CE OPERATION MANUAL

ELECTRIC MINI WIRE WINCH MACHINE

DUKE Electric Mini Wire Winch Introduction

The DUKE Electric Builder's Winch is designed for building sites, commercial and domestic, as well as various construction workplaces, such as warehousing, buildings, storage areas, factories in general, as well as domestic applications.

CONTENTS

1. Preface

- Please read this Instruction Manual carefully before you start using the electric winch. You will find many useful hints which will help you to keep the winch always in its first-class condition.
- You are kindly requested to read this manual thoroughly, to follow scrupulously the instructions given and for safety reasons, avoid controlling, adjusting or performing procedures other than those specified.
- This winch has been designed and built in full compliance with EN ISO 12100, ISO 14121 and EN 60204 standards on machine and further modification, with high-quality materials and particularly studying the possibilities to reduce as much as possible the risks of accident.
- Foreword to the operating instructions
  The operating instructions are designed to familiarize the user with the winch and its designated use.
- The instruction manual contains important information on how to operate the winch safety, properly and most efficiently. Observing these instructions helps to avoid danger, to reduce repair costs and downtimes and to increase the reliability and life of the winch.
- The instruction manual is to be supplemented by the respective national rules and regulations for accident prevention and environmental protection.
  The operating instructions must always be available wherever the winch is in use.
  These operating instructions must be applied by any person in change of carrying out work with and on the winch, such as
  - operation including setting up, troubleshooting in the course of work, care of consumables
  - maintenance (serving, inspection, repair) and/or
  - transport

  This electric winch is designed and built in full compliance with the safety standard, please read carefully before installing the machine. You will find many hints to keep the machine in its best condition, also to avoid the risk of accident.
- In addition to the operating instructions and to the mandatory rules and regulations for accident
- Prevention and environment protection in the country and place of use of the winch, the generally recognized technical rules for safe and proper working must also be observed.

2. Safety Instruction

2-1 Safety regulations

2-1-1 General safety rules

1. This electric winch is designed for lifting products only. Do not apply the electric winch for lifting person.
2. The electric winch should be hung on a rigid suspended bar..
3. Installing the electric winch at a proper levelling condition to ensure the steel rope arranged neatly. This may avoid steel rope friction against the winch body due to regular winding.
4. Make sure your power source comply with the voltage indicated on the electric winch before connecting the power wires to the power source.
5. Connect the power wires. Tighten the terminals securely.
6. Make sure the electric winch has been properly grounded. The power circuit should be equipped with an electric shock breaker.
7. Before operating the electric winch, read and follow the instructions for allowable lifting weight, speed and voltage etc. Indicated on the attached plate.
8. Do not exceed the rated lifting capacity of the electric winch. Allowable lifting weight is indicated on the attached plate.
9. The electric winch should be operated by a skilled operator. Before operating the electric winch check again if all lock screws are tightened securely without loosening.
10. Before operating the electric winch check to see if the steel rope drum runs to the correct direction and the brake works normally.
11. Do not allow any person approaches under the electric winch, bracket or weight.
12. Select a proper location for mounting the electric winch, to prevent the lifting weight bumping against any construction, steel frame or construction beam etc while lifting.
13. Always keep the steel rope in a good condition. When applying the electric winch for lifting heavy load, keep the steel rope at least 3 turns wounded around the drum.
14. Lift weight vertically. Do not lift weight in a slant or horizontal direction. Do not have weight hooked on the steel rope for a long time.
15. Do not use the electric winch to pull out any object fixed in the floor or any construction.
16. When the electric winch is running, keep your hands or any object away from it to avoid danger.
17. Prevent control wire or power wire from hooking or contacting by the wire rope. This may avoid electric shock or any danger.
18. In case any malfunction or abnormal noise occurs during operation, stop the electric winch immediately. Check and repair it immediately for safety.
19. Do not alter the electric circuit or use any other replacement parts not supplied from the original manufacturer.. This avoids affection on the winch performance or any accident.
20. The operator is requested to fully obey the safety rules listed for safety protection.

2-1-2 Electrical safety rules

1. Before installing, please pay attention to the input rated voltage and current and make sure the winch is grounded, in order to prevent accident.
2. There must be a main power switch (main breaker) at main input side of electric control system.
3. Remember to disconnect the main power before repair, maintenance and clean.
4. Unauthorized or untrained personnel cannot repair or maintain any electric equipment.
5. The keys of electric box and mode select should be conserved by authorized personnel. Don't give the key or authorized code to unauthorized personnel.
6. Comply with the maintenance instruction to repair and maintain the electric equipment.
7. Before operating the winch, check all of the electric equipments and parts are broken or damaged or not. If there is something broken or damaged, replace a new one immediately and please note its original rated specification.
8. After connecting power, check the direction of motor rotation and the direction of winch is correct or not.
9. Please check whether the function of emergency stop button is normal or not. The emergency stop button is used under emergency situation to cut off power of winch. (Operator usually misunderstand that the winch is broken down when they forgot to release the emergency stop button.)
10. Please check whether the function of each safety parts is normal or not, such as emergency stop button, emergency stop wire, interlocking switch, main power switch, safety valve, limit switch, and etc.
11. Please check whether the screws of each terminal base are tightened or not. If the screws loose, screw them tightly.
12. The wiring practices of electric control system must be complied with circuit diagram.

2-1-3 Safety rules of winch

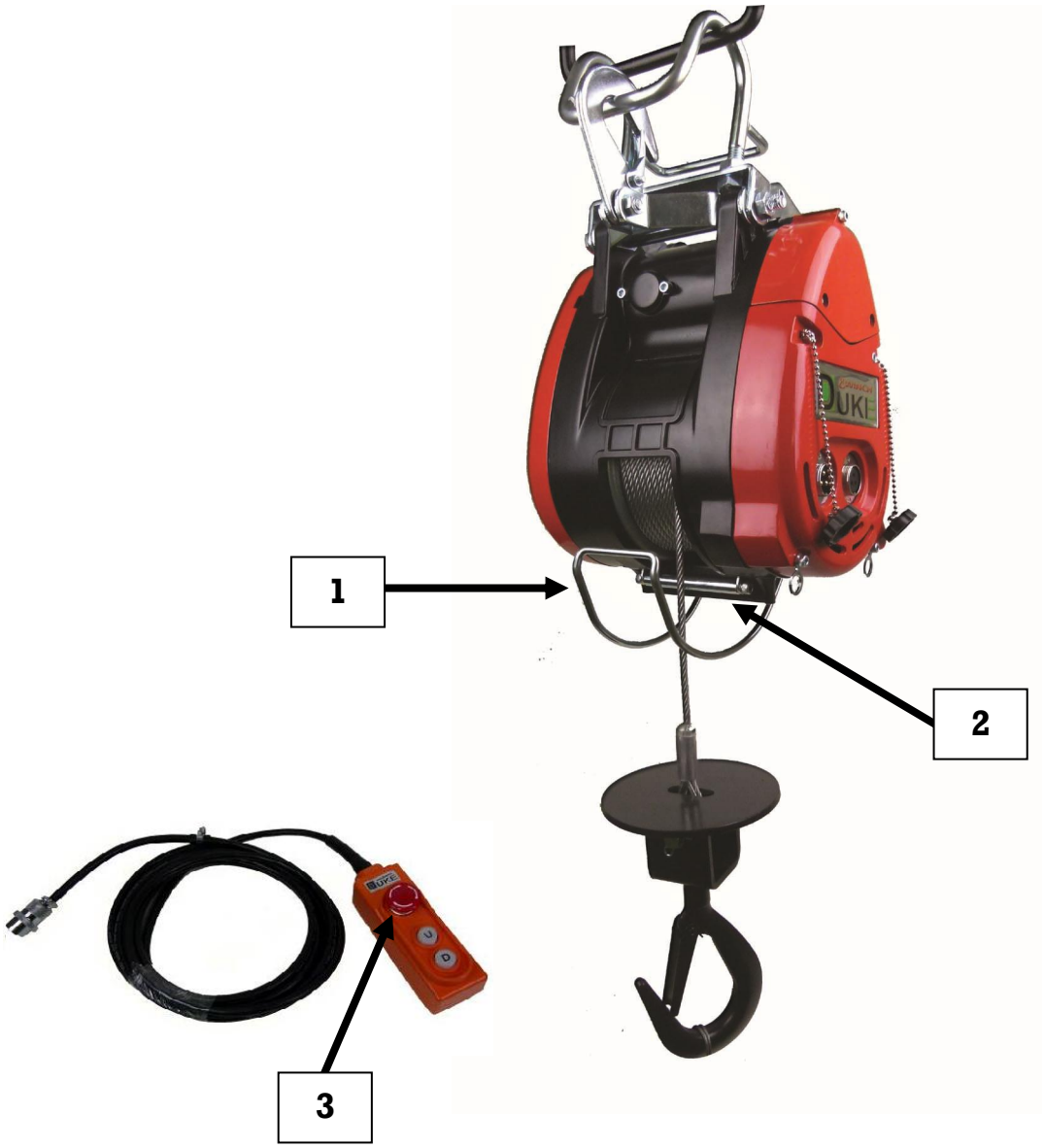
1. Don't misuse the winch, to avoid danger.
2. Before start the winch, make sure all the protecting covers are not breakdown and damage.
3. If the mechanism or any part breakdown, operator should stop the winch immediately and then examine and repair it.
4. If it results abnormal sound during operation, operator should stop the winch immediately and then examine and repair it.
5. If abnormal temperature phenomenon happens during operation, operator should stop the winch immediately and then examine and repair it.
6. Don't modify the original design of mechanical structure, in order to keep the best efficiency and security.
7. Please store the spare parts and tools well, and avoid moist and damage.
8. Untrained or unauthorized operator is prohibited operating, installing or maintaining winch.
9. Please maintain and repair the winch according to service instruction.
10. Please replace broken part according to the specification in part list.

