22SbAL 3009

DELTA®

STEEL WIRE ROPE WINCH

OPERATIONS MANUAL

Model: *CWS 160*
CWS 230
CWS 300

DELTA has manufactured superior quality powered hoists, winches, platforms and accessories. Our equipment is used by people working at height, people who need lifting works. We educate our customers on safe operations in access applications and relevant codes. And we spend a lot of time talking about the best practices for working safety at height. It makes sense that we leverage this experience by offering the best quality of material handling products.

We know you have a choice of other lifting equipment suppliers. To get the work and do it with quality, brought by the DELTA lifting equipments.

We earns committed customers by putting ourselves in your safety equipment business. We listen to our customers to match with fast, efficient hoisting. Try us today!

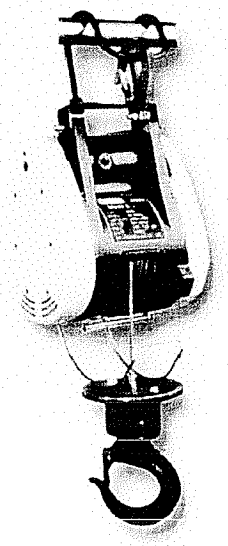
CONTENTS

6. Guarantee

We hereby certify that this mini winch was manufactured under our single-unit control of quality and was passed in strict inspection in accordance with the international material handling standards.

- Inspected according to the above test load.
- Inspected for the operation between wire and drum.
- Inspected for the operation of motor limit load test.
- Inspected for the brake load performance.
- Inspected for the working duty cycle (%ED) with the rated voltage, frequency and a 63% of the rated load per 1 working hour.
- Inspected for the swivel hook and suspension hanger.

Before the winch operation, it is recommended to read the detailed description of the manual. For A/S and operation training, each designated dealer shall support of the maintenance service.
We fully guarantee that this mini winch is tested according to the above figures.



7. Warning

WARING ! *Without following instructions, it may result in personal inquiry or equipment damage.*

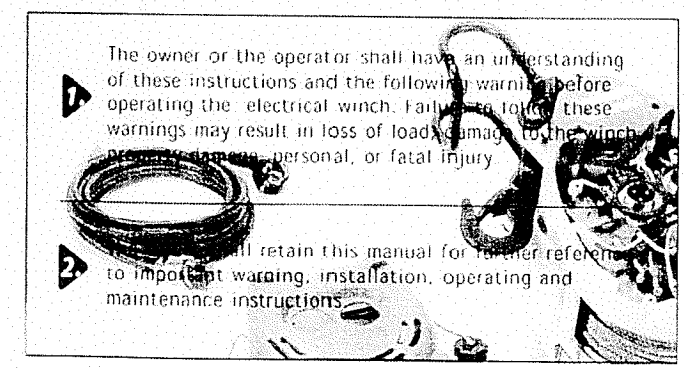
1. Do not try to lift more than the rated capacity.
2. Do not ride on the moving load.
3. Do not work, walk or stand under an operating winch.
4. Stop the operation if there is a noise or vibration in the gear.
5. Avoid water splashes on the push button switch.
6. Use a wire rope evenly positioned on the drum.
7. Before the use, make sure the loaded cargo balanced.
8. Make sure to fix a rope in the center of swivel hook
9. When the wire rope is kinked, distorted, or damaged, immediately replace with a new one.
10. Always leave the push button switch positioned immediately after use.

1. Specification

MODEL	CWS-160	CWS-230	CWS-300
CAPACITY (KG)	160	230	300
STANDARD LIFT (M)	30	30	60
CONTROL CABLE (M)	5	5	5
OPERATION VOLTAGE . SINGLE	200V-240V	200V-240V	200V-240V
CYCLE (HZ)	50/60	50/60	50/60
MOTOR POWER (KW) / MOTOR AMPLE(A)	1.2/6	1.3/7	1.3/8
LIFTING SPEED (M/MIN.)	23	23	15
WIRE ROPE (mm)	Ø 5	Ø 5	Ø 5
DUTY-RATE (ED%)	25%	25%	25%
NO. OF STARTS PER HOUR	300	300	300
INSULATION CLASS	F	F	F
NET WEIGHT (KG)	15	16	20

1.2 Instruction for DELTA® miniwinch

WARING !

