KIO-Winch

ELECTRIC AC WINCH

Reduce 24V Pendant Control

MODEL

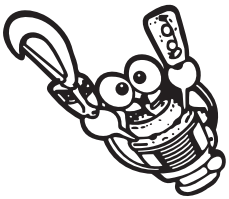
GRV-200, GRV-300, GRV-500
GRV-200L, GRV-300L, GRV-500L
GSW-200, GSW-300, GSW-300L
GSW-500, GSW-500L

●INSTRUCTION MANUAL●

Your First Winching Solutions

ISO 9001

Management System Certification MS008



ELECTRIC WINCH

Thank you for purchasing "KIO-Winch" products. This manual covers operation and maintenance of the winch. All information in this publication is based on the latest production information available at the time of printing.

GENERAL SAFETY PRECAUTIONS

KIO-Winch is designed to give safe and dependable service if operations are according to the instructions. Read and understand this manual before installation and operation of the winch.

Follow these general safety precautions:

- Confirm that the winch complies with the using conditions.
- Keep the winch secure strongly and the rope is not wound to be deviated to the drum.
- Don't use unsuitable pulleys or accessories.
- Don't use unsuitable rope in construction, such as rope having any defects or not strong enough..
- Pay attention to the grounding, it provides a path of least resistance for electric current to reduce the risk of shock.
- Check the winch for smooth operation without load before loading operation.
- Make sure the wire rope to be wound evenly in the first layer on the drum, rewind it if a mixed windings in existence.

⚠ WARNING

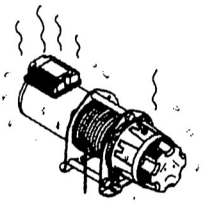
The winch is not to be used to lift, support or otherwise transport personnel.
A minimum of five (5) wraps of rope around the drum is necessary to support the load rated.

ENVIRONMENT PRECAUTIONS

⚠ DANGER	
⃠	■The following environmental conditions may result in the possible cause of winch trouble

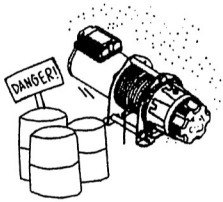
■ Low temperature below -10℃, high temperature above 40℃ or humidity above 90% conditions

※ Cause malfunction of spare parts



■ In a organic chemistry or explosive powder condition

※ Cause explosion

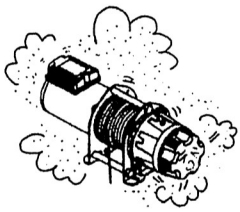


■ In heavy acid or salty conditions

※ Cause malfunctior of spare parts

■ In heavy general powder

※ Cause malfunction of performances



■ In the rain or snow

※ Cause rust or short circuit

I . SPECIFICATION

Model	Load Rated (KG)	Speed (M/min)	Motor Rating IP44 kw/poles	Wire Rope (mm x m)	Power Source	Cross Weight (KG)
GRV-200	200KG	12-18	0.6 x 4	6 x 30	220V-240V 50/60HZ 1PH Reduce 24V Pendant Control	35
GRV-300	300KG	12-18	1.15 x 4	6 x 30		38
GRV-500	500KG	18-23	1.8 x 4	8 x 30		72
GRV-200L	200KG	12-18	0.6 x 4	5 x50		35
GRV-300L	300KG	12-18	1.15 x 4	6 x 45		43
GRV-500L	500KG	18-23	1.8 x 4	7 x 60		72

Model	Load Rated (KG)	Speed (M/min)	Motor (w)	Wire Rope (ø mm x m)	Power Source	N.W (KG)	G.W (KG)
GSW-200	200	12-18	600	6mm x 30M 5mm x 50M	220-240V 1PH 50-60Hz	32	33
GSW-300	300	12-18	1150	6mm x 30M		35	36
GSW-300L	300	12-18	1150	6mm x 45M 7mm x 30M		37	38
GSW-500	500	18-23	1800	7mm x 40M 8mm x 30M		53	54
GSW-500L	500	18-23	1800	7mm x 60M 8mm x 50M		64	65

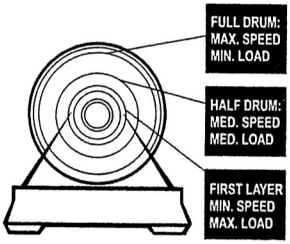
Percentage duty cycle: The ratio of overall operating hours of motor to the working hours including the pause hours of the motor, It's expressed by percentage. Percentage Duty Cycle (%ED)= $\frac{Tb}{Tb+Ts}$ x 100%