2-2. Location of warning sign, CE mark, nameplate

Electric shock

CE symbol
CE
Nameplate
HOIST&WINCH DUKE
Nameplate


2-3. All safety related elements



ITEM	DESCRIPTION
1	PUSH ROD SET OF UPPER LIMIT
2	PUSH ROD SET OF LOWER LIMIT
3	EMERGENCY STOP

2-4. Checklist of electrical and safety function

Item	Content inspection and safety requirement	Result	Comment
1	Is every terminal protected by isolation plate (IP2X)?	YES	
2	Does technician follow the procedure number to wire?	YES	
3	Are the diameter of grounding wire and each circuit accord with safety requirement of designed electrical circuit?	YES	
4	Is fuse accord with safety requirement of designed electrical circuit?	YES	
5	Are these screws on electric box fixed tightly?	YES	
6	Is the electric box equipped with a ventilator (e.g. fan)?	YES	
7	Does the design of electric box conform to IP requirement?	YES	
8	Is all the function of every control switch and component described specifically on this operation manual?	YES	
9	Are input voltage, frequency, and phase marked correctly?	YES	
10	Is the machine earthed?	YES	
11	Is there an independent earth copper plate equipped inside electric box?	YES	
12	Is every function of control device regular?	YES	
13	Is the emergency stop device functional?	YES	
14	Is the rotary direction of motor or transmission correct?	YES	
15	Is the cover functional (fixed or movable)?	YES	
16	Is the machine set stable?	YES	
17	Have all the acute angle and fur been ground?	YES	
18	Has the machine been pasted a CE mark?	YES	
19	Has the machine been pasted a nameplate?	YES	
20	Has the machine been pasted related warning marks?	YES	
21	Have the listed related safety parts in TCF 1.6 been installed indeed?	YES	
22	Have all the safety information and attentions been provided completely for user?	YES	
23	Does the written language of manual and machine conform to local country?	YES	
24	Has the operation manual been provided?	YES	
25	Has the EC Declaration of Conformity been signed?	YES	

3. Mini Wire Winch Description

3-1 General characteristics

3-1-1 Usages

Fit for various workplace applications, such as general factories, warehouse, construction, plumbing, and agriculture industries. Designed for unique rigging applications encountered at small venues, lightweight, quiet, and portable. Operates on 100V-120V or 220V-240V, which means you can plug it in just about anywhere.

3-1-2 Features

Braking: Dual braking system combines dynamic and mechanical braking, provides instant and safe braking.

Gearing: Precision machined gears heat treated for strength and durability, the ball or needle bearings at all rotating points run in oil bath lubrication for a quieter, smoother and cooler operation.

Upper limit switch: When hook disc touch it, the motor will automatically stop.

Lower limit switch: The design is in order to prevent wire rope under-wound

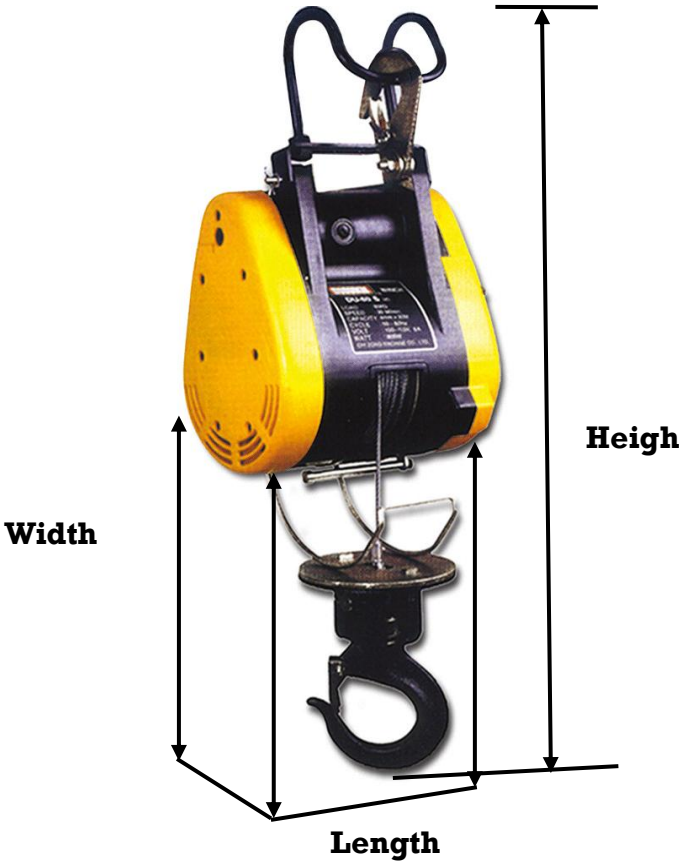
Push button: Easy to maintenance, simply layout of the control with 7M power cable as standard and emergency stop as option.

IP RATE: Heavy duty IP65 waterproof.

Hook: 360℃ swivel hook as standard

Model Dimensions	DU-160A	DU-230A	DU-250A	DU-300A	DU-500A
Length (mm)	240	240	240	240	240
Width (mm)	180	180	210	210	210
Height (mm)	660	660	670	670	670
Capacity (kg)	160	230	250	300	500
Standard Lift(m)	30		60		40
Control Cable(m)	7				
Lifting Speed(m/min)	50HZ-19	50HZ-19	50HZ-12	50HZ-12	50HZ-12
Wire rope(mm)	5				6
Safety Factor	WLL X 1.25				
Insulation Class	F				
ED%	35%				
No. Of Starts per hr	300				
Power Cable (m)	5				
Net Weight (kg)	21.5	21.5	28	28	28

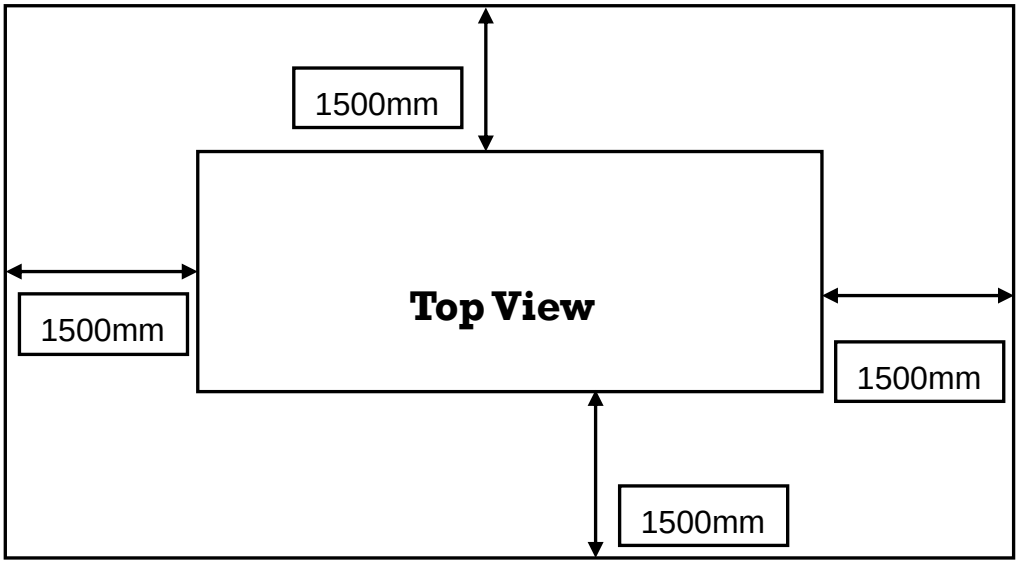
3-3 Overall dimensions



MODEL	Length	Width	Height
DU-160A	240mm	180mm	660mm
DU-230A	240mm	180mm	660mm
DU-250A	240mm	210mm	670mm
DU-300A	240mm	210mm	670mm
DU-500A	240mm	210mm	670mm

3-4 Working space required and operating position

FRONT OPERATOR



FRONT OPERATOR

3-5 Main units and name

Item	Part's name
1	GEAR
2	UPPER HOOK
3	MOTOR
4	Electric Department
5	LOWER HOOK
6	WIRE ROPE

4. Pre-use Preparation

4-1 Notice and inspection before operation

4-1-1 Mechanical Check

1. Are all transport protection facilities removed?

2. Is there any mechanical damage?

3.Are all the safety device, safety covers refitted from the set-up installation?

4. Are all winch unit correctly aligned and locked in position?

5. Are all mobile and rotating parts exempt of foreign bodies? Is there mobility unimpaired (tools wire, yarns, waste, etc.)

4-1-2 Electrical Check

1. Are all ground conductors connected?

2. Are all cables connected?

3. Is there any mechanical damage of electrical control operating and indicator units

4. Are all plug-in connection to the winch fitted correctly?

5. Are all the cable near mobile parts fixed correctly?

6. Are the cable fitting tightened?

7. Were wire rests and metal objects removed and cleaned away from switch box, junction box, control cabinets, and operating panel?

8. Are frequency inverters motor set for the correct V/Hz ratio if applied?

9. Are the drive rotating direction correct?

4-2 Expected use and limits of use

Specification of essential parts:

Please refer to the list of specification in operation manual.

This winch is expected to be used under industrial environment:

The well lighting, well ventilation, clean environment, dry, and maintains a normal temperature (-10℃ to +50℃).

The winch needs the following supplies:
Electric power: single phase/ 100-120V or 220-240V/ 50Hz and 60Hz (or base on previous designation) (-10°C to +50°C).

Working Duty (ED%):

35%.

No more than 20 minutes use within 60 minutes frame.

The required technique and experience during safety operation and use.

They should be a proficient operator or trained staff.

5. Transport, Install and Dismantle

5-1 Transport

Always carry the winch with two hands to prevent a strike.

Below table shows net weight and gross weight for each model of winch.

