

# KOSHIN

## OPERATION MANUAL BATTERY WINCHES

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### 《 RE MODEL 》

Thank you for purchasing Koshin Battery Winch.  
Upon receipt of good, please check the followings.

\*Model is exactly what you ordered

\*No damage in delivery

\*All accessories are included.

In case of any discrepancy or damage, please contact an agent or shop you ordered.

**Be sure to read this manual before operation.**

## KOSHIN LTD.

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[www.koshinpump.com](http://www.koshinpump.com)

## KOSHIN LTD.

## Warning

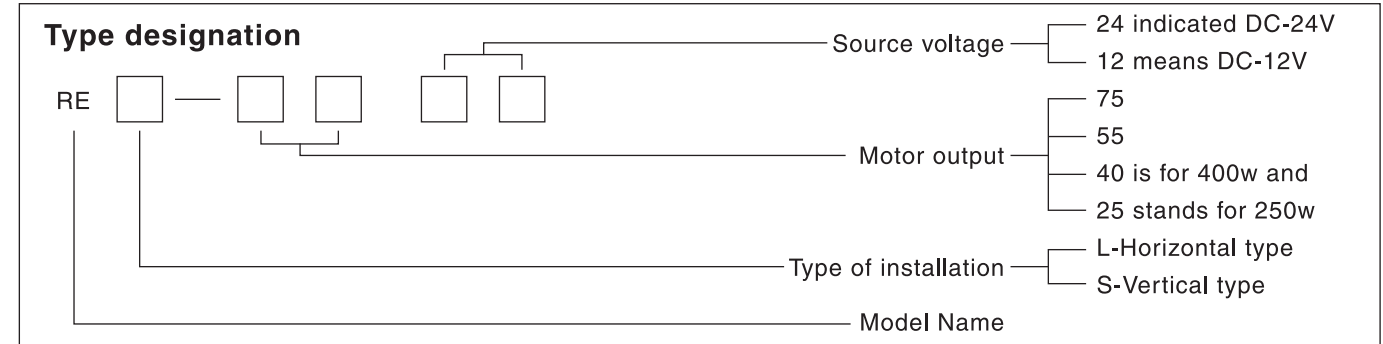
- This is a battery powered winch designed for small fishing boats. Do not use or install this unit for purposes other than those indicated in this manual. Doing so may result in malfunction and/or injury.
- Never allow any person except for our designated service engineers to disassemble, repair, and/or remodel this unit. Doing so may result in malfunction and/or injury.
- Do not touch the rolling part during operation. Doing so may result in injury.
- Installation and/or mounting of this unit require special techniques. Ask your distributor for installation.
- Be sure to disconnect this unit from the power supply before cleaning. Do not touch this unit with wet hands. Doing so may result in electric shock and/or injury.
- For safety purposes, be sure to install a breaker for wiring. Refer to the performance curve and operation limit defined in the specifications in order to set the capacity, since it changes depending on the winch load.
- Operate this unit in a safe environment, isolated from the access of infants and children.

## Caution

- If this unit does not operate, or malfunctions, immediately disconnect the power supply and ask your distributor for inspection any necessary repairs. Continuing to use the unit without doing so may result in electric shock, electricity leakage, and/or fire due to short-circuit.
- Do not apply any shock to the main body during operation. Doing so may result in electric shock, electricity leakage, and/or fire due to short-circuit.
- Do not move this unit during operation. Doing so may result in injury.
- Each unit has a designated voltage (12 VDC or 24 VDC). Check the voltage for connection before use.
- Connect the power supply cord to the battery using proper wiring. Not doing so may result in motor damage.
- To use this unit, start the engine and charge the battery.
- The ECARL may stop if the unit becomes snagged or blocked by a tree stump or other obstacle lying at the bottom of the water. Loosen the rope quickly, stop operation, and restart after removing the obstacle. Failure to do so may result in damage to the unit and/or injury.
- Never shift gears during operation. Doing so may cause damage to the unit and/or injury.
- Do not scratch, damage, remodel, forcibly bend, pull, twist and/or bundle the power supply cord. Do not place any heavy objects on the cord, or place the cord between heavy objects. Doing so may result in fire and/or electric shock.
- Do not use the winch for weights heavier than that specified. Doing so may result in the unit heating up, fire, and/or malfunction due to overload.
- Never immerse this unit in the water. Doing so may result in electricity leakage and/or malfunction.
- Be sure to disconnect this unit from the power supply when not in use for long periods of time. Not doing so may result in electric shock and/or leakage due to insulation deterioration.

## CAUTION

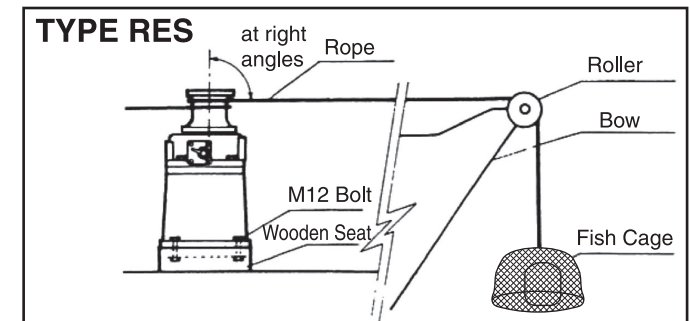
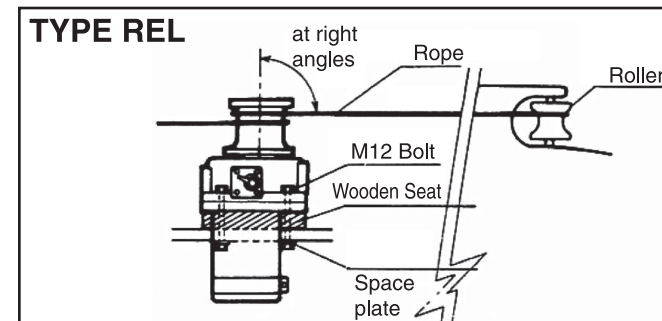
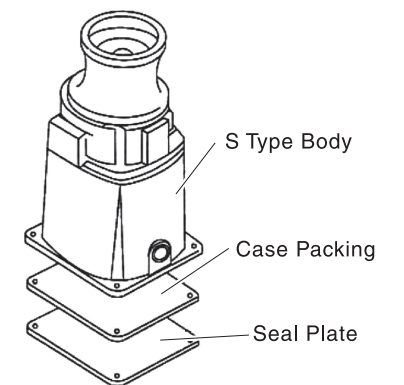
This is a battery winch developed for small sized fishing boats. The application includes fish cage, anchor weighing of ships, octopus-trap raising, anchor raising for laver cultivation rafts, ship drawing works, kelp pulling, scallop net hauling, fishing net drawing and other hoisting works.



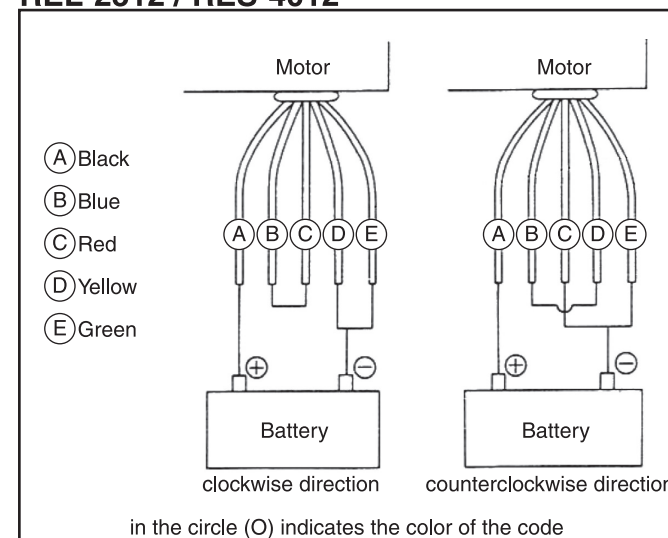
## SETTING

### i) Installation

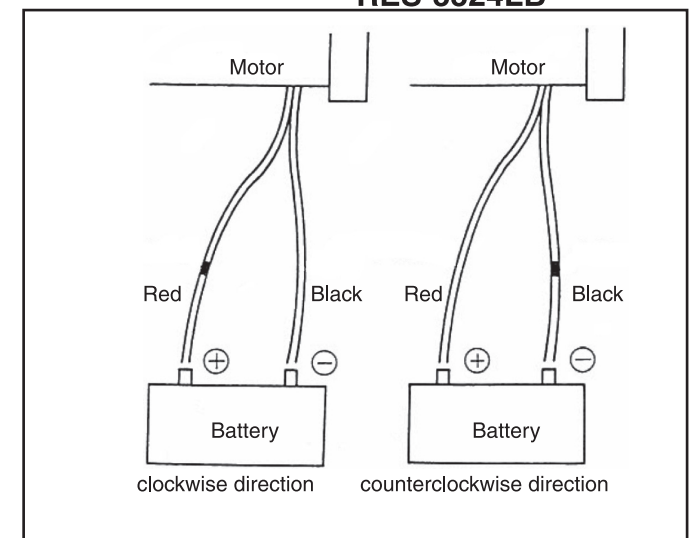
- Vertical type(S) shall be fixed firmly with M12 bolts onto the base at four places.
- Be sure to lay the vertical main unit packing, or substitute seal material, prior to setting the battery winch with electromagnetic brake.
- Horizontal type(L) shall be fixed firmly with M12 bolts at 4 places on the flange after providing an opening of the size corresponding to the motor on the attaching surface.



