


















SELECTION GUIDE FOR OUR JOYSTICK CONTROLLERS

	Models	Features
	30JB	Most miniaturized series in our joystick controllers. 3-dimensional coordinate type is also available. Spring return device is incorporated inside and it activates an operating lever to automatically return to center position.
	30JE	Modified version of type 30JB and switches are incorporated inside, instead of potentiometers. Spring return device is incorporated inside as in 30JB series.
	30JH	Lowest-cost version of 3-dimensional coordinate type joystick controllers and no other dimensional coordinate is available. Spring return device and dust-proof rubber cover are fitted as standard version.
	30JL	Lowest-cost version of 1-dimensional coordinate type joystick controllers and no other dimensional coordinate is available. Spring return device fitted is standard version.
	L30JL	1-dimensional coordinate joystick controller incorporated an inductance type contactless potentiometer. It offers long life expectancy, high reliability and safety. Spring return device fitted is standard version.
	40JB	Low-cost version with widest operating angle among miniaturized joystick controllers.
	40JE	Almost same outer dimensions as low-cost type 40JB and incorporates code switches of digital output, instead of potentiometers. Spring return device fitted is standard version.
	50JA	Most standardized joystick controllers. Various special specifications are easily available.
	L50JA	50JA type joystick controller mounted with inductance type contactless potentiometers, instead of conductive plastic potentiometers, which suits specially for the application with strong mechanical vibration.
	50JC	Very robustly constructed and mounted as standard with dust-proof rubber cover, and incorporated with spring return device which activates an operating lever to automatically return to center position.
	60JB	Low-cost type with number of parts reduced by incorporating potentiometer inside. Spring return devices incorporated inside and it activates an operating lever to automatically return to center position, as in 50JC series.
	90JA	Very strong constructed and mounted as standard with dust-proof rubber cover and incorporated with spring return device which activates an operating lever to automatically return to center position. Various special knob shapes are available. Suitable for outdoor applications.
	90JB	Almost same specifications as 90JA type, but potentiometers are incorporated inside housing. Suitable for space-saving inside the cabinet.
	C90JAM	90JA type joystick controller mounted with cobra shaped knob, which suits for multi-directional operations such as robot operations. It is possible to operate complex functions with push-button switches and see-saw motion potentiometer incorporated in the knob.
	C90JBM	Same specifications as C90JAM, but potentiometers are incorporated inside housing, suitable for space-saving inside the cabinet.
	L90JA	90JA type joystick controller mounted with inductance type contactless potentiometers, instead of conductive plastic potentiometers. It offers long life expectancy, high reliability and safety and best suitable for special vehicles with strong vibration.
	100JB	This model has a seasaw type potentiometer as Z axis potentiometer and 3-dimensional coordinate type is only available. Suitable for various indoor applications.

Potentiometers' Mounting Method		Switch incorporated inside	Degree of Protection (IP code) (Note 1)		Life Expectancy (Note 2)		Applications	Page
Outside	Inside		Standard Version (No Rubber cover)	Special Version with Rubber Cover	Standard Version	Special Longer-life Version		
—	○	—	IP40	IP54 (2 axes type only)	(Unit: Ten Thousand) Abt. 500	(Unit: Ten Thousand) Abt. 1,000	Various kinds of measuring devices, electromotive wheelchairs, robot operations, precision machine tools, etc.	10,11
—	—	○	IP40	IP54 (2 axes type only)	Abt. 100	—	Medical instruments, studio-related apparatuses, industrial vehicles, etc.	12,13
—	○	—	IP65		Abt. 200	—	Electromotive wheelchairs, robot operations, 3-dimensional coordinate measuring apparatuses, etc.	14,15
—	○	—	IP65		Abt. 200	—	Medical instruments, industrial vehicles, robot operations, crane operations, etc.	16,17
—	○	—	IP65		Abt. 500	—	Robot operations, crane operations, industrial vehicles, civil engineering and construction machinery, etc.	18,19
—	○	—	IP40	IP54	Abt. 500	—	Picture disposal devices, electromotive wheelchairs, medical instruments, etc.	20,21
—	—	○	IP40	IP54	Abt. 500	—	Medical instruments, industrial vehicles, robot operations, etc.	22,23
○	—	—	IP40	IP54 (Consult 3 axes type)	Abt. 500	Abt. 1,000	3-dimensional coordinate measuring apparatuses, CAD/CAM/CAE display devices, robot operations, etc.	24,25
○	—	—	IP40	IP54 (Consult 3 axes type)	Abt. 1,000		Various kinds tooling machines, robot operations, conveyer systems, etc.	26,27
○	—	—	IP54		Abt. 500	Abt. 1,000	Precision equipment for industrial use, construction machinery, crane operations, etc.	28,29
—	○	—	IP40	IP54 (2 axes type only)	Abt. 500	—	3-dimensional coordinate measuring apparatuses, picture disposal devices, robot operations, etc.	30,31
○	—	—	IP65		Abt. 500	Abt. 1,000	Robot operations, crane operations, industrial vehicles, civil engineering and construction machinery, etc.	32,33
—	○	—	IP65		Abt. 500	—	Robot operations, crane operations, industrial vehicles, precision machine tools, etc.	32,33
○	—	—	IP40		Abt. 500	Abt. 1,000	Medical instruments, industrial vehicles, robot operations, etc.	34,35
—	○	—	IP40		Abt. 500	—		34,35
○	—	—	IP65		Abt. 1,000	—	Robot operations, crane operations, industrial vehicles, civil engineering and construction machinery, etc.	36,37
—	○	—	IP40		Abt. 500	—	3-dimensional coordinate measuring apparatuses, picture disposal devices, industrial vehicles, robot operations, etc.	38,39

Note 1) IP degree can only apply the part including the lever above mounting panel and as for the details of IP degree, please see page 57.
Other "IP degrees" are available on request.

