

INSTRUCTION MANUAL

ITEM NO.: ST-TAIP030(50)(51)(70)
FOLDED POSITION CONTROL TORQUE
REACTION ARM



ST-TAIP030(50)(51)(70)-I-2402A-YM

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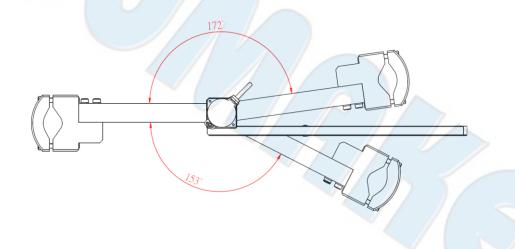
I. Introduction

ST-TAIP030(50)(51)(70) Position Control Torque Reaction Arm enhance capacity to tighten screws sequentially according to position and requirement of work-piece.

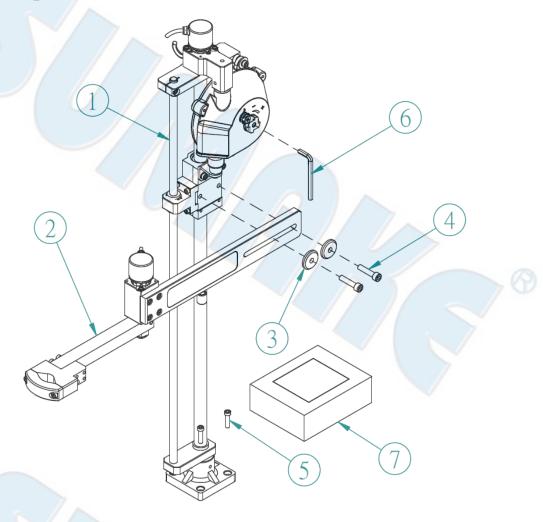
Applied to integrate with electric screwdriver (W/ signal controller) and servo screwdriver. To absorb the reaction force of driver also preventing missing tighten-stripping. Improve the quality of working.

II. Feature

- 1. It can be set by the user's demand to set screw tighten positions and sequences.
- 2. The system can't do next job if any missing screwing of first working. The system will warn if any screwing fault.
- 3. To absorb the reaction force of screwdriver.
- 4. The operator can move screwdriver easily where wants and stop at specific height.
- 5. To increase the torque setting stability.
- 6. The mechanism ensure working angle is 90 degrees with workpiece, which can prevent the screw stripping when working. The whole spindle can swivel 360° and front arm can swivel around 325° for horizontal direction.



III. Item inspections



Comparison

	Description	Q'TY	Remark
01	Position control torque reaction arm	1SET	
02	Arm set	1 SET	
03	Washer	2 PCS	Attached
04	Screw INCL. spring washer	2 PCS	Attached
05	Screw M6*25	4 PCS	Accessories
06	6mm allen key	1 PCS	bag
07	Control box set (INCL. connector 16Pin *1	1 PCS	
07	10Pin*1)	0 1	

NOTE: unit display: mm / kg / ms / ppr/ °C / V / A / kgf-cm²(Nm)



IV. Safety precautions

Follow instructions depicted in the manual and operate the machine correctly.

< Be sure to follow the instructions >

1. Warning sign:



[Prohibition Sign], it will occur personal injury or product damaged if didn't follow instruction.



[Alarm Sign] Damage of properties, or injury of personal may occur if not observed.

2. Safety information:



Follow instructions depicted in the manual and operate the machine correctly.



DO NOT let contaminants such as water or oil enter into the machine.



DO NOT dismantle or modification.



Keep hand away from institutional movements, range of movement when working.



Please adjust the spring tension against weight of suspend tool.



Please maintain and clean the component regularly.

NOTE: The torque value requirement depends on different screw size.(kgf- cm²): *** M3-6.5 / M4-13 / M5-27 / M6-45 / M8-110 / M10-220 ***

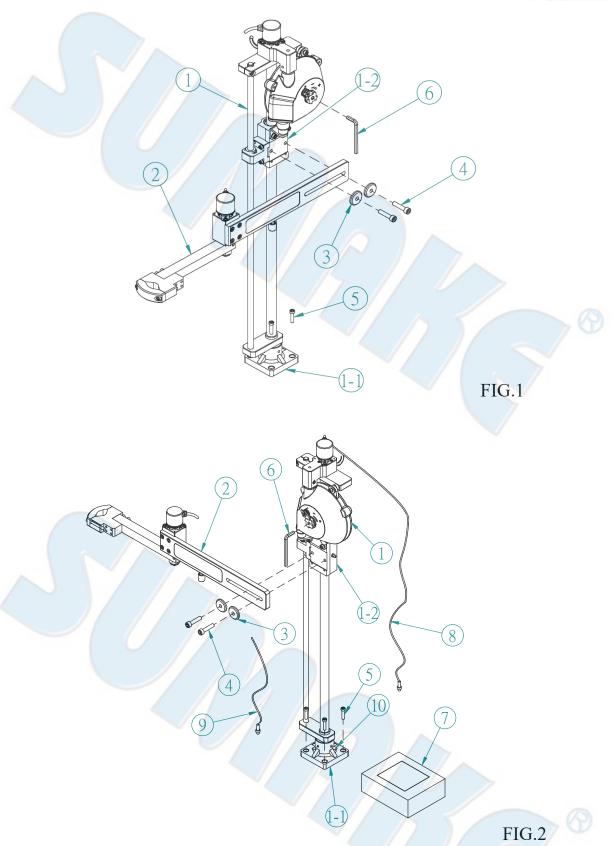
V. Description

- 1. Assembly: please follow the steps below to take out the product.
 - 1. instruction manual 2.upper cover 3.arm set (#2) 4.accessories bag 5.internal EPE Please follow the steps below to assemble (refer to FIG.):
- (A). Take out the positioning torque arm (#1) and 4 M6*25 (#5) screws. Install the base (#1-1) on a stable work table. (Table thickness over 20mm) refer to FIG. 1
- (B). Install the arm set (#2) horizontally on the linear bearing set groove of the position torque control arm (#1-2) (please note label must be outward).

 Insert 2 screws(#4), spring washer, washer(#3) and tighten.