Tb=Total sum of loading hours Ts=Total sum of stopping hours Tb+Ts=Appoximately to 10mm

II. INSTRUCTION FOR INSTALLATION

2-1. Load Rated

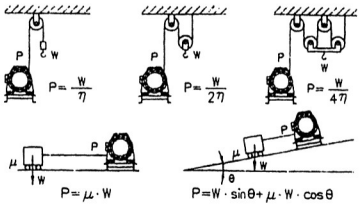
Load and speed vary according to how much wire rope is on the drum. The first layer of rope on the drum delivers the slowest speed and the maximum load.
A full drum delivers the maximum speed and the minimum load. For this reason, winches are rated at their full drum capacities.



2-2. Calculating Head Load

▲η sheave coefficient:

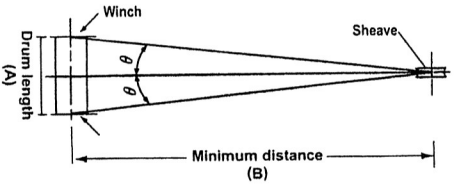
No. of sheaves	1	1
Roller bearing	0.98	0.98
Sleeve bearing	0.96	0.96



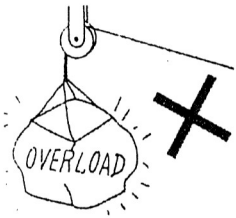
P:Rope tension η:Sheave efficient
θ:Angle W:Load μ:Friction factor

2-4. Calculating Fleet Angle

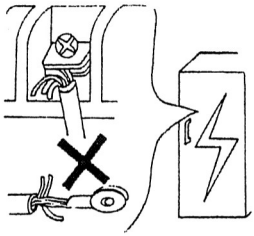
To obtain the best wire rope service, the maximum fleet angle (θ) should be more than 1.5 drgree for smooth drum.
The minimum distance (B): B for 1.5 degree fleet angle (θ)=Drum length (A) (in centimeter) x16
For example: For a winch with a smooth drum in 11 cm drum length, it requires a 1.5 degree angle. The minimum distance (B)=11x16=1.76Meter



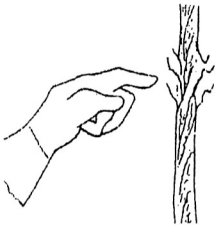
III. HANDING PRECAUTIONS



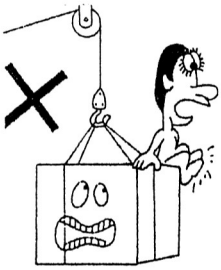
1. Don't overload
   Ensure you know your own lifting capacity of your winch



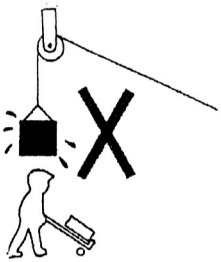
2. Do connect cable on main line switch and fasten them
   A considerable voltage drop might occur when failing to comply with these



3. Don't ignore breakdown accessories
   Inspect all wire rope, cable, hook, sheave before using them for lift

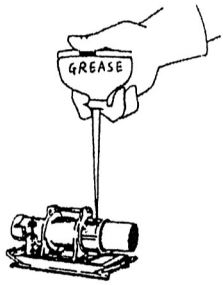


4. Don't transport people
   The winch is not used for lifting or supporting people

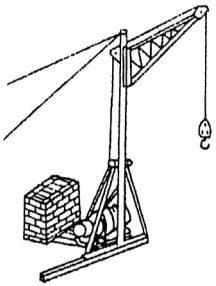


5. Don't stand under operation
   You will be crushed if load faills unexpectedly

6. Don't operate winch in the rain
   Avoid water splashes on the push button switch and on the motor



7. Do perform maintenance on schedule
   It's an essential part of keeping winch run in perfect



8. Do anchor crane with ballasted container and wire rope
   The anchorage to the ground and fixing wire rope shall be considered in perfect.