### RES-2512(L) / 4024 REL-2512 / RES-4012

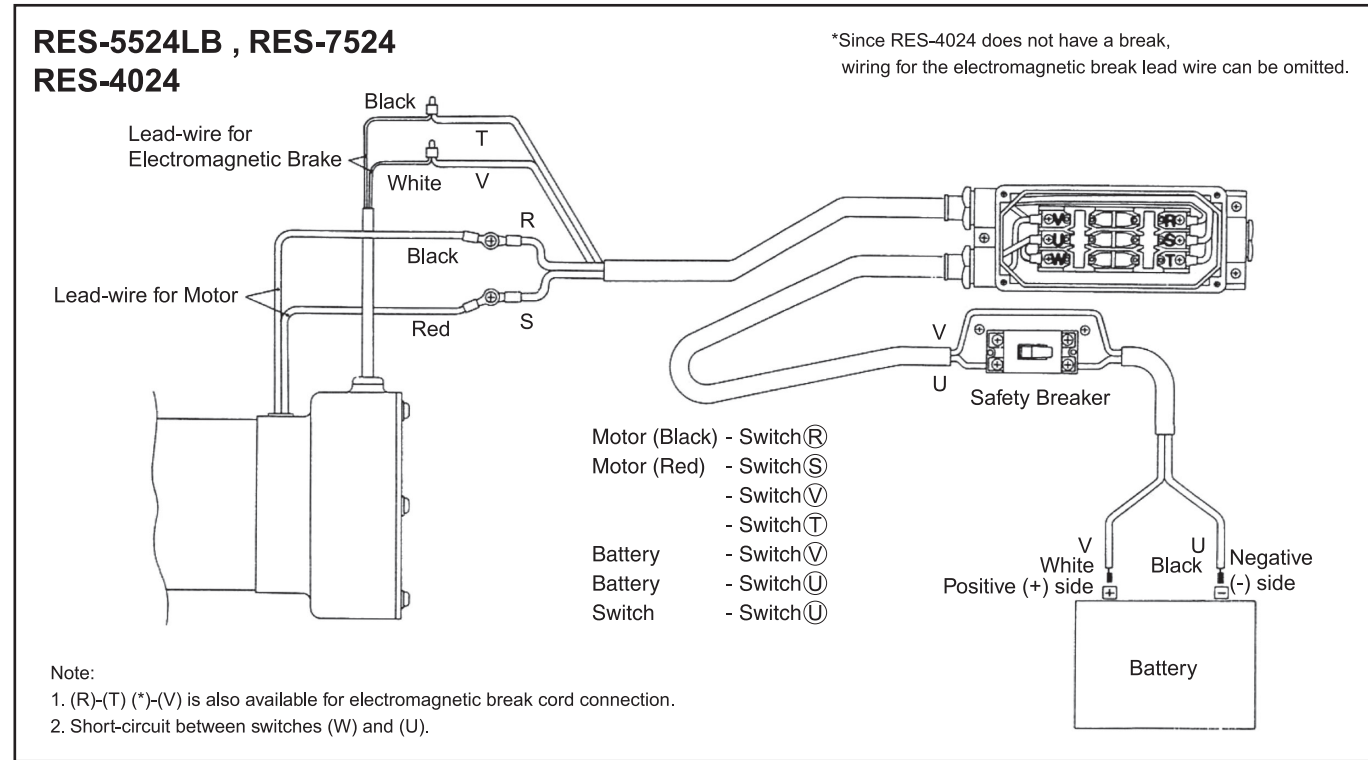


### RES-4024                      RES-7524 RES-5524LB



# WRITING

## Magnet motor type Simultaneous use of both positive and negative rotation



### Precautions

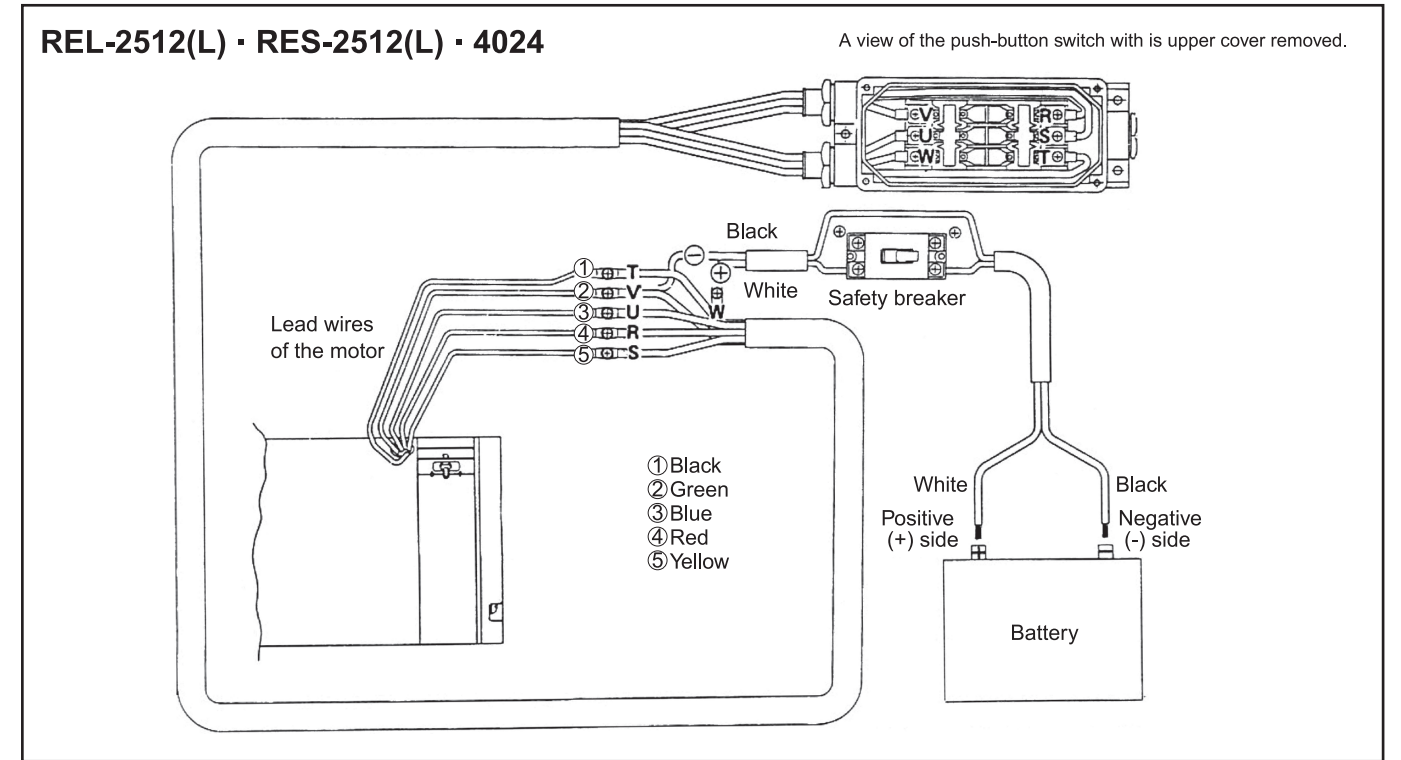
- Use the push button switch for both positive and negative (KASUGA ELECTRIC WORKS LTD. BSW-330B). (This cannot be used for RES-4024, RES-7524.)
  - Use N120-H of GS or equivalent for the battery.
  - If the battery charge has become low and load is given to the motor (i.e. larger electricity flows), the voltage will decrease extremely. Charge the battery or replace it with a new one. If you use a battery with a low charge, excess current will flow at startup, which may cause the voltage to decrease. As such, the brake will not open nor will the motor rotate, which may result in burnout. To avoid such events, always check the battery charge. Charge the battery if the voltage drops by 3 V or more at startup. It drops by only 0.4 V for a new or freshly charged battery.
  - Use a power supply cord with a diameter of 5.5mm<sup>2</sup>.
  - Be sure to use a safety breaker and fuse to protect the motor. (For safety breaker, we recommend Tempearl Industrial Co., Ltd.'s wiring breaker.)
- |                  |       |       |       |
|------------------|-------|-------|-------|
| Load             | 200kg | 400kg | 600kg |
| Breaking current | 40A   | 60A   | 80A   |
- (See the performance curve for more details.)
- Avoid as much as possible using an electric wire over 10m long. If necessary for use, use a wire with a diameter of 8.0mm<sup>2</sup> or more.
  - Connect firmly between crimp terminals using screws and nuts. Loose connections may generate heat and result in burnout.