 NOTE: The arm set must install groove of linear bearing set (#1-2) correctly, refer to FIG.2
- (C). Please insert 6mm allen key to spring balancer and adjust the spring tension. Please refer to P-11.
- (D). Take out the control box set (#7) and install on proper location.
- (E).Please insert "4 PIN" (#8) connector to control box set (#7) "Encoder" (R1) and tighten. Please insert "5 PIN" (#9) connector to control box set(#7) "Encoder" (R2) and tighten.
- (F). Please connect power cord (#10), control box set (#7) to correct voltage and turn power on.

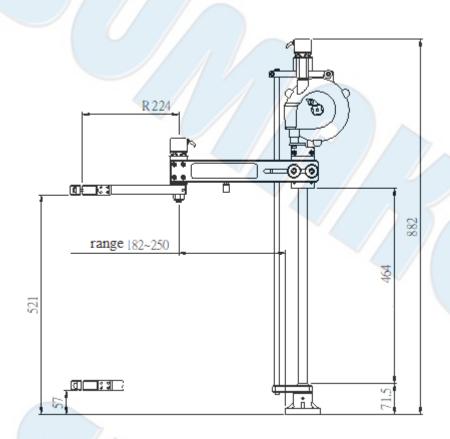


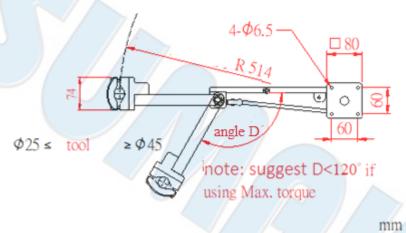


Refer to Page 4 for Component name; refer to Page 12 for spring tension adjustment.

2. Dimension:

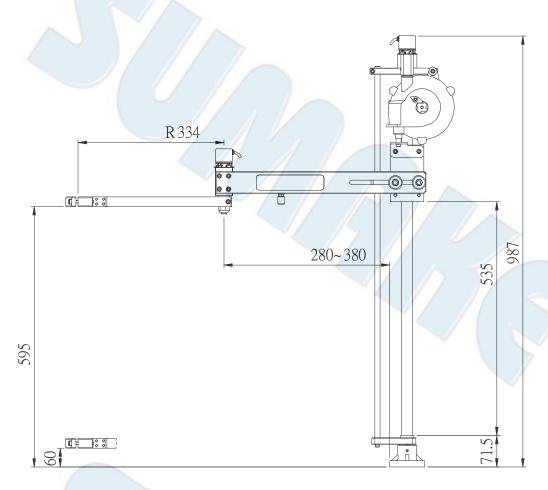
♦ Model : ST-TAIP030

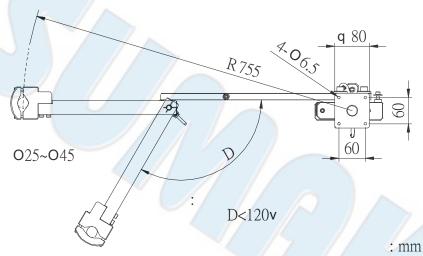




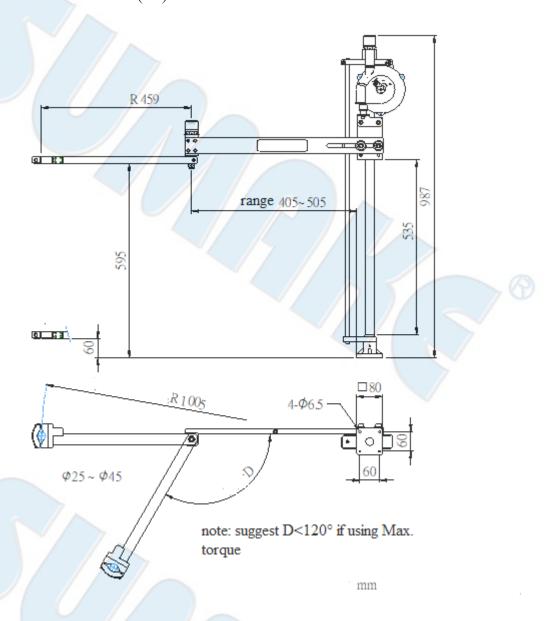


♦ Model: ST-TAIP050





♦ Model: ST-TAIP051(70)



2. Working environment:

	Model NO.	ST-TAIP030	ST-TAIP050	ST-TAIP051(70)	
	Weight(N.W)	Approx.7.8kg	Approx.10.9kg	Approx.11.4kg	
	Max. torque	150kgf-cm(14.7Nm)	250kgf-cm(24.5Nm)	250kgf-cm(24.5Nm)	
Spec.	area	Indoor			
	voltage	100-240V AC			
	temperature	(g)		
	humidity	2	0%~90% (NO freezing	g)	



VI. Installation

1. Installation instruction :

- ♦ ST-TAIP030(50)(51)(70) Please install the screwdriver to front clamp by arrow direction (FIG.3) and tighten by M6*50 2 PCS screw.
 - (1). Please ensure if A. the arm set is at the lowest point, B. if the spring balancer release spring tension. Check if cable soft or curved. if spring tension is not released, please refer to spring tension adjustment for "weaken" by Page 12.
 - (2). Please refer to FIG. 3 to assemble Front clamp and Rear clamp by M6*50 2pcs screw. The available clamp diameter is $\emptyset 25 \sim \emptyset$ 45. Please tighten 2pcs M6 screws evenly (thread tighten>12mm) by proper torque.
 - (3). Please adjust the spring balancer tension by "spring tension adjustment" (P12) after installing the screwdriver.
 - (4). Please must check for point 1 include A&B to install or exchange tool. Or the arm set will rebound strongly if spring tension didn't match. And may cause personal injury.

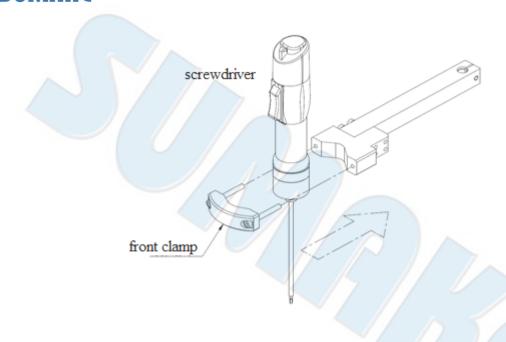
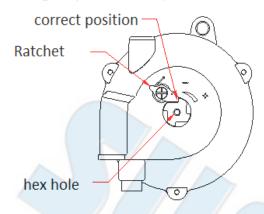


FIG. 3

3. Spring tension adjustment:



The operator needs hold spring balancer by one hand, the other hand hold 6mm allen key to insert hex hole completely and carefully.

