option Symbol：**G**

Model No. for Master Cylinder Side
model **SWLZ0G0-M**

Model No. for Tool Adapter Side
model **SWLZ0G0-T**

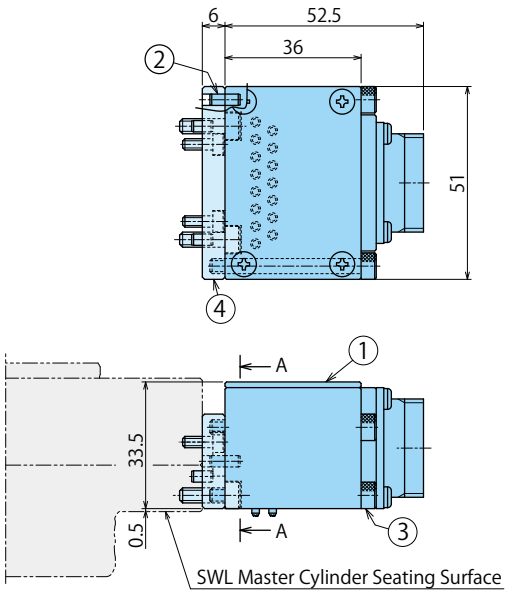
Specifications

Rated Value (per contact)		DC 24V 3A
Contact Resistance (Initial Value)		100mΩ or less
Total Current Capacity		17A
Number of Poles (per electrode)		15
Weight※1	Master Cylinder Side	125g
	Tool Adapter Side	145g

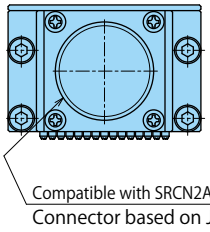
※1. Weight per kit.

External Dimensions

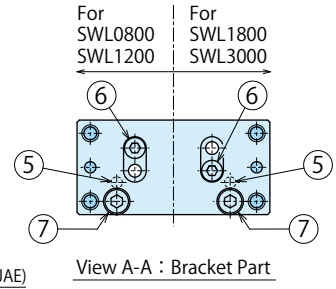
Master Cylinder Side



All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0G0-M	SWRZ0G0-M	①	Electrode (Master Side)	1
		②	Parallel Pin φ3×8 B Type (SUS)	2
		③	Hexagon Socket Bolt M4×0.7×40(SUS)	4
	SWLZ0E0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Parallel Pin φ3×6 B Type (SUS)	2
		⑥	Hexagon Socket Bolt M3×0.5×8(SUS)	2
		⑦	Hexagon Socket Bolt M4×0.7×12(SUS)	2

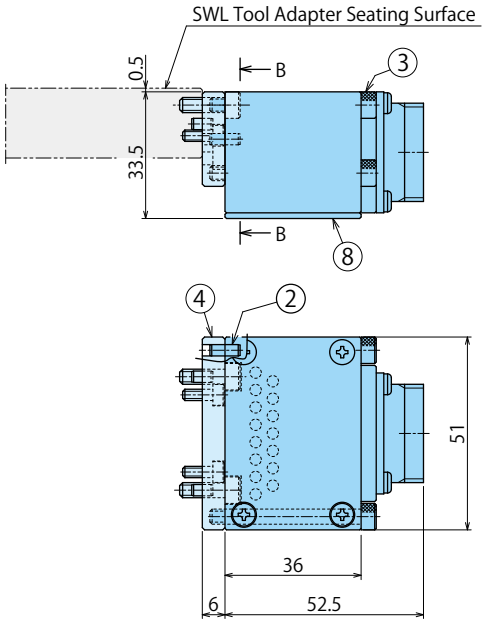


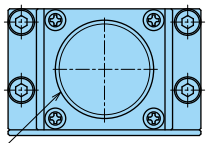
Compatible with SRCN2A21-16P (Pin)(JAE)
Connector based on JIS C 5432



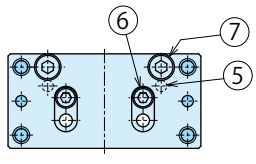
View A-A：Bracket Part

Tool Adapter Side





Compatible with SRCN2A21-16S (Socket)(JAE)
Connector based on JIS C 5432



View B-B：Bracket Part

All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0G0-T	SWRZ0G0-T	⑧	Electrode (Tool Side)	1
		②	Parallel Pin φ3×8 B Type (SUS)	2
		③	Hexagon Socket Bolt M4×0.7×40(SUS)	4
	SWLZ0E0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Parallel Pin φ3×6 B Type (SUS)	2
		⑥	Hexagon Socket Bolt M3×0.5×8(SUS)	2
		⑦	Hexagon Socket Bolt M4×0.7×12(SUS)	2

External Option：Compact Electric Power Transmission

Able to add an external option. Refer to P.63 for details.

External Option Symbol：**K**

Model No. for Master Cylinder Side
model **SWLZ0K0-M**

Model No. for Tool Adapter Side
model **SWLZ0K0-T**

Specifications

Rated Value (per contact)		AC/DC 200V 5A
Total Current Capacity		12A
Number of Poles (per electrode)		4
Weight※1	Master Cylinder Side	21g
	Tool Adapter Side	17g
Cable with Applicable Terminal (Sold Separately)		SWZ0K0-CL□ (Refer to P.46)

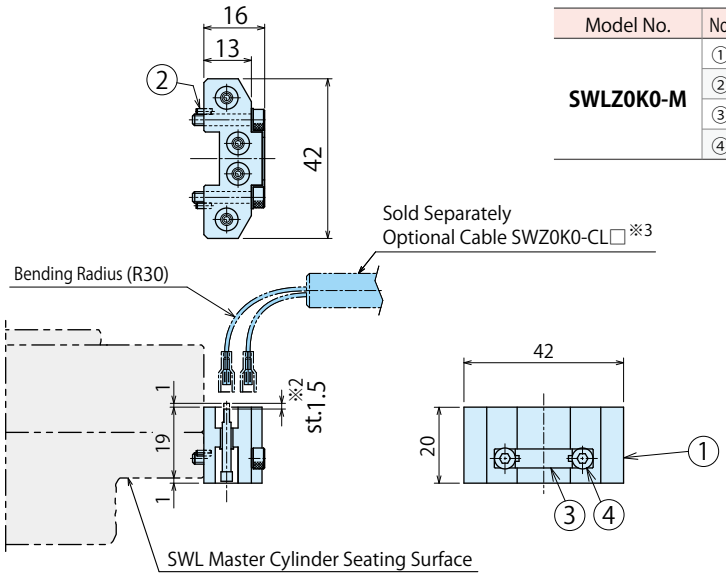
※1. Weight per kit.

Applicable Cable

The cable with applicable terminal and applicable terminal are not included.
Please prepare the cable with applicable terminal (SWZ0K0-CL□) on P.46 or design it yourself referring to the applicable terminal on P.40.

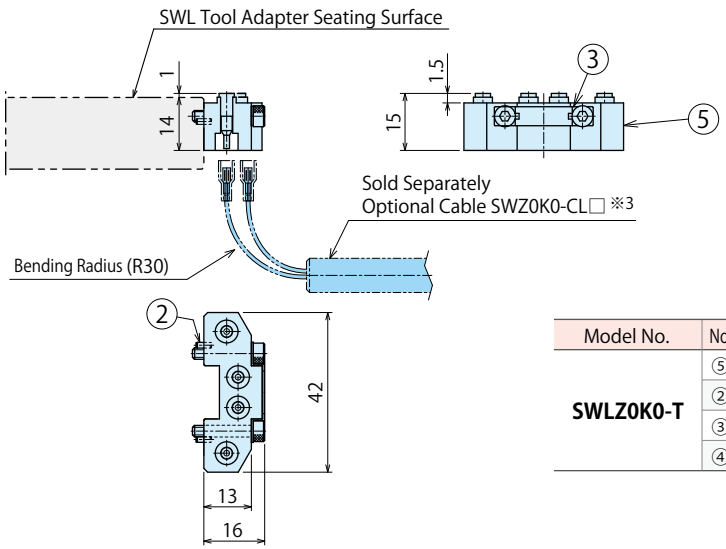
External Dimensions

Master Cylinder Side



Model No.	No.	Name	Quantity
SWLZ0K0-M	①	Electrode (Master Side)	1
	②	Parallel Pin ϕ1.5×4 B Type (SUS)	2
	③	Bolt Cover 4SW101785-00	1
	④	Hexagon Socket Bolt M3×0.5×16(SUS)	2

Tool Adapter Side

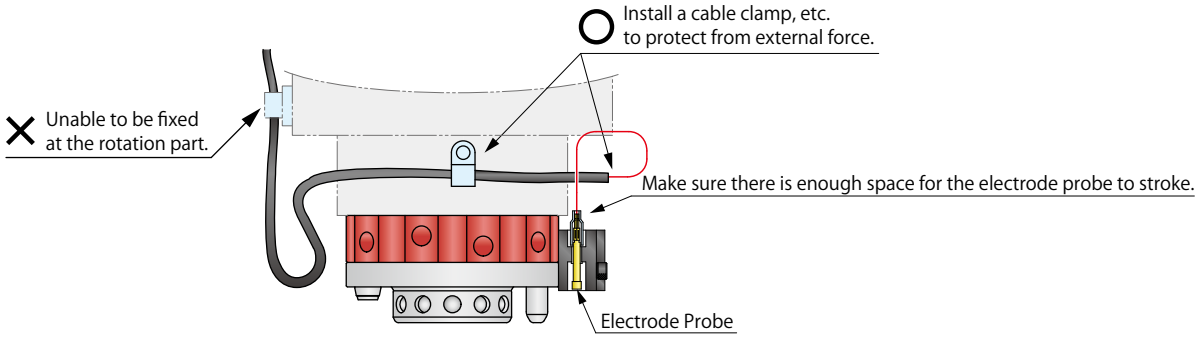


Model No.	No.	Name	Quantity
SWLZ0K0-T	⑤	Electrode (Tool Side)	1
	②	Parallel Pin ϕ1.5×4 B Type (SUS)	2
	③	Bolt Cover 4SW101785-00	1
	④	Hexagon Socket Bolt M3×0.5×16(SUS)	2

Notes : ※2. The electrode probe on master side strokes 1.5mm (※2) when connecting with SWL.
When fixing the cable, make sure there is enough space for the probe operation.
※3. The optional cable and terminal are not included in the electrode. Please prepare them separately.

Notes on Wire/Cable Procedure and Wiring

- Make sure to fix the wire and cable so that they are not pulled while a robot is moving or turning around.
  External force should not be applied on the connector part since it leads to breaking of wire, detaching of connector and contact failure.
  However, the electrode probe on master side strokes 1.5mm when connecting with SWL. When fixing the cable, make sure there is enough space for the probe to stroke.



- As for Compact Electric Power Transmission option, the electrode probes on both master cylinder and tool adaptor are exchangeable.
  The electrode probes will be fallen out if pushed from the cable connecting side with power stronger than a certain level.
  In case the electrode probes are pushed out after connecting the cable, make sure to push them back from the seating surface side before use.