Note 2) Life expectancy is approximate number of operations mechanically under the normal operational conditions, which is an aim when designing and selecting. In case of severe environmental conditions such as vibration, shock, high humidity, higher or lower temperature, extreme operations over partial part and etc., please consider these factors into account when reading these values. Longer-life version has ball bearings inside (pat. pend), which offers longer mechanical life.

■PRECAUTIONS FOR DESIGN

- Potentiometers used on joystick controllers employ precision-class conductive plastic resistive element, and therefore, please make sure that "Sakae" joystick controllers should always be used with voltage method (Voltage shall be applied between terminals ① - ③ and output obtained from terminal ②). Please also take care that more than 1 mA shall not flow through terminal ② (movable contact) because overcurrent burns out the resistive element (Appropriate current through terminal ② should be below 10 μ A).
- Potentiometer used on joystick controllers employ precision inductance type contactless potentiometer and therefore, please don't apply any voltage to other terminals excluding IN (Input) terminal when using or measuring. Otherwise, the potentiometer may be burnt out.
- When stick (operating lever) is situated at neutral position, the output of potentiometer is adjusted within 50% \pm 1.5% against applied voltage. In case of 30JB and 40JB, this value is within 50% \pm 2%. In case of 30JH, 30JL and L30JL, this value is within 50% \pm 5%. In case of 100JB, this value is within 50% \pm 2% for X and Y axes and within 50% \pm 3% for Z axis. Higher accuracy is available to your request.
- In case of with a center tap on potentiometers, constant zone of output of center position is adjusted at approx. 3 $^{\circ}$.
- In case of with switches mounted for each axis, the angle of switching is at approx. \pm 5 $^{\circ}$ from each axis center position. Higher accuracy is available to your request.
- Please take care not to apply excessive side-load over 50N (5.0 kgf), and /or push-pull force over 50N (5.0 kgf) to the stick. Otherwise, it may bend with such overload. In case of applying over 50N (5 kgf) to the stick, please consult us in advance.
- Please take care not to apply over 10N (1 kgf) force on potentiometer terminals and/or leads.
- In case operating environment abounds with vibration and shock for long period of time, please consult us in advance. Specifications and values shown in vibration, shock and life expectancy shall be based on the following test conditions.
 - Vibration 10~55Hz 98m/s²(10G) shall be in accordance with MIL-STD-202F-204.
 - Shock 294m/s²(30G) shall be in accordance with MIL-STD-202F-213.
 - Life expectancy shall be based on test conditions under which lever shall be moved forward and backward per each operation at the speed of 40 r.p.m. in normal room temperature.
- Further technical details to be mounted precision potentiometers, please refer to the proper items in our General Catalog on precision potentiometers, dials and servo components separately.

■PRECAUTIONS FOR USE

All values mentioned in this catalog are based under the condition of normal mounting method and application. If special mounting method and application are made, the values may change. In that case, we would kindly request you to confirm completely on all data in view of operation, performance, reliability, safety and so on at your application after your careful checking and testing.

Normal mounting method means:

Potentiometers:
Please see page 22, in our General Catalog No. 0202.

Joystick Controllers:
The knob or lever is in the upward position.

- In case of with spring return device, subject to models, there are 2 kinds of spring return force for X and Y axes, respectively, namely, one is stronger return force using 2 springs (we mentioned, "subject to directivity") and the other is constant return force using 1 spring (we mentioned, "omni-directional type"). So, please take care of this difference when selecting. When repeating spring return action without gripping with hand, the life expectancy may be shorter than specified, because such operation may bring over-worn out the resistive element of the potentiometers at the center position and other damages of inner construction. Lever operation is preferably made as slow and stable as possible.
- Potentiometer and switch mounted in the knob are dust-proof construction and, however, are not water-proof construction. When using in rather bad environmental conditions such as outdoor, atmosphere of water, gas, etc., please consult us before ordering.
- Dust- and water-proof rubber cover tends to deteriorate when used outdoors all the time, and therefore we recommend to make replacement with new ones after 1 to 1.5 years use. (Dust- and water-proof rubber cover is available as spare parts.)
- We assume no responsibility on so-called "products liability", unless we are fully noticed of the use or applications and a written confirmation to do so was issued from us. This policy shall also be applied for the applications of life support devices and nuclear facilities.
- We will guarantee all of our products for one year after the date of shipment. During this period, as for faults and troubles which are attributable to our responsibility, we will repair and adjust them free of charge. We can not bear any cost for the relative damage based on failures of our products. As for faults and troubles which are not attributable to our responsibility or which take place after warranty period, we will require payment for actual costs for repair and adjustment plus all shipping charges including actual freightage.