MODEL	NET WEIGHT	GROSS WEIGHT
DU-160A	21.5 KG	23.0 KG
DU-230A	21.5 KG	23.0 KG
DU-250A	28.0 KG	29.0 KG
DU-300A	28.0 KG	29.0 KG
DU-500A	28.0 KG	29.0 KG

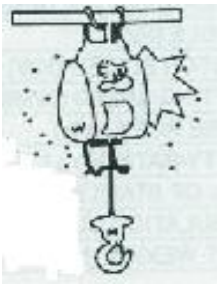
5-2 Install

5-2-1 Environment Precautions

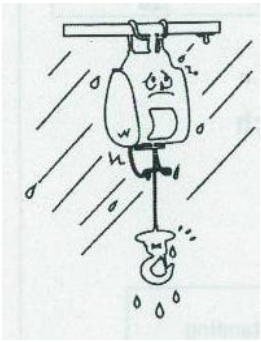
The following environmental conditions may adversely affect the winch

Low temperature below -10°C
High temperature above 40°C
· High humidity conditions above 90%

In organic, chemical, or explosive conditions



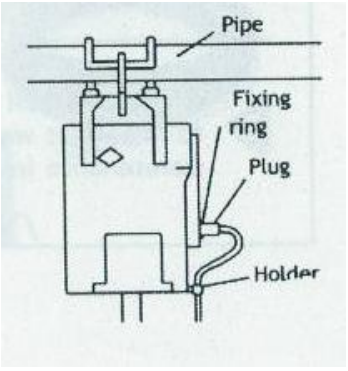
In wet weather conditions or snow *(Cause rust or short circuit)*



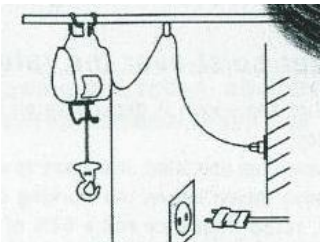
In heavy dusty conditions *(Cause malfunction or poor performance)*

5-2-2 Power Cord Insertion

- Insert the power plug into the power receptacle of the winch, firmly hand tighten by turning the locking ring clockwise.
- Be sure to lock the cord onto the holder mounted on the winch.
- Do not allow the cords to be tangled into the wire rope and drum
- The normal length of the cord is 15 feet . Longer cords up to can be used, however to avoid any malfunction, or any decrease in power efficiency do not exceed a total length of 32 feet cord



Determining the appropriate cord based on length required



Grounding

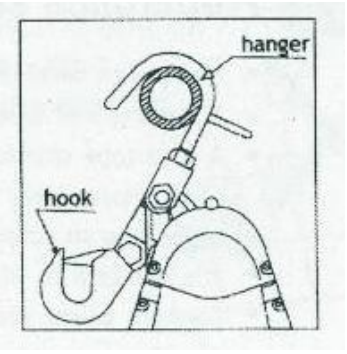
- To prevent the risk of electric shock, the power plug must be plugged into a matching grounded socket.

Switch/Pendant cord connection

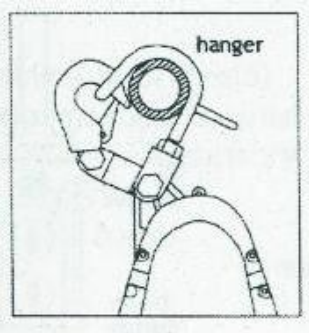
- Insert the pendant plug into the pendant receptacle of the winch and tighten it by turning the locking ring clockwise. Be sure to hook the cord on the holder.
- To extend the length of the cord connect an extension cord of 15feet max. Do not exceed 50feet in total

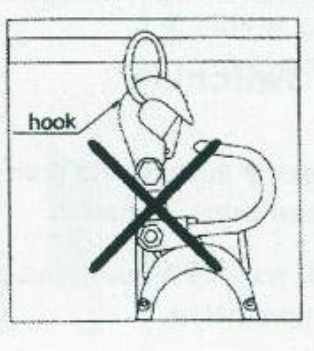
5-2-3 Mounting

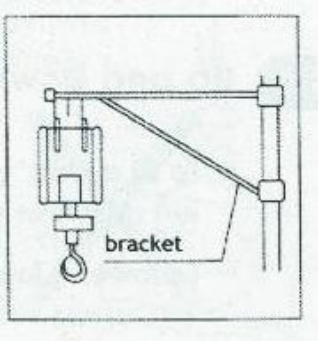
- The winch is designed to be hung or mounted on a firm or stable bar or bracket. Which ensures the winch doesn't move from side to side, or swing in a 360°
- As an optional accessory the winch Bracket can be purchased.
- When hung, do not allow the body or load to be caught by any obstruction.



Be sure to lock the hanger for extra safety
Never hang from the hook only.
This hook is not designed to take a load







5-2-4 Emergency stop button

Check the function of emergency stop button is normal or not. The emergency stop button is used for cutting off the power supply that should be optional in any time. (Customer might forget to release the emergency stop button, during operation, and misunderstand the machine is broken down.)

5-2-5 Continuous rating

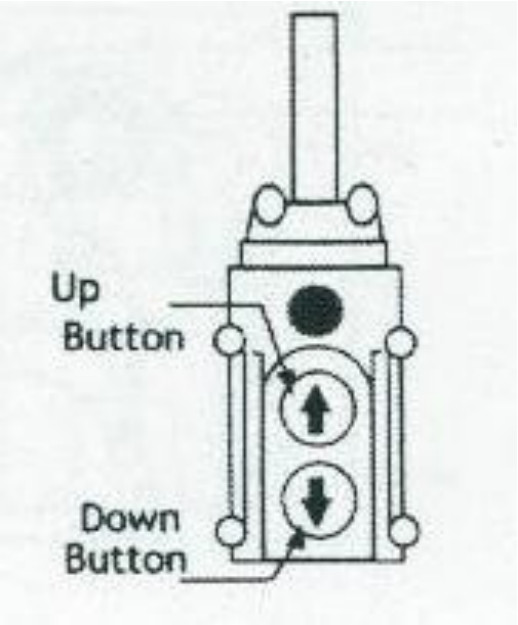
Never use the winch beyond the 20 minutes permitted per hour.

The life of the winch depends on the conditions of the load and working frequency.
During long operating periods make sure to use the winch within its continuous rating.

Continuous Rating means the amount of allowable usage within one hour which is 25% or 15 minutes per hour or 300 starts per hour.
The maximum number of starts means the number of times the motor starts within the hour.

6. Operation

6-1 Control device: Control panel

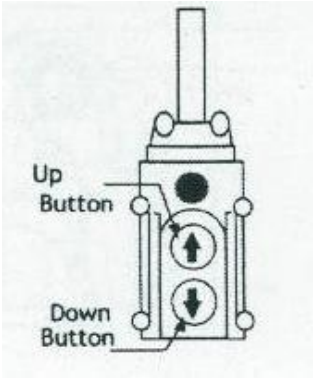


6-2 Operating procedure

The person who is untrained or unfamiliar with the operation procedure is prohibited from operating machine.

Preparation before Working

- Check all safety and environmental conditions
- Ensure there are a minimum of five(5) wraps of wire wound around the drum
- Check the wire rope and discard should there be any signs of excessive wear, too many broken wires, corrosion, or other defects.
- One wire rope consists of 7 strands. One strand has 19 wires. So one of the 7 strands must not have more than 3 of the 19, damaged wires.
- Connect the main power source and ensure grounding.
- Do not lift loads exceeding the rated load.
- Always use power source at the rated voltage.



Up and Down Control Switch

- **To Lift a Load.** Press ▲ Button
- **To Lower a Load. Press** ▼ Button

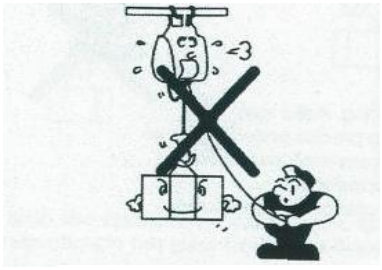
6-3 Handling Precautions

WARNING

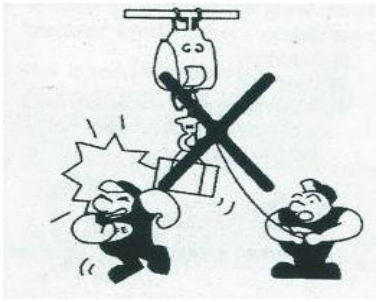
Pay close attention to the following instructions.

Incorrectly operating the winch may result in personal injury or equipment damage.

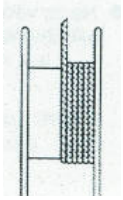
Never try to lift a load more than the rated



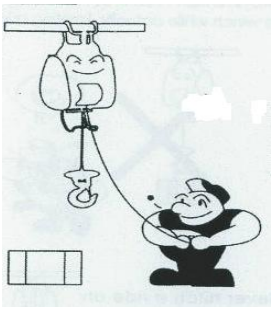
Don't work, walk or stand under and operating winch



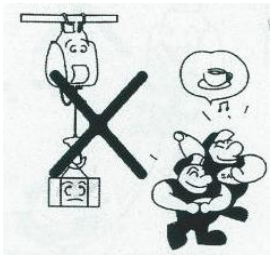
A minimum of five (5) wraps of rope around the drum is necessary to support the rated load



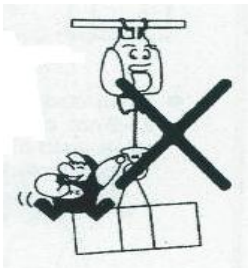
Prior to lifting make sure the brake is performing correctly.
If any malfunction is detected stop the operation immediately.



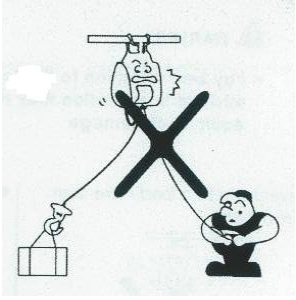
Always remain in control.
Never leave a load



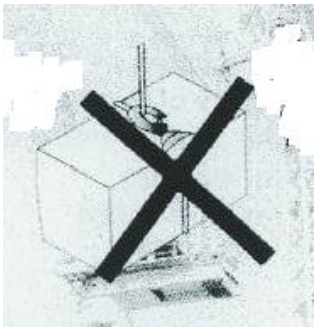
Never ride on the hook, sling, or load



Always look up when working the winch. Watch for overhead danger
Be sure to lift a load vertically. Any slack may allow wire to be tangled.

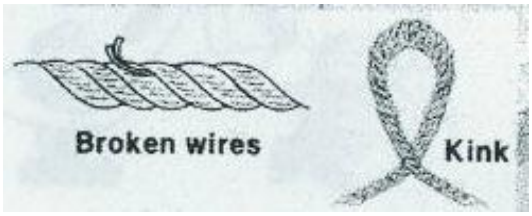


Never wrap the load with the wire rope



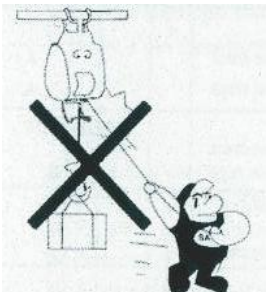
Wire rope with one or more of the following defects must be replaced immediately.