### How to connect

You will find terminal blocks T, S, R, W, U, and V as shown in figure II when opening the push button switch cover.

- Connect terminal block R of the push button switch (hereafter referred to as "switch") using a black motor lead wire.
- Connect terminal block S using a red motor lead wire.
- Connect terminal block T using a black (white) electromagnetic break lead wire.
- Connect terminal block V using both a white (black) electromagnetic break lead wire and white electric wire from the positive side of the battery.
- Short-circuit terminal blocks U and W and connect terminal block U with a black electric wire from the negative side of the battery.
- Install a safety breaker in the electric wire from the motor lead wire to the battery. If you press the positive side of the switch, the roller operates clockwise from the roller side; and if you press the negative, it does counterclockwise.

## WHEN USED FOR BOTH FORWARD AND REVERSE TURN



### (1) CAUTIONARY INSTRUCTIONS

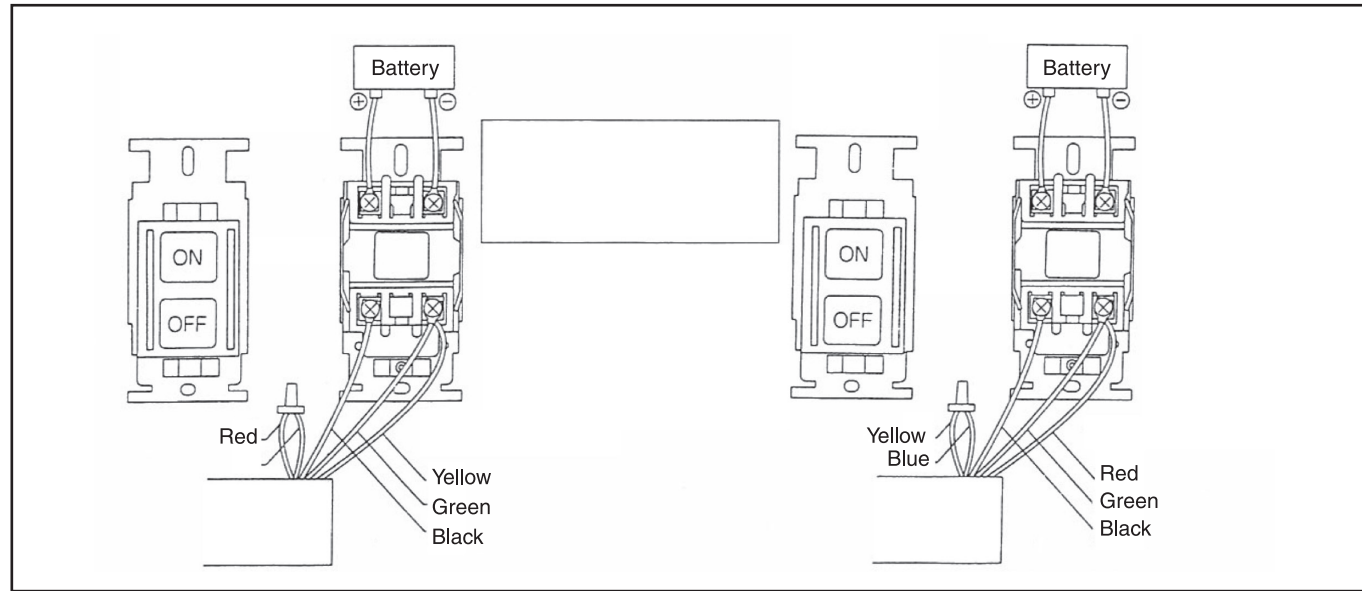
- Use a push-button switch of forward-stop-reverse type.
  - Use a GS battery of N120H or an equivalent.
  - When battery capacity is lowered charge or replace the battery with a new one as the voltage drops extremely when load is applied to the motor. Please pay attention to battery capacity at all times. Perform charging if the voltage drops more than 3V at start-up. With a new battery, voltage drop is up to 0.4V only.
  - Use 5.5mm<sup>2</sup> wires (cords) of 6 cores between the push-button switch and the motor lead wires and 5.5mm<sup>2</sup> wires of 2 cores between the battery and the motor lead wires.
  - Be sure to use safety breakers and fuses to protect the motor.
- | Load             | RES-4012      |                |
|------------------|---------------|----------------|
|                  | 90kg (100rpm) | 130kg (100rpm) |
| Breaking current | 40A           | 60A            |
| Shut-off current | 60A           | 80A            |
- Refrain from extending the wire over 10 m as far as possible. If longer extension is necessary, use a wire of 5.5mm<sup>2</sup> or larger.
  - Connect the solderless terminals firmly with screws and nuts. Loose fastening can generate heat and may cause burning.

### (2) CONNECTING METHOD

Open the upper cover of the push-button switches, then the terminals blocks T,S,R,W,U and V are exposed as shown in the above drawing.

- Connect R terminal block of the push-button switch (the switch in the following text) with red lead wire of the motor.
- Connect S terminal block of the switch with yellow lead wire of the motor.
- Connect T terminal block of the switch with black lead wire of the motor.
- Connect V terminal block of the switch with green lead wire of the motor and also connect the wire from V terminal block of the switch to the wire from negative (-) side of the battery.
- Connect U terminal block of the switch with blue lead wire of the motor.
- Connect the wire from W terminal block of the switch with the wire from positive (+) side of the battery.
- Insert a safety breaker into the wiring from the lead wires of the motor to the battery.





### Power source

The required power is DC-24V or DC-12V. For the battery capacity, refer to the following table. The data, however show the relationship between battery and Model RE only and do not include such factors as generator and other loads. For battery selection, therefore, please consult the dealer.

	250W, 24V type	400W, 24V & 250W, 12V type	400W, 12V type
Short-time load (About 60 min.)	30Ah/10HRX2	45Ah/10HRX2	45Ah/10HRX3
Long-time load (About 180 min.)	90Ah/10HRX2	170Ah/10HRX2	170Ah/10HRX3

(For standard lead battery)

### HOW TO USE

#### a. After completing installation and wiring, check the following points prior to turning on the switch.

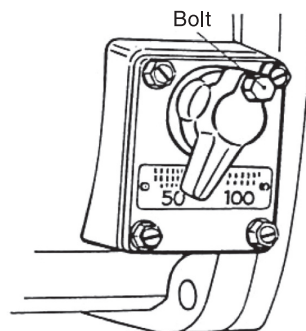
- Are the fuses used adequate?
- Is the wiring correct?
- Is the motor wiring correct?
- Is the battery winch installed exactly?

#### b. After checking, turn on the switch to operate the Model RE.

- First operate without load and check for any unusual noise. (Cracking noise from the inside issued in the initial stage of operation, particularly in cold season, is due to viscosity of the grease and if of no problem.)
- Then increase the load gradually. (For anchor weighing, control the load by the winding force of the rope.) At this time, check the extension cord and connected wires for any over-heat by touching.

#### c. Speed change

For RES / REL-2512 / 2512L / 4024L / RES-4012, and order made types (Brake type), it is possible to change the rate of roller revolution. At the time of shipment, the roller is set at low-speed revolution but it can be shifted to high-speed by controlling the speed-change lever. Be sure, however, to follow the procedure described below as no speed-change is possible during operation. Under switched off condition, loosen the bolt and turn the speed-change lever from low-speed position to the middle position between low-speed and high-speed. This is neutral position where the motor gear and roller gear are not interlocked. The roller can be turned freely under this condition. While turning the roller manually little by little, lower the speed-change lever to the position where the high-speed gear is interlocked. After adjusting the control lever, re-tighten the bolt. Speed change from high-speed to low-speed is not possible either during operation.