DEGREES OF PROTECTION

Example : IP **5** **4**

The 1st characteristic numeral:
Degrees of protection against solid foreign objects

The 2nd characteristic numeral:
Degrees of protection against ingress of water

The 1st numeral

IP	Degrees of Protection
0	Non-protected
1	Protected against solid foreign objects of 50mm. dia. and greater.
2	Protected against solid foreign objects of 12.5mm. dia. and greater.
3	Protected against solid foreign objects of 2.5mm. dia. and greater.
4	Protected against solid foreign objects of 1.0mm. dia. and greater.
5	Dust-protected
6	Dust-tight

The 2nd numeral

IP	Degrees of Protection
0	Non-protected
1	Protected against vertically falling water drops.
2	Protected against vertically falling water drops when enclosure tilted up to 15°.
3	Protected against spraying water.
4	Protected against splashing water.
5	Protected against water jets.
6	Protected against powerful water jets.
7	Protected against the effects of temporary immersion in water.
8	Protected against the effects of continuous immersion in water.

Note: The above table is defined in conformity to the standards of IEC60 529 (1989) and JIS C 0920 (1993).

WARRANTY

- When using our joystick controllers and foot controllers under the conditions of over-loaded or deviating from the specified contents of this catalog and our specification sheets, there may be a certain accidents such as broken parts of the unit, generation of excess heat on the apparatuses which may produce fire, disconnection of the circuit and so on.
So, please do not use such applications in order to avoid any accidents.

- We will guarantee all of our joystick controllers and foot controllers for one year after the date of shipment in principle. During this period, as for failures and faults which are attributable to our responsibility, we will repair and adjust them free of charge. As for failures and faults which are not attributable to our responsibility or which take place after warranty period, we will require payment for actual costs for repair and adjustment plus all shipping charges including actual freightage. Unfortunately, we can not bear any cost for the relative damage to be caused by the failures of our joystick controllers and foot controllers.

GENERAL NOTES

- This catalog shows all of "Sakae" present standard joystick controllers and foot controllers as of March, 2002. You are cordially invited to apply to us for careful investigations and considerations for further particulars of joystick controllers and foot controllers not listed in this catalog for your particular requirements.
- All dimensions used in this catalog are in metric system.
- The figures or values of torque and friction are mentioned under S.I. units (International Systems of Units) and if necessary to use the gravimetric units, please see the figures or values mentioned in the parentheses.
- Please do not scale all drawings given in this catalog because all drawings are arranged for easiness to read and layout.
- All numerical values on the table mentioned in this catalog are approximate numerical values.
- All details of this catalog may be subject to change without notice for timely improvements of quality or design.
- Please confirm all specifications and drawings mentioned in this catalog with our authorized selling agents or with our head office direct prior to ordering, if necessary.
- For further information, please contact our head office direct in the following address :

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E-mail : trade@sakae-tsushin. co.jp

Standard and Special Specifications Available

As special combinations are not always available, please consult us before ordering.

Specifications/Model		30JB	30JE	30JH	30JL	L30JL	40JB	40JE	50JA	L50JA	50JC	60JB	90JA	L90JA	90JB	C90J	100JB	Remarks	
Directions of Lever Operation	1-and 2-dimensional coordinate type	O	⊙	—	—	—	⊙	—	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	—		
		X	○	○	—	—	—	○	○	○	○	○	○	○	○	○	○	○	
		I	○	○	—	⊙	⊙	○	○	○	○	○	○	○	○	○	○	○	
		Q	○	⊙	—	—	—	○	⊙	○	○	○	○	○	○	○	○	⊙	
	L	—	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○	—	
	3-dimensional coordinate type	Z	—	—	—	—	—	—	—	○	○	—	—	—	—	—	⊙	—	
		T	○	—	⊙	—	—	—	—	○	○	—	○	○	—	○	⊙	—	
		R	—	—	—	—	—	—	—	○	○	—	—	—	—	—	—	—	
U		○	○	—	—	—	—	—	○	○	—	○	○	—	○	○	⊙	note 15	
Other dimensional coordinate type	S	—	—	—	—	—	—	○	○	○	—	○	○	○	○	○	—		
Spring return device		⊙	⊙	⊙	⊙	⊙	○	⊙	○	○	⊙	⊙	⊙	⊙	⊙	⊙	⊙		
Dust-proof rubber		○	○	⊙	○	○	○	○	○	○	⊙	○	⊙	⊙	⊙	⊙	⊙	⊙	note 14
Micro-switch		—	⊙ note 12	○ note 12	○ note 2	—	○ note 10	—	○ note 3	○ note 3	○ note 3	○ note 4	○ note 3	○ note 3	○ note 2	○	—	Number of switch to be mounted is subject to models.	
Digital code switch		—	—	—	—	—	⊙ note 10	—	—	—	—	—	—	—	—	—	—		
Rotary-switch		—	—	—	—	—	—	○ note 5	○ note 5	○	○	—	—	—	—	—	—		
Alteration of potentiometer's total resistance value		○	—	○	○	—	○	—	○	○	○	○	○	—	○	○	—	Standard is 10kΩ.	
Intermediate tap of potentiometer		⊙	—	—	○	—	○	—	○	○	○	○	○	—	○	○	—	Standard is current tap.(with blind zone of approx. 3°)	
Center position detecting switch		—	—	—	—	—	—	—	○ note 3	○ note 3	○ note 6	○ note 3	○ note 3	○ note 3	○ note 3	○ note 7	○	Available for 2-dimensional coordinate type only.	
Switch incorporated inside knob		○ note 12	○ note 12	—	○ note 12	—	○ note 8	○ note 8	○ note 8	○ note 8	○ note 9	○ note 8	○ note 11	○ note 11	○ note 11	⊙	—	Automatically return type.	
Rocker switch incorporated inside knob		—	—	—	—	—	—	—	—	—	—	—	○ note 11	○ note 11	○ note 11	—	—		
Sub-panel for mounting		○	○	○	○	○	○	○	○	○	○	○	○	○	○	⊙	—		
Potentiometer's "O" position adjusting mechanism		—	—	—	—	—	—	—	○	○	○	○	○	○	—	○	—		
Special knob shapes		○	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—		
Detent mechanism		—	—	—	—	—	—	—	○	○	○	—	○	○	—	○	—	Max.7 positions available in each X and Y axis. Max.5 for L50JA.	