External Option：Cable with Terminal for Compact Electric Power Transmission

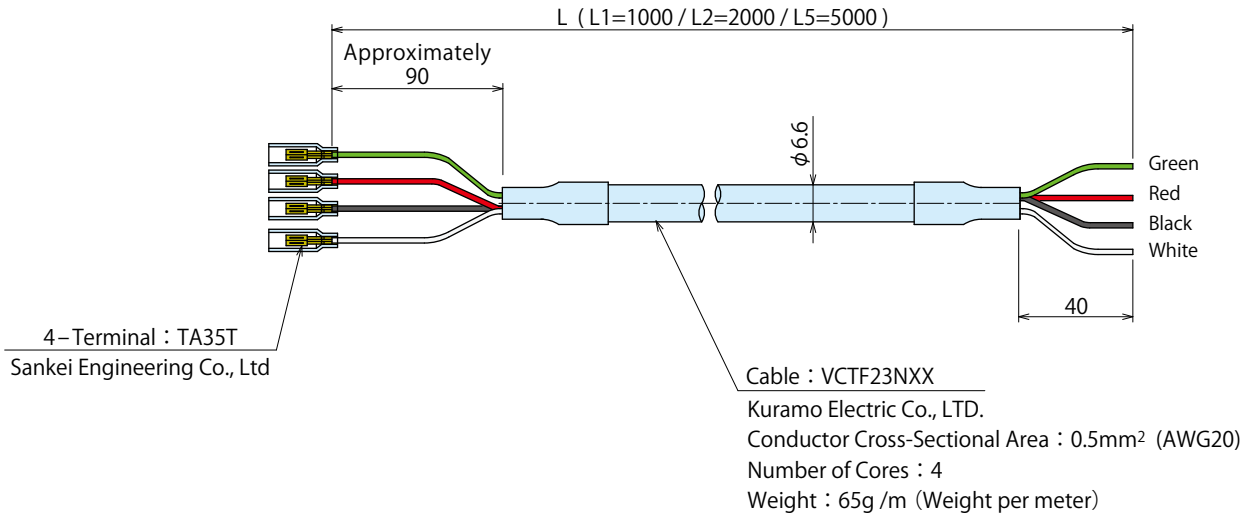
This cable is an optional cable applicable to the Compact Electric Power Transmission SWLZ0K0-M/T(External Option Symbol：K).

Model No. Indication

SWZ0K0-C **L1 L2 L5**

Cable Length
L1：1m
L2：2m
L5：5m

Design No.
(Revision Number)



※A crimp tool for crimping the applicable terminal (TA35T) is required when preparing a cable by yourself referring to this drawing.

External Option：Power Transmission Option (Connector Based on MIL-DTL-5015)

External Option Symbol：**E**

Model No. for Master Cylinder Side
model **SWLZ0E0-M**

Model No. for Tool Adapter Side
model **SWLZ0E0-T**

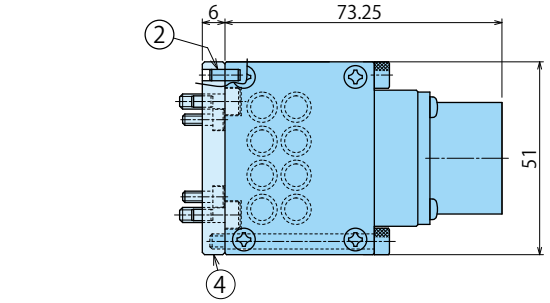
Specifications

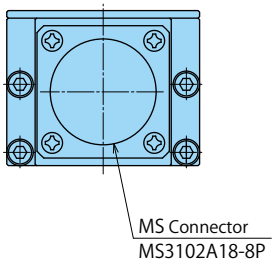
Rated Value (per contact)		AC/DC 200V 5A
Total Current Capacity		24A
Number of Poles (per electrode)		8
Weight※1	Master Cylinder Side	165g
	Tool Adapter Side	175g

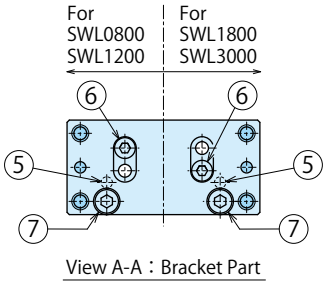
※1. Weight per kit.

External Dimensions

Master Cylinder Side

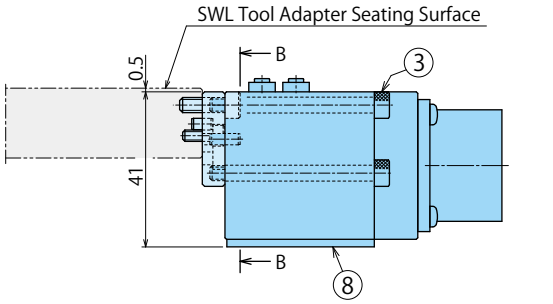


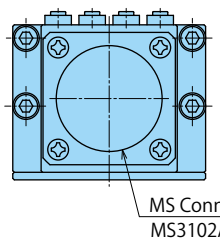


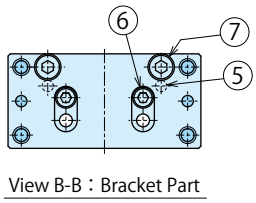


All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0E0-M	SWRZ 0E0-M	①	Electrode (Master Side)	1
		②	Parallel Pin ϕ3×8 B Type (SUS)	2
		③	Hexagon Socket Bolt M4×0.7×45(SUS)	4
	SWLZ 0E0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Parallel Pin ϕ3×6 B Type (SUS)	2
		⑥	Hexagon Socket Bolt M3×0.5×8(SUS)	2
		⑦	Hexagon Socket Bolt M4×0.7×12(SUS)	2

Tool Adapter Side







All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0E0-T	SWRZ 0E0-T	⑧	Electrode (Tool Side)	1
		②	Parallel Pin ϕ3×8 B Type (SUS)	2
		③	Hexagon Socket Bolt M4×0.7×45(SUS)	4
	SWLZ 0E0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Parallel Pin ϕ3×6 B Type (SUS)	2
		⑥	Hexagon Socket Bolt M3×0.5×8(SUS)	2
		⑦	Hexagon Socket Bolt M4×0.7×12(SUS)	2

External Option：High Current Transmission Option (Connector Based on MIL-DTL-5015)

External Option Symbol：**H**

Model No. for Master Cylinder Side
model **SWLZ0H0-M**

Model No. for Tool Adapter Side
model **SWLZ0H0-T**

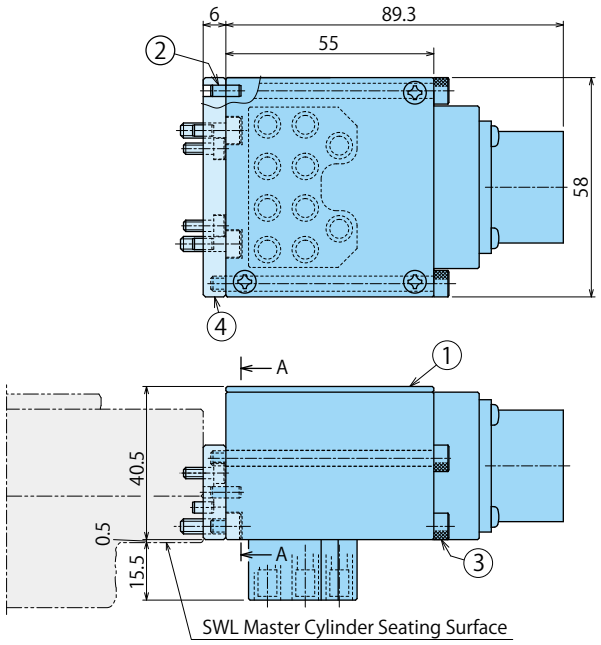
Specifications

Rated Value (per contact)		AC/DC 200V 13A
Total Current Capacity		57A
Number of Poles (per electrode)		10
Weight※1	Master Cylinder Side	310g
	Tool Adapter Side	240g

※1. Weight per kit.

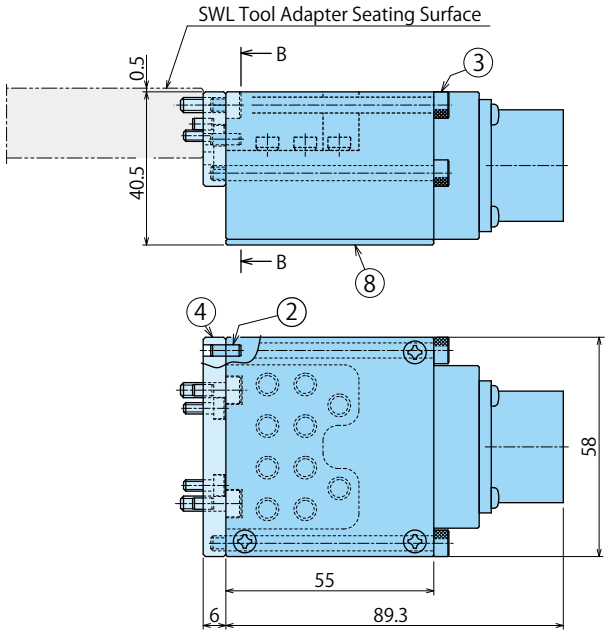
External Dimensions

Master Cylinder Side



All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0H0-M	SWRZ 0H0-M	①	Electrode (Master Side)	1
		②	Parallel Pin ϕ3×8 B Type (SUS)	2
		③	Hexagon Socket Bolt M4×0.7×60(SUS)	4
	SWLZ 0H0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Parallel Pin ϕ3×6 B Type (SUS)	2
		⑥	Hexagon Socket Bolt M3×0.5×8(SUS)	2
		⑦	Hexagon Socket Bolt M4×0.7×12(SUS)	2

Tool Adapter Side



All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0H0-T	SWRZ 0H0-T	⑧	Electrode (Tool Side)	1
		②	Parallel Pin ϕ3×8 B Type (SUS)	2
		③	Hexagon Socket Bolt M4×0.7×60(SUS)	4
	SWLZ 0H0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Parallel Pin ϕ3×6 B Type (SUS)	2
		⑥	Hexagon Socket Bolt M3×0.5×8(SUS)	2
		⑦	Hexagon Socket Bolt M4×0.7×12(SUS)	2