9. Do not try to lift fixed or obstructed loads.

10. Excessive inching (e.g giving short pulses to the motor) shall be avoided.

Ⅳ. MAINTENANCE AND INSPECTION

4-1. Checking References

Classification of checks				Checking Item		Checking Reference	Checking Method
Daily	Periodical						
	One month	Three months	One year				
			◎	Marking	Lable and the like	Existence of label	Visual
		◎		Installation	Winding-in direction of wire rope	Fleet angle θ =within 1.5 degree	Visual, measuring
		◎			Loosing and centre run-out foundation	Existence of abnormalities	Checking of installing bolts
◎				Control/Switch	Working	Reasonable actuation	Manual
	◎				Condition of clamping of wiring	Confirming of accuracy of fastening condition	Decomposition checking
		◎			Wearing of contact point	To be free from remarkable wearing and damage	Decomposition checking
		◎			Outer damage of cable	To be free from exposure of conductive wire	Visual
◎	◎				Attaching condition of earth line	Existence of abnormalities of connecting wires	Visual
		◎			Condition of insulation	1 MΩ min	Measure with 500v insulation-Resistance tester
			◎	Motor	Condition of insulation	1 MΩ min	Measure with resistance tester
			◎		Staining damage	Existence of abnormalities	Decomposition check
	◎			Brake	Loosening of set screws	To be free from loosening	Decomposition check
		◎			Wearing of lining	To be free from remarkable wear and damage	Decomposition check
◎	◎				Performance	Distance to be not more than 1.5% of rope length to be wound-in during 1 minute	Visual
			◎	Gear	Damage, wearing	To be free from remarkable wear and damage	Decomposition check
		◎			Condition of grease feeding	Existence of suitability of amount and deteioration with grease Mobilux EP2. Shell Unedo 2 or Esso Beacon EP2	Measuring

4-2. Checking Reference

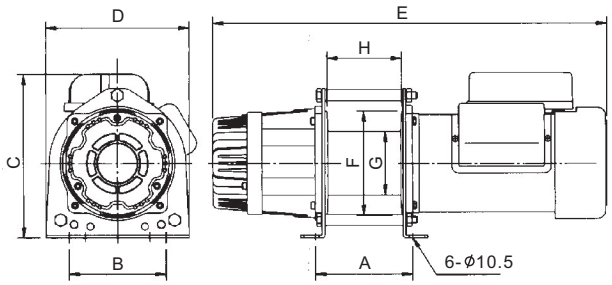
Classification of checks				Checking Item		Checking Reference	Checking Method
Daily	Periodical						
	One month	Three months	One year				
◎				Wire Rope	Breaking of base wire	Less than 10%	Visual
◎					Decreasing of Diameter	7% of normal diameter max	Visual
◎					Kink phenomena run-out of foundation	To be free from kink phenomena	Visual
◎					Deforming of corrosion	To be not remarkable	Visual
◎					Fastening condition of end	To be sufficient for hanging up of load	Visual
◎					Condition of rope winding-in	To be free from irregular winding	Visual
◎					Condition of feed oil	To be not insufficient in feed-out	Visual
	◎				Condition of dead turn of rope	Confirming of normalities of operating-out	Visual
◎	◎			Frame	Structure	To be free cracks. rupture harmful deformation	Visual
◎	◎			Drum	Rupture of flange	To be free cracks. rupture harmful deformation	Visual
		◎			Wear of drum	To be free from remarkable wearing	Visual
◎				Operation	Rotary direction	Winding-in direction is normal	Visual
◎					Abnormal rotary sound	To be free from oscillation and impact sound	Hear out
			◎		Over load test	Existence of abnormalities	Working

V. TROUBLE SHOOTING

Before operation, open terminal box of motor to ascertain the corrective wirings. Checking the winch for smooth operation by pressing up and down button of push button switch. When the winch fails to start after several attempts or if any errors happen, check followings:

1. No any reaction
   a) Power source
   b) Check push button switch, switch cords and wirings
2. Having buzz, but fail to start
   a) Check brake coil, bridge rectifier
   b) Check push button switch, switch cords and wirings
3. Lower speed; higher vibration
   a) Short circuit at starting capacitor
   b) Contact point of centrifugal switch can not be open
4. Defective starting
   a) Brake coil and bridge rectifier
   b) Contact point of centrifugal switch to be open circuit
   c) Starting capacitor
   d) Brake disk wear
5. Failing in re-starting
   a) Overload
   b) Considerable voltage drop and provide non-opening of brake
   c) Loose screw in push button switch
   d) Motor cable section
   e) Cable connection
6. Failure in brake or having grease leakage
   a) Brake coil
   b) Brake disk
   c) Brake metal disk
   d) Brake spring
   e) Considerable voltage drop can provoke non-opening of brake
7. Counter rotation
   a) Single phase: Exchange the white and yellow wires of push button switch
   b) Three phase: Exchange any two wires of motor alternately