(Note) 1. ⊙ means standard specifications ○ means special specifications and — means "not available".

2. Life expectancy : min. 100,000 operations under the ratings at 30V.D.C./100mA.

3. Life expectancy : min. 200,000 operations under the ratings at 125V.A.C./5A.

4. Life expectancy : min. 100,000 operations under the ratings at 30V.D.C./100mA.

5. No. of contacts : 3 contacts per 1 circuit, Rating 100V. A.C./200mA Life expectancy:min. 50,000 operations.

6. With 1 pc. each micro-switch for X and Y axis under series connections. Rating 30V.D.C./100mA. Life expectancy: min. 100,000 operations.

7. With 1 pc each micro-switch for X and Y axis under series connections. Rating 30V.D C./100mA. Life expectancy: min. 100,000 operations.

8. Rating 125V.A.C./3A. Life expectancy : min. 25,000 operations.

9. Rating 125V.A.C/6A.Life expectancy : min. 25,000 operations.

10. Rating 12V.D.C./1mA Life expectancy : min. 1,000,000 operations.

11. Rating 250V.A.C./10A Life expectancy : min. 300,000 operations.

12. Rating 24 V.D.C./50mA Life expectancy : 1,000,000 operations.

13. Please use to apply 0.15W or 5mA, whichever is bigger, to all switches mentioned in the above, When using the switch below the above values, there may be caused an interruption. If you require to use under such below values, please consult us before ordering.

14. We are using a rather stronger rubber material against environmental conditions as our dust-proof rubber cover and however, when you use it in an atmosphere of oil or lower temperature, please consult us before ordering. Please also note that, when changing the dust-proof rubber covers, some types of them can not change by yourselves, which means, in that case, we would kindly request you to return it to do so at our side.

15. Seesaw type potentiometer used.

16. Please consult us for other special specifications except the above-mentioned.

{ When the switch is under non-operating condition, the condition between terminals COM and NO is "ON" and when operating the condition between terminal COM and NC is "ON" . }

Special Specifications Available

Special Knob Shapes

Type 101
Push-button knob
($\varnothing 23 \times 50L$)



Fixable to type 40JB, 40JE, 50JA and 60JB (switch incorporated inside the knob)

Type 102A
Push-button knob
($\varnothing 30 \times 68L$)



Fixable to type 50JC, (switch incorporated inside the knob)

Type 103
Push-button knob
($\varnothing 16 \times 30L$)



Fixable to type 50JA, (switch mounted outside the housing)

Type 104
Push-button knob
($\varnothing 19 \times 45L$)



Fixable to type 30JB and 30JE (switch incorporated inside the knob)

Type 201
Grip-knob ($\varnothing 32 \times 55L$)



Fixable type 50JA and 50JC

Type 202
Grip-knob ($\varnothing 20 \times 37L$)



Fixable type 50JA and 60JB

(Note) There are 2 types of switches for push-button knob: Momentary type (standard) and Alternate type (special). "L" means length of knob in mm.

Type 301
Rotary-knob ($\varnothing 23 \times 55L$)



Fixable to type 50JA and 60JB

Type 302
Rotary-knob ($\varnothing 30 \times 55L$)



Fixable to type 50JA and 60JB

Type 303
Rotary-knob ($\varnothing 16 \times 30L$)



Fixable to type 50JA-ZZ with spring/return device

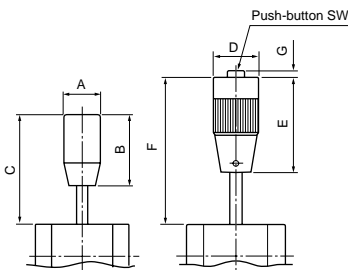
Type 304
Rotary-knob ($\varnothing 18 \times 26L$)