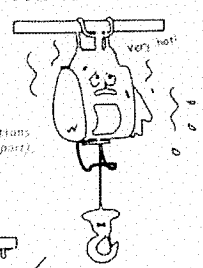


2. Installment Precaution

2.1 Environment Precaution

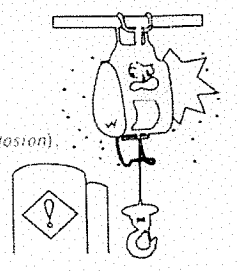
The following environmental conditions may result in the possible causes of winch trouble

- Low temperature below -10℃, high temperature above +40℃ or humidity above 90% conditions.

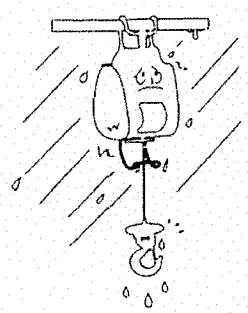


In heavy acid or salty conditions *(Cause malfunction of spare part)*.

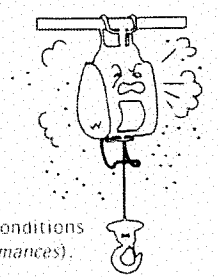
- In a organic chemistry or explosive power conditions



(Cause explosion).



- In the rain or snow *(Cause rust or short circuit)*.

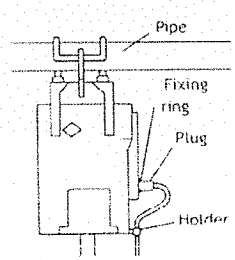


- In a heavy general powder conditions *(Cause malfunction or performances)*.

2.2 Plug Insertion

Power Core Insertion

Insert the power plug into the power receptacle of the winch, and tighten it by turning the locking ring clockwise. Be sure to lock the cord by a holder. Do not allow the cords to be caught by wire rope and drum. The length of power cord is subject to the distance of 20 meter, for any other case, please use a power cable by 5.5mm² to prevent a considerable voltage drop to be happened.



6. Trouble Shootings

Checking the winch for smooth operation by pressing up and down button of pushbutton switch. When winch fails to start after several attempts, or if any defective operation to be happened, check followings.

Observed Anomaly	Possible Cause	Solution
No reaction after pressing the Buttons of switch	No power	Check power source
	Disconnection of plug, powder cord or switch cord	Replace or repair
	Burnt or communicated motor resulting from over load	Replace
	Burnt diode ass'y	Replace
	Considerable voltage drop	Adjust to rated voltage
	Wearing of carbon brush	Replace carbon brush
Brake distance too long	Wearing of lining, pressed plate and pawl	Replace
	Disconnection of electronic generated feed-back braking	Repair nut cord Replace D type resistor
	Too high voltage	Adjust to rated voltage
No over-winding Prevention while swivel hook touches limit lever	Disconnection of electronic generated feed-back braking	Repair nut cord Replace D type resistor
	Malfunction of limit switch	Replace
Lifting speed too slow	Overload	Reduce load
	Considerable voltage drop	Adjust to rated voltage Check the section of power cord
Electricity leakage or shock	Burnt motor resulting from overload	Replace motor
	Wearing of carbon brush	Replace carbon brush and clean carbon powder left in the motor
	Water invaded in motor or push button switch	Dry it Replace motor if too heavy water invaded
Abnormal sound in gear box	Insufficient oil resulting from oil leakage	Replace oil seal Fill with sufficient oil
	Distortion of gear box	Repair

5. Checking

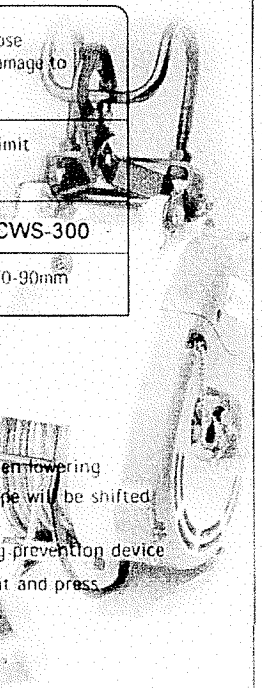
• Braking

- Braking device are composed of a mechanic brake and a electronic generated brake. The brake distance from the time of braking until stopping completely should be within 1.5% of rope length to the wound in during 1 minute.
- Owing to the rope speed on no load is faster than that on rated load, the brake distance on no load will be longer, but still within 1.5% of rope length.
- The rope speed on no load is 1.5 - 1.8 times of rated speed on rated load.

• Over-Winding Lift Prevention Device

A special mechanism prevents a over-winding when lifting.
When the swivel hook touches the limit lever, Lifting is automatically stopped

Over-Winding Limit Lever Picture



- However, if the limit lever is set too close to the winch body, it will cause serious damage to the limit lever and the winch body.
- A suggested distance (S) between the limit lever and winch body is as follows.