The Speed-Change lever

### CAUTIONARY INSTRUCTIONS FOR USE

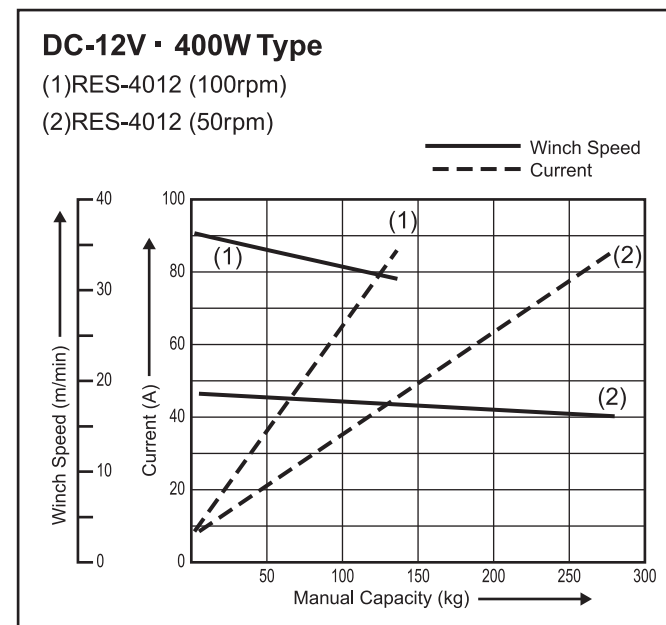
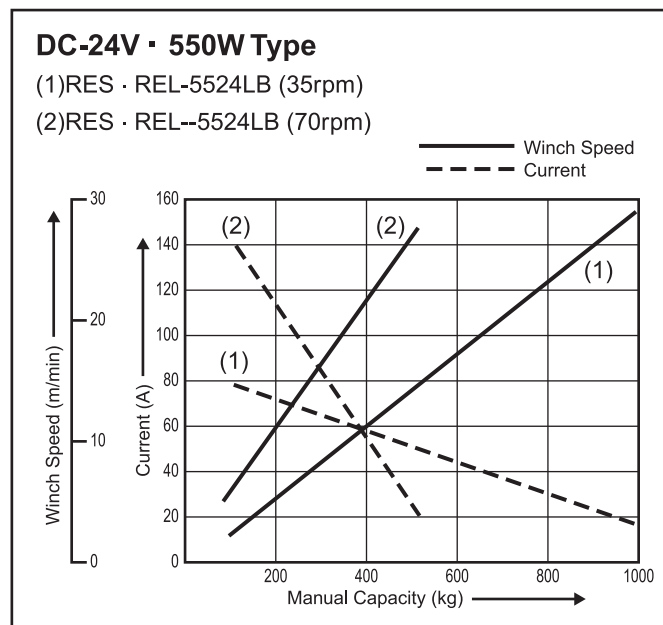
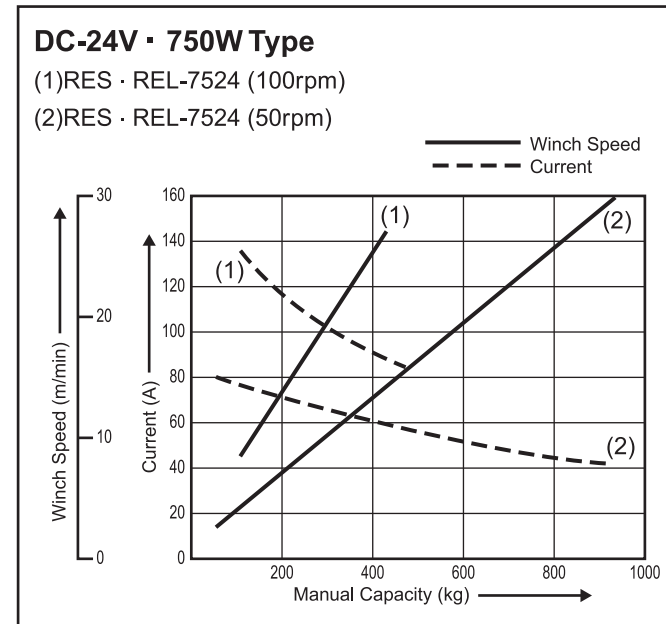
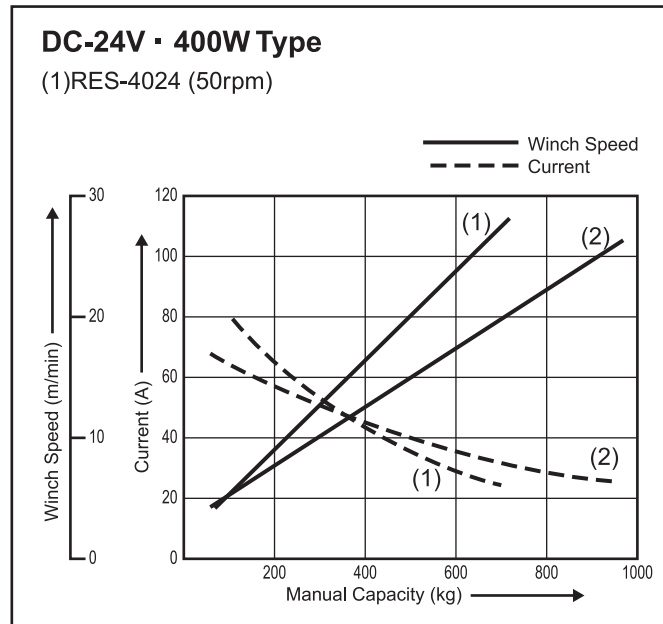
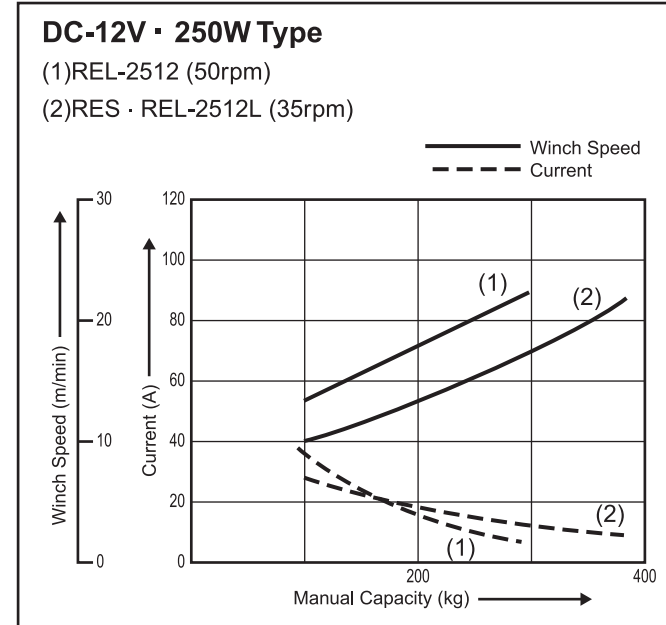
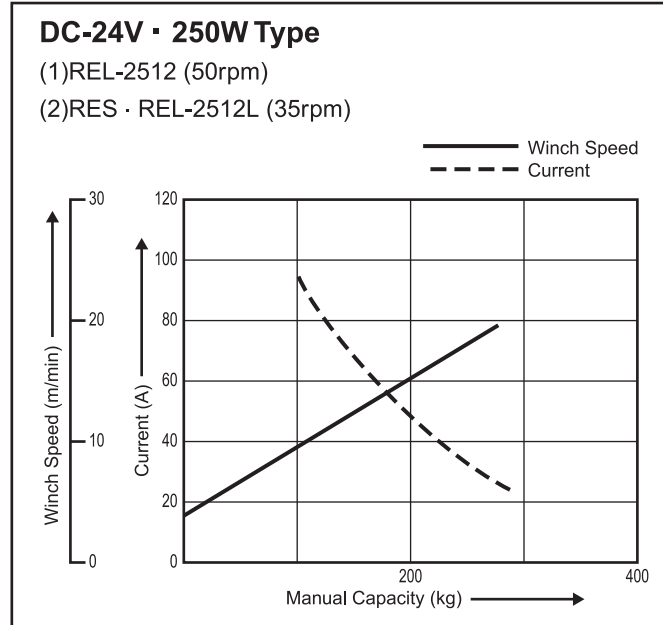
- When used for a long time, keep the engine running for charging.
- For short-time use (five minutes or so), there is no problem even if the engine is not operated but it is advisable to run the engine as far as possible.
- When the net is caught by roots, the winch stops. Loosen the rope promptly to suspend operation, and cut off the roots before starting operation again.
- Absolutely refrain from changing speed during operation.
- A motor of low-noise type is used for this winch and the operating time normally differs from the time when electronic fishing equipment such as Ioran and sonar are operated. If the electronic equipment are affected by the noise of the battery winch, separate the power source system.