Fixable to type 30JB and 30JE

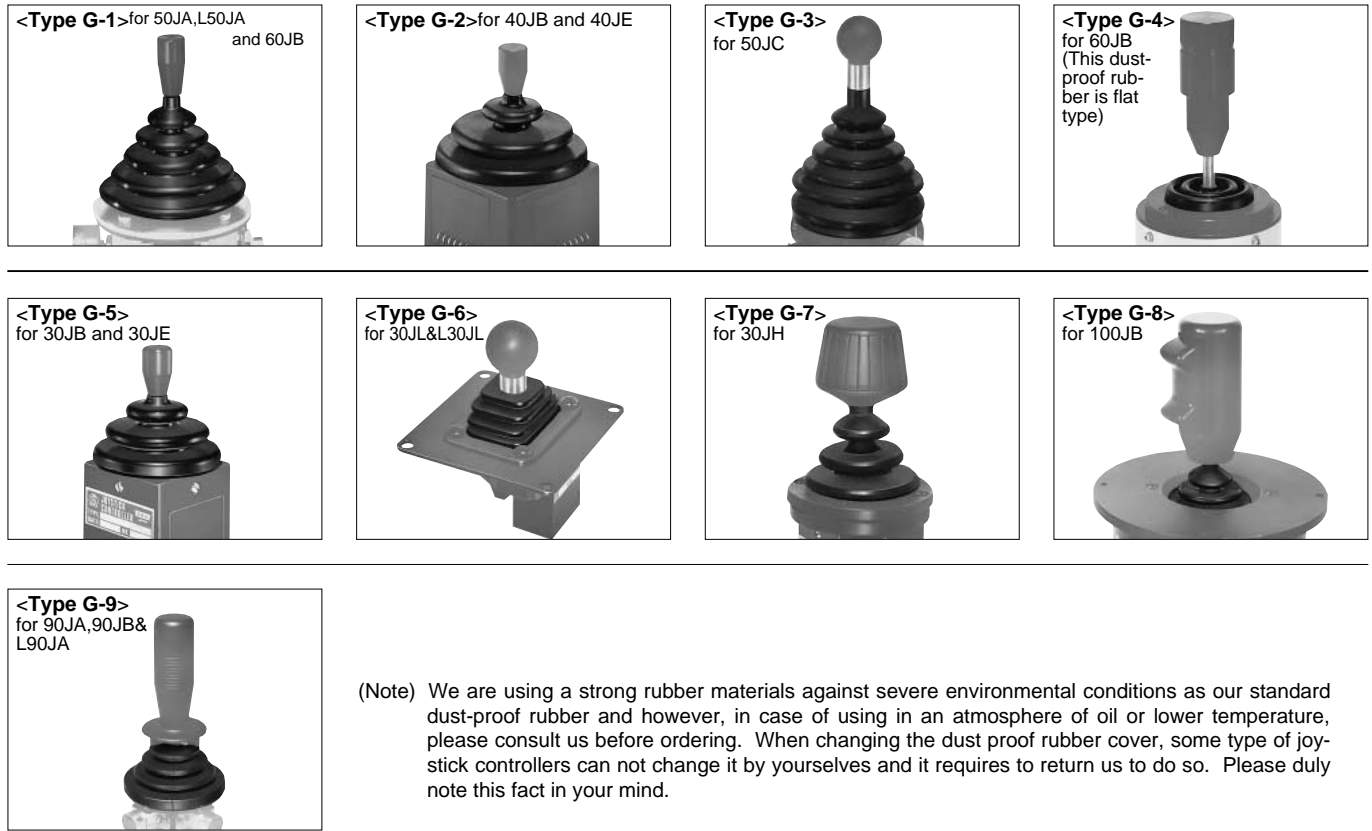
Detailed Dimensions of Special Shape Knob

Special Shape Knob	Fixable Joystick Controllers' Series										
	Dimensions	30JB, JE		40JB, JE		50JA		50JC		60JB	
		Without rubber cover	With type G5 rubber cover	Without rubber cover	With type G2 rubber cover	With rubber cover	With type G1 rubber cover	With rubber cover	Without rubber cover	With type G1 rubber cover	
Type (101)	D	—	—	$\phi 23$	$\phi 23$	$\phi 23$	$\phi 23$	—	$\phi 23$	$\phi 23$	
	E	—	—	50	50	50	50	—	50	50	
	F	—	—	Abt. 74	Abt. 74	Abt. 77	Abt. 102	—	Abt. 82	Abt. 101	
	G	—	—	Abt. 3	Abt. 3	Abt. 3	Abt. 3	—	Abt. 3	Abt. 3	
Type (102A) (with rubber cover)	D	—	—	—	—	—	—	$\phi 30$	—	—	
	E	—	—	—	—	—	—	68	—	—	
	F	—	—	—	—	—	—	Abt. 127	—	—	
Type (103)	D	—	—	—	—	$\phi 16$	$\phi 16$	—	—	—	
	E	—	—	—	—	30	30	—	—	—	
	F	—	—	—	—	Abt. 57	Abt. 83	—	—	—	
	G	—	—	—	—	Abt. 3	Abt. 3	—	—	—	
Type (104)	D	$\phi 19$	$\phi 19$	—	—	—	—	—	—	—	
	E	45	45	—	—	—	—	—	—	—	
	F	Abt. 57	Abt. 67	—	—	—	—	—	—	—	
	G	Abt. 4	Abt. 4	—	—	—	—	—	—	—	
Type (201)	A	—	—	—	—	$\phi 32$	$\phi 32$	$\phi 32$	—	—	
	B	—	—	—	—	55	55	55	—	—	
	C	—	—	—	—	Abt. 82	Abt. 106	Abt. 132	—	—	
Type (202)	A	—	—	—	—	$\phi 20$	$\phi 20$	—	$\phi 20$	$\phi 20$	
	B	—	—	—	—	37	37	—	37	37	
	C	—	—	—	—	Abt. 58	Abt. 82	—	Abt. 63	Abt. 81	
Type (301)	A	—	—	—	—	$\phi 23$	$\phi 23$	—	$\phi 23$	$\phi 23$	
	B	—	—	—	—	55	55	—	55	55	
	C	—	—	—	—	Abt. 73	Abt. 107	—	Abt. 78	Abt. 106	
Type (302)	A	—	—	—	—	$\phi 30$	$\phi 30$	—	$\phi 30$	$\phi 30$	
	B	—	—	—	—	55	55	—	55	55	
	C	—	—	—	—	Abt. 73	Abt. 107	—	Abt. 78	Abt. 106	
Type (303)	A	—	—	—	—	$\phi 16$	$\phi 16$	—	—	—	
	B	—	—	—	—	30	30	—	—	—	
	C	—	—	—	—	Abt. 57	Abt. 83	—	—	—	
Type (304)	A	$\phi 18$	$\phi 18$	—	—	—	—	—	—	—	
	B	26	26	—	—	—	—	—	—	—	
	C	Abt. 38	Abt. 48	—	—	—	—	—	—	—	