VI. DIMENTIONS

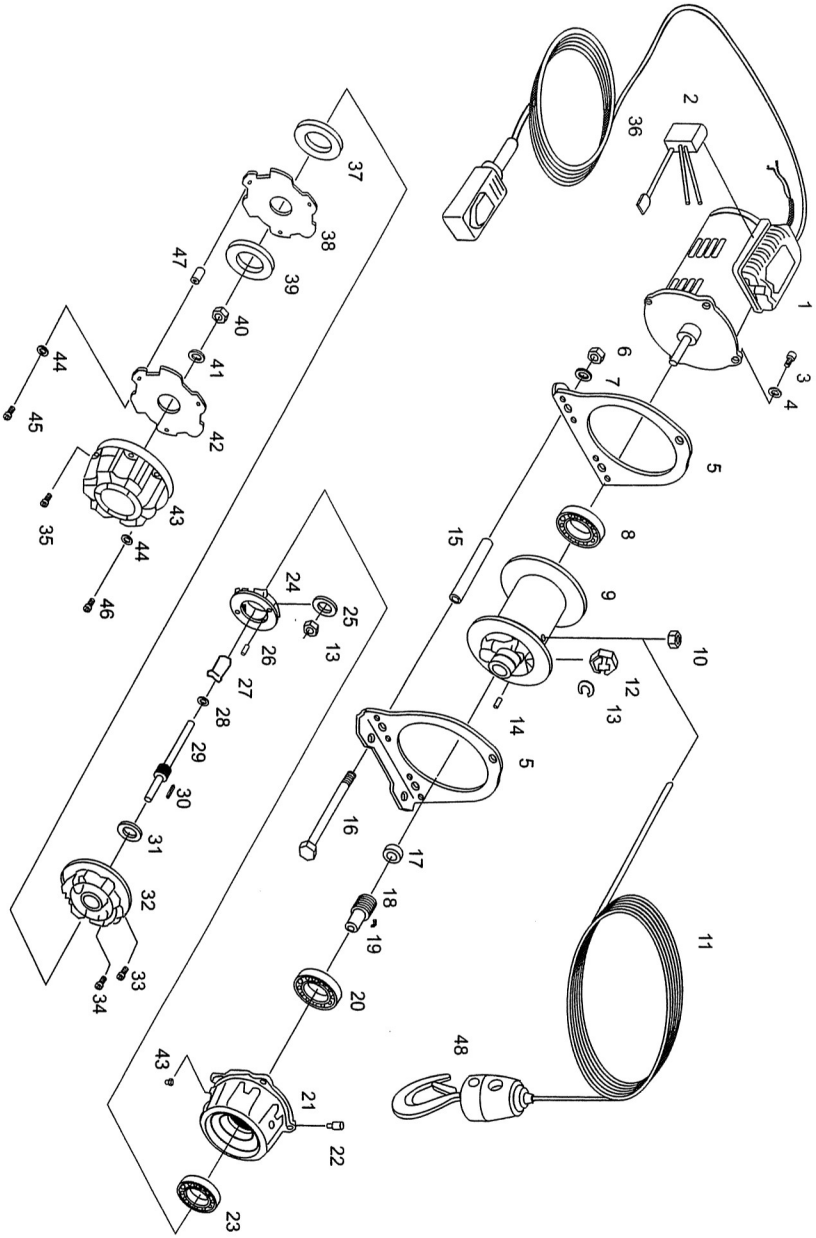


DIMENTIONS (MM)								
MODEL	A	B	C	D	E	F	G	H
GRV-300	155	152	290	210	565	ϕ154	ϕ74	110
GRV-300L	190	152	290	210	510	ϕ154	ϕ74	153
GRV-500	190	160	303	260	670	ϕ169	ϕ79	147
GRV-500L	205	160	303	260	720	ϕ180	ϕ90	210

DIMENTIONS (MM)								
MODEL	A	B	C	D	E	F	G	H
GSW-200	155	152	290	210	535	ϕ154	ϕ94	107
GSW-300	155	152	290	210	565	ϕ154	ϕ94	107
GSW-300L	190	152	290	210	610	ϕ154	ϕ74	153
GSW-500	190	160	310	260	650	ϕ169	ϕ79	147
GSW-500L	205	160	300	260	720	ϕ180	ϕ90	210