1. Kink
2. Distortion
3. Corrosion
4. Showing signs of excessive wear or if 1 of the 7 strands has more than 3 of the 19 wires damaged

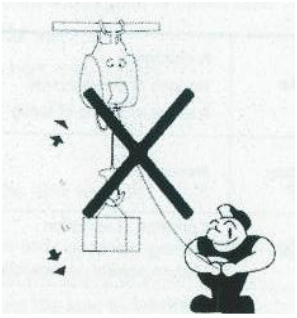


Do not pull the control pendant to move/pull a load

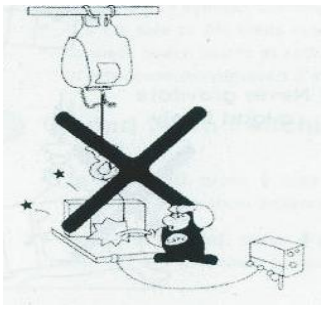
Do not exceed the continuous rating



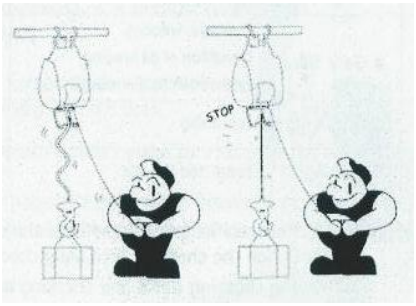
Do not rapidly change from Lifting to Lowering



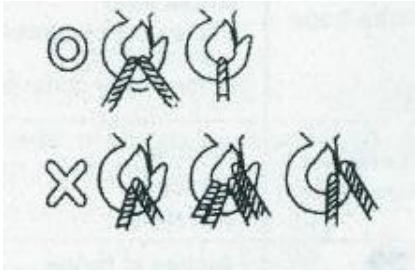
Never work on or weld on a suspended load



Stop operation immediately if the wire rope slackens.



Ensure the slings are fixed in the centre of the swivel hook



Other Important Precautions

Stop operating the winch if there is an abnormal noise or vibration in the gear box.

Do not use the winch or the wire rope as grounding for a welding machine

Make sure the load being lifted is well balanced and secured before commencing.

7. Maintenance and Adjustment

7-1 Periodical Checking

	Parts	Checks	Checking Method	Timing			
				Daily	3mths/ 20 hrs	1 year	3 years
1	Brake	Performance	Visual		✓		
		Wearing of pressed plate	Decomposition Check				✓
		Broken springs	Decomposition check				✓
2	Carbon Brushes	Wearing	Decomposition Check		✓		
3	Motor	Condition of insulation	Visual	✓			
		Staining damage	Visual		✓		
		Carbon Powder accumulation	Decomposition Check			✓	
4	Control Assy	Working	Manual	✓			
		Outer damage of switch cords	Visual	✓			
		Connection of earth wire	Visual	✓			
		Condition of Insulation	Visual		✓		
5	Safety devices	Over prevention function	Visual	✓			
		Reverse winding prevention function	Visual	✓			
		Distortion over winding function	Visual	✓			
		Wrong rotary direction-winding	Visual	✓			
6	Wire Rope	Kinking	Visual	✓			
		Broken wires	Visual	✓			
		Decreased diameter by more than 10%	Visual	✓			
		Deforming or corrosion	Visual	✓			
7	Swivel hook & Hanger	Distortion	Visual	✓			
		Damage	Visual	✓			
		Loosening	Visual	✓			
8	Drum	Rupture of Flange	Visual		✓		
		Wearing	Visual		✓		
9	Gear Case	Damaged	Visual	✓			
		Check oil level	Measuring		✓		
		Lubrication for couplings	Measuring		✓		
10	Fastenings	Loosening	Manual	✓			

***It is Important that*:**

1. **Only Qualified persons can conduct any form of Checking**
2. **Each Item listed above is to be carried out according to the specified Timing**

7-2 Wire Rope Replacement

Swivel Hook

- Put a new wire rope through the hole of the round plate of the swivel hook
- Insert a sleeve pin through the thimble of the wire rope
- Insert a pin through the sleeve pin and bend it with pliers

Drum

- Insert a new wire rope w/clamp through the limit switch lever and insert it into the hole of the drum
- Put a P.T. screw into the hole of the drum and tighten it by a hexagon key
- Uneven winding of the rope may cause the load to swing thus damaging the rope and reducing its life swan

Oil Lubrication

- The winch is prefabricated at the factory and do not require initial lubrication.
- Re-lubrication interval depends upon service.

Carbon Brush Replacement

- It is essential to check the carbon brushes periodically. If the length is less than 7.5mm, it is necessary to replace the carbon brushes immediately.
- When replacing, smoothly insert carbon brushes into carbon holders, then put brush caps into the holes.
- Before tightening the carbon brush holders, make sure they are positioned correctly.
- A set of carbon brushes consists of 2 pieces. Always replace 2 pieces on opposite sides of the winch body at the same time.

7-3 Braking and Winding Devices

7-3-1Braking

- Braking is via a mechanical brake and an electronic generated brake. The brake distance from time of braking until stopping completely should be within 1.5 % of rope length wound during 1 minute.
  This can be determined by simply timing the amount of rope that is wound in 1 minute and calculated by 1.5%.
- The rope speed with no load is faster than that with the rated load. The brake distance with no load will be longer, but still within 1.5% of rope length

7-3-2Over-Winding Lift Prevention Device

- A special mechanism prevents over-winding when lifting. When the swivel hook touches the limit lever, lifting is automatically stopped.
- If the limit lever is set to close to the winch body, it will cause serious damage to the limit lever and winch body.
-

7-3-3 Reverse-Winding Prevention Device

A special mechanism prevents reverse over-winding:

- When lowering if the rope is fully extended, this device will cause the wire rope to shift its position from the front, toward the back.
- To disengage this device the wire rope needs to be shifted back to the front position. To do this pull and hold the rope downward and press the ↑ button.

7-4 Troubleshooting

If the winch fails to start after several attempts or the winch's operation appears to be defective check the following:

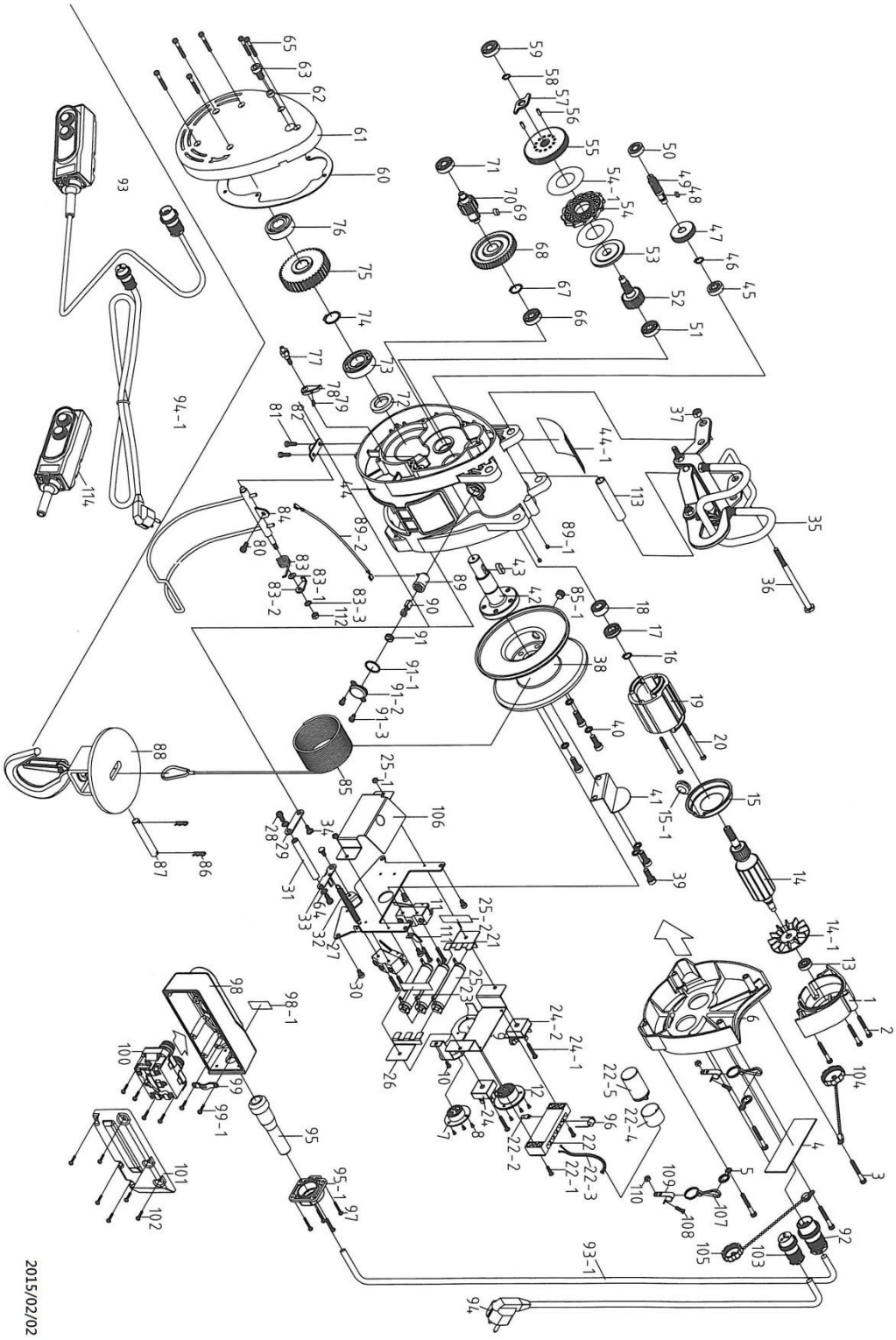
Observed Anomaly	***Possible Cause***	***Solution***
No Reaction after pressing the buttons on the control pendant	No power	Check power source
	Disconnection of plug, power cord or pendant cord	Replace or repair
	Damaged motor resulting from overload	Replace
	Burnt diode assy	Replace
	Considerable voltage drop	Adjust to rated voltage
	Wearing of carbon brushes	Replace carbon brushes
Brake distance too long	Wearing of lining, pressed plate and pawl	Replace
	Disconnection of electronic generated braking	Repair nut cord or Replace D type resister
	Voltage Too high	Adjust to rated voltage
No over-winding Prevention while swivel hook touches limit lever	Disconnection of electronic generated braking	Repair nut cord or Replace D type resister
	Malfunction of limit switch	Replace
Lifting speed too slow	Overload	Reduce Load
	Considerable voltage drop	Adjust to rated voltage and check the section of the power cord
Electrical leakage or shock	Burnt motor resulting from overload	Replace motor
	Wearing of carbon brushes	Replace carbon brushes and clean any carbon powder in the motor
	Water invaded motor or push button	Dry it or replace motor if badly saturated
Abnormal sound in gear box	Insufficient oil resulting from oil leakage	Replace oil seal and refill with sufficient oil
	Distortion of gear box	Repair

NB: All mechanical or electrical work must be carried out by a qualified tradesperson