- increase spring tension: Turn the allen key to clockwise to adjust scale by scale.
- weaken spring tension: one hand hole spring balancer and one thumb push ratchet (NOTE: the allen key need turn hex hole clockwise to release rachet before pushing.)
- → and hold allen key carefully to turn counter-clockwise scale by scale then fixed by



NOTE: When weaken the spring tension, the allen key must inset at Six o'clock direction. And pull out after turning 90° (accordance quarter scale). Adjust over will cause personal injury.



NOTE: Make sure the rachet is fixed after adjusting.

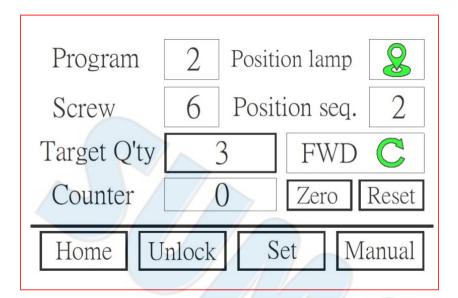


VII. Operation

Language option:
 Click "English" for English version.



2. Home page: front page keep 2s (or touch screen) → home page (last setting)

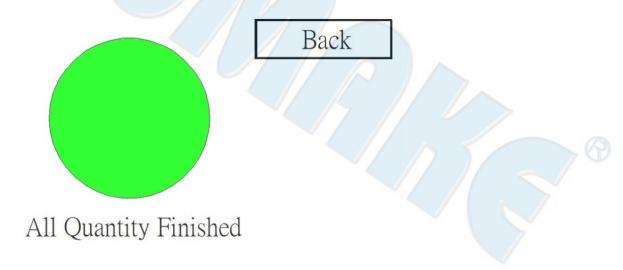


- 2-1 Program: program NO.
- 2-2. Screw: screw count No. of program.
- 2-3. Target Q'ty: To set the quantity of each batch. There is password control (can be OFF)
 - 2-3-1. The password disk will display after touching. Please enter password to change setting.
 - 2-3-2. The digital disk will display after entering correct password(can be OFF), please enter the required Q'TY by value range 1~Max. 60,000.

2-4. Counter: finished product counting, the "All Quantity Finished" display (sound, see FIG.6) after the number of product reach target Q'TY.

Please click "Back" to home page and reset to be "zero" by entering password (can be OFF).

Please note the number will be returned to zero after turning power off and turn on again.



- 2-5.Position lamp: It displays green light and a short sound if the screwdriver move to correct position (FIG.5) and approve to working. If NO display, the screwdriver won't be able to working.
- 2-6. Position seq.: Indicated the product number after reaching setting number of screw. The number will remain "1" after turning off the power and turning on again.
- 2-7. electric screwdriver: the text of forward and clockwise arrow (green light) display when screwdriver trigger by forward. the text of reverse and counter-clockwise (orange light) display when screwdriver

trigger by reverse. (if screwdriver has no reverse signal output function, the screen will only display for forward.)

2-8 Reset: If system take OK sign but judge by operator for NG, click the mandatory "reset" and enter password (available to set OFF)

The 2-6 will jump automatically to "1", the work-piece must be removed and update, and then start to work.

NOTE: Please click "Reset" if the working sequence is the last.

The finished product Q'TY count can not reply. (refer to 2-6 Position seq.)



3. Unlock: Please enter the password after clicking. (available to set OFF, refer to FIG.7). The screwdriver can work freely.

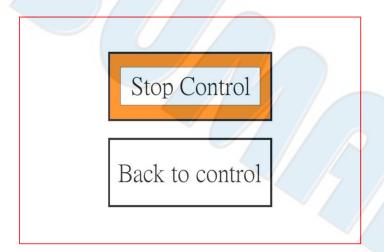


FIG.7

4. Set: Click "Set" to enter password(can be OFF) and the main setting page display (see FIG.8) and the setting instructions are as below.

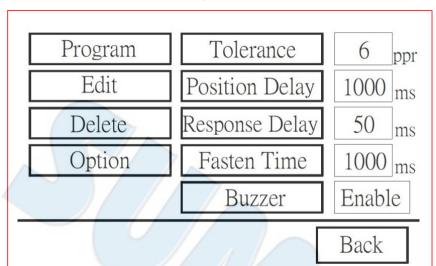
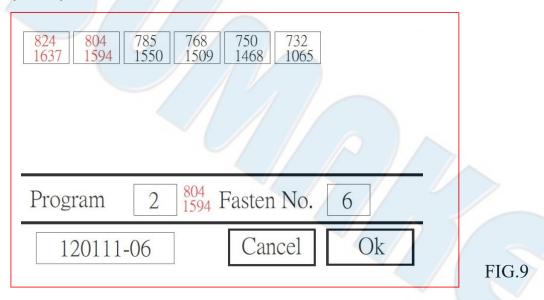


FIG.8

4-1. Program: Click "Program", and the screen will display the current setting, the coordinated point teaching from left to right, the description is as below (FIG.9)



- 4-1-1 first teaching: Move the screwdriver to the holes position of the work-piece by sequence (refer to check coordinate guide). The coordinate frame will display red and white if position is correct. And click "confirm" for affirm screwing position. Then jump to home page.
- 4-2 file edit: Please select "file editing" switching to selection page.

There are then file number per page, and total 3 pages include 30 set file numbers for memory storage.

Please note to install the work-piece on fixture and ensure fix by stable table.

- , also make sure base of torque arm relative position with fixture is same before editing.
- 4-2-1 Click the file number to edit. If you want to edit file name of 02, please click 02 and screen will appear to edit. (FIG.10)



-	File: 2			120	0111-	06		X
A	В	C	D	Е	F	G	Н	Ι
J	K	L	M	N	O	Р	Q	R
S	Т	U	V	W	X	Y	Z	0
1	2	3	4	5	6	7	8	9
_	~	/	*	(<<	O	K

FIG.10

Using the keyboard to edit (Max. 9 code), press OK button after set new name and jump to home page.

4-2-2. Please click "Start" to set the hole position, and the window will display as shown in FIG. 11), you can start to set the position and sequence.

Please note the Edit posit is next sequence.

The BIT must be placed above hole position and click read to set first hole position.

Set according to the above steps, and click "Back" and "Save" after finishing.