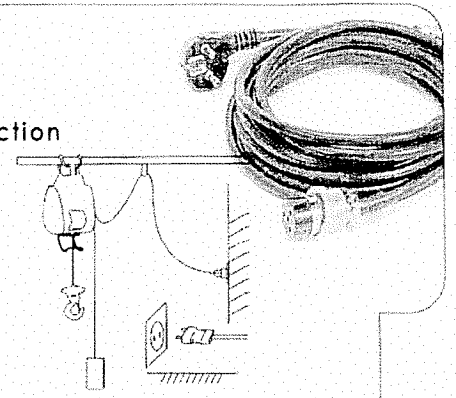
Model	CWS-160 CWS-230	CWS-300
Distance	80-100mm	70-90mm

• Reverse-Winding Prevention Device

- A special mechanism prevents a over reverse-winding when lowering.
- When lowering, a wire rope is fully extended, the wire rope will be shifted its position from 0 to X.
- When a wire rope touches the limit lever of over-winding prevention device
- When the wire rope is shifted to the position of X, pull it and press the ↑ button return its position to 0.

The selection of power cord section

Section	Cord Length
2.0mm²	20m
3.5mm²	35m



Grounding

- To prevent the risk of electric shock, the power plug must be plugged into a matching outlet and grounded in good condition.

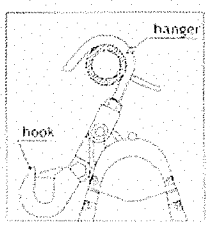
Switch cord connection

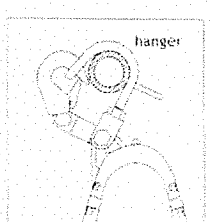
- Insert the switch plug into the switch receptacle of the winch and tighten it by turning the locking clockwise. Be sure to hook the cord by a holder.
- To extend the length of to switch cord, please adopt a switch extension cord (10M)

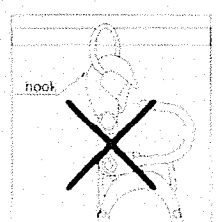
2.3 Mounting

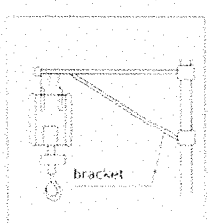
The winch designed to be hanged or mounted on a firm or stable bar or bracket CRH-0710 (optional accessory).
When hanged, do not allow the body or load to be caught by any construction of frame, or other obstruction.

Be sure to lock the hanger for extra safety.









2.4 Continuous Rating

- *Never hoist over the rated percentage duty cycle.*

The life of the winch is depending on the conditions of the load and working frequency.
In the long time operation, make sure to use the machine within its continuous ratings.
Continuous rating means the working duty cycle (%ED) is subject to the rated voltage, rated frequency and a 63% of rated load.

Percentage duty cycle (%ED) =[Tb ÷(Tb + Ts)] × 100(%)

Tb : Total sum of overall loading operating hours
Ts : Total sum of stopping hours
Tb + Ts = approximately 1 to 10 min

The maximum of starts of the machine means the number of starts of motor per 1 working hour including the pause hours of winch which is value of number working times added with the number of inching.

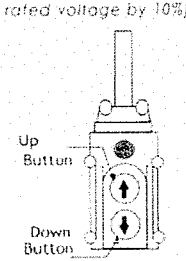
3. Working Method

3.1 Preparation Before Working

- Be sure to carefully check all safety and environmental conditions.
- A minimum of five(5) wraps of wire rope wound around the drum is necessary.
- A wire rope should be discarded and not be used again if rope shows sign of excessive wear too many broken wires, corrosion or other defects.
- Make sure to connect the main power source and grounding.
- It's not safe to lift loads exceeding the rated load.
- Connect power source at rated voltage
  (It will cause maladjusted if input voltage falls out of rated voltage by 10%)

3.2 Up and Down Switching

- **To lift a load**, press ↑ Button and drum will rotates as show below operation.
- **To lower a load**, press ↓ Button and drum will rotates as shown below.



5.2 Wire Rope Replacement

- **Swivel Hook**
  - Put a new wire rope through the hole of the round plate of swivel hook.
  - Insert a sleeve pin through the thimble of wire rope.
  - Insert a pin through the sleeve pin and bent it by a pliers.