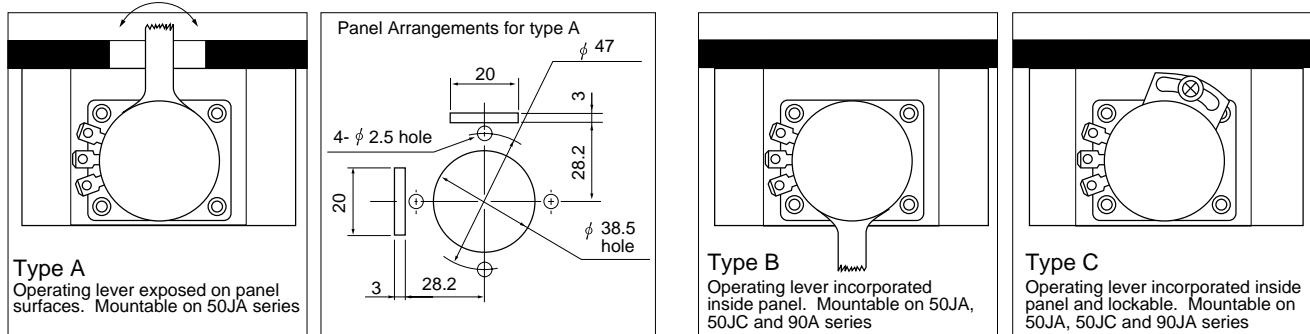
(Note) The height of above C and F shows the dimension when standard type of each model with YO, ZT and ZZ mounts such special knobs.

Dust Proof Rubber (Model 30JH, 50JC, 90JB series have a dust proof rubber as their standard version)



(Note) We are using a strong rubber materials against severe environmental conditions as our standard dust-proof rubber and however, in case of using in an atmosphere of oil or lower temperature, please consult us before ordering. When changing the dust proof rubber cover, some type of joystick controllers can not change it by yourselves and it requires to return us to do so. Please duly note this fact in your mind.

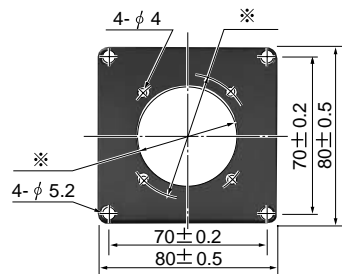
Potentiometer's "O" Position Adjusting Mechanism



(Note) In case of with dust-proof rubber cover, the dimensions shall change and please ask us the details.

Sub-panel for Mounting

It is possible to supply each type of joystick controller with this sub-panel on request. (Thickness : 2mm)



Note : 1) The dimensions of mark "※" are determined by the joystick controllers to be mounted.
 2) For mounting use of 90JA, L90JA, M90JA and 90JB, the outer dimension is $\square 100$ and inner dimension between $\phi 5.2$ hole pitch is $\square 90$.

Standard and Special Specifications Available

As special combinations are not always available, please consult us before ordering.