External Option：Servo Electrode

External Option Symbol：**F**

Model No. for Master Cylinder Side

model **SWLZ0F0-** **M01** **M02** **M05**

Model No. for Tool Adapter Side

model **SWLZ0F0-** **T01** **T02** **T05**

Specifications

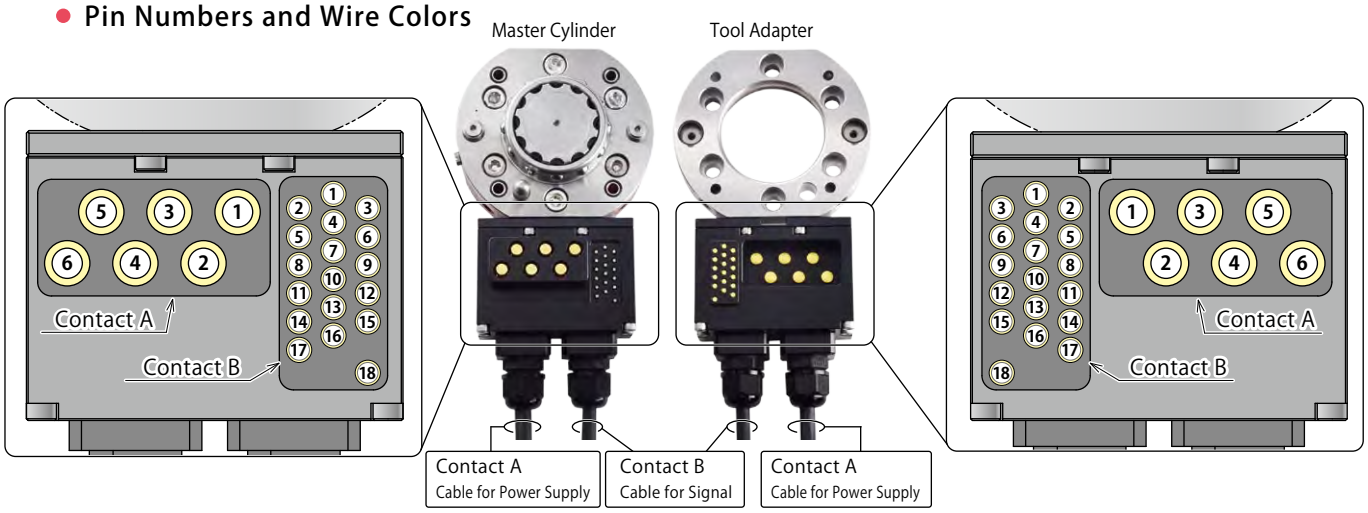
Contact A for Power Supply			
	Rated Value (per contact)		AC / DC 240V 20A ※1 ※2
	Number of Poles (per electrode)		6
Contact B for Signal			
	Rated Value (per contact)		DC 24V 3A
	Number of Poles (per electrode)		17 (for Signal) + 1 (for Functional Ground)
	Total Current Capacity		10A
Cable Specifications			Refer to the following table.
Lead Wire Length	– **M01/ T01**		1m
	– **M02/ T02**		2m
	– **M05/ T05**		5m
Weight ※3	Master Cylinder Side	– **M01**	Electrode 510g + Cable 280g
		– **M02**	Electrode 510g + Cable 560g
		– **M05**	Electrode 510g + Cable 1400g
	Tool Adapter Side	– **T01**	Electrode 470g + Cable 280g
		– **T02**	Electrode 470g + Cable 560g
		– **T05**	Electrode 470g + Cable 1400g

※1. Depending on the operating environment of a customer, the cable for power supply may become hot. Refer to the following conditions, and check if the maximum temperature in the operating environment combined with the temperature rise is safe before using the product.
- After 5 minutes of use with all 6 poles at 50% usage rate of 20A (5 sec. ON/ 5 sec. OFF), the cable temperature rise is Δt= about 20℃.
- After 5 minutes of use with all 6 poles at 100% usage rate of 20A and continuous current, the cable temperature rise is Δt=about 40℃.

※2. When supplying power for more than 5 minutes, reduce the current per electrode to suppress the temperature rise.
- Example 1. Using multiple electrodes can reduce the current per pole.
- Example 2. Suppress the surface temperature of cable coating installed in areas easily touched by people to below 60℃.

※3. Weight per kit.

Pin Numbers and Wire Colors



Contact A Cable for Power Supply

HIFLON SD/2586 6C×15AWG Black

NISSEI ELECTRIC
Conductor Cross-Sectional Area：2.0 mm² (AWG15)
Number of Cores：6
Cable Rated Value Temp：105℃ Voltage：600V

Weight：188g /m (Weight per meter)

Pin Number	1	2	3	4	5	6
Wire Color	Brown	Yellow	Green	Red	White	Black

Contact B Cable for Signal

HIFLON SD-SB/20276 10P×23AWG Black (with Shield)

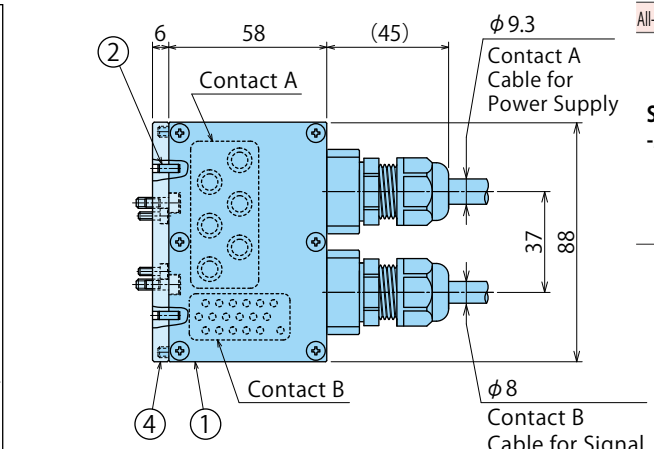
NISSEI ELECTRIC
Conductor Cross-Sectional Area：0.3mm² (AWG23)
Cable Rated Value Temp：80℃ Voltage：30V

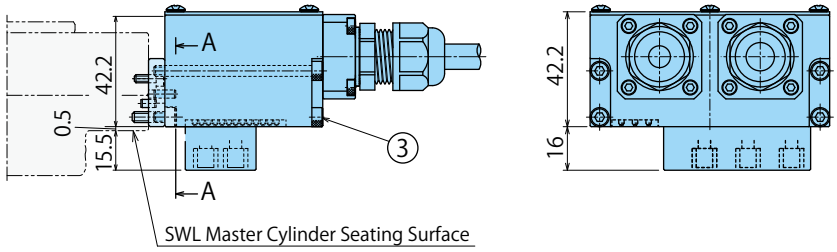
Weight：119g /m (Weight per meter)
Number of Cores：20

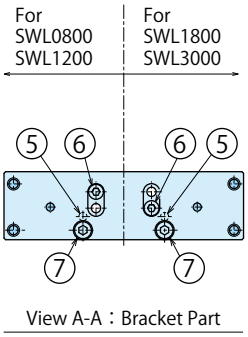
Pin Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18(FG)	Not Used	Not Used
Wire Color	Yellow/ Blue	Yellow/ Red	Yellow/ Black	White/ Blue	White/ Red	White/ Black	Pink	Light Blue	Violet	Gray	Orange	Blue	Brown	Yellow	Green	Red	White	Black	Orange/ Black	Orange/ Blue
	Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair		Twisted Pair	

External Dimensions

Master Cylinder Side



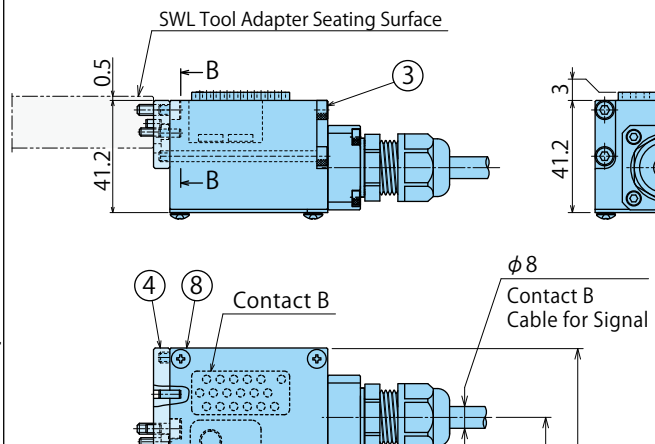


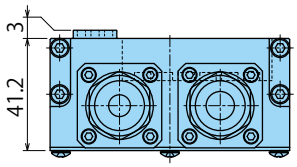


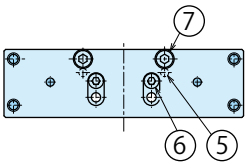
View A-A：Bracket Part

All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0F0 -M01/M02/M05	SWRZ0F0 -M01/ M02/ M05	①	Electrode (Master Side)	1
		②	Parallel Pin ϕ3×8 B Type (SUS)	2
		③	Hexagon Socket Bolt M4×0.7×60(SUS)	4
	SWLZ 0F0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Parallel Pin ϕ3×6 B Type (SUS)	2
		⑥	Hexagon Socket Bolt M3×0.5×8(SUS)	2
		⑦	Hexagon Socket Bolt M4×0.7×12(SUS)	2

Tool Adapter Side







View B-B：Bracket Part

All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0F0 -T01/T02/T05	SWRZ0F0 -T01/ T02/ T05	⑧	Electrode (Tool Side)	1
		②	Parallel Pin ϕ3×8 B Type (SUS)	2
		③	Hexagon Socket Bolt M4×0.7×60(SUS)	4
	SWLZ 0F0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Parallel Pin ϕ3×6 B Type (SUS)	2
		⑥	Hexagon Socket Bolt M3×0.5×8(SUS)	2
		⑦	Hexagon Socket Bolt M4×0.7×12(SUS)	2

Note : 1. For SWLZ0F0-□01/02/05 the lead wire length is different from its shown in the specifications.
(SWLZ0F0-□01 : Lead Wire Length 1m, SWLZ0F0-□02 : Lead Wire Length 2m, SWLZ0F0-□05 : Lead Wire Length 5m)

External Option：Compact Waterproof Electrode (Noncontact Waterproof Option) IP67

Able to add an external option. Refer to P.63 for details.

External Option Symbol：**W/WX**

Model No. for Master Cylinder Side

model **SWLZ0** [**W** / **WX**] **0-M**

W： NPN
WX：PNP

Model No. for Tool Adapter Side

model **SWLZ0W0-T**

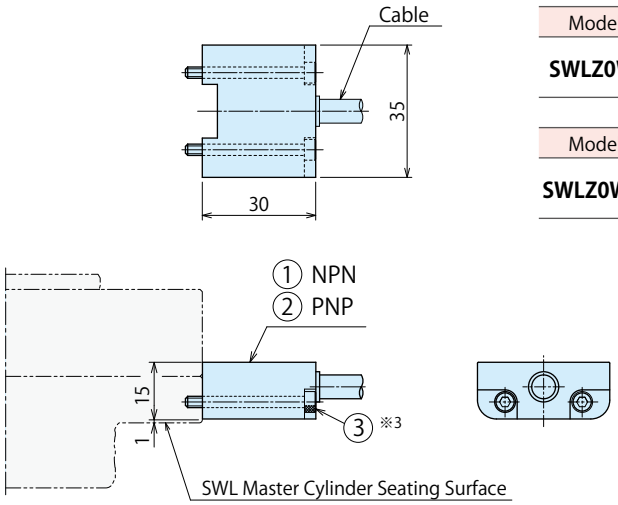
Specifications

Number of Signals (per electrode)		4
Protection Grade ※1		IP67
Cable		PUR φ6.3 7×0.259mm²
Cable Length	Master Cylinder Side	2m
	Tool Adapter Side	1m
Weight ※2	Master Cylinder Side	Electrode 20g + Cable 120g
	Tool Adapter Side	Electrode 20g + Cable 60g

※1. Protection grade of the electrode part.
※2. Weight per kit.