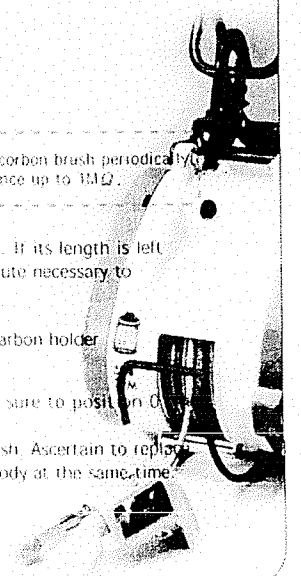
- **Drum**
  - Let a new wire rope w/clamp through the limit lever and insert it into the hole of the drum.
  - Put a P.T. screw into the hole of the drum and tighten it by a hexagon wrench.
  - Press the ↑ button to rotate the drum in the lifting direction.
  - A uneven winding of wire rope may cause the load to be swing, thus damaging the rope and reducing its life.

- **Oil Lubrication**

Winch are prefabricated at the factory and do not require initial lubrication. Relubrication interval depends upon service. Recommended oil replenishment quantity & intervals are as follows.

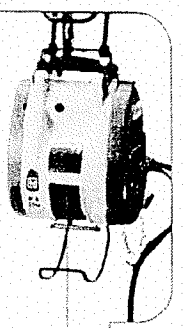
- **Carbon Brush Replacement**

ATTENTION! Clean the accumulated powder of carbon brush periodically to ascertain the insulation resistance up to 1MΩ.



- It is essential to check the carbon brush periodically. If its length is left less than 7.5 mm resulting from wearing, it is absolute necessary to replace carbon brush immediately.
- While replacing, smoothly insert carbon brush into carbon holder in the first place, then put brush cap into the hole.
- Before tightening the carbon brush holder, make sure to position [illegible].
- A set of carbon brush consists 2 piece of carbon brush. Ascertain to replace 2 PCs of carbon brush on opposite sides of winch body at the same time.

4. Handling Precaution

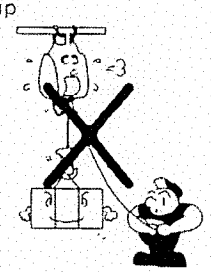


4.1 Environment Precaution

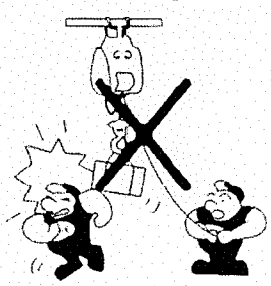
⚠ WARING

- **Pay best attention to the following instruction, obvious mistake in operation may result in personal inquiry or equipment damage**

- Never try to lift a load more than rated cap

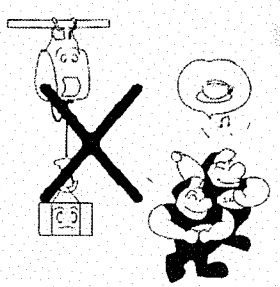


- Don't work, walk or stand under an operating winch

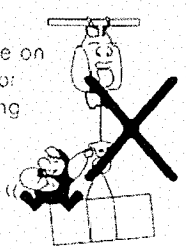


- Aminimum of five(5) wraps of rope around the drum is necessary to support he load rated

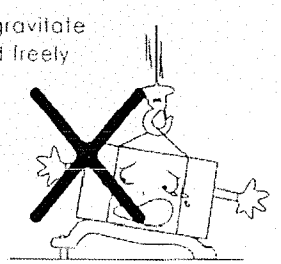
- Always remain in control. Never neglect the winch while actually hoisting a load