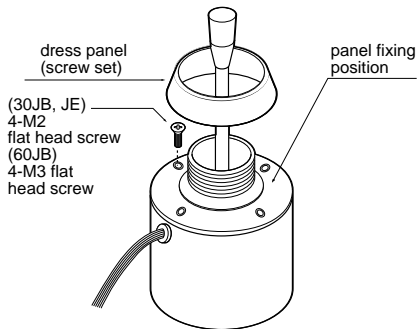
Specifications/Model		30JB	30JE	30JH	30JL	L30JL	40JB	40JE	50JA	L50JA	50JC	60JB	90JA	L90JA	90JB	C90J	100JB	Remarks	
Directions of Lever Operation	1-and 2-dimensional coordinate type	O	⊙	—	—	—	⊙	—	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	—		
		X	○	○	—	—	—	○	○	○	○	○	○	○	○	○	○	○	
		I	○	○	—	⊙	⊙	○	○	○	○	○	○	○	○	○	○	○	
		Q	○	⊙	—	—	—	○	⊙	○	○	○	○	○	○	○	○	⊙	
	3-dimensional coordinate type	L	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	
		Z	—	—	—	—	—	—	○	○	—	—	—	—	—	—	⊙	—	
		T	○	—	⊙	—	—	—	○	○	—	○	○	—	○	⊙	—	—	
		R	—	—	—	—	—	—	○	○	—	—	—	—	—	—	—	—	
Other dimensional coordinate type	U	○	○	—	—	—	—	○	○	—	○	○	—	○	○	○	⊙	note 15	
	S	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○	—		
Spring return device		⊙	⊙	⊙	⊙	⊙	○	⊙	○	○	⊙	⊙	⊙	⊙	⊙	⊙	⊙		
Dust-proof rubber		○	○	⊙	○	○	○	○	○	○	⊙	○	⊙	⊙	⊙	⊙	⊙	⊙	note 14
Micro-switch		—	⊙ note 12	○ note 12	○ note 2	—	○ note 10	—	○ note 3	○ note 3	○ note 3	○ note 4	○ note 3	○ note 3	○ note 2	○	—	Number of switch to be mounted is subject to models.	
Digital code switch		—	—	—	—	—	⊙ note 10	—	—	—	—	—	—	—	—	—	—		
Rotary-switch		—	—	—	—	—	—	○ note 5	○ note 5	○	○	—	—	—	—	—	—		
Alteration of potentiometer's total resistance value		○	—	○	○	—	○	—	○	○	○	○	○	—	○	○	—	Standard is 10kΩ.	
Intermediate tap of potentiometer		⊙	—	—	○	—	○	—	○	○	○	○	○	—	○	○	—	Standard is current tap.(with blind zone of approx. 3°)	
Center position detecting switch		—	—	—	—	—	—	○ note 3	○ note 3	○ note 6	○ note 3	○ note 3	○ note 3	○ note 3	○ note 7	○	—	Available for 2-dimensional coordinate type only.	
Switch incorporated inside knob		○ note 12	○ note 12	—	○ note 12	—	○ note 8	○ note 8	○ note 8	○ note 8	○ note 9	○ note 8	○ note 11	○ note 11	○ note 11	⊙	—	Automatically return type.	
Rocker switch incorporated inside knob		—	—	—	—	—	—	—	—	—	—	—	○ note 11	○ note 11	○ note 11	—	—		
Sub-panel for mounting		○	○	○	○	○	○	○	○	○	○	○	○	○	○	⊙	—		
Potentiometer's "O" position adjusting mechanism		—	—	—	—	—	—	—	○	○	○	○	○	○	—	○	—		
Special knob shapes		○	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—		
Detent mechanism		—	—	—	—	—	—	—	○	○	○	—	○	○	—	○	—	Max.7 positions available in each X and Y axis. Max.5 for L50JA.	

- (Note) 1. ⊙ means standard specifications ○ means special specifications and — means "not available".
2. Life expectancy : min. 100,000 operations under the ratings at 30V.D.C./100mA.
3. Life expectancy : min. 200,000 operations under the ratings at 125V.A.C./5A.
4. Life expectancy : min. 100,000 operations under the ratings at 30V.D.C./100mA.
5. No. of contacts : 3 contacts per 1 circuit, Rating 100V. A.C./200mA Life expectancy: min. 50,000 operations.
6. With 1 pc. each micro-switch for X and Y axis under series connections. Rating 30V.D.C./100mA. Life expectancy: min. 100,000 operations.
7. With 1 pc each micro-switch for X and Y axis under series connections. Rating 30V.D C./100mA. Life expectancy: min. 100,000 operations.
8. Rating 125V.A.C./3A. Life expectancy : min. 25,000 operations.
9. Rating 125V.A.C/6A. Life expectancy : min. 25,000 operations.
10. Rating 12V.D.C./1mA Life expectancy : min. 1,000,000 operations.
11. Rating 250V.A.C./10A Life expectancy : min. 300,000 operations.
12. Rating 24 V.D.C./50mA Life expectancy : 1,000,000 operations.
13. Please use to apply 0.15W or 5mA, whichever is bigger, to all switches mentioned in the above, When using the switch below the above values, there may be caused an interruption. If you require to use under such below values, please consult us before ordering.
14. We are using a rather stronger rubber material against environmental conditions as our dust-proof rubber cover and however, when you use it in an atmosphere of oil or lower temperature, please consult us before ordering. Please also note that, when changing the dust-proof rubber covers, some types of them can not change by yourselves, which means, in that case, we would kindly request you to return it to do so at our side.
15. Seesaw type potentiometer used.
16. Please consult us for other special specifications except the above-mentioned.