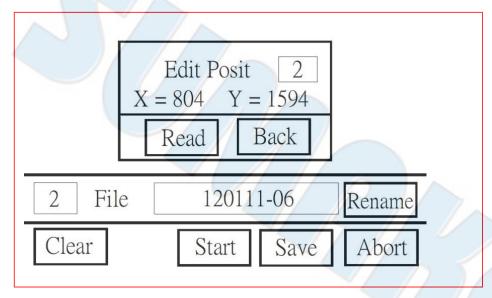


FIG.11

4-3. Cancel:

The saved file will display after clicking, select the file number needs to cancel and select "YES" as shown in FIG. 12)

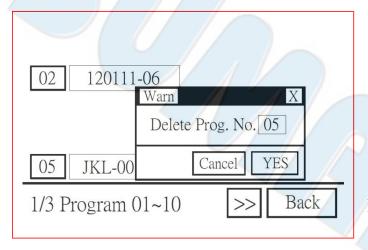


FIG.12

4-4. Password edit:

The screen (as shown in FIG. 13) display after clicking which is divided into NG password, Supervisor, Counter, Administrator, Job reset password.

Please click the require items to change 4-digit password by 0000~9999 and enter "OK" to home page.

Click ON or OFF the password.

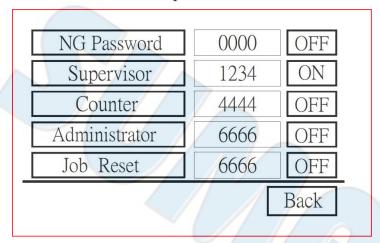


FIG.13

4-5 Positioning tolerance: It can set allowable tolerance divided into 2,4,6,8,10 PPR-five cycles selection press. Recommend to set 4 or 6 (refer to P.15 FIG.8) NOTE: Encoder is 4096 PPR per circle. For example: working radius R=400mm setting 4 PPR, tolerance 2.5mm.



4-6 positioning delay: the waiting time after screwdriver positioning. From 100 to 1000(ms), per 100 is one division. Total 10 division are available to choose. Recommend to use 200ms.

NOTE: $1 \sec = 1000 \text{ ms.}$

4-7 Tighten delay: the delay time after positioning divided into 50, 100, 200, 400, 800 (ms), five-stage cycle selection. Recommended to set 200ms.

4-8 tighten time:

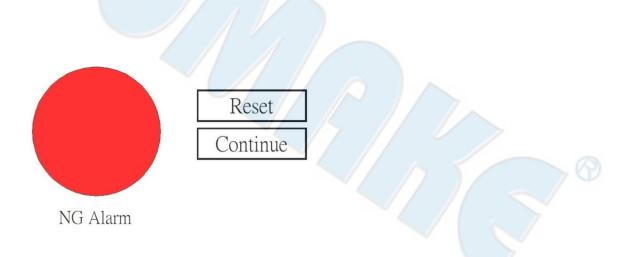
Divided into $0 \cdot 1000 \cdot 2000 \cdot 3000 \cdot 4000 \cdot 5000 \cdot 6000 \cdot 7000 \cdot 8000$ (ms), choose depends on screw tighten time.

4-8-1 The controller detects "NG" and stop counting if the tighten time is exceeds the set time. And screwdriver can't work.

Please enter password to release. (FIG.15)

4-8-2 Click "Reset": The position control torque reaction arm return to Seq.1. The workpiece must be replaced or remove all the screws that have been finished on workpiece, and then start the assembly.

4-8-3 Click "Continue": The current abnormal screw cab be removed first and continue to assembly.



4-8-4 Please set tighten time to be "0" if using servo screwdriver. The detection and alarm signal offer from servo screwdriver.

4-9 Buzzer:

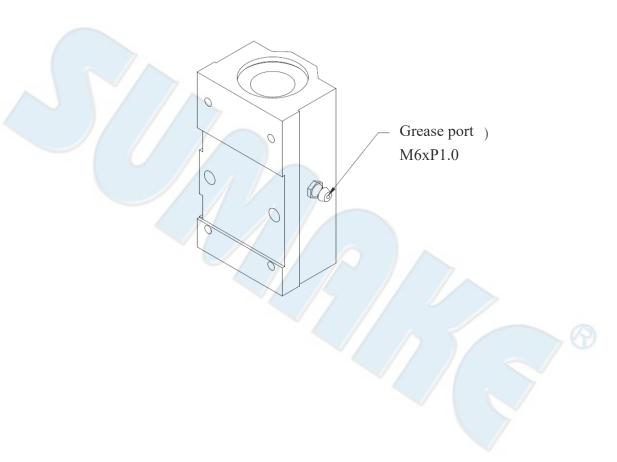
When it is set to "OFF", there will be no sound prompt when the screw positioning is done with screwing finished.

VIII. Maintenance

To make sure the component of Torque Reaction Arm is durable, please clean and lubricate it weekly.

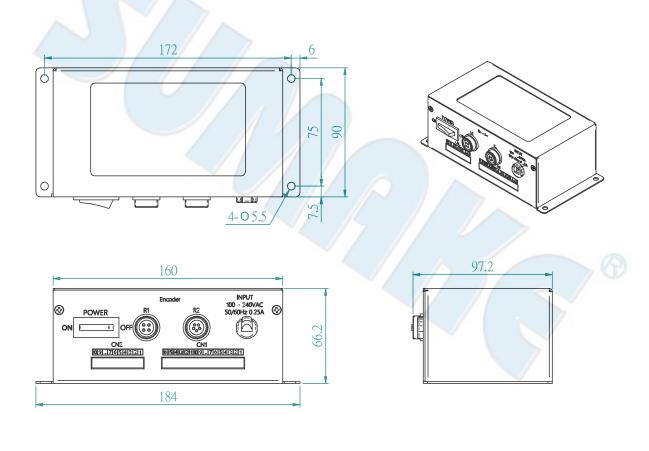
- 1. Daily maintenance:
 - Please clean and wipe the surface of the sliding spindle frequently and lubricate with clean by protection oil (WD-40 or similar oil).
- 2. Weekly maintenance: remove dust from the exterior components, linear axis fill the grease for lubricating purpose. (as shown in the picture).

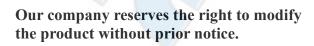
If the operating environment with frequent or severe, please shorten the maintenance of the time.