8. Drawings and Part list

8-1 Assembly drawings and part list

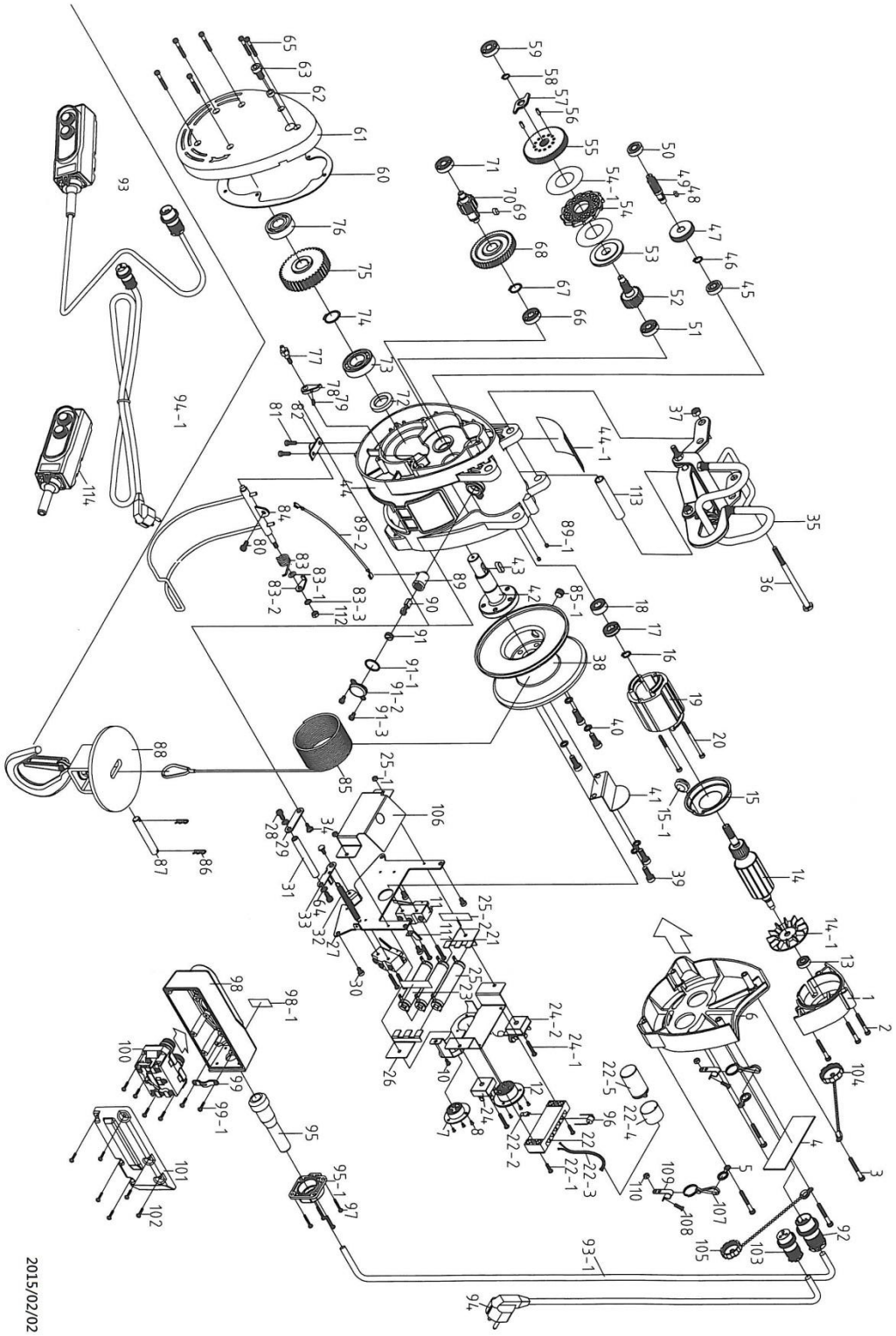
MODEL: DU-160A - Assembly drawings



MODEL: DU-160A - part list

1	MOTOR COVER	38	REEL DRUM	83-1	WASHER
2	SCREWS	39	SCREW	83-2	UPPER LIMIT PUSH ROD
3	SCREWS	40	WASHER	83-3	WASHER
4	PLT COVER PROTECTION	41	PRESS SHEET OF WIRE ROPE	84	PUSH ROD SET OF UPPER LIMIT
5	TWIN-CIRCLE TYPE HOOK	42	OUTPUT SHAFT	85	WIRE ROPE 5MM X 30M
6	COVER OF WIRING BOX	43	KEY	85-1	SCREW
7	CONTROL CABLE SOCKET	44	MAIN BODY BASE	86	R TYPE PIN
8	SCREWS	44-1	STICKER	87	WIRE ROPE FIXING PIN
9	SOCKET RACK OF CONTROL CABLE	45	BEARING	88	LOWER HOOK SET
10	SCREWS	46	SNAP RING	89	BASE OF CARBON BRUSH
11	MICRO SWITCH	47	FIRST SECTION GEAR	89-1	SCREW
11-1	SCREW	48	KEY	89-2	CABLE
12	CONTROL CABLE SOCKET	49	FIRST SECTION GEAR SHAFT	90	CARBON BRUSH
13	BEARING	50	BEARING	91	CARBON BRUSH COVER
14	ROTOR 1.3KW	51	BEARING	91-1	O RING
14-1	FAN	52	SECOND SECTION GEAR SHAFT	91-2	CARBON BRUSH PROTECTION
15	AIR GUIDING IRON COVER	53	WASHER OF BRAKE	91-3	SCREW
15-1	Plastic tube	54	BRASS BRAKE LINING	92	CONNECTOR OF CONTROL CABLE
16	SNAP RING	54-1	WASHER	93	CONTROL SWITCH SET 7M
17	BEARING	55	SECOND SECTION GEAR	93-1	SWITCH CABLE
18	OIL SEAL	56	COTTER PIN	94	110V POWER CABLE
19	STATOR 1.3KW	57	ROTARY STOPPING SHEET		240V POWER CABLE
20	SCREWS	58	SNAP RING	94-1	110V POWER CABLE SET
21	TERMINAL BLOCK FIX	59	BEARING		240V POWER CABLE SET
22	TERMINAL BLOCK	60	PACKING PLANK	95	PLASTIC TUBE
22-1	SCREW	61	GEAR COVER	95-1	PLASTIC TUBE HOLDER
22-2	TERMINAL PLATE	62	TUBE	96	DIODE
22-3	CAPACITOR	63	SCREWS	97	SCREW
22-4		64	WASHER	98	SWITCH BOX
22-5		65	SCREWS	98-1	STICKER
23	RESISTOR 40W 52OM	66	BEARING	99	COPPER PLATE
23-1	SCREW	67	SNAP RING	99-1	SCREW
24	BRIDGE TYPE REGULATOR	68	THIRD SECTION GEAR	100	SWITCH CONTACT
24-1	SCREW	69	KEY	100-1	SCREW
24-2	REGULATOR W/ VARISTOR	70	THIRD SECTION GEAR SHAFT	100-2	SCREW
25	RESISTOR 40W 10OM	71	BEARING	101	SWITCH COVER
25-1	NUT	72	OIL SEAL	102	SCREW
26	RESISTOR RACK	73	BEARING	103	POWER CONNECTOR
27	WIRING RACK	74	SNAP RING	104	EMERGENCY CONNECTOR
28	SCREWS	75	FOURTH SECTION GEAR	105	PLT COVER PROTECTION
29	FIXING SHEET OF REVERSE REEL PUSH ROD	76	BEARING	106	SOCKET COVER
30	SCREWS	77	CLICK FIXING SCREWS	107	LANYARD CLIPS
31	ANTI-REVERSE REEL PUSH ROD	78	CLICK	108	SCREW
32	SPRING	79	SPRING	109	BINDER OF CABLE
33	FIXING SHEET OF REVERSE REEL PUSH ROD	80	SCREWS	110	WASHER
34	SCREWS	80-1	NUT	111	CLIP
35	UPPER HOOK SET	81	SCREWS	112	WASHER
36	SCREWS	82	UPPER LIMIT HOLDER	113	STEEL TUBE OF UPPER HOOK
37	NUTS	83	SPRING	114	CONTROL SWITCH SET W/O CABLE