External Dimensions

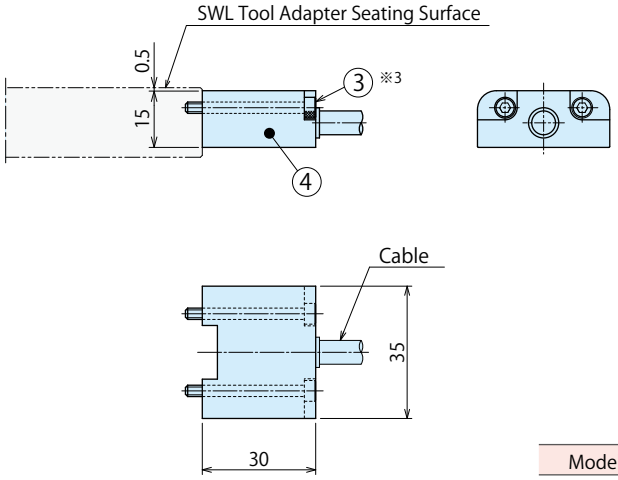
Master Cylinder Side



Model No.	No.	Name	Quantity
SWLZ0W0-M	①	Electrode (Master Side) **NPN** (B & Plus)	1
	③	Hexagon Socket Bolt M3×0.5×30(SUS) ※3	2

Model No.	No.	Name	Quantity
SWLZ0WX0-M	②	Electrode (Master Side) **PNP** (B & Plus)	1
	③	Hexagon Socket Bolt M3×0.5×30(SUS) ※3	2

Tool Adapter Side



Model No.	No.	Name	Quantity
SWLZ0W0-T	④	Electrode (Tool Side) (B & Plus)	1
	③	Hexagon Socket Bolt M3×0.5×30(SUS) ※3	2

Note： ※3. The tightening torque for M3 mounting bolts marked with ※3 should be 0.63 N・m.

Details and Notes on External Option：Compact Noncontact Waterproof Electrode

Applicable Sensor

Supply Voltage	12V DC
Total Current Consumption	≦60mA
Residual Voltage	≦3.5V

※Total current consumption of sensors must not exceed the total rated output current.

Electrode Specifications (Tool Adapter Side)

Model No.	SWLZ0W0-T	
Applicable Sensor	DC 3-Wire Sensor	
Output Voltage	12V ±1.5V DC	
No. of Input Signals	4	
Total Output Current	≦ 30mA	≦ 60mA
Operating Distance	0~3mm	0~2mm
Operating Temperature	0 ~ 50℃	
Protection Grade	IP67	
Material	ABS	
Cable	PUR φ6.3 / 7×0.259mm² Hitachi Metals, Ltd. RBT-VUCTF	

Electrode Specifications (Master Cylinder Side)

Model No.	NPN	SWLZ0W0-M
	PNP	SWLZ0WX0-M
Supply Voltage (Input Voltage)	24V DC ±10% (Including Ripple)	
Current Consumption	≦ 200mA	
No. of Output Signals	4 + 1 (Inzone)	
Load Current	≦ 50mA / 1 Output	
Operating Temperature	0 ~ 50℃	
Protection Grade	IP67	
Material	ABS	
Cable	PUR φ6.3 / 7×0.259mm² Hitachi Metals, Ltd. RBT-VUCTF	

■ LED Indication Status LED：Green

LED	Meaning
ON	The power is supplied.
OFF	The power is not supplied.
Blink	Blinks in case of abnormality.

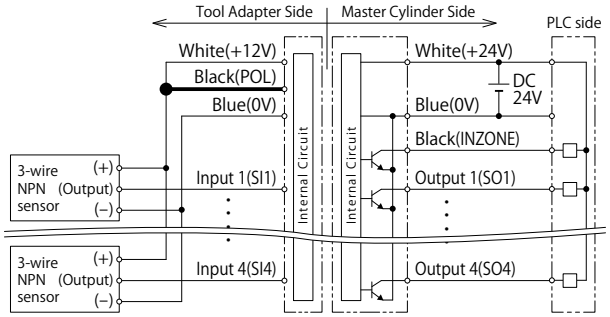
■ LED Indication Inzone LED：Orange

The master cylinder and tool adapter are opposed, LED is lit when you can communicate.

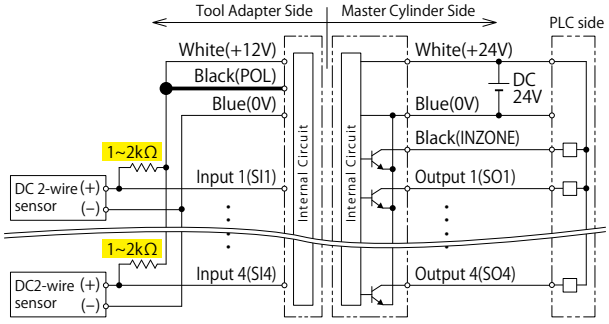
Wiring Diagram

SWLZ0W0-M（NPN）

■ For DC 3-wire NPN sensor connection

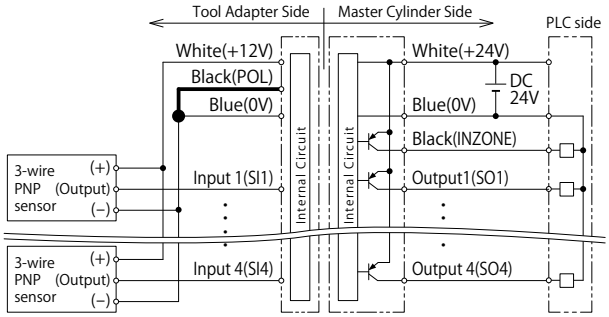


■ For DC 2-wire sensor connection (when NPN is set)

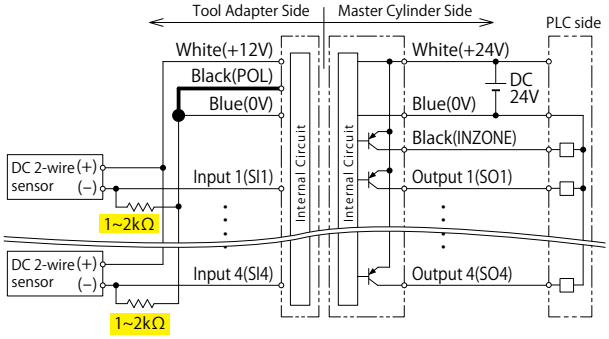


SWLZ0WX0-M（PNP）

■ For DC 3-wire PNP sensor connection



■ For DC 2-wire sensor connection (when PNP is set)



■ When connecting a DC 2-wire sensor, ensure to wire a resistor of about 1 to 2 k Ω.

■ POL is wiring for switching the polarity (NPN/PNP) of the sensor.

Wiring Color

■ Electrode for Tool Adapter side

Output + 12V	White
Output 0V	Blue
Polarity Switching POL	Black
Input 1 (SI1)	Brown
Input 2 (SI2)	Red
Input 3 (SI3)	Yellow
Input 4 (SI4)	Green

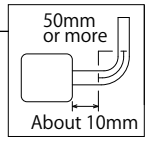
■ Electrode for Master Cylinder side

Input +24V	White
Input 0V	Blue
INZONE	Black
Output 1 (SO1)	Brown
Output 2 (SO2)	Red
Output 3 (SO3)	Yellow
Output 4 (SO4)	Green

Bending Radius of Cable

The minimum bending radius for the sensors are 50mm.

※ Do not pull the cable with excessive force.

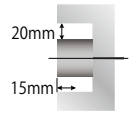


Attention for Installation

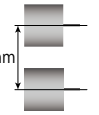
(Read this section thoroughly before installation.)

- Ensure the power is switched off during installation or maintenance operations.
- Use a regulated power supply, e.g. switch-model type. Simpler power supplies, such as a full-wave rectification type, will cause the permissible ripple rating to be exceeded and may cause malfunction.
- Do not put metal objects between electrodes during operation. Failure to do so may cause heat generation, ignition, or malfunction.
- Ensure correct connections by referencing the wiring diagram.
- To avoid malfunction caused by induction noise, cable should be kept apart from motor or other power cable.
- The control communication device in the product may affect electronic devices and medical devices. Persons wearing pacemakers should stay away from this product.
- In order to avoid influence of surrounding metal, or to avoid mutual influence between parallel-mounted sensors, keep the minimum free zone as described on the right.

■ Surrounding Metal



■ Parallel Installation



The information above is quoted from B & Plus K.K. Remote System User's Guide (No.T315201G).

Please contact B & Plus K.K. (TEL 81(0)-493-71-5160) for further information about electrodes (Model No. SWRZ0W0-M-__ / SWRZ0W0-T-__).

External Option：Waterproof Electrode (Noncontact Waterproof Option) IP67

External Option Symbol：**V/VX**

Model No. for Master Cylinder Side

model **SWLZ0** [**V** / **VX**] **0-** [**M** / **M05**]

V： NPN
VX：PNP

M： Cable 2m
M05：Cable 5m

Model No. for Tool Adapter Side

model **SWLZ0V0-T**

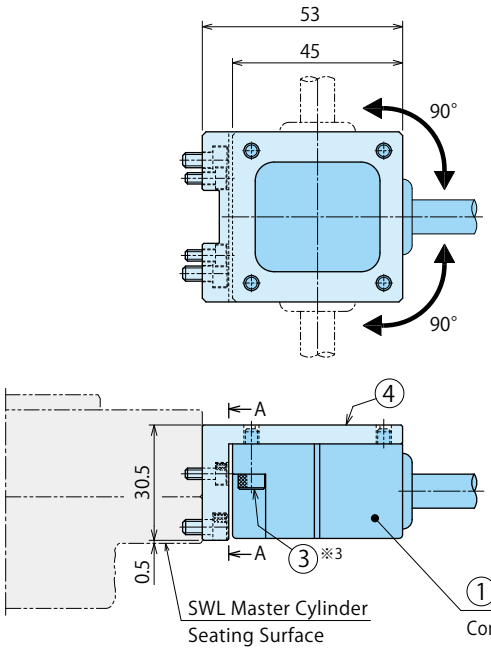
Specifications

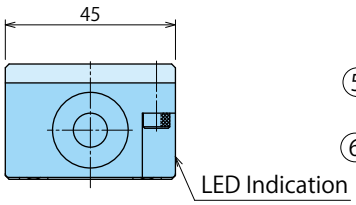
Number of Signals (per electrode)		12
Protection Grade ※1		IP67
Cable		PUR φ8.6 2×0.5mm²+13×0.18mm²
Cable Length	Master Cylinder Side **-M**	2m
	Master Cylinder Side **-M05**	5m
	Tool Adapter Side	1m
Weight ※2	Master Cylinder Side **-M**	Electrode 130g + Cable 210g
	Master Cylinder Side **-M05**	Electrode 130g + Cable 525g
	Tool Adapter Side	Electrode 130g + Cable 105g

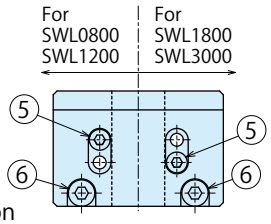
※1. Protection grade of the electrode part.
※2. Weight per kit.

External Dimensions

Master Cylinder Side







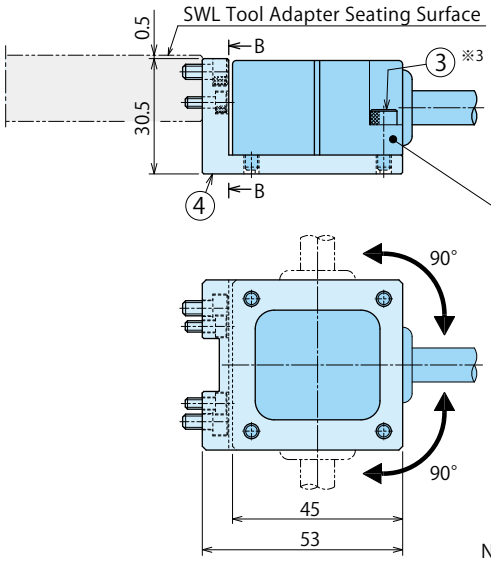
① NPN ② PNP

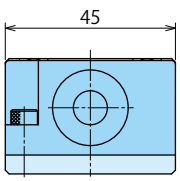
Consider the phasing (cable drawing direction) when mounting the electrode.