### TROUBLE & REMEDY

Details of trouble	Cause	Measures
Motor fails to turn	Fuse disconnection	Replace the fuse.
	Inadequate wiring	Check the wiring.
	Erroneous motor wiring	Check the wiring.
The roller does not turn though the motor turns.	Speed change gear is at neutral position	Engage the gear exactly
	Gear is broken.	Repair.
Though the roller turns but the power is low	Voltage drop of battery or insufficient capacity	Charge the battery or replace the battery.
	Voltage drop of wires.	Change the wiring to thicker and shorter wires.
Noise is generated.	Gear is broken.	Repair
	Rusting due to sea water allowed inside	Repair
	Wear of bearings	Repair



## PERFORMANCE CURVE



## SPECIFICATIONS

### DC-12V · 250W Type

Model	RES-2512	REL-2512	RES-2512L
Voltage	DC-12V		
Current	30A		
Motor Output	250W		
Rating	1h / 30A		
Roller Revolution	50rpm (Low) / 100rpm (High)		35rpm (Low) / 70rpm (High)
Manual Capacity	280kg (Low) / 140kg (High)		360kg (Low) / 180kg (High)
Winch Speed (with 100kg Load)	6m/min (Low) / 13m/min (High)		4.5m/min (Low) / 10m/min (High)
Net Weight	20kg	15kg	20kg

### DC-24V · 250W Type

Model	REL-2524
Voltage	DC-24V
Current	30A
Motor Output	250W
Rating	1h / 30A
Roller Revolution	100rpm
Manual Capacity	300kg
Winch Speed (with 100kg Load)	23m/min
Net Weight	14.5kg

### DC-12V · 400W Type

Model	RES-4012
Voltage	DC-12V
Current	55A
Motor Output	400W
Rating	1h / 55A
Roller Revolution	50rpm (Low) / 100rpm (High)
Manual Capacity	270kg (Low) / 130kg (High)
Winch Speed (with 100kg Load)	18m/min (Low) / 33m/min (High)
Net Weight	24.5kg

### DC-24V · 400W Type

Model	RES-4024
Voltage	DC-24V
Current	25A
Motor Output	400W
Rating	1h / 25A
Roller Revolution	50rpm (Low) / 100rpm (High)
Manual Capacity	700kg (Low) / 350kg (High)
Winch Speed (with 100kg Load)	20m/min (Low) / 33m/min (High)
Net Weight	24kg

### DC-24V · 750W Type

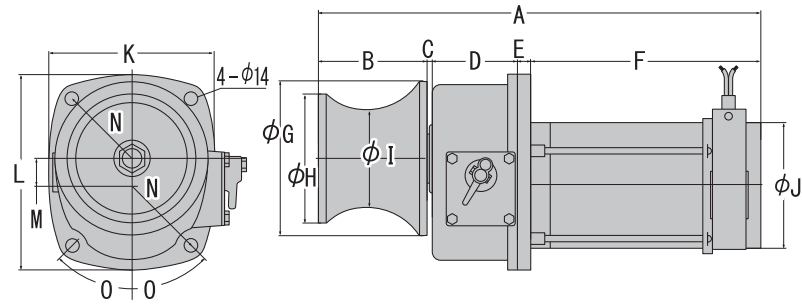
Model	RES-7524
Voltage	DC-24V
Current	43A
Motor Output	750W
Rating	1h / 43A
Roller Revolution	50rpm (Low) / 100rpm (High)
Manual Capacity	900kg (Low) / 450kg (High)
Winch Speed (with 100kg Load)	17m/min (Low) / 33m/min (High)
Net Weight	22kg

### DC-24V · 550W Type

Model	RES-5524LB	
Voltage	DC-24V	
Current	31A	
Motor Output	550W	
Rating	1h / 31A	
Roller Revolution	35rpm (Low) / 70rpm (High)	
Manual Capacity	1000kg (Low) / 500kg (High)	
Winch Speed (with 100kg Load)	15m/min (Low) / 25m/min (High)	
Electro-magnetic brake	Unsticking torque	4.0N · m(0.4kgf · m)
	Voltage	DC-24V
	Output	15W
Net Weight	30kg	

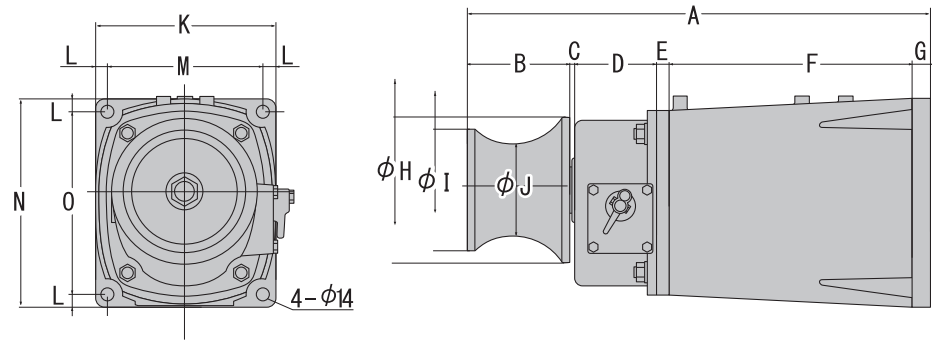
## DIMENSION

REL-2512  
REL-2512L  
REL-2524



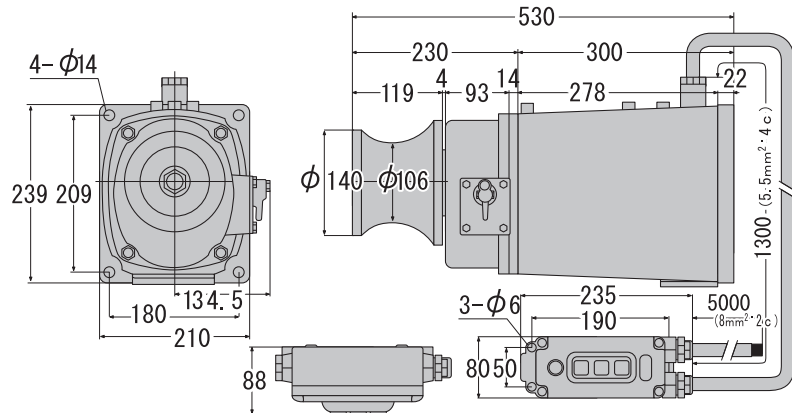
MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
REL-2512	427	119	4	93	14	197	166	140	106	113	182	211	29	R92	45°
REL-2512L															
REL-2524															
REL-4024	433	119	4	93	14	203	166	140	106	136	182	211	29	R92	45°
REL-4024L															
REL-7524	480	119	6	93	14	248	166	140	106	136	182	211	29	R92	45°

RES-2512  
RES-2512L  
RES-4012  
RES-4024  
RES-4024L  
RES-7524

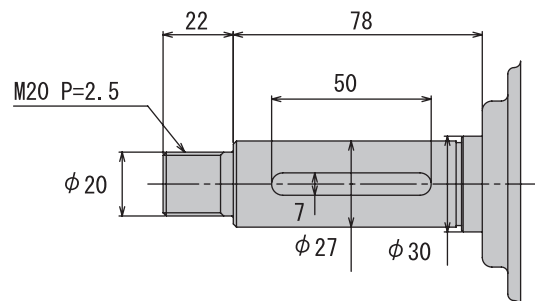


MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
RES-2512	530	119	4	93	14	278	22	166	140	106	210	15	180	239	209
RES-2512L															
RES-4024															
RES-4024L															
RES-7524	532	119	6	93	14	278	22	166	140	106	210	15	180	239	209