- Never hitch a ride on the hook, sling or load being moving



- Never gravitate a load freely



5. Checking

5.1 Checking Reference

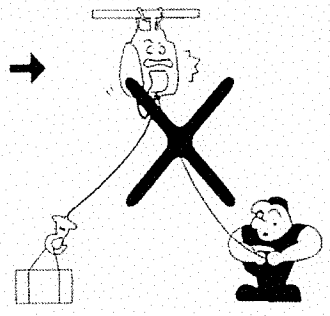
	Checking Items		Checking Method	Classification of checks			
				Periodical			
				Daily	3month/ 20hours	1 Year	3 Year
1	● brake	Performance	Visual	▲			
		Wearing of pressed plate	Decomposition check				▲
		Break or escaping of spring	Decomposition check				▲
2	● Carbon Brush	Wearing	Decomposition check		▲		
3	● Motor	Condition of insulation	Measuring,50MΩ/min	▲	▲	▲	
		Staining, damage	Visual				
		Carbon powder accumulation	Decomposition check				
4	● Control Ass'y	Working	Manual	▲			
		Outer damage of switch cords	Visual	▲			
		Attaching condition of earth line.	Visual	▲			
		Condition of insulation	Measuring,50MΩ/min		▲		
5	● Safety Device	Over-prevention function	Visual	▲			
		Reverse winding preventionfunction.	Visual	▲			
		Distortion over winding lever.	Visual	▲			
		Wrong rotary direction-winding .	Visual	▲			
6	● Wire Rope	Kink phenomena	Visual	▲			
		Broken wires	Visual	▲			
		Decreasing of diameter more than 10%	Visual	▲			
		Deforming or corrosion	Visual	▲			
7	● Swivel Hook & Hanger Distortion	Distortion	Visual	▲			
		Damage	Visual				
		Loosening	Visual				
8	● Drum	Rupture of flange	Visual		▲		
		wearing	Visual		▲		
9	● Gear Case	Damage, wearing	Visual	▲			
		Condition of oil feeding	Measuring			▲	
		Lubrication for couplings	Measuring			▲	
10	● Fastenings	Loosening	Manual	▲		▲	
11	● Marking	Label and the like	Manual			▲	

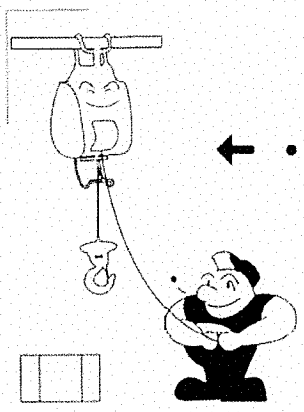
Remark
1. The specified person performs the checking of winch
2. Divide the checking into daily checking and periodic checking
3. The checking items and checking method in daily and periodic checking are to be carried out and different according to the using frequency

4. Handling Precaution

- Always look up when working around winch, danger overhead

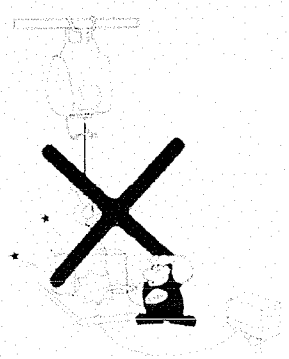
  Be sure to lift a load vertically. Slack may allow wires to be caught in the drum.





- Prior to lifting, make sure to have a precise performance of brake. If any malfunction of brake happened, stop the operation immediately

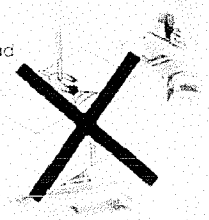
- When load suspended in air, it will not allow to be welding. Never weld a load while actually lifting a load



- Wire rope with one or more of the following defects shall be removed or replaced immediately

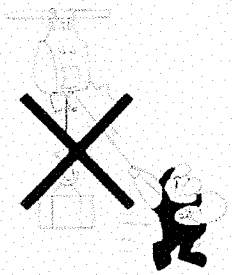
  1) Kink
  2) Distortion
  3) Corrosion
  4) Showing signs of excessive wear or of having broken wires not less than 10 pcs

- Never wrap the load with the wire rope

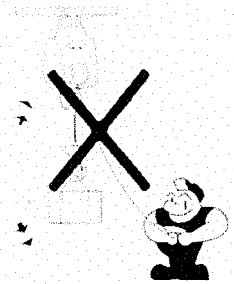


4.1 Environment Precaution

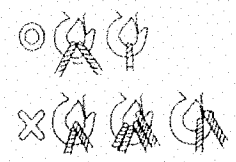
- Do not pull the switch cord to move a load.
- Do not over continuous ratings



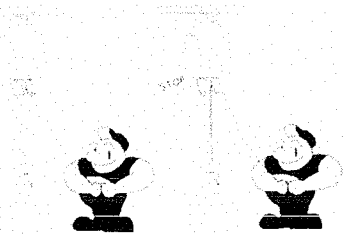
- Never plugging (instant reverse wind) and inching



- Stop the operation if there is any queer noise or vibration in the gear box to be happened.
- Do not connect the wire rope with the grounding of welding machine
- While welding, do not have any contact with the welding objects because of having spark.
- In order to prevent the layer down due to over loosening of rope, irregular winding, etc., operate according to the suitable operating method.
- Use a winch by fixing so securely that the rope around the drum is uneven



- Be sure to fix a rope in the center of swivel hook
- Be sure to stop operation immediately when the wire rope become fully slackened
- Avoid catching the hook or lifting a load on a fixed obstruction
- Always leave the push button switch positioned immediately after use



- Make sure that the load being lifting are well balanced and secured before starting