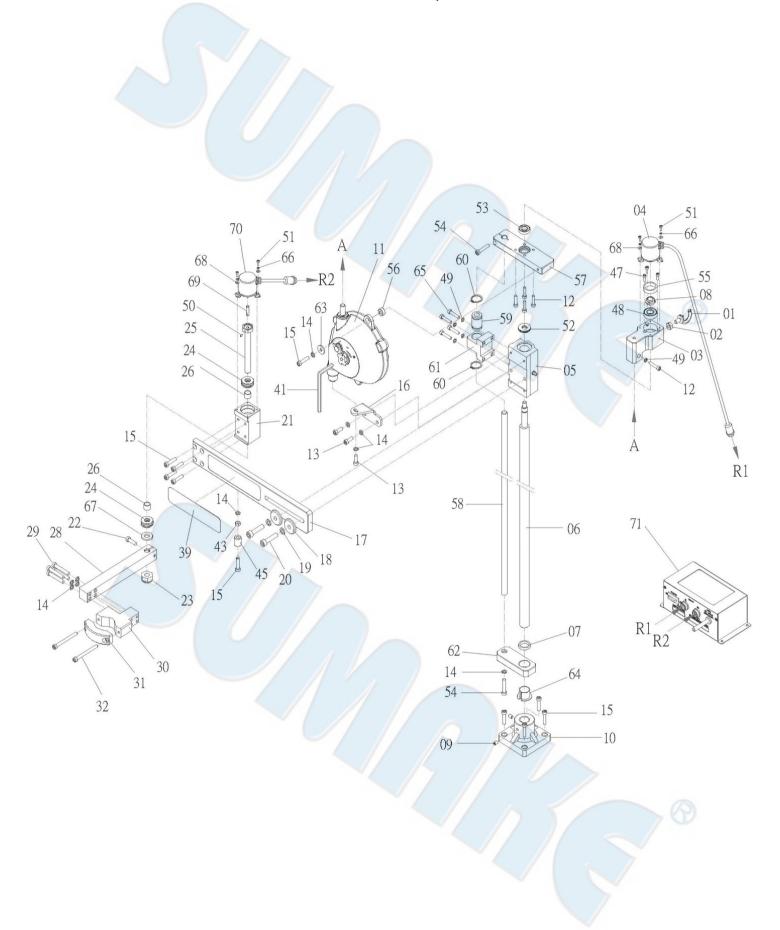


CL-A2 control box set dimension





ST-TAIP030 FOLDED POSITION CONTROL TORQUE REACTION ARM



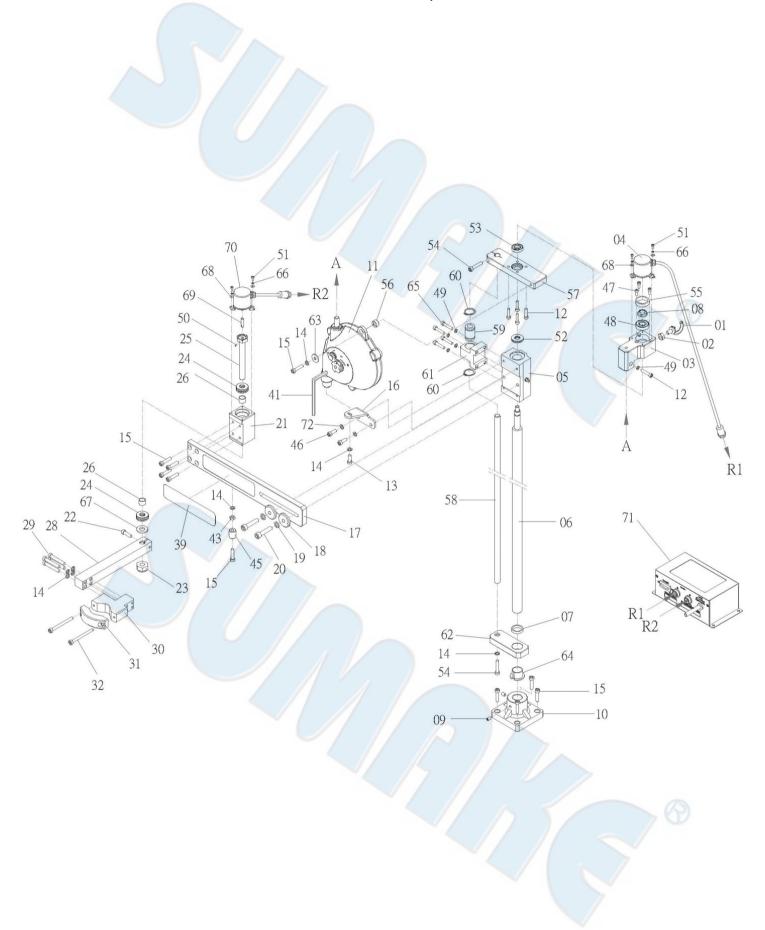
ST-TAIP030 FOLDED POSITION CONTROL TORQUE REACTION ARM

PARTS LIST

No.	Parts No.	Description	Q'ty
1	TA300-003	Screw	1
2	NT080	Nut	1/
3	350A2-003	Hanger	1
4	350A2-004-AS	Encoder Set R1 (4Pin Connector)	1
5	350A2-005	Linear Bearing	1
6	350A2-006	Spindle	1
7	TA300-029	Spindle Pad	1
8	NT120E	Nut	1
9	SWN2001	Set Screw	2
10	TA300-007	Base Plate	1
11	SB3KTA	Spring Balancer	1
12	SWR2012	Screw	5
13	SWR2005	Screw	3
14	WRS060	Spring Washer	9
15	SWR2018	Screw	10
16	350A2-016	Board	1
17	350A2-017	Rear Arm	1
18	WR080C	Washer	2
19	WRS080	Spring Washer	2
20	SWR2052	Screw	2
21	350A2-021	Connect Block	1
22	SWR2002	Screw	1
23	NT1/2	Nut	1 /
24	BG002	Bearing	2
25	350A2-025	Spindle	1
26	OH222	Bushing	2
28	350A2-028	Front Arm	1
29	SWR2058	Screw	4
30	TR350-030	Rear Fixture (Opt.)	1
31	TR350-031	Front Fixture (Opt.)	1