RES-5524LB

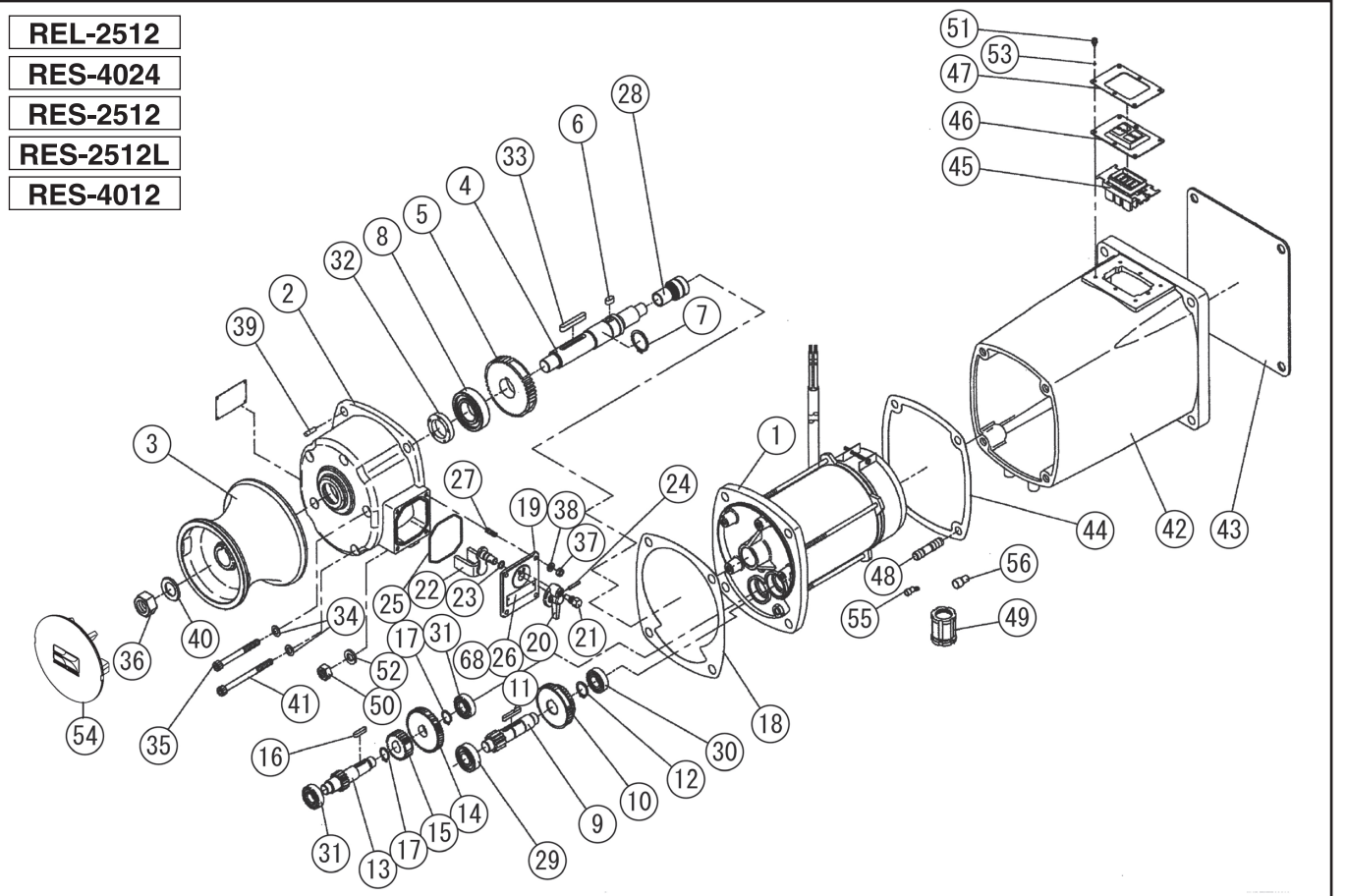


Rollar Shaft



## PARTS LIST

REL-2512  
RES-4024  
RES-2512  
RES-2512L  
RES-4012

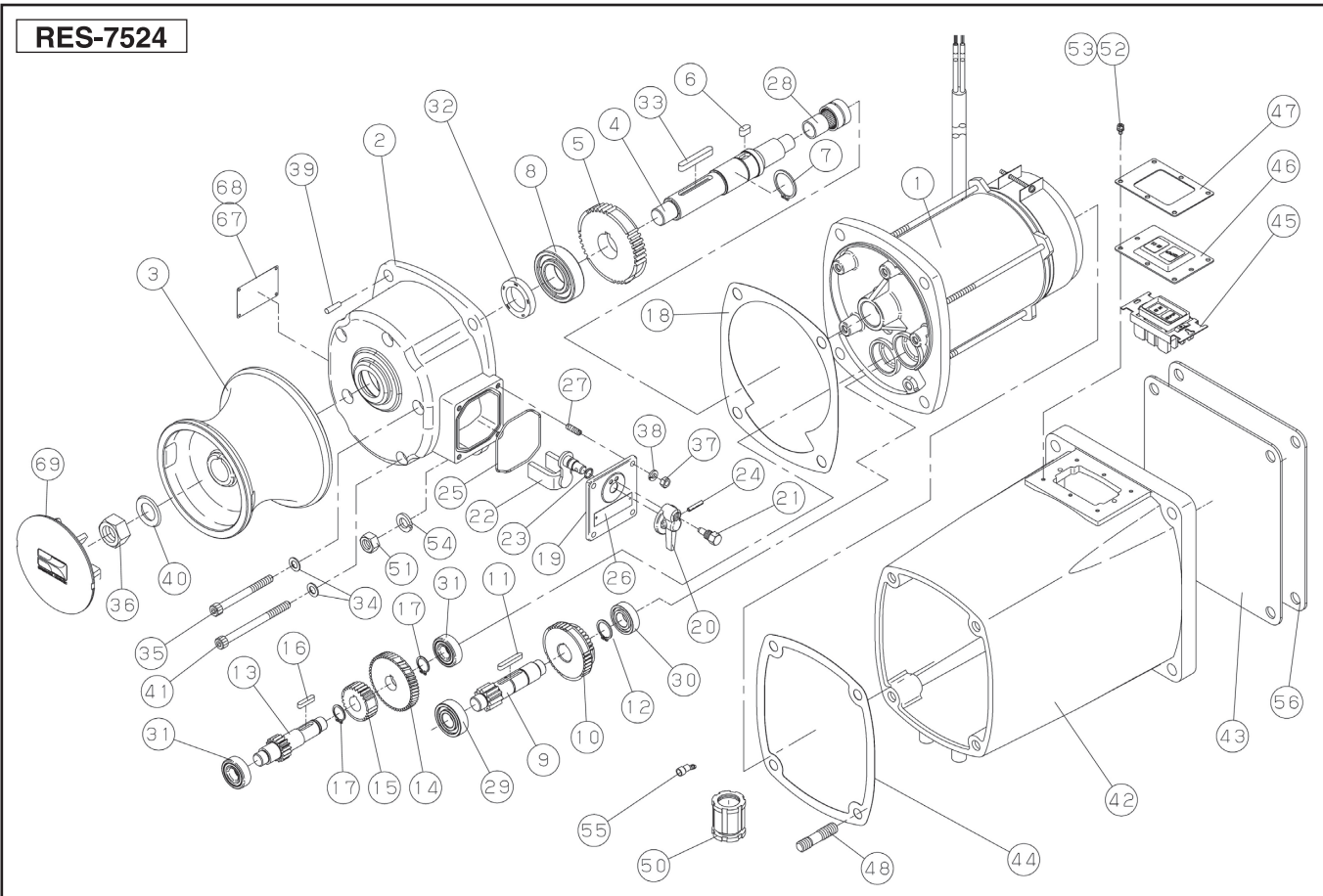


No	Parts No	Parts Name	QTY	SIZE	MATERIAL	REMARKS	No	Parts No	Parts Name	QTY	SIZE	MATERIAL	REMARKS	
1	0271304	Motor Assy	1	400W-24V		4024(2WIRE)	26	0270056	50.100 Change Speed Plate	1		SUS		
	0271307	Motor Assy	1	250W 12V		2512/2512L(5WIRE)		0270064	35.70 Change Speed Plate	1		SUS	RES-2512L	
	0271308	Motor Assy	1	250W/12V		2512(GREEN)(5WIRE)		27	0270047	Reset Bolt M6x12	4	M6x12	SUS	
	0271309	Motor Assy	1	400W/24V		4024(GREEN)(5WIRE)		28	927600018	Needle Bearing	1			
	0278109	Motor Assy	1	400W/12V		4012(GREEN)(5WIRE)		29	0271228	Ball Bearing	1	6203ZZ		(912706013)
2	0270837	Gear Cover	1		ADC		30	0271230	Ball Bearing	1	6003ZZ		(911806013)	
	0270809	Gear Cover	1		ADC	GREEN MODEL	31	0271227	Ball Bearing	2	6202ZZ		(912706012)	
3	0270043	Roller	1		AC7A		32	893755194	Oil Seal	1	AE1679A0	TC-30-45-8 NBR	2512L	
4	0270010	Roller Shaft	1		SUS		33	884205076	Parallel Key	1	7x7x50	SUS		
5	0270009	M2-44 Gear	1		S45C		34	854255008	Seal Washer phi 8	5	phi 8			
6	0270492	Parallel Key	1	7x7x14			35	734505081	Socket Bolt M8x85	4	M8x85	SUS		
7	888327030	C-Stop Ring	1		30SK		36	827405020	Nut M20	1	M20	SUS		
8	0271233	Ball Bearing	1	6206ZZ		(912706018)	37	827405006	Nut M6	4	M6			
9	0270012	M2-11 Gear Shaft	1		SCM		38	843805006	Spring Washer phi 6	4	phi 6	SUS		
10	0270057	M1.5 Change Gear	1		S45C		39	847905077	Taper Pin	1	5x20	SUS		
11	0270061	M1.5-46xM1.5-38 Change Gear	1			2512L	40	844405020	Washer phi 20	1	phi 20	SUS		
12	0270493	Parallel Key	1	5x5x35.5	S45C		41	734505084	Socket Bolt M8x100	1	M8x100	SUS		
13	888327020	C-Stop Ring	1		20SK		42	0270764	Motor Case	1				
14	0270011	M1.5-17 Gear Shaft	1		SCM		43	0270073	Motor Case	1	GREEN		GREEN MODEL	
15	0270062	M1.5-13 Gear Shaft	1			2512L	44	0270520	Cas Packing (Under)	1				
16	0270018	M1.25-50 Gear	1		S45C		45	0270118	Cas Packing (Upper)	1				
17	0270019	M1.5-26 Gear	1		S45C		46	0270872	Switch	1				
18	0270063	M1.5-21 Gear	1			2512L	47	0271147	Switch Rubber (Outside)	1		EPDM		
19-24	884209041	Parallel Key	1	5x5x20	S45C		48	0271148	Switch Rubber Plate (6Hole)	1		SUS		
19	888305017	C-Stop Ring	2		17SUS		49	0270765	Reset Bolt M12x39	4	M12x39	SUS		
20	0270013	Gear Cover Packing	1				50	0270465	Joint For Electric Wire	1				
21	0278091	Variable Speed Equipment Assy	1				51	827405012	Nut M12	4	M12	SUS		
22	0271098	Change Speed Box	1				52	754905002	⊕Screw M4x10	6	M4x10			
23	0270040	Change Speed Cap	1				53	843805012	Washer phi 12	4	phi 12	SUS		
24	0270051	Pin	1				54	854305004	Seal Washer phi 4	6	phi 4	SUS		
25	0278049	Gear Change Arm Assy	1				55	0271146	Roll Cap	1		EPDM		
26	889855009	O-Ring	1	P9	NBR		56	944600102	Solderless Termina	5		BT5.5-SS4		
27	849805172	Spring Pin	1	4x22	SUS			944500008	Insulating Solderless Connector	1		CE-8		
28	0270755	O-Ring	1											