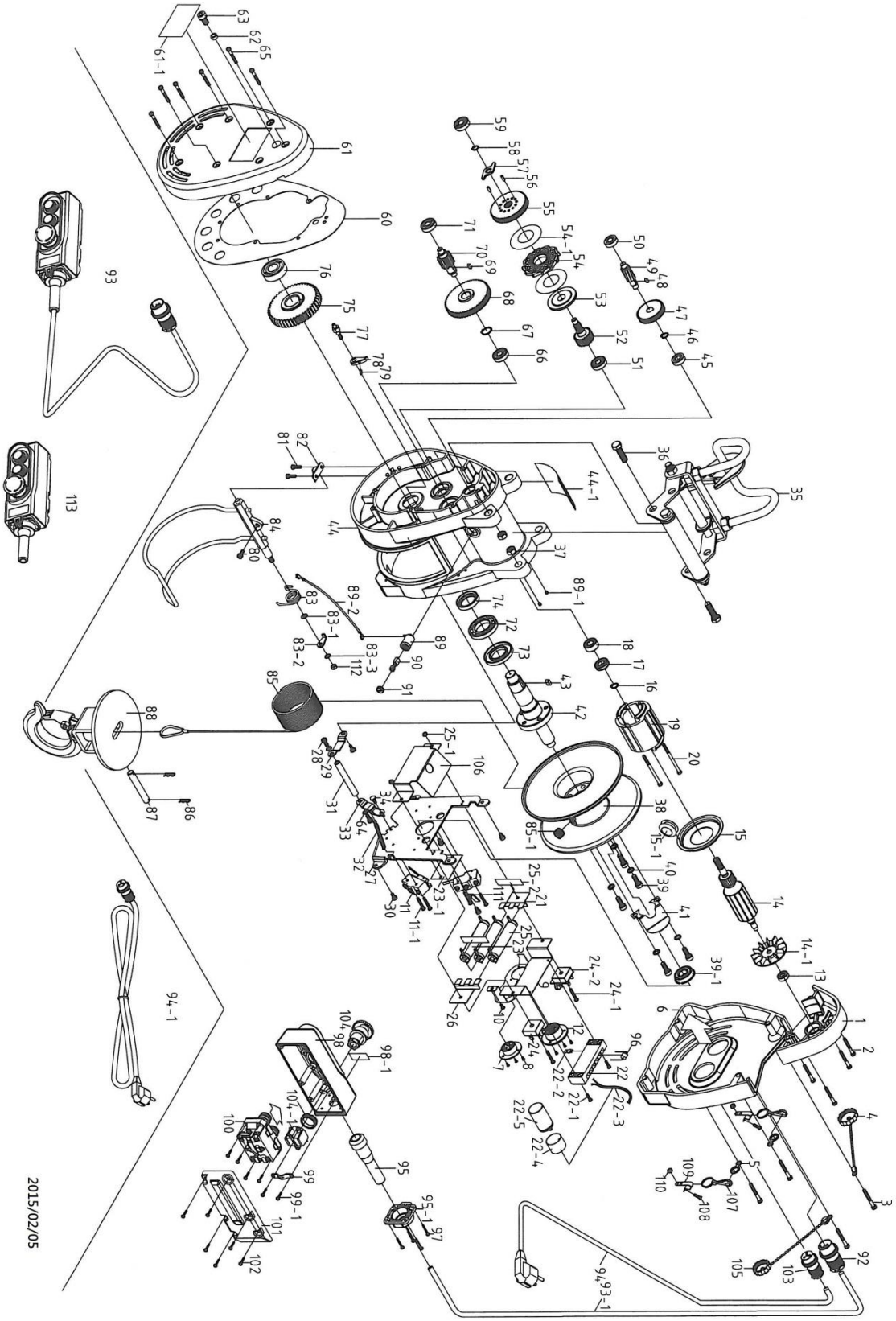
MODEL: DU-230A - Assembly drawings



MODEL: DU-230A - part list

1	MOTOR COVER	38	REEL DRUM	83-1	WASHER
2	SCREWS	39	SCREW	83-2	UPPER LIMIT PUSH ROD
3	SCREWS	40	WASHER	83-3	WASHER
4	PLT COVER PROTECTION	41	PRESS SHEET OF WIRE ROPE	84	PUSH ROD SET OF UPPER LIMIT
5	TWIN-CIRCLE TYPE HOOK	42	OUTPUT SHAFT	85	WIRE ROPE 5MM X 30M
6	COVER OF WIRING BOX	43	KEY	85-1	SCREW
7	CONTROL CABLE SOCKET	44	MAIN BODY BASE	86	R TYPE PIN
8	SCREWS	44-1	STICKER	87	WIRE ROPE FIXING PIN
9	SOCKET RACK OF CONTROL CABLE	45	BEARING	88	LOWER HOOK SET
10	SCREWS	46	SNAP RING	89	BASE OF CARBON BRUSH
11	MICRO SWITCH	47	FIRST SECTION GEAR	89-1	SCREW
11-1	SCREW	48	KEY	89-2	CABLE
12	CONTROL CABLE SOCKET	49	FIRST SECTION GEAR SHAFT	90	CARBON BRUSH
13	BEARING	50	BEARING	91	CARBON BRUSH COVER
14	ROTOR 1.3KW	51	BEARING	91-1	O RING
14-1	FAN	52	SECOND SECTION GEAR SHAFT	91-2	CARBON BRUSH PROTECTION
15	AIR GUIDING IRON COVER	53	WASHER OF BRAKE	91-3	SCREW
15-1	Plastic tube	54	BRASS BRAKE LINING	92	CONNECTOR OF CONTROL CABLE
16	SNAP RING	54-1	WASHER	93	CONTROL SWITCH SET 7M
17	BEARING	55	SECOND SECTION GEAR	93-1	SWITCH CABLE
18	OIL SEAL	56	COTTER PIN	94	110V POWER CABLE
19	STATOR 1.3KW	57	ROTARY STOPPING SHEET		240V POWER CABLE
20	SCREWS	58	SNAP RING	94-1	110V POWER CABLE SET
21	TERMINAL BLOCK FIX	59	BEARING		240V POWER CABLE SET
22	TERMINAL BLOCK	60	PACKING PLANK	95	PLASTIC TUBE
22-1	SCREW	61	GEAR COVER	95-1	PLASTIC TUBE HOLDER
22-2	TERMINAL PLATE	62	TUBE	96	DIODE
22-3		63	SCREWS	97	SCREW
22-4	CAPACITOR	64	WASHER	98	SWITCH BOX
22-5		65	SCREWS	98-1	STICKER
23	RESISTOR 40W 52OM	66	BEARING	99	COPPER PLATE
23-1	SCREW	67	SNAP RING	99-1	SCREW
24	BRIDGE TYPE REGULATOR	68	THIRD SECTION GEAR	100	SWITCH CONTACT
24-1	SCREW	69	KEY	100-1	SCREW
24-2	REGULATOR W/ VARISTOR	70	THIRD SECTION GEAR SHAFT	100-2	SCREW
25	RESISTOR 40W 10OM	71	BEARING	101	SWITCH COVER
25-1	NUT	72	OIL SEAL	102	SCREW
26	RESISTOR RACK	73	BEARING	103	POWER CONNECTOR
27	WIRING RACK	74	SNAP RING	104	EMERGENCY CONNECTOR
28	SCREWS	75	FOURTH SECTION GEAR	105	PLT COVER PROTECTION
29	FIXING SHEET OF REVERSE REEL PUSH ROD	76	BEARING	106	SOCKET COVER
30	SCREWS	77	CLICK FIXING SCREWS	107	LANYARD CLIPS
31	ANTI-REVERSE REEL PUSH ROD	78	CLICK	108	SCREW
32	SPRING	79	SPRING	109	BINDER OF CABLE
33	FIXING SHEET OF REVERSE REEL PUSH ROD	80	SCREWS	110	WASHER
34	SCREWS	80-1	NUT	111	CLIP
35	UPPER HOOK SET	81	SCREWS	112	WASHER
36	SCREWS	82	UPPER LIMIT HOLDER	113	STEEL TUBE OF UPPER HOOK
37	NUTS	83	SPRING	114	CONTROL SWITCH SET W/O CABLE