No.	Parts No.	Description	Q'ty
32	SWR2086	Screw	2
39		Label	1
41	SK6	Allen Key 6m/M	1
43	NT060	Nut	2
47	SWR2010	Screw	7
48	BG028	Bearing	1
49	WRS050	Spring Washer	5
50	SWN2012	Set Screw	2
51	SWR2024	Screw	4
52	BG043	Bearing	1
53	BG6901	Bearing	1
54	SWR2039	Screw	2
55	350A2-055	Plug	1
56	350A2-056	Block	1
57	350A2-057	Upper Fixed Board	1
58	350A2-058	Slide Spindle	1
59	BG047	Linear Bearing	1
60	RRCS210	C Snap	2
61	350A2-061	Internal Sliding Seat	1
62	350A2-062	Lower Fixed Plate	1
63	WR060A	Washer	1
64	OH223	Bushing	1
65	SWR2031	Screw	4
66	WRS030	Spring Washer	4
67	350A2-067	Pad Of Connect Block	1
68	WR030B	Washer	4
69	350A2-069	Pin Of Connect Block	1
70	350A2-070-AS	Encoder Set R2 (5Pin Connector)	1
71	CL-A2	Control Box Set (Opt.)	1

ST-TAIP050 FOLDED POSITION CONTROL TORQUE REACTION ARM



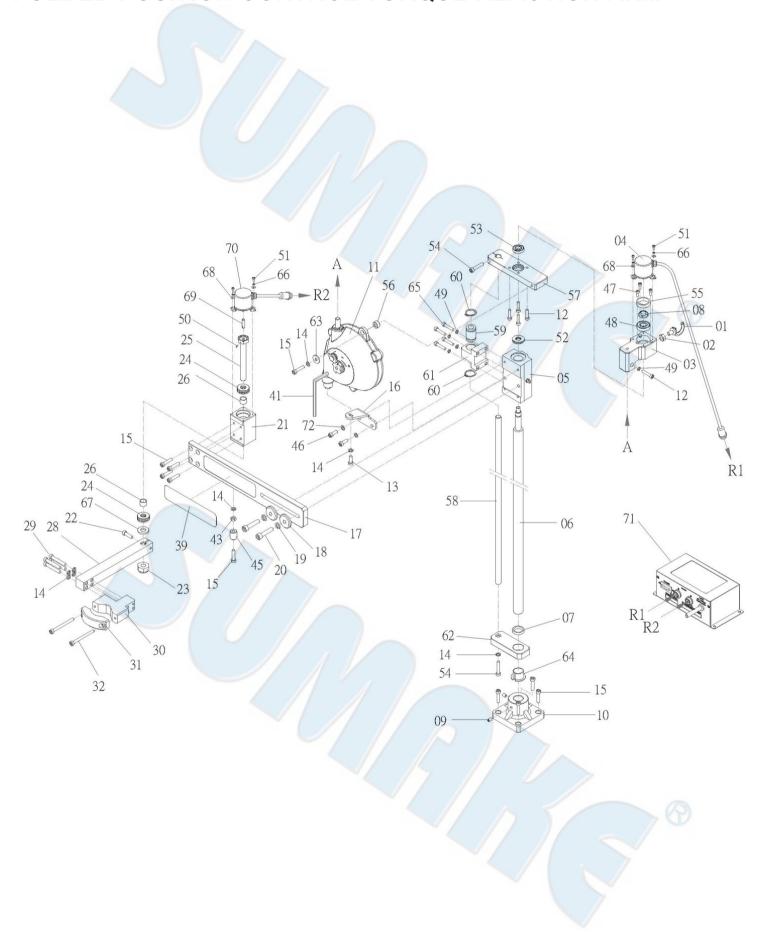
ST-TAIP050 FOLDED POSITION CONTROL TORQUE REACTION ARM

PARTS LIST

No.	Parts No.	Description	Q'ty
1	TA300-003	Screw	1
2	NT080	Nut	1/
3	350A2-003	Hanger	1
4	350A2-004-AS	Encoder Set R1 (4Pin Connector)	1
5	650A2-005	Linear Bearing	1
6	650A2-006	Spindle	1
7	TA600-007	Spindle Pad	1
8	NT120E	Nut	1
9	SWN2001	Set Screw	2
10	TA600-009	Base Plate	1
11	SB5KTA	Spring Balancer	1
12	SWR2012	Screw	5
13	SWR2005	Screw	1
14	WRS060	Spring Washer	8
15	SWR2018	Screw	9
16	650A2-016	Board	1
17	650A2-017	Rear Arm	1
18	WR100A	Washer	2
19	WRS100	Spring Washer	2
20	SWR2075	Screw	2
21	350A2-021	Connect Block	1
22	SWR2002	Screw	1
23	NT1/2	Nut	1 /
24	BG002	Bearing	2
25	350A2-025	Spindle	1
26	OH222	Bushing	2
28	650A2-028	Front Arm	1
29	SWR2058	Screw	4
30	TR350-030	Rear Fixture (Opt.)	1
31	TR350-031	Front Fixture (Opt.)	1

No.	Parts No.	Description	Q'ty
32	SWR2086	Screw (Opt.)	2
39		Label	1
41	SK6	Allen Key 6m/M	1
43	NT060	Nut	1
46	SWR2043	Screw	2
47	SWR2010	Bearing	7
48	BG028	Spring Washer	1
49	WRS050	Allen Key 6m/M	5
50	SWN2012	Set Screw	2
51	SWR2024	Screw	4
52	BG043	Bearing	1
53	BG6901	Bearing	1
54	SWR2039	Screw	2
55	350A2-055	Plug	1
56	350A2-056	Block	1
57	650A2-057	Upper Fixed Board	1
58	650A2-058	Slide Spindle	1
59	BG047	Linear Bearing	1
60	RRCS210	C Snap	2
61	350A2-061	Internal Sliding Seat	1
62	650A2-062	Lower Fixed Plate	1
63	WR060A	Washer	1
64	OH224	Bushing	1
65	SWR2031	Screw	4
66	WRS030	Spring Washer	4
67	350A2-067	Pad Of Connect Block	1
68	WR030B	Washer	4
69	350A2-069	Pin Of Connect Block	1
70	350A2-070-AS	Encoder Set R2 (5Pin Connector)	1
71	CL-A2	Control Box Set (Opt.)	1