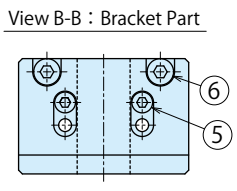
All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0V0 -M / M05	SWRZ 0V0-M/M05	①	Electrode (Master Side) **NPN** Made by B & Plus RS12E-422N-PU-02/05	1
		③	Hexagon Socket Bolt M4×0.7×12(SUS) ※3	2
	SWRZ 0V0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Hexagon Socket Bolt M3×0.5×8(SUS)	2
		⑥	Hexagon Socket Bolt M4×0.7×8(SUS)	2

All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0VX0 -M / M05	SWRZ 0VX0-M/M05	②	Electrode (Master Side) **PNP** Made by B & Plus RS12E-422P-PU-02/05	1
		③	Hexagon Socket Bolt M4×0.7×12(SUS) ※3	2
	SWRZ 0V0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Hexagon Socket Bolt M3×0.5×8(SUS)	2
		⑥	Hexagon Socket Bolt M4×0.7×8(SUS)	2

Tool Adapter Side







⑦ Consider the phasing (cable drawing direction) when mounting the electrode.

Even if the mounting phase of electrode on master and tool sides is different, signals can be transmitted.

All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0V0-T	SWRZ 0V0-T	⑦	Electrode (Tool Side) Made by B & Plus RS12T-422-PU-01	1
		③	Hexagon Socket Bolt M4×0.7×12(SUS) ※3	2
	SWRZ 0V0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Hexagon Socket Bolt M3×0.5×8(SUS)	2
		⑥	Hexagon Socket Bolt M4×0.7×8(SUS)	2

Note： ※3. The tightening torque for M4 mounting bolts marked with ※3 should be 1.5 N・m.

Details and Notes on External Option：Noncontact Waterproof Electrode

Applicable Sensor

Supply Voltage	12V DC
Total Current Consumption	≦230mA
Residual Voltage	≦3.5V

※Total current consumption of sensors must not exceed the total rated output current.

Electrode Specifications (Tool Adapter Side)

Model No.	SWLZ0V0-T
Applicable Sensor	DC 3-Wire Sensor
Output Voltage	12V ±1.5V DC
Total Output Current	≦ 230mA
No. of Input Signals	12
Operating Distance	2~5mm
Operating Temperature	0 ～ 50℃
Protection Grade	IP67
Material	ABS
Cable	PUR φ8.6 2×0.5mm²+13×0.18mm²

Electrode Specifications (Master Cylinder Side)

Model No.	NPN	SWLZ0V0-M/M05
	PNP	SWLZ0VX0-M/M05
Supply Voltage (Input Voltage)		24V DC ±10% (Including Ripple)
Current Consumption		≦ 600mA
No. of Output Signals		12 +1 (INZONE)
Load Current		≦ 50mA / 1 Output
Operating Temperature		0 ～ 50℃
Protection Grade		IP67
Material		ABS
Cable		PUR φ8.6 2×0.5mm²+13×0.18mm²

■ LED Indication Status LED：Green

LED	Meaning
ON	The power is supplied.
OFF	The power is not supplied.
Blink	Blinks in case of abnormality.

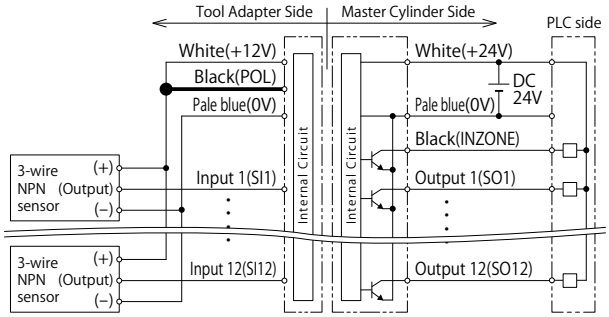
■ LED Indication Inzone LED：Orange

The master cylinder and tool adapter are opposed, LED is lit when you can communicate. When there is an output signal from each sensor, it flashes accordingly.

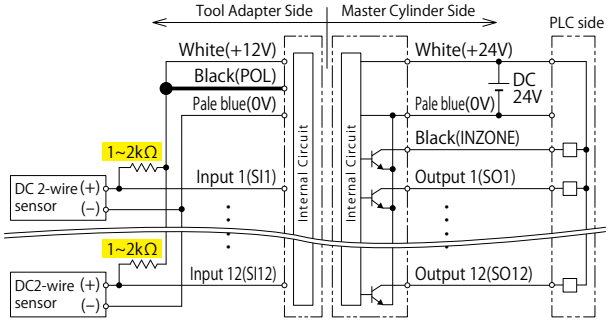
Wiring Diagram

SWLZ0V0-M/M05 （NPN）

■ For DC 3-wire NPN sensor connection

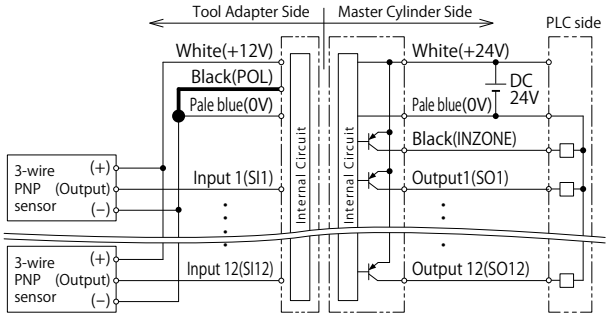


■ For DC 2-wire sensor connection (when NPN is set)

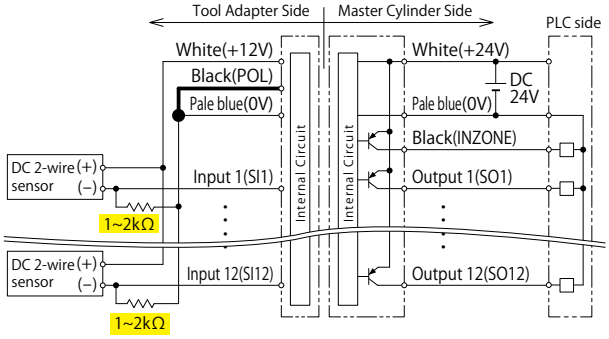


SWLZ0VX0-M/M05 （PNP）

■ For DC 3-wire PNP sensor connection



■ For DC 2-wire sensor connection (when PNP is set)



■ When connecting a DC 2-wire sensor, ensure to wire a resistor of about 1 to 2 k Ω.

■ POL is wiring for switching the polarity (NPN/PNP) of the sensor.

Wiring Color

■ Electrode for Tool Adapter side

Output + 12V	White
Output 0V	Pale blue
Polarity Switching POL	Black
Input 1 (SI1)	Brown
Input 2 (SI2)	Red
Input 3 (SI3)	Orange
Input 4 (SI4)	Yellow
Input 5 (SI5)	Green
Input 6 (SI6)	Blue
Input 7 (SI7)	Violet
Input 8 (SI8)	Gray
Input 9 (SI9)	Brown ＊■■
Input 10 (SI10)	Red ＊■■
Input 11 (SI11)	Orange＊■■
Input 12 (SI12)	Yellow ＊■■

■ Electrode for Master Cylinder side

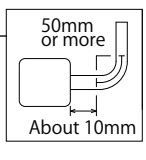
Input +24V	White
Input 0V	Pale blue
INZONE	Black
Output 1 (SO1)	Brown
Output 2 (SO2)	Red
Output 3 (SO3)	Orange
Output 4 (SO4)	Yellow
Output 5 (SO5)	Green
Output 6 (SO6)	Blue
Output 7 (SO7)	Violet
Output 8 (SO8)	Gray
Output 9 (SO9)	Brown ＊■■
Output 10 (SO10)	Red ＊■■
Output 11 (SO11)	Orange＊■■
Output 12 (SO12)	Yellow ＊■■

■ ＊ is the line where ■■ is printed on the core wire of each color.
The unused lines are green＊, blue＊, and violet＊.

Bending Radius of Cable

The minimum bending radius for the sensors are 50mm.

※ Do not pull the cable with excessive force.



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(Read this section thoroughly before installation.)

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- Use a regulated power supply, e.g. switch-model type. Simpler power supplies, such as a full-wave rectification type, will cause the permissible ripple rating to be exceeded and may cause malfunction.
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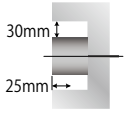
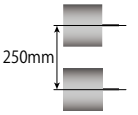
- The control communication device in the product may affect electronic devices and medical devices. Persons wearing pacemakers should stay away from this product.
- In order to avoid influence of surrounding metal, or to avoid mutual influence between parallel-mounted sensors, keep the minimum free zone as described on the right.

■ Surrounding Metal



■ Parallel Installation



The information above is quoted from B & Plus K.K. Remote System User's Guide (No.T313A01Ue). Please contact B & Plus K.K. (TEL 81(0)-493-71-5160) for further information about electrodes (Model No. RS12E-422□-PU-02/05 and RS12T-422-PU-01).

External Option：Ground Electrode

External Option Symbol：**T**

Model No. for Master Cylinder Side
model **SWLZ0T0-M**

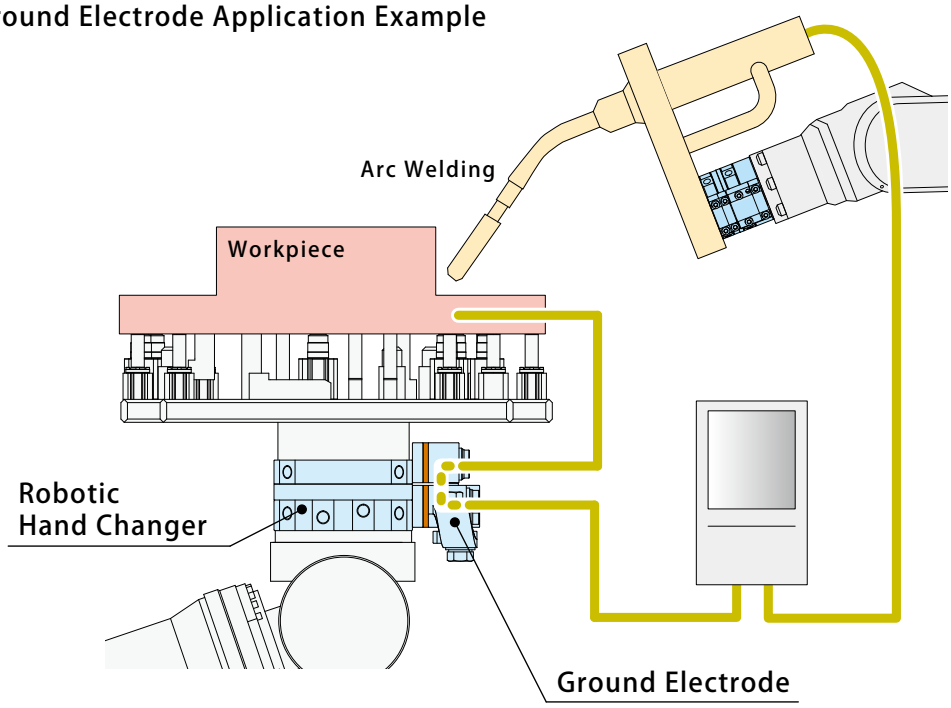
Model No. for Tool Adapter Side
model **SWLZ0T0-T**

Specifications

Rated Capacity		500A (Activity Ratio 50%)
Weight ※1	Master Cylinder Side	1260 g
	Tool Adapter Side	435 g

※1. Weight per kit.