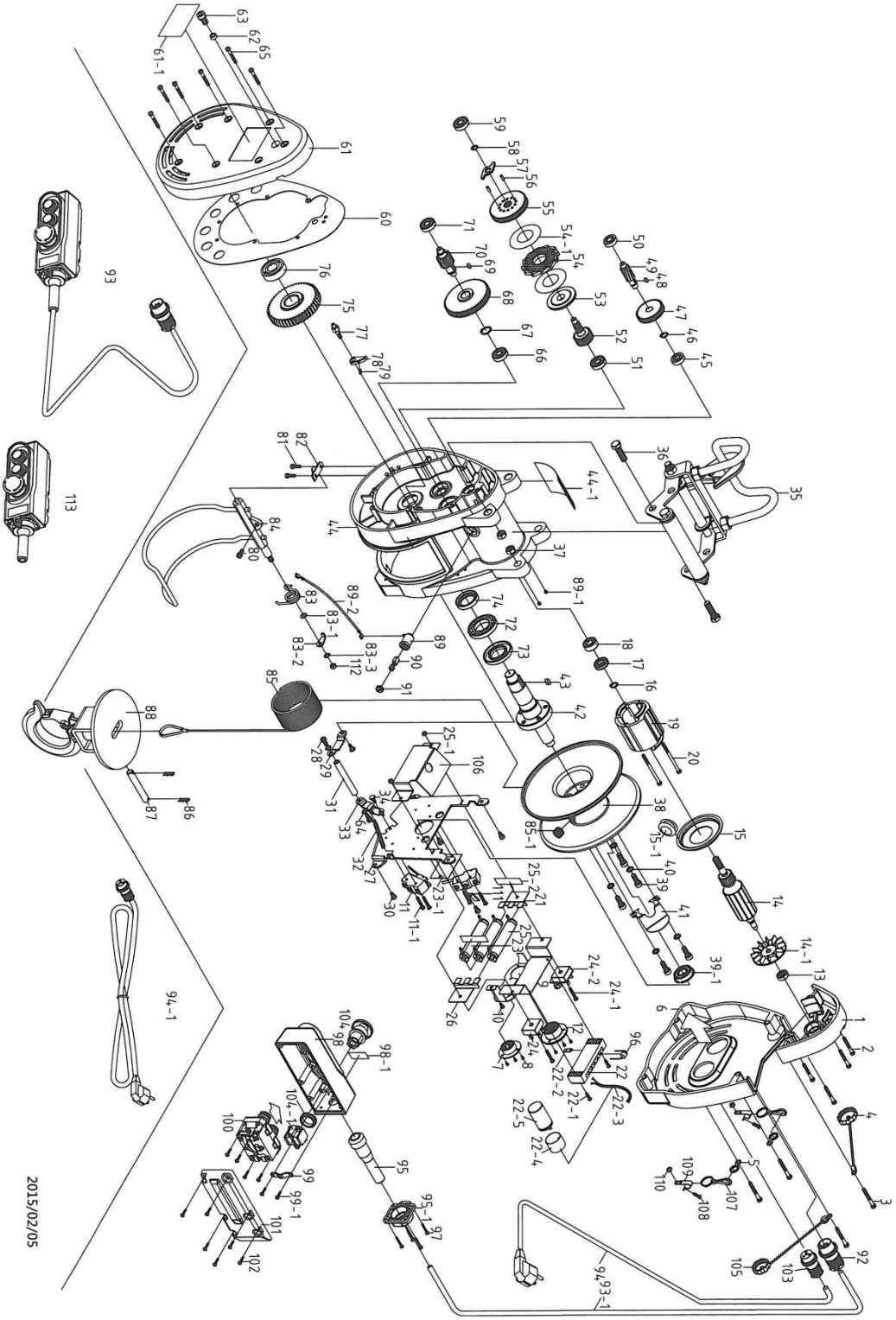
MODEL: DU-250A - Assembly drawings



MODEL: DU-250A - part list

1	MOTOR COVER	36	SCREWS	80-1	NUT
2	SCREWS	37	NUTS	81	SCREWS
3	SCREWS	38	REEL DRUM	82	UPPER LIMIT HOLDER
4	PLT COVER PROTECTION	39	SCREW	83	SPRING
5	TWIN-CIRCLE TYPE HOOK	40	WASHER	83-1	WASHER
6	COVER OF WIRING BOX	41	PRESS SHEET OF WIRE ROPE	83-2	UPPER LIMIT PUSH ROD
7	CONTROL CABLE SOCKET	42	OUTPUT SHAFT	83-3	WASHER
8	SCREWS	43	KEY	84	PUSH ROD SET OF UPPER LIMIT
9	SOCKET RACK OF CONTROL CABLE	44	MAIN BODY BASE	85	WIRE ROPE
10	SCREWS	44-1	STICKER	85-1	SCREW
11	MICRO SWITCH	45	BEARING	86	R TYPE PIN
11-1	SCREW	46	FIXING SPRING	87	WIRE ROPE FIXING PIN
12	CONTROL CABLE SOCKET	47	FIRST SECTION GEAR	88	LOWER HOOK SET
13	BEARING	48	KEY	89	BASE OF CARBON BRUSH
14	ROTOR	49	FIRST SECTION GEAR SHAFT	89-1	SCREW
14-1	FAN	50	BEARING	89-2	CABLE
15	AIR GUIDING IRON COVER	51	BEARING	90	CARBON BRUSH
15-1	Plastic tube	52	SECOND SECTION GEAR SHAFT	91	CARBON BRUSH COVER
16	FIXING SPRING	53	WASHER OF BRAKE	92	CONNECTOR OF CONTROL CABLE
17	BEARING	54	BRASS BRAKE LINING	93	CONTROL SWITCH SET
18	OIL SEAL	54-1	WASHER	93-1	SWITCH CABLE
19	STATOR	55	SECOND SECTION GEAR	94	POWER CABLE
20	SCREWS	56	COTTER PIN	94-1	POWER CABLE SET
21	TERMINAL BLOCK FIX	57	ROTARY STOPPING SHEET	95	PLASTIC TUBE
22	TERMINAL BLOCK	58	FIXING SPRING	95-1	PLASTIC TUBE HOLDER
22-1	SCREW	59	BEARING	96	DIODE
22-2	TERMINAL PLATE	60	PACKING PLANK	97	SCREW
22-3	CAPACITOR	61	GEAR COVER	98	SWITCH BOX
22-4		61-1	Capacity Label	98-1	STICKER
22-5		62	TUBE	99	COPPER PLATE
23	RESISTOR 40W 52OM	63	SCREWS	99-1	SCREW
23-1	SCREW	64	WASHER	100	SWITCH CONTACT
24	BRIDGE TYPE REGULATOR	65	SCREWS	100-1	SCREW
24-1	SCREW	66	BEARING	100-2	SCREW
24-2	REGULATOR W/ VARISTOR	67	FIXING SPRING	101	SWITCH COVER
25	RESISTOR 40W 10OM	68	THIRD SECTION GEAR	102	SCREW
25-1	NUT	69	KEY	103	POWER CONNECTOR EMERGENCY CONNECTOR
26	RESISTOR RACK	70	THIRD SECTION GEAR SHAFT	104	
27	WIRING RACK	71	BEARING	104-1	
27-1	INSULATED SHEET	72	BEARING	105	PLT COVER PROTECTION
28	SCREWS	73	OIL SEAL	106	SOCKET COVER
29	FIXING SHEET OF REVERSE REEL PUSH ROD	74	OIL SEAL	107	LANYARD CLIPS
30	SCREWS	75	FOURTH SECTION GEAR	108	SCREW
31	ANTI-REVERSE REEL PUSH ROD	76	BEARING	109	BINDER OF CABLE
32	SPRING	77	CLICK FIXING SCREWS	110	WASHER
33	FIXING SHEET OF REVERSE REEL PUSH ROD	78	CLICK	111	CLIP
34	SCREWS	79	SPRING	112	WASHER
35	UPPER HOOK SET	80	SCREWS	113	STEEL TUBE OF UPPER HOOK

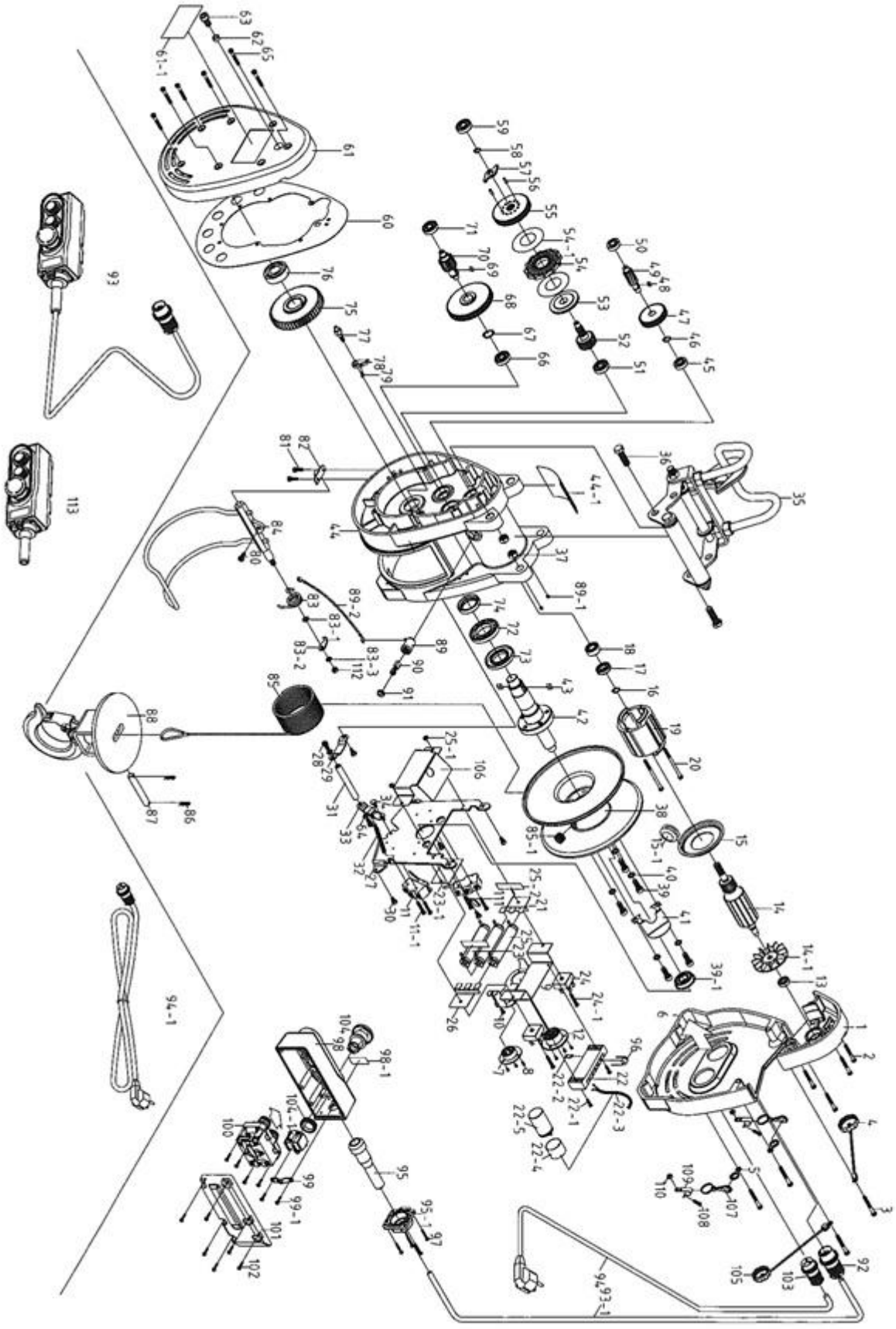
MODEL: DU-300A - Assembly drawings



MODEL: DU-300A - part list

1	MOTOR COVER	36	SCREWS	80-1	NUT
2	SCREWS	37	NUTS	81	SCREWS
3	SCREWS	38	REEL DRUM	82	UPPER LIMIT HOLDER
4	PLT COVER PROTECTION	39	SCREW	83	SPRING
5	TWIN-CIRCLE TYPE HOOK	40	WASHER	83-1	WASHER
6	COVER OF WIRING BOX	41	PRESS SHEET OF WIRE ROPE	83-2	UPPER LIMIT PUSH ROD
7	CONTROL CABLE SOCKET	42	OUTPUT SHAFT	83-3	WASHER
8	SCREWS	43	KEY	84	PUSH ROD SET OF UPPER LIMIT
9	SOCKET RACK OF CONTROL CABLE	44	MAIN BODY BASE	85	WIRE ROPE
10	SCREWS	44-1	STICKER	85-1	SCREW
11	MICRO SWITCH	45	BEARING	86	R TYPE PIN
11-1	SCREW	46	FIXING SPRING	87	WIRE ROPE FIXING PIN
12	CONTROL CABLE SOCKET	47	FIRST SECTION GEAR	88	LOWER HOOK SET
13	BEARING	48	KEY	89	BASE OF CARBON BRUSH
14	ROTOR	49	FIRST SECTION GEAR SHAFT	89-1	SCREW
14-1	FAN	50	BEARING	89-2	CABLE
15	AIR GUIDING IRON COVER	51	BEARING	90	CARBON BRUSH
15-1	Plastic tube	52	SECOND SECTION GEAR SHAFT	91	CARBON BRUSH COVER
16	FIXING SPRING	53	WASHER OF BRAKE	92	CONNECTOR OF CONTROL CABLE
17	BEARING	54	BRASS BRAKE LINING	93	CONTROL SWITCH SET
18	OIL SEAL	54-1	WASHER	93-1	SWITCH CABLE
19	STATOR	55	SECOND SECTION GEAR	94	POWER CABLE
20	SCREWS	56	COTTER PIN	94-1	POWER CABLE SET
21	TERMINAL BLOCK FIX	57	ROTARY STOPPING SHEET	95	PLASTIC TUBE
22	TERMINAL BLOCK	58	FIXING SPRING	95-1	PLASTIC TUBE HOLDER
22-1	SCREW	59	BEARING	96	DIODE
22-2	TERMINAL PLATE	60	PACKING PLANK	97	SCREW
22-3	CAPACITOR	61	GEAR COVER	98	SWITCH BOX
22-4		61-1	Capacity Label	98-1	STICKER
22-5		62	TUBE	99	COPPER PLATE
23	RESISTOR 40W 52OM	63	SCREWS	99-1	SCREW
23-1	SCREW	64	WASHER	100	SWITCH CONTACT
24	BRIDGE TYPE REGULATOR	65	SCREWS	100-1	SCREW
24-1	SCREW	66	BEARING	100-2	SCREW
24-2	REGULATOR W/ VARISTOR	67	FIXING SPRING	101	SWITCH COVER
25	RESISTOR 40W 10OM	68	THIRD SECTION GEAR	102	SCREW
25-1	NUT	69	KEY	103	POWER CONNECTOR EMERGENCY CONNECTOR
26	RESISTOR RACK	70	THIRD SECTION GEAR SHAFT	104	
27	WIRING RACK	71	BEARING	104-1	
27-1	INSULATED SHEET	72	BEARING	105	PLT COVER PROTECTION
28	SCREWS	73	OIL SEAL	106	SOCKET COVER
29	FIXING SHEET OF REVERSE REEL PUSH ROD	74	OIL SEAL	107	LANYARD CLIPS
30	SCREWS	75	FOURTH SECTION GEAR	108	SCREW
31	ANTI-REVERSE REEL PUSH ROD	76	BEARING	109	BINDER OF CABLE
32	SPRING	77	CLICK FIXING SCREWS	110	WASHER
33	FIXING SHEET OF REVERSE REEL PUSH ROD	78	CLICK	111	CLIP
34	SCREWS	79	SPRING	112	WASHER
35	UPPER HOOK SET	80	SCREWS	113	STEEL TUBE OF UPPER HOOK