ST-TAIP051(70) FOLDED POSITION CONTROL TORQUE REACTION ARM



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PARTS LIST

No.	Parts No.	Description	Q'ty
1	TA300-003	Screw	1
2	NT080	Nut	1/
3	350A2-003	Hanger	1
4	350A2-004-AS	Encoder Set R1 (4Pin Connector)	1
5	650A2-005	Linear Bearing	1
6	650A2-006	Spindle	1
7	TA600-007	Spindle Pad	1
8	NT120E	Nut	1
9	SWN2001	Set Screw	2
10	TA600-009	Base Plate	1
11	SB5KTA	Spring Balancer	1
12	SWR2012	Screw	5
13	SWR2005	Screw	1
14	WRS060	Spring Washer	8
15	SWR2018	Screw	8
16	650A2-016	Board	1
17	900A2-017	Rear Arm	1
18	WR100A	Washer	2
19	WRS100	Spring Washer	2
20	SWR2075	Screw	2
21	350A2-021	Connect Block	1
22	SWR2002	Screw	/1
23	NT1/2	Nut	1 //
24	BG002	Bearing	2
25	350A2-025	Spindle	1
26	OH222	Bushing	2
28	900A2-028	Front Arm	1
29	SWR2058	Screw	4
30	TR350-030	Rear Fixture (Opt.)	1
31	TR350-031	Front Fixture (Opt.)	1

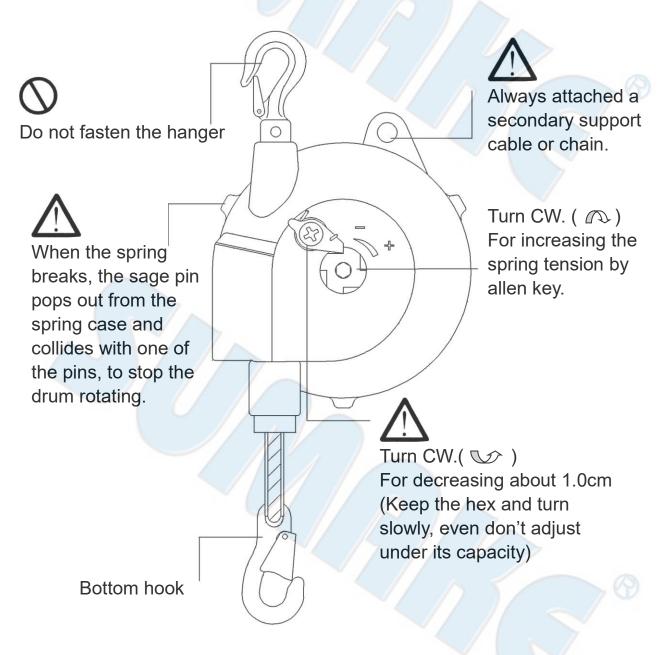
No.	Parts No.	Description	Q'ty
32	SWR2086	Screw (Opt.)	2
39		Label	1
41	SK6	Allen Key 6m/M	1
43	NT060	Nut	1
46	SWR2043	Screw	2
47	SWR2010	Bearing	3
48	BG028	Spring Washer	1
49	WRS050	Set Screw	5
50	SWN2012	Screw	2
51	SWR2024	Bearing	4
52	BG043	Bearing	1
53	BG6901	Screw	1
54	SWR2039	Plug	2
55	350A2-055	Block	1
56	350A2-056	Upper Fixed Board	1
57	650A2-057	Slide Spindle	1
58	650A2-058	Linear Bearing	1
59	BG047	C Snap	1
60	RRCS210	Internal Sliding Seat	2
61	350A2-061	Lower Fixed Plate	1
62	650A2-062	Washer	1
63	WR060A	Bushing	1
64	OH224	Screw	1
65	SWR2031	Spring Washer	4
66	WRS030	Pad Of Connect Block	4
67	350A2-067	Washer	1
68	WR030B	Pin Of Connect Block	4
69	350A2-069	Encoder Set R2 (5Pin Connector)	1
70	350A2-070-AS	Encoder Set R2 (5Pin Connector)	1
71	CL-A2	Control Box Set (Opt.)	1



Operation Manual

SA-22030, SA-22050, SA-22070

Read this manual before use



⚠Caution

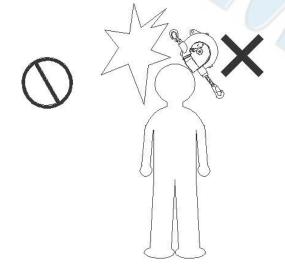
⊘Prohibition



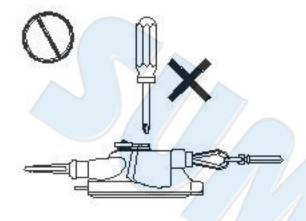


Incorrect use of the spring balancer could cause personal injury.

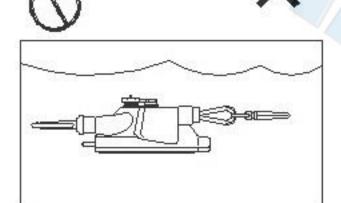
Observe instruction in the manual and use the balancer correctly.



Never stand under the spring balancer.

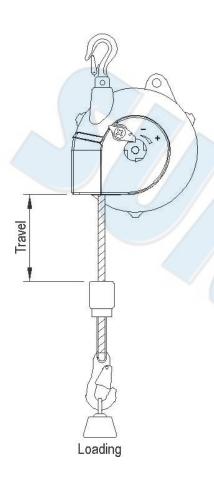


Prohibition of disassembly.



Never put the spring balancer in fluid.





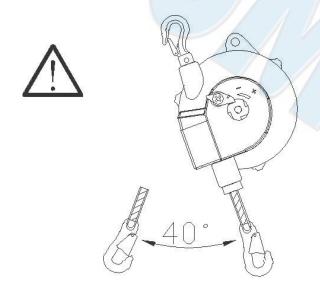
Don't twist and rub the cordage with cable during travel.

Don't load over its capacity.