Ground Electrode Application Example



Activity Ratio

Activity ratio shows the ratio of load time when welding with rated capacity to the prescribed period (10 minutes in JIS standard). Make sure that the activity ratio does not exceed 50% which is the rated activity ratio of the ground electrode (SWLZ0T0-M/T).

$$\text{Activity Ratio (\%)} = \frac{\text{Welding Time (min.)}}{\text{Prescribed Period (10 min.)}} \times 100$$

$$\text{Allowable Activity Ratio (\%)} = \frac{(\text{Rated Capacity 500 (A)})^2}{(\text{Operating Current(A)})^2} \times \text{Rated Activity Ratio 50 (\%)}$$

In case of Ground Electrode (SWLZ0T0-M/T) :

Ex.1) When welding with 500A, because the activity ratio is 50%, it can be operated for 5 minutes and needs to be suspended for 5 minutes in a 10-minute period.

Ex.2) When welding with 390A, the activity ratio is 78% so it can be operated for about 8 minutes and needs to be suspended for about 2 minutes in a 10-minute period.

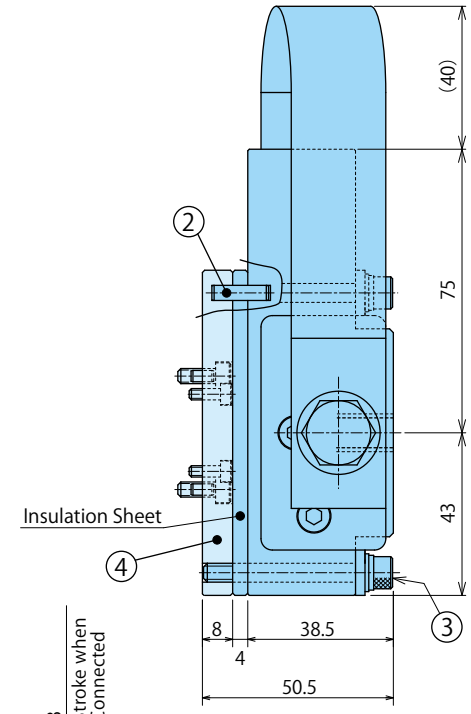
Ex.3) Unable to be operated when exceeding the rated capacity 500A. Please contact us.

Notes for Usage

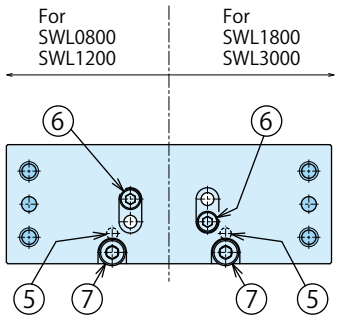
Electrode part of Ground Electrode (SWLZ0T0-M/T) strokes when connecting. Press not to tilt until reaching SWL connecting position by using a robot, etc. When not pressing with a robot, SWL is unable to complete connecting operation.

External Dimensions

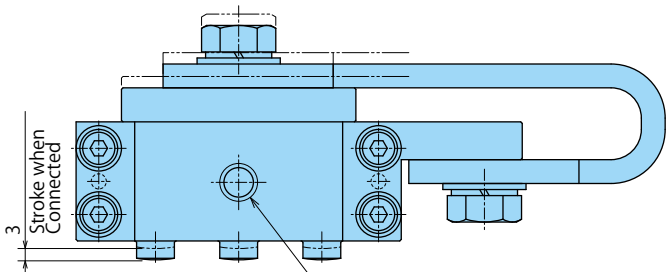
Master Cylinder Side



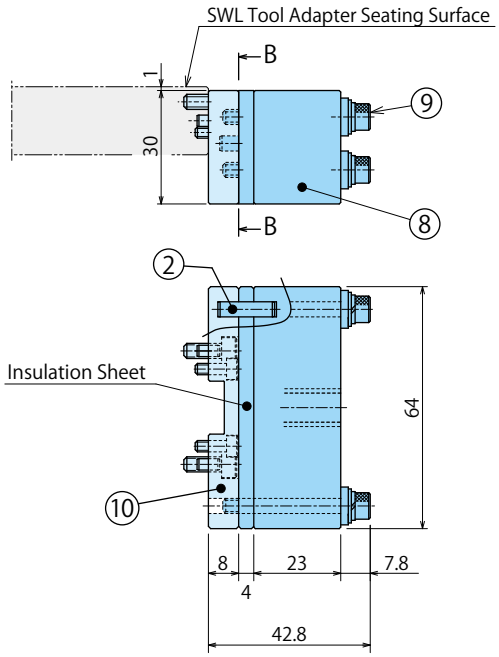
All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0T0-M	SWRZ 0T0-M	①	Electrode (Master Side) ※Including Insulation Sheet	1
		②	Parallel Pin ϕ4×15 (Resin)	2
		③	Hexagonal Socket Bolt M5×0.8×45(SUS)	4
	SWLZ 0T0-MB	④	Bracket (Master Side)	1
		⑤	Parallel Pin ϕ3×6 B Type (SUS)	2
		⑥	Hexagonal Socket Bolt M3×0.5×8(SUS)	2
		⑦	Hexagonal Socket Bolt M4×0.7×10(SUS)	2

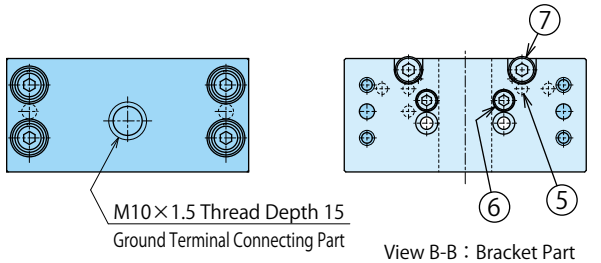


View A-A：Bracket Part



Tool Adapter Side





View B-B：Bracket Part

All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0T0-T	SWRZ 0T0-T	⑧	Electrode (Tool Side) ※Including Insulation Sheet	1
		②	Parallel Pin ϕ4×15 (Resin)	2
		⑨	Hexagon Socket Bolt M4×0.7×35(SUS)	4
	SWRZ 0T0-TB	⑩	Bracket (Tool Side)	1
		⑤	Parallel Pin ϕ3×6 B Type (SUS)	2
		⑥	Hexagonal Socket Bolt M3×0.5×8(SUS)	2
		⑦	Hexagonal Socket Bolt M4×0.7×10(SUS)	2

External Option：Ethernet Electrode

External Option Symbol：**L**

Model No. for Master Cylinder Side
model **SWLZ0L0-M**

Model No. for Tool Adapter Side
model **SWLZ0L0-T**

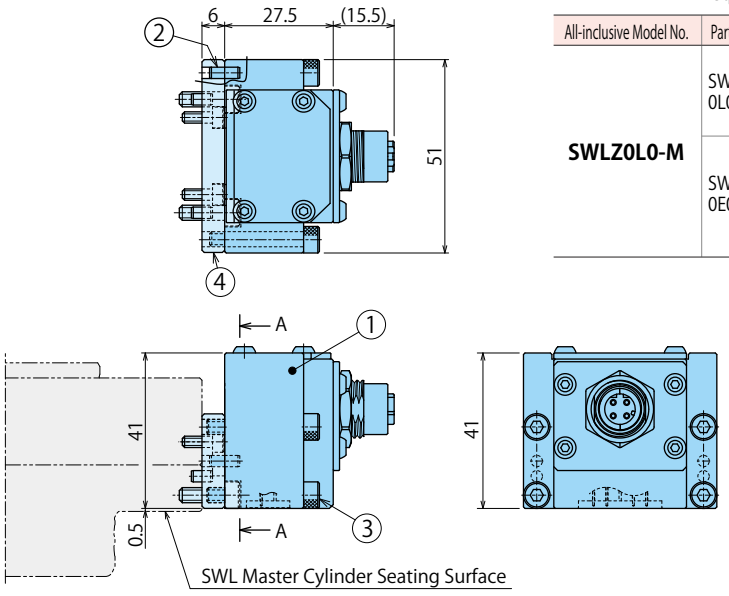
Specifications

Rated Value (per contact)		DC 30V 0.5A
Number of Poles (per electrode)		4
Connector		M12 D-code 4 poles (female) (based on IEC61076-2-101)
Ethernet Applicable Standard		100BASE-TX※3
Transmission Speed		100Mbps※3
Category		CAT5
Applicable Fieldbus		EtherNet/IP EtherCAT PROFINET Modbus TCP CC-Link IE Field Network Basic※2
Weight※1	Master Cylinder Side	130 g
	Tool Adapter Side	120 g

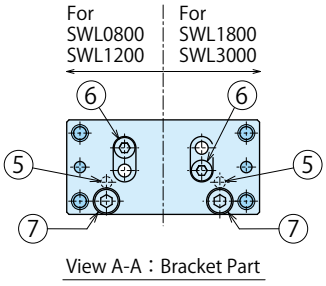
※1. Weight per kit.
※2. Cannot be used with a fieldbus that requires a communication speed of 1Gbps such as CC-Link IE.
※3. In the case transmission speed of Ethernet applicable standard 1000BASE-T (transmission speed : 1 Gbps) is required, please contact us.

External Dimensions

Master Cylinder Side

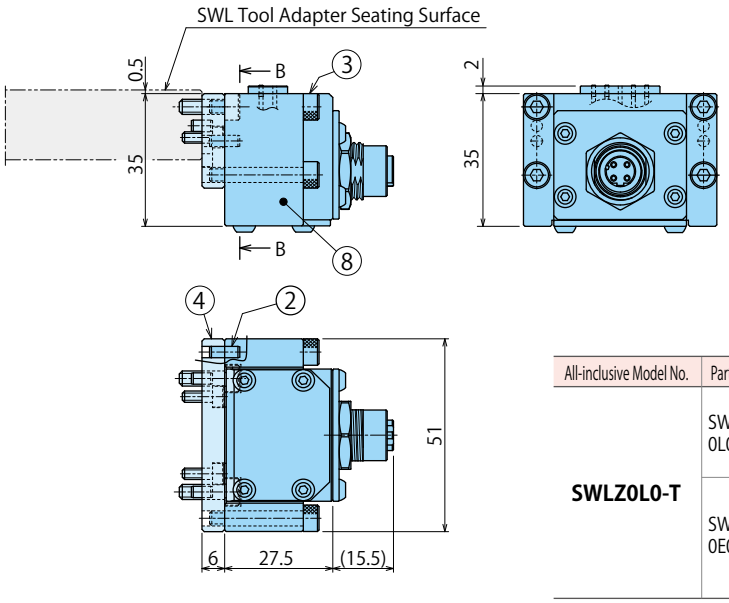


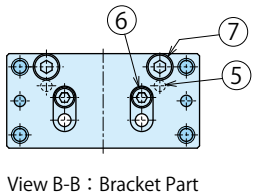
All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0L0-M	SWRZ 0L0-M	①	Electrode (Master Side)	1
		②	Parallel Pin φ3×8 B Type (SUS)	2
		③	Hexagonal Socket Bolt M4×0.7×25(SUS)	4
	SWLZ 0E0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Parallel Pin φ3×6 B Type (SUS)	2
		⑥	Hexagonal Socket Bolt M3×0.5×8(SUS)	2
		⑦	Hexagonal Socket Bolt M4×0.7×12(SUS)	2



View A-A：Bracket Part

Tool Adapter Side





View B-B：Bracket Part

All-inclusive Model No.	Part No.	No.	Name	Quantity
SWLZ0L0-T	SWRZ 0L0-T	⑧	Electrode (Tool Side)	1
		②	Parallel Pin φ3×8 B Type (SUS)	2
		③	Hexagonal Socket Bolt M4×0.7×25(SUS)	4
	SWLZ 0E0	④	Bracket (Common for Master/Tool Side)	1
		⑤	Parallel Pin φ3×6 B Type (SUS)	2
		⑥	Hexagonal Socket Bolt M3×0.5×8(SUS)	2
		⑦	Hexagonal Socket Bolt M4×0.7×12(SUS)	2

MEMO

External Option：Air Joint 3-Port Option (1 Port Rc1/8)

Able to add an external option.
Refer to P.63 for details.