{ When the switch is under non-operating condition, the condition between terminals COM and NO is "ON" and when operating the condition between terminal COM and NC is "ON" . }

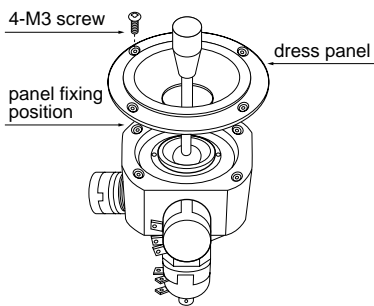
MOUNTING METHOD OF OUR JOYSTICK CONTROLLERS (How to mount each type of joystick controllers)

●Type 30JB, 30JE&60JB



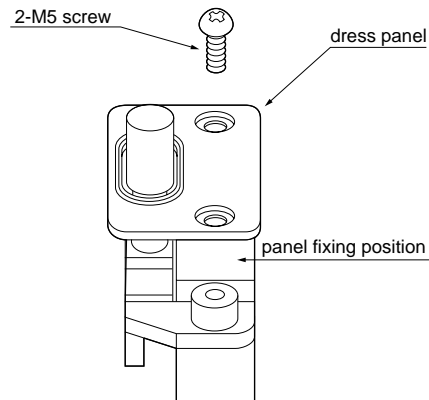
- ① Remove dress panel (screw set) and then remove 4 screws from the body.
- ② Put the panel of your set to the position shown on the sketch and secure it with 4 screws.
- ③ Fix the dress panel.

●Type 50JA&L50JA



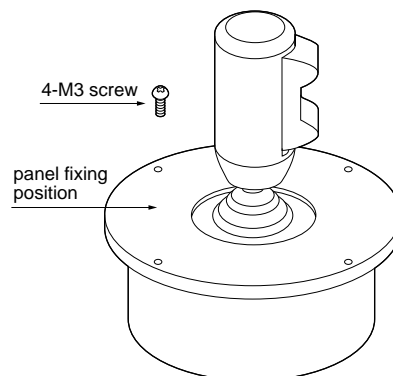
- ① Remove 4 screws from the body.
- ② Put the panel of your set to the position shown on the above sketch.
- ③ Secure the dress panel with 4 screws.

●Type 30JL&L30JL



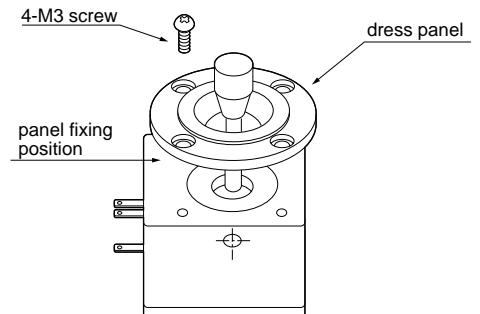
- ① Remove 2 screws from the dress panel.
- ② Put the panel of your set to the position shown on the above sketch.
- ③ Secure the dress panel with 2 screws.

●Type 100JB



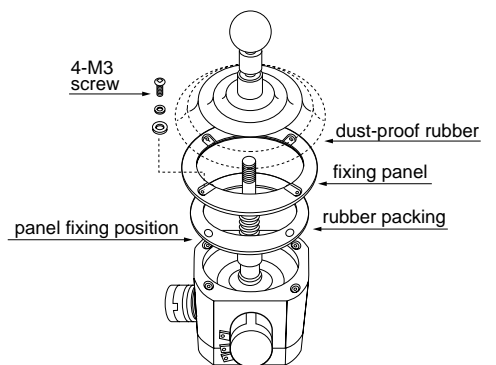
- ① Put the rear of your panel to the position shown on the above sketch.
- ② Secure with 4 screws attached.

●Type 40JB&40JE



- ① Remove 4 screws from the dress panel.
- ② Put the panel of your set to the position shown on the above sketch.
- ③ Secure the dress panel with 4 screws.

●Type 30JH,50JC,90JA,90JB&L90JA



- ① Turn up the dust-proof rubber and there appears fixing panel.
- ② Remove 4 screws from the fixing panel and then remove rubber packing.
- ③ Put the panel of your set to the position shown on the sketch and assemble the parts by opposite steps of above-mentioned procedure.

Specially Ordered Joysticks

Sakae Joystick controllers can be supplied with various special specifications according to customers' request and the followings are a part of such special models. Multi-dimensional coordinate operating types other than 3-dimensional coordinate are available on request.



S50JAK-ZT-31R3P
Knob part for operating Z axis with a built-in linear-motion potentiometer and with a push-button switch.



S30JLK-XI -11R1GP
With special "T" shape knob with a push-button switch.



S50JAK-ZR-06R3GP
Special knob for operating Z axis with 2 micro-switches and a push-button switch.



S65JHM-ZS-30R3P
Round shape knob can only operate on Z axis.



S90JAM-YO-24R2GP
Round shape knob with 2 push-button switches.



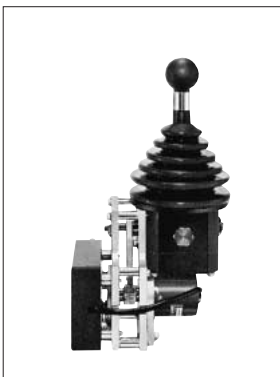
S50JAK-YO-09R2G
With push-button switch, encoders and gray colored rubber cover.



S90JAM-ZZ-36R3G
With a linear-motion potentiometer for Z axis and special knob with 7 push-button switches.



S50JAK-ZZ-30GP
Seesaw knob used for operating Z axis. The knob is processed with a solid plastic material.



S50JCK-XI-09G
With an encoder as well as over-drive gears.



S90JAM-YX-24R2G
With over-drive gears together with potentiometers.



S90JBM-YO-24R2GP
2 axes control. With 4 push-button switches in the hand grip.



S150 JNK-YS-40
Special operations by special shaped lever.