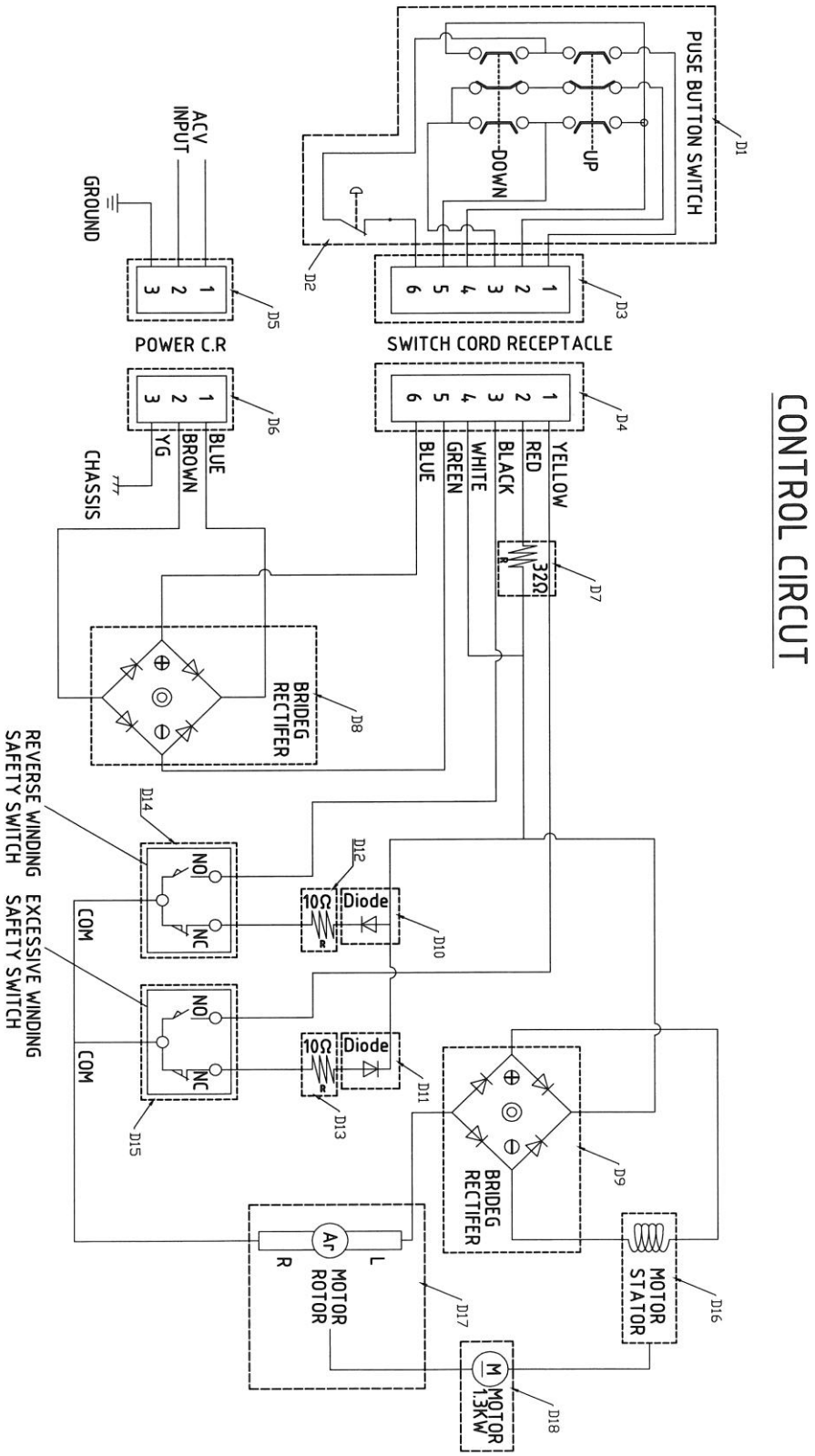
MODEL: DU-500A - Assembly drawings

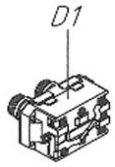
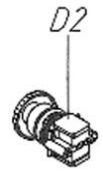


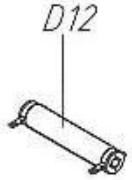
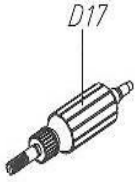
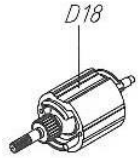
MODEL: DU-500A - part list

1	MOTOR COVER	36	SCREWS	80-1	NUT
2	SCREWS	37	NUTS	81	SCREWS
3	SCREWS	38	REEL DRUM	82	UPPER LIMIT HOLDER
4	PLT COVER PROTECTION	39	SCREW	83	SPRING
5	TWIN-CIRCLE TYPE HOOK	40	WASHER	83-1	WASHER
6	COVER OF WIRING BOX	41	PRESS SHEET OF WIRE ROPE	83-2	UPPER LIMIT PUSH ROD
7	CONTROL CABLE SOCKET	42	OUTPUT SHAFT	83-3	WASHER
8	SCREWS	43	KEY*2	84	PUSH ROD SET OF UPPER LIMIT
9	SOCKET RACK OF CONTROL CABLE	44	MAIN BODY BASE	85	WIRE ROPE
10	SCREWS	44-1	STICKER	85-1	SCREW
11	MICRO SWITCH	45	BEARING	86	R TYPE PIN
11-1	SCREW	46	FIXING SPRING	87	WIRE ROPE FIXING PIN
12	CONTROL CABLE SOCKET	47	FIRST SECTION GEAR	88	LOWER HOOK SET
13	BEARING	48	KEY	89	BASE OF CARBON BRUSH
14	ROTOR	49	FIRST SECTION GEAR SHAFT	89-1	SCREW
14-1	FAN	50	BEARING	89-2	CABLE
15	AIR GUIDING IRON COVER	51	BEARING	90	CARBON BRUSH
15-1	Plastic tube	52	SECOND SECTION GEAR SHAFT	91	CARBON BRUSH COVER
16	FIXING SPRING	53	WASHER OF BRAKE	92	CONNECTOR OF CONTROL CABLE
17	BEARING	54	BRASS BRAKE LINING	93	CONTROL SWITCH SET
18	OIL SEAL	54-1	WASHER	93-1	SWITCH CABLE
19	STATOR	55	SECOND SECTION GEAR	94	POWER CABLE
20	SCREWS	56	COTTER PIN	94-1	POWER CABLE SET
21	TERMINAL BLOCK FIX	57	ROTARY STOPPING SHEET	95	PLASTIC TUBE
22	TERMINAL BLOCK	58	FIXING SPRING	95-1	PLASTIC TUBE HOLDER
22-1	SCREW	59	BEARING	96	DIODE
22-2	TERMINAL PLATE	60	PACKING PLANK	97	SCREW
22-3	CAPACITOR	61	GEAR COVER	98	SWITCH BOX
22-4		61-1	Capacity Label	98-1	STICKER
22-5		62	TUBE	99	COPPER PLATE
23	RESISTOR 40W 52OM	63	SCREWS	99-1	SCREW
23-1	SCREW	64	WASHER	100	SWITCH CONTACT
24	BRIDGE TYPE REGULATOR	65	SCREWS	100-1	SCREW
24-1	SCREW	66	BEARING	100-2	SCREW
24-2	REGULATOR W/ VARISTOR	67	FIXING SPRING	101	SWITCH COVER
25	RESISTOR 40W 10OM	68	THIRD SECTION GEAR	102	SCREW
25-1	NUT	69	KEY	103	POWER CONNECTOR EMERGENCY CONNECTOR
26	RESISTOR RACK	70	THIRD SECTION GEAR SHAFT	104	
27	WIRING RACK	71	BEARING	104-1	
27-1	INSULATED SHEET	72	BEARING	105	PLT COVER PROTECTION
28	SCREWS	73	OIL SEAL	106	SOCKET COVER
29	FIXING SHEET OF REVERSE REEL PUSH ROD	74	OIL SEAL	107	LANYARD CLIPS
30	SCREWS	75	FOURTH SECTION GEAR	108	SCREW
31	ANTI-REVERSE REEL PUSH ROD	76	BEARING	109	BINDER OF CABLE
32	SPRING	77	CLICK FIXING SCREWS	110	WASHER
33	FIXING SHEET OF REVERSE REEL PUSH ROD	78	CLICK	111	CLIP
34	SCREWS	79	SPRING	112	WASHER
35	UPPER HOOK SET	80	SCREWS	113	STEEL TUBE OF UPPER HOOK

8-2 Electrical system drawings and part list
MODEL:DU-160A/230A/250A/300A/500A



Item	Description	Specification
	PUSE BUTTON SWITCH	UP / DOWN 500V 2.2KW
	EMERGENCY STOP	10A 250V
	CONNECTORS 7-PM	30Φ 15A 250V
	CONNECTORS 7-PM	30Φ 15A 250V
	CONNECTORS 3-P	25Φ 10A 250V
	CONNECTORS 3-R	25Φ 10A 250V
	RESISTANCE	40W 52Ω
	BRIDEG RECTIFER	52A 1200V
	BRIDEG RECTIFER	52A 1200V

Item	Description	Specification
	DIODE	6A 1000V
	DIODE	6A 1000V
	RESISTANCE	40W 10Ω
	RESISTANCE	40W 10Ω
	LIMIT SWITCH	10A 125V
	LIMIT SWITCH	10A 125V
	MOTOR STATOR	
	MOTOR ROTOR	
	SERIES WOUND MOTOR	1.3KW

MEMO

MEMO