# PARTS LIST

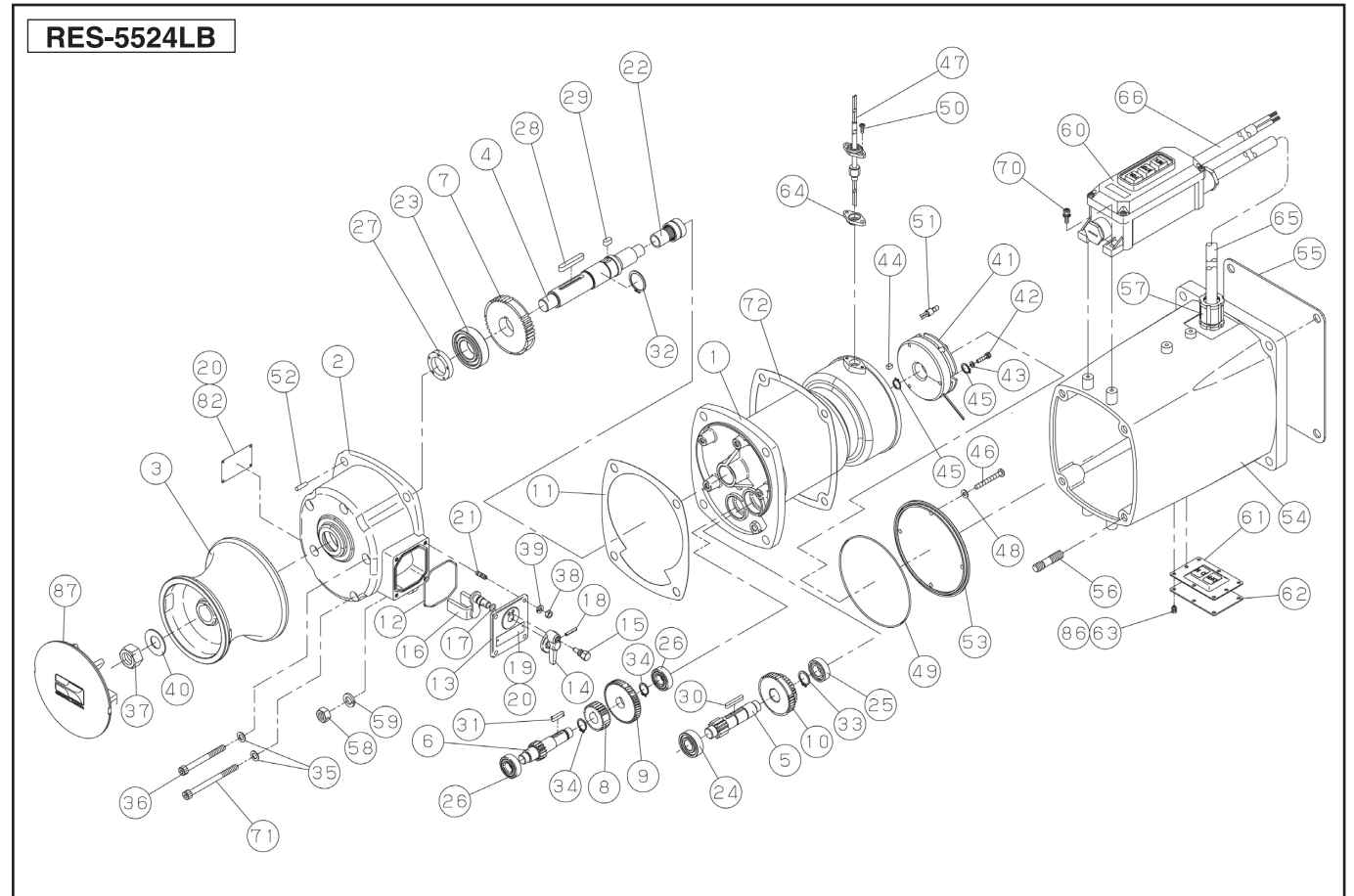
## RES-7524



No	Parts No	Parts Name	QTY	SIZE	MATERIAL
1	0271306	Motor Assy	1		
2	0270995	Gear Cover	1		
3	0270043	Roller	1		AC7A
4	0271027	Roller Shaft	1		
5	0271028	M2-44 Gear	1		
6	884209066	Parallel Key	1		
7	888327030	C-Stop Ring	1		30SK
8	0271233	Ball Bearing	1	6206ZZ	(912706018)
9	0271029	M2-11 Gear Shaft	1		
10	0270057	M1.5 Change Gear	1		S45C
11	0270493	Parallel Key	1	5x5x35.5	S45C
12	888327020	C-Stop Ring	1		20SK
13	0271032	M1.5-17 Gear Shaft	1		
14	0270018	M1.25-50 Gear	1		S45C
15	0271030	M1.5-26 Gear	1		
16	884209039	Parallel Key	1		
17	888305017	C-Stop Ring	1		17SUS
18	0270013	Gear Cover Packing	1		
19-24	0278091	Variable Speed Equipment Assy	1		
19	0271098	Change Speed Box	1		
20	0270040	Change Speed Cap	1		
21	0270051	Pin	1		
22	0278049	Gear Change Arm Assy	1		
23	889855009	O-Ring	1	P9	NBR
24	849805172	Spring Pin	1	4x22	SUS
25	0270755	O-Ring	1		
26	0270056	50.100 Change Speed Plate	1		SUS
27	0270047	Reset Bolt M6x12	4	M6x12	SUS
28	927600018	Needle Bearing	1		
29	0271228	Ball Bearing	1	6203ZZ	(912706013)
30	0271230	Ball Bearing	1	6003ZZ	(911806013)
31	0271227	Ball Bearing	2	6202ZZ	(912706012)
32	893755194	Oil Seal	1	AE1679A0	TC-30-45-8 NBR
33	884205076	Parallel Key	1	7x7x50	SUS
34	854255008	Seal Washer φ8	5	φ8	
35	734505081	Socket Bolt M8x85	4	M8x85	SUS
36	827405020	Nut M20	1	M20	SUS
37	827405006	Nut M6	4	M6	
38	843805006	Spring Washer φ6	4	φ6	SUS
39	847905077	Taper Pin	1	5x20	SUS
40	844405020	Washer φ20	1	φ20	SUS
41	734505084	Socket Bolt M8x100	1	M8x100	SUS
42	0270986	Motor Case	1		
43	0270520	Case Packing (Under)	1		
44	0270118	Case Packing (Upper)	1		
45	0271042	750W Switch	1		
46	0270870	Switch Rubber	1		
47	0270871	Switch Rubber Plate	1		SUS
48	0270765	Reset Bolt M12x39	4	M12x39	SUS
50	0270465	Joint For Electric Wire	1		
51	827405012	Nut M12	4	M12	SUS
52	754905002	Socket Bolt M4x10	6	M4x10	
53	854305004	Seal Washer φ4	6	φ4	SUS
54	843805012	Washer φ12	4	φ12	SUS
55	944600102	Solderless Terminal	2		
56	0270907	Seal Plate	1	T3.2	SPCC
67	0271340	Name Plate	1		
68	854505006	Parker Rivet	6	NO. 2x3	SUS