External Option Symbol：**R**

Model No. for Master Cylinder Side
model **SWLZ0R0-M**

Model No. for Tool Adapter Side
model **SWLZ0R0-T**

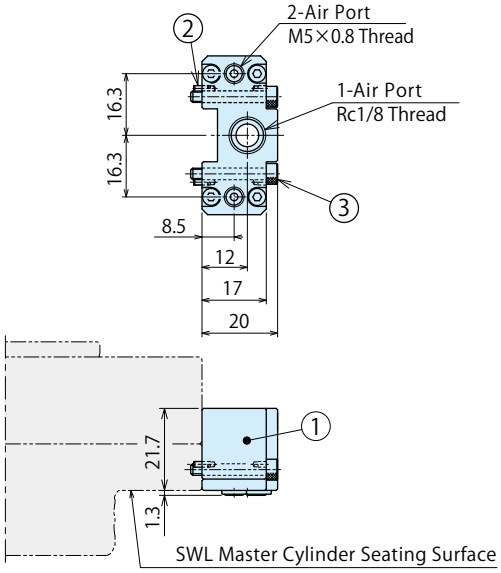
Specifications

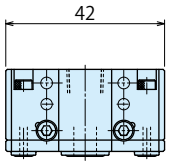
Port Size		Rc1/8	M5
Number of Ports		1	2
OperatingPressure		max. 0.7MPa (Vacuum Available)	
Withstanding Pressure		1.1MPa	
Min. Passage Area		28.3mm²	3.1mm²
Operating Temperature		0～70℃	
Usable Fluid		Dry Air	
Reaction Force (per port)	Pressure at 0.7 MPa	0.13 kN	0.04kN
	Pressure at 0.5 MPa	0.10 kN	0.03kN
	Pressure at P MPa	0.154×P+0.019 kN	0.047×P+0.008 kN
Weight ※1	Master Cylinder Side	54 g	
	Tool Adapter Side	28 g	

※1. Weight per kit.

External Dimensions

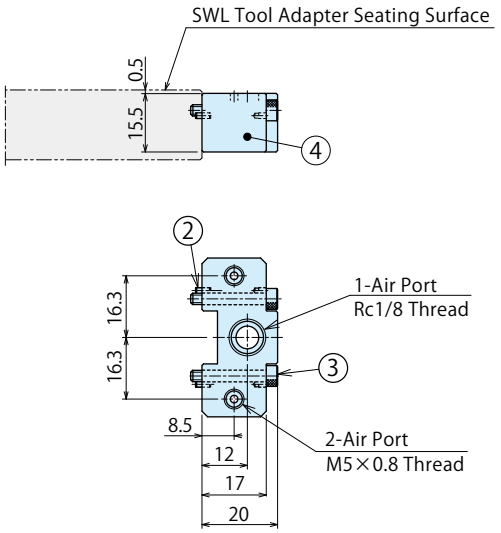
Master Cylinder Side

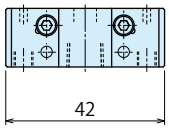




Model No.	No.	Name	Quantity
SWLZ0R0-M	①	Joint (Master Side)	1
	②	Parallel Pin ϕ1.5×4 B Type (SUS)	2
	③	Hexagon Socket Bolt M3×0.5×20(SUS)	2

Tool Adapter Side





Model No.	No.	Name	Quantity
SWLZ0R0-T	④	Joint (Tool Side)	1
	②	Parallel Pin ϕ1.5×4 B Type (SUS)	2
	③	Hexagon Socket Bolt M3×0.5×20(SUS)	2

MEMO

External Option：Air Joint 4-Port Option

Able to add an external option.
Refer to P.63 for details.

External Option Symbol：**P**

Model No. for Master Cylinder Side
model **SWLZ0P0-M**

Model No. for Tool Adapter Side
model **SWLZ0P0-T**

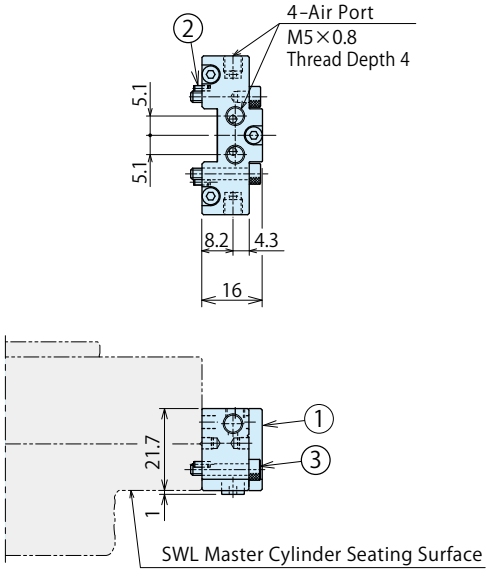
Specifications

Number of Ports		4
Operating Pressure		max. 1.0MPa (Vacuum Available)
Withstanding Pressure		1.5MPa
Min. Passage Area		3.1mm² (Equal to ϕ2)
Operating Temperature		0～70℃
Usable Fluid		Dry Air
Reaction Force (per port)	Pressure at 1 MPa	0.03 kN
	Pressure at 0.5MPa	0.02 kN
	Pressure at P MPa	0.027×P +0.004 kN
Weight ※1	Master Cylinder Side	74 g
	Tool Adapter Side	64 g

※1. Weight per kit.

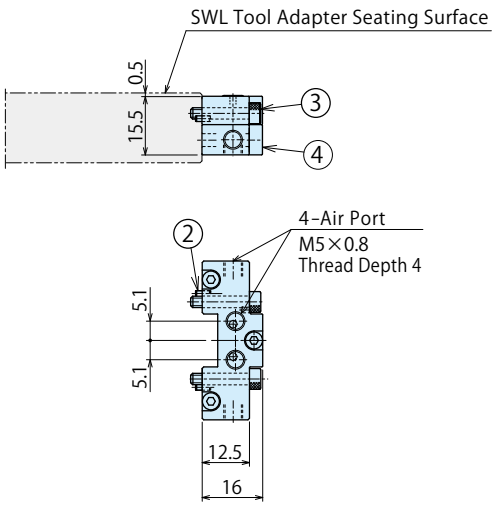
External Dimensions

Master Cylinder Side



Model No.	No.	Name	Quantity
SWLZ0P0-M	①	Joint (Master Side)	1
	②	Parallel Pin ϕ1.5×4 B Type (SUS)	2
	③	Hexagon Socket Bolt M3×0.5×16(SUS)	2

Tool Adapter Side



Model No.	No.	Name	Quantity
SWLZ0P0-T	④	Joint (Tool Side)	1
	②	Parallel Pin ϕ1.5×4 B Type (SUS)	2
	③	Hexagon Socket Bolt M3×0.5×16(SUS)	2

External Option : Air Joint 2-Port Option

External Option Symbol : **Q**

Model No. for Master Cylinder Side
model **SWLZ0Q0-M**

Model No. for Tool Adapter Side
model **SWLZ0Q0-T**

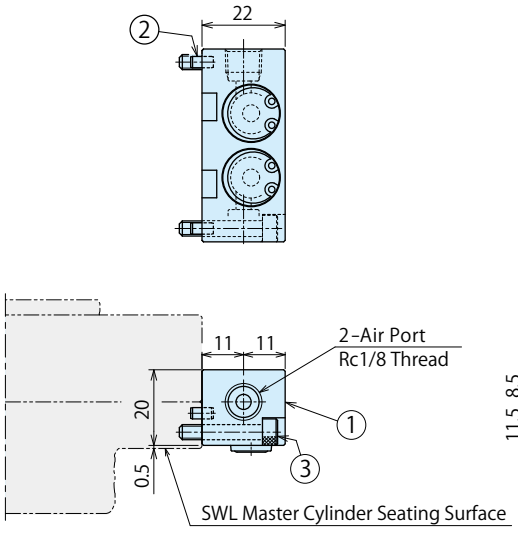
Specifications

Number of Ports		2
Operating Pressure		max. 1.0MPa (Vacuum Available)
Withstanding Pressure		1.5MPa
Min. Passage Area		12.6mm² (Equal to ϕ4)
Operating Temperature		0 ~ 70℃
Usable Fluid		Dry Air
Reaction Force (per port)	Pressure at 1 MPa	0.13 kN
	Pressure at 0.5MPa	0.07 kN
	Pressure at P MPa	0.117×P +0.01 kN
Weight ※1	Master Cylinder Side	70 g
	Tool Adapter Side	60 g

※1. Weight per kit.

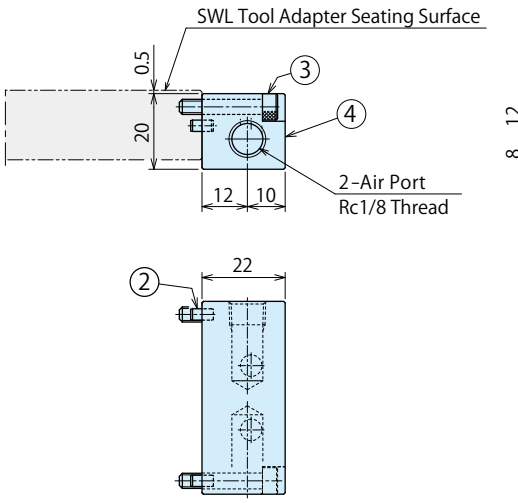
External Dimensions

Master Cylinder Side



Model No.	No.	Name	Quantity
SWLZ0Q0-M	①	Joint (Master Side)	1
	②	Parallel Pin ϕ3×6 B Type (SUS)	2
	③	Hexagon Socket Bolt M4×0.7×20(SUS)	2