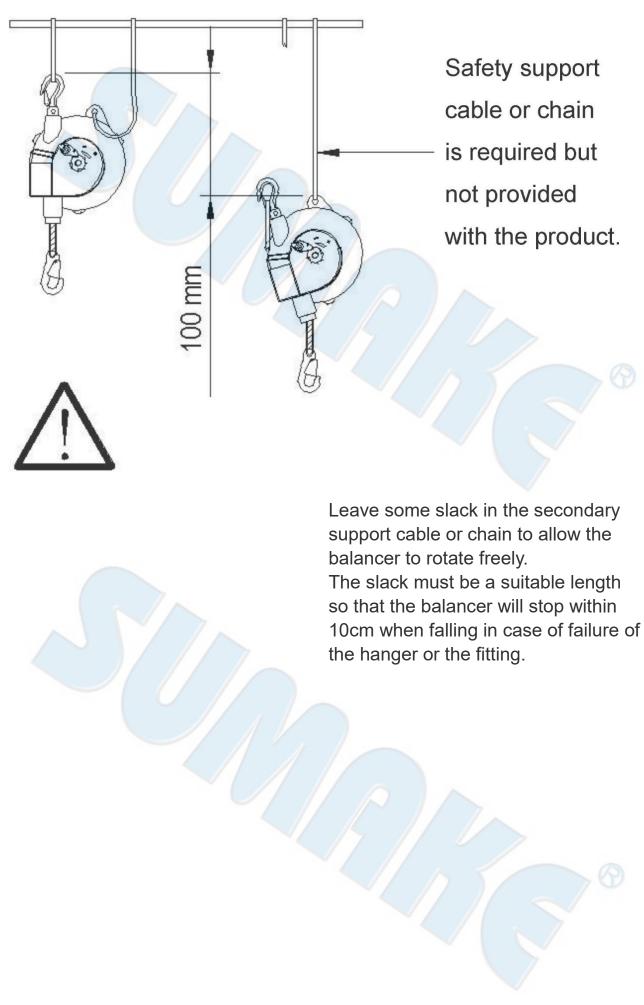


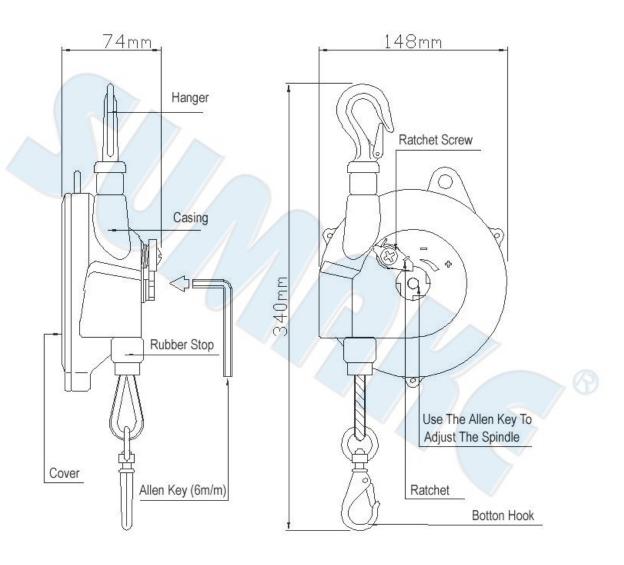
- 1. Take the tools off while remove the spring balancer, prevent the devise drop down.
- 2. Please remove the spring balancer and tools if rest for a long time.
- 3. Remove the spring balancer and devise before arranging the tension.

Application area:



Large angle using will debase the wire rope's life, Under $\pm 20^{\circ}$ is better.





Model	Capacity	Weight	Travel
SA-22030	1.5 – 3.0 kg	1.73 kg	1.3 m
SA-22050	3.0 – 5.0 kg	1.82 kg	1.3 m
SA-22070	5.0 – 7.0 kg	1.85 kg	1.3 m

1. Installation

- (1) Attached the spring balancer to the steady place.
- (2) Please attached a secondary support cable and install to the steady position.
- (3) Install the devise within the capacity to the bottom hook.
- (4) Please adjust the tension within the capacity after install the devise.

2. Checks before use

- (1) The hanger and bottom hook is steady and turn swivel.
- (2) The cable is complete.
- (3) The ratchet spring and spindle is steady.
- (4) The appearance is complete, no any damage.



EC DECLARATION OF CONFORMITY

We: SUMAKE INDUSTRIAL CO., LTD.

4F, No. 351, Yangguang St., Neihu District, Taipei City, Taiwan

declare in sole responsibility that the equipment

Equipment: SPRING BALANCER

Model/ Serial No.: SA-22030(22050)(22070)

to which this declaration applies, complies with these normative documents:

• Machinery Directive: 2006/42/EC

and conforms to the following EN standard,

• EN ISO 12100: 2010

Name and Signature/Position

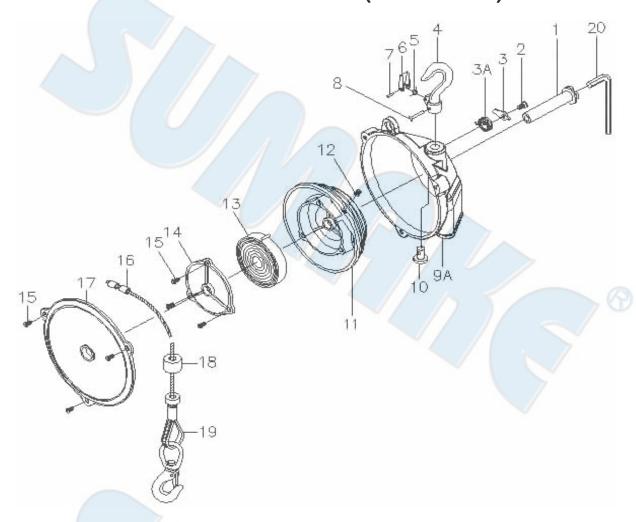
Date and Place

2013/2/22

Mike Su – Managing Director

Taipei, Taiwan

SA-22030 SA-22050 SA-22070 SPRING BALANCER (1.5-3KG) SPRING BALANCER (3-5KG) SPRING BALANCER (5.0-7.0KGS)



PARTS LIST

No.	Parts No.	Description	Q'ty
1	SA22030-01	Spindle	1
2	SA22030-02	Screw	1
3	SA22030-03	Ratchet	1
3A	SA22030-03A	Ratchet Spring	1
4~10	SA22030-09AS	Casing Set [Incl. 4, 5, 6, 7, 8, 9A, 10]	1
	SA22030-13S	Spring Plate Set [Incl. 11, 13] [SA-22030]	1
11&13	SA22050-13S	Spring Plate Set [Incl. 11, 13] [SA-22050]	1
	SA22070-13S	Spring Plate Set [Incl. 11, 13] [SA-22070]	1
12	SA22030-12	Screw	1
14	SA22030-14	Spring Cover	1
15	SA22030-15	Screw	6
16~19	SA22030-19S	Cable Set [Incl. 16(2), 18, 19]	1
17	SA22030-17	Cover	1
20	SA22030-20	Hex Spanner / rod	1

NOTE



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NOTE



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