# PARTS LIST

## RES-5524LB



No	Parts No	Parts Name	QTY	SIZE	MATERIAL
1	0271305	Motor Assy	1		550W 24V
2	0270837	Gear Cover	1		ADC
3	0270043	Roller	1		AC7A
4	0270010	Roller Shaft	1		SUS
5	0270012	M2-11 Gear Shaf	1		SCM
6	0270062	Gear Shaft	1		
7	0270874	M2-44 Gear	1		SCM
8	0270063	M1.5-21 Gear	1		
9	0270018	M1.25-50 Gear	1		S45C
10	0270061	Change Gear	1		
11	0270013	Gear Cover Packing	1		
12	0270755	O-Ring	1		
13-18	0278091	Variable Speed Equipment Assy	1		
13	0271098	Change Speed Box	1		
14	0270040	Change Speed Cap	1		
15	0270051	Pin	1		
16	0278049	Gear Change Arm Assy	1		
17	889855009	O-Ring	1	P9	NBR
18	849805172	Spring Pin	1	4x22	SUS
19	0270064	35.70 Caution Label	1		SUS
20	854505006	Parker Rivet	6	NO. 2x3	SUS
21	0270047	Reset Bolt M6x12	4	M6x12	SUS
22	927600018	Needle Bearing	1		
23	0271233	Bearing	1	6206ZZ	(912706018)
24	0271228	Bearing	1	6203ZZ	(912706013)
25	0271230	Bearing	1	6003ZZ	(911806013)
26	0271227	Bearing	2	6202ZZ	(912706012)
27	893755194	Oil Seal	1	AE1679A0	TC-30-45-8 NBR
28	884205076	Parallel Key	1	7x7x50	SUS
29	0270492	Parallel Key	1	7x7x14	
30	0270493	Parallel Key	1	5x5x35.5	S45C
31	884209041	Parallel Key	1	5x5x20	S45C
32	888327030	Shaft Stop Ring	1		30SK
33	888327020	Shaft Stop Ring	1		20SK
34	888305017	Shaft Stop Ring	2		17SUS
35	854255008	Seal Washer φ8	5	φ8	
36	734505081	Socket Bolt M8x85	4	M8x85	SUS
37	827405020	Nut M20	1	M20	SUS
38	827405006	Nut M6	4	M6	
39	843805006	Spring Washer φ6	4	φ6	SUS
40	844405020	Washer φ20	1	φ20	SUS
41	0270945	Cluch	1		SNB-0.4G-24V
42	734532042	Socket Bolt M5x32	3	M5x32	SCM
43	843822005	Spring Washer φ5	3	φ5	
44	884009167	Parallel Key	1	5x5x8	S45C
45	888327014	Shaft Stop Ring	2		
46	703305124	Screw	4	M6x60	SUS
47	0270722	Electric Brake Code	1	0.75x2	
48	854255006	Seal Washer φ6	4	300MM	
49	890155145	O-Ring	1	φ6	NBR S145
50	703305076	Screw	2		SUS
51	944500002	Solderless Connector	2	M4x12	CE-2
52	847905077	Taper Pin	1		SUS
53	0270717	Brake Cover	1	5x20	
54	0270764	Motor Case	1		
55	0270520	Case Packing (Under)	1		
56	0270765	Reset Bolt M12x39	4		SUS
57	0270465	Pole For Electric Piercing	1	M12x39	
58	827405012	Nut M12	4		SUS
59	843805012	Washer φ12	4	M12	SUS
60	0270511	Switch	1	φ12	
61	0271149	Switch Plate Packing	1		EPDM
62	0270984	Switch Cover	1	T1.0	SUS304
63	754905002	Socket Bolt M4x10	6	T=2.0	
64	0240009	Gland	1	M4x10	PBT
65	0278044	Power Code Assy A	1		4x5.5sqx1300MM
66	0278045	Power Code Assy B	1	TERMINAL	2x8sqx5000MM
70	708205049	Screw	3	TERMINAL	SUS
71	734505084	Socket Bolt M8X100	1	M5x20	SUS
72	0270118	Foot Cover Packing	1	M8x100	
82	0271338	Name Plate	1		SUS
86	854305004	Seal Washer φ4	6		SUS
87	0270797	Cord Bush A	2	φ4	CR



## MODEL LIST AND MOTOR PARTS LIST

PRODUCT CODE & MODEL NUMBER				CODE NUMBER OF MOTOR	
9P	0278631	RES-4024-BAA	WHITE	0271304	2WIRE TYPE
9P	0278611	RES-2512-BAA	WHITE	0271307	5WIRE TYPE
9P	0278740	RES-2512L-BAA	WHITE	0271307	5WIRE TYPE
9P	0278632	REL-2512-BAA	WHITE	0271307	5WIRE TYPE
	0278759	REL-2512-BAB	GREEN	0271308	5WIRE TYPE
10P	0278756	RES-5524LB-BAD	WHITE	0271305	2WIRE TYPE
10P	0278757	RES-7524-BAA	WHITE	0271306	2WIRE TYPE
9P	0278721	RES-2512-BAB	GREEN	0271308	5WIRE TYPE
9P	0278758	RES-2512-BAE	GREEN	0271308	5WIRE TYPE
9P	0278722	RES-4024-BAB	GREEN	0271309	5WIRE TYPE
9P	0278760	RES-4024-BAD	GREEN	0271309	5WIRE TYPE

### SPARE PARTS FOR ELECTRIC MOTOR 2WIRE TYPE

MODEL : 0278631 RES-4024-BAA

MOTOR : 0271304

0271271	Carbon Brush B			
0271310	Brush Spring			
0271311	Brush Holder A_B			
0271323	Amature			
0271262	End Bracket			
0271007	Magnet Adapter	1		
0278071	M2-11 Gear Shaft Assy	1	NO.9 `NO.12	
0278070	M1.5-17 Gear Shaft Assy	1	NO.13 `NO.17	
0278050	Gear Change Unit Assy		NO.19 `24,26,28	
0270459	Grease	15		
0300012	Voltege Name Plate	1	T FILM	
0270581	Operation Manual	1		

### SPARE PARTS FOR ELECTRIC MOTOR 5WIRE TYPE

MODEL : 0278611 RES-2512-BAA  
0278740 RES-2512L-BAA  
0278632 REL-2512-BAA

MOTOR : 0271307

MODEL : 0278721 RES-2512-BAB (GREEN MODEL)  
0278751 RES-2512-BAC (GREEN MODEL)  
0278755 RES-2512-BAD (GREEN MODEL)  
0278758 RES-2512-BAE (GREEN MODEL)  
0278759 REL-2512-BAB (GREEN MODEL)

MOTOR : 0271308

0278071	M2-11 Gear Shaft Assy	1	NO.9 `NO.12	
0278070	M1.5-17 Gear Shaft Assy	1	NO.13 `NO.17	
0278050	Gear Change Unit Assy	1	NO.19 `24,26,28	
0271272	Carbon Brush A	2		
0271310	Brush Spring	2		
0271311	Brush Holder A_B	2		
0271239	Amature	1		
0271087	Rear Cover	1		
0270002	Adapter	1		
0270459	Grease	15		
0270581	Operation Manual	1		

### SPARE PARTS FOR ELECTRIC MOTOR 2WIRE TYPE

MODEL : 0278756 RES-5524LB-BAD

MOTOR : 0271305

0278046	Power Code Assy C	1	1X5.5X,`X50MM	
944500008	Solderless Connector	2		
0270771	Sleeve	2		
0271271	Carbon Brush B	2		550W 24V
0271310	Brush Spring	2		
0271311	Brush Holder A_B	2		
0271324	Amature	1		
0270987	End Bracket	1		
0271009	Adapter	1	ADC 0270719	
0278074	M2-11 Gear Shaft Assy	1	NO.9 `NO.12	
0278073	M1.5-17 Gear Shaft Assy	1	NO.13 `NO.17	
0278050	Gear Change Unit Assy	1	NO.19 `24,26,28	
0270459	Grease	15		
0270907	Water Proof Plate	1	SPCC	T3.2
0270581	Operation Manual	1		

### SPARE PARTS FOR ELECTRIC MOTOR 2WIRE TYPE

MODEL : 0278757 RES-7524-BAA

MOTOR : 0271306

0271270	Carbon Brush C	2		750W24V
0271310	Brush Spring	2		
0271312	Brush Holder C	2		750W24V
0271326	Amature	1		
0271262	Rear Cover	1		
0271007	Magnet Adapter	1		
0278087	M2-11 Gear Saft Assy	1	NO.9 `NO.12	
0278085	M1.5-17 Gear Shaft Assy	1	NO.13 `NO.17	
0278050	Gear Change Unit Assy	1	NO.19 `24,26,28	
0270459	Grease	15		
0270581	Operation Manual	1		

### SPARE PARTS FOR ELECTRIC MOTOR 5WIRE TYPE

MODEL : 0278722 RES-4024-BAB (GREEN MODEL)  
0278760 RES-4024-BAD (GREEN MODEL)

MOTOR : 0271309 Green Model

0271271	Carbon Brush B			
0271310	Brush Spring			
0271311	Brush Holder A_B			
0278071	M2-11 Gear Shaft Assy	1	NO.9 `NO.12	
0278070	M1.5-17 Gear Shaft Assy	1	NO.13 `NO.17	
0278050	Gear Change Unit Assy		NO.19 `24,26,28	
0270459	Grease	15		
0270033	Adapter			
0271322	Amature			
0271088	Rear Cover			
0300012	Voltege Name Plate	1	T FILM	
0270581	Operation Manual	1		