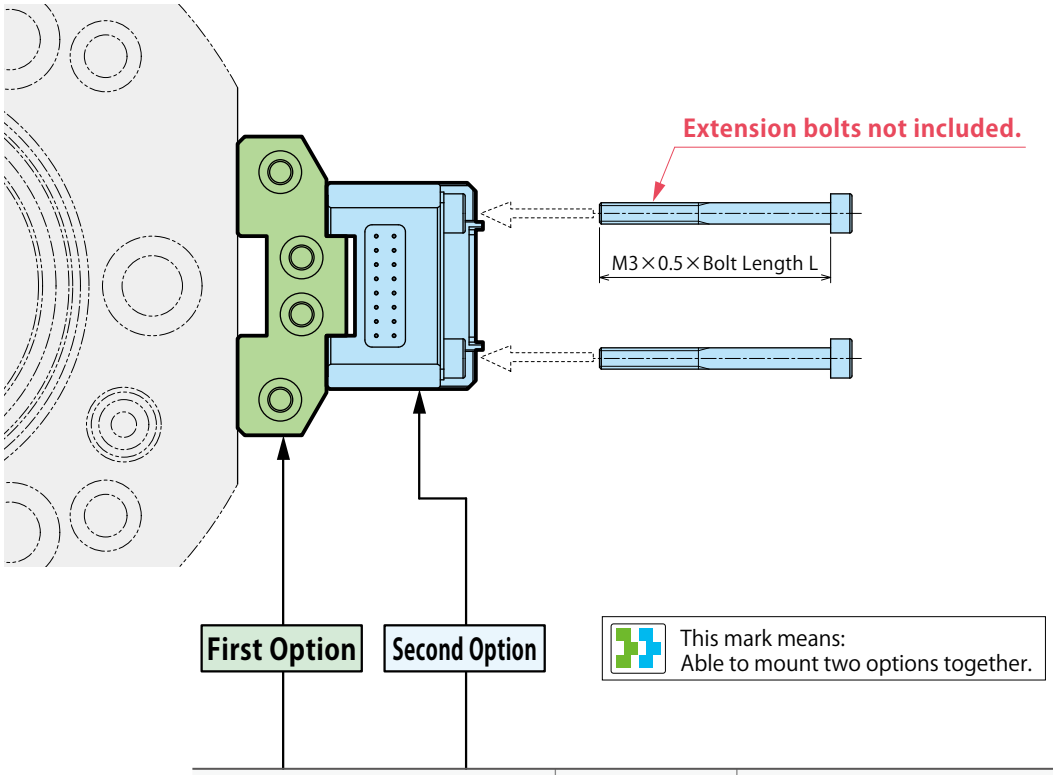
Tool Adapter Side



Model No.	No.	Name	Quantity
SWLZ0Q0-T	④	Joint (Tool Side)	1
	②	Parallel Pin ϕ3×6 B Type (SUS)	2
	③	Hexagon Socket Bolt M4×0.7×20(SUS)	2

Mounting Dimension of Two Options

This table shows bolt length and combination of option symbols when mounting two external options together.



External Option Symbol		M3×0.5 Bolt Length L (mm)	Remarks
First Option	Second Option		
B / C	**B / C**	30	Remove bolt cover from the first option.
K	**B / C**	30	Remove bolt cover from the first option.
	J	35	
	K	30	
	U	40	
P	**B / C**	30	
	J	35	
	K	30	
	U	40	
	P	30	
	W	45	
R	**B / C**	35	
	J	40	
	K	35	
	U	45	
	P	35	
	R	40	
	W	50	

Cautions for External Options

Notes for Design

1) Check Specifications

- Please use each product according to the specifications.

2) Operating Environment (Electrode)

- Do not use the product in the environment with water・vapor・liquid・scattering of chemicals・explosion・gas with causticity. Also, using in the environment with cutting chips・cutting fluid・dust・spatter scattering may lead to continuity error of electrode. We offer IP67-Compatible Noncontact Waterproof Electrode for the environment with water・vapor・liquid・cutting chips.

3) Electrification of Electrodes while Connecting/Disconnecting (Electrode)

- If connecting/disconnecting robotic hand changer while energized (hot swapping), there will be a discharge phenomenon (spark phenomenon) between the electrodes opposing each other. The tips of contact probes and electrode bars will be severely worn down due to the phenomenon, and the basis metal might be melted due to oxidation or abrasion of gold-plating leading to conduction failure. Electricity should be shut off while connecting/disconnecting the robotic hand changer. In case of continuous electrification with more than 40 ~ 60% of rated current, it is recommended to use multiple electrodes in a line. (In order to improve durability of contact probes.)

Installation Notes

1) Please supply filtered clean dry air.

- Make sure to supply filtered clean dry air.
- Oil supply with a lubricator etc. is unnecessary.

2) Preparation for Piping

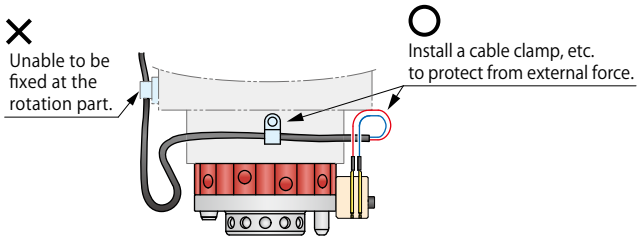
- The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly. The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
- There is no filter provided with this product for prevention of contaminants in the air circuit.

3) Applying Sealing Tape

- When using sealing tape, wrap with it 1 to 2 times following the screwing direction. When piping, be careful that contaminant such as sealing tape does not enter in products. Pieces of the sealing tape can cause air leaks and malfunction.

4) Notes on Wire/Cable Procedure and Wiring (Electrode)

- Make sure to fix the wire and cable so that they are not pulled while a robot is moving or turning around. External force should not be applied on the connector part since it leads to breaking of wire, detaching of connector and contact failure.



- When allocating each electric signal, imperceptible signal and power signal should be apart. Otherwise noise will be propagated from power signal to imperceptible signal (except for F : Servo Electrode). Also it is the same for wire and cable of external options (electrode). Make sure to keep imperceptible signal from power signal.

5) Connection Method for -D/E/G/H/J/L：Connector

- A Connector must be fully inserted into the electrode. As for -D/E/G/H/L options, make sure to screw up the connector. If a connector is not fully inserted or screwed up, it will cause contact failure. Tightening Torque for -D：D-SUB Connector：0.3N・m

6) Notes for using -K：Compact Electric Power Transmission

- As for Compact Electric Power Transmission option, the electrode probes on both master cylinder and tool adaptor are exchangeable. The electrode probes will be fallen out if pushed from the cable connecting side with power stronger than a certain level. In case the electrode probes are pushed out after connecting the cable, make sure to push them back from the seating surface side before use.

Continuing “Installation Notes” on the Next Page

Cautions for External Options

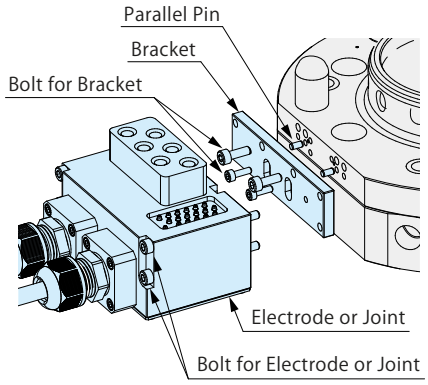
Installation Notes (Continued)

7) Installation of External Option

For bolt for electrode or joint, apply screw lock glue (equivalent to 1401 made by ThreeBond) on the tip of the mounting bolt and tighten it with the tightening torque shown in Table A.

For bolt for bracket, apply screw lock glue (equivalent to 1344 made by ThreeBond) on the tip of the mounting bolt and tighten it with the tightening torque shown in Table B.

When mounting, use the attached pins and tighten them with bolts evenly not to incline the master cylinder and tool adapter.



【Table A：Tightening Torque of Bolt for Electrode or Joint】

External Option Symbol	Model No.	Bolt Size / Tightening Torque
J	SWLZ0J0-M/T	M3×0.5：0.5 N・m
B	SWLZ0B0-M/T	
C	SWLZ0C0-M□/T□	
U	SWLZ0U0-M□/T□	
K	SWLZ0K0-M/T	
W	SWLZ0W0-M/T	M3×0.5：0.63 N・m
WX	SWLZWX0-M/T	
D	SWLZ0D0-M/T	M4×0.7：1.5 N・m
G	SWLZ0G0-M/T	
E	SWLZ0E0-M/T	
H	SWLZ0H0-M/T	
F	SWLZ0F0-M□/T□	
V	SWLZ0V0-M□/T	
VX	SWLZVX0-M□/T	
L	SWLZ0L0-M/T	
T	SWLZ0T0-M/T	M5×0.8：3 N・m
R	SWLZ0R0-M/T	M3×0.5：1.3 N・m
P	SWLZ0P0-M/T	
Q	SWLZ0Q0-M	M4×0.7：3.2 N・m

【Table B：Tightening Torque of Bolt for Bracket】

External Option Symbol	Model No.	Bolt Size / Tightening Torque
G	SWLZ0G0-M/T	Bolt for Bracket M3×0.5：1.3 N・m M4×0.7：3.2 N・m
E	SWLZ0E0-M/T	
H	SWLZ0H0-M/T	
F	SWLZ0F0-M□/T□	
V	SWLZ0V0-M/T	
VX	SWLZVX0-M/T	
L	SWLZ0L0-M/T	
T	SWLZ0T0-M/T	

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 safety protocols are ensured.

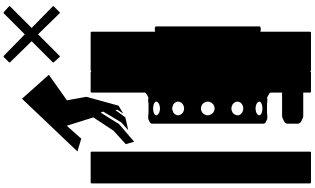
① The machine and equipment can only be inspected or prepared when it is confirmed that the safety devices are in place.

② Before the product is removed, make sure that the above-mentioned safety devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.

③ After stopping the product, do not remove until the temperature drops.

④ Make sure there is no trouble/issue in the bolts and respective parts before restarting the machine or equipment.

3) Do not touch a master cylinder, a tool adapter or an external option while it is working. Otherwise, your hands may be injured.



4) When the robot is in operation, make sure the safety of environment in case of a tool/workpiece detachment.

5) Do not disassemble or modify.

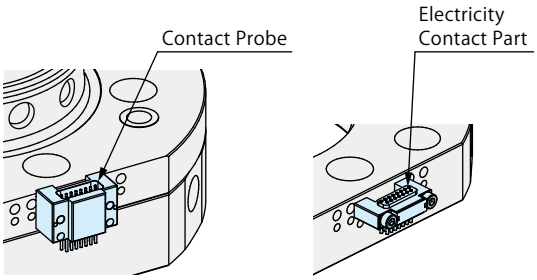
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

Maintenance・Inspection

1) Removal of the Product 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 circuit.
- Make sure there is no trouble/issue in the bolts and respective parts before restarting.

2) Regularly examine and retighten piping, mounting bolts and wires to ensure proper use.

3) Make an inspection before use and regularly.
- If there is dirt or dust on the electric contact part, electric signal is hard to conduct. Wipe it out with a cloth soaked in an organic solvent such as IPA.
- If there is a contact failure while in use, make an inspection mainly of the electricity connection part and clean it out.
  If the contact probe of master cylinder has abnormality, it has to be replaced.



4) Make sure to supply filtered clean dry air.

5) Make sure there is smooth action and no air leaks.
- Especially when it is restarted after left unused for a long period, make sure it can be operated properly.
  If there is air leak while connecting, please contact us for overhaul and repair.

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

7) Please contact us for overhaul and repair.

Warranty

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

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

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

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

KOSMEK
Harmony in Innovation

KOSMEK LTD.

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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.

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CAT.NO. SBR-SWL001-03-G1B
Printed in Japan

2022/6 First 0Ry
2024/3 3rd 0Ry

New

Robotic Hand Changer

Model SWL

New Option December 2023

Action Confirmation Sensor

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