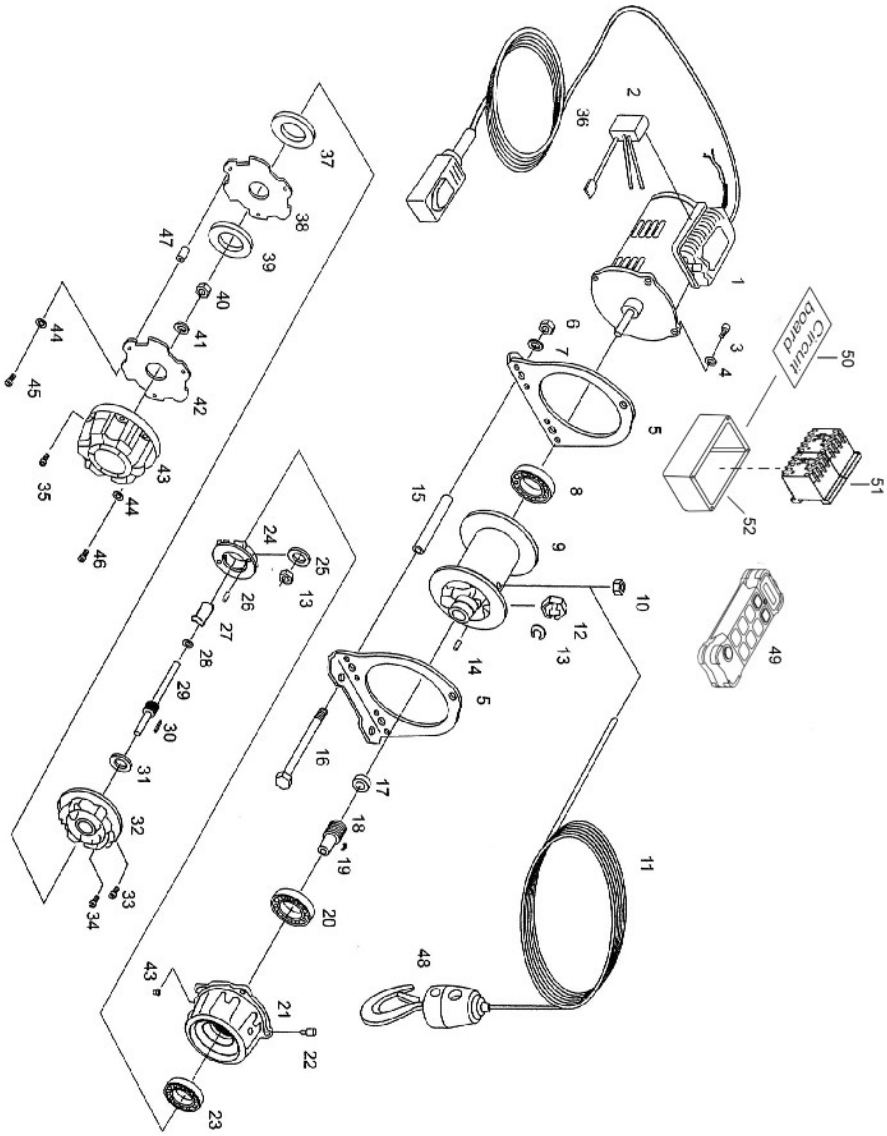
GRV-200, GRV-300, GRV-500

GRV-200L, GRV-300L, GRV-500L



GSW-200, GSW-300, GSW-300L,

GSW-500, GSW-500L



For GRV-series

ITEM	PART DESCRIPTION	Qty	ITEM	PART DESCRIPTION	Qty	ITEM	PART DESCRIPTION	Qty
1	MOTOR	1	19	KEY WAY	1	37	BRAKE COIL	1
2	BRIDGE TYPE RECTIFIER	1	20	BEARING	1	38	MAGNETIC PAD A	1
3	HEX HEAD CAP SCREW	12	21	GEAR BOX	1	39	BRAKE RUBBER	1
4	SPRING WASHER	12	22	GREASE NIPPLE	1	40	HEX TRANSMISSION HEAD	1
5	MAIN BODY MOUNT	2	23	BEARING	1	41	C-RING	1
6	NUT	3	24	NO. 1 TRANSMISSION PLATE	1	42	MAGNETIC PAD B	1
7	SPRING WASHER	3	25	ONE-PHASE OIL GEAR	2	43	BRAKE COVER	1
8	BEARING	1	26	CLAMP LEVER	2	44	FLAT WASHER	6
9	ROPE WHEEL	1	27	TRANSMISSION SLEEVE	1	45	SOCKET SCREW	3
10	PLUG SCREW	1	28	POWDER BEARING	1	46	SOCKET SCREW	3
11	STEEL ROPE SET	1	29	ONE-PHASE SHAFT	1	47	BRAKE SLEEVE	1
12	TWO-PHASE OIL GEAR	2	30	KEY WAY	1	48	HOOK SET	1
13	BEARING	4	31	BEARING				
14	CLAMP LEVER	2	32	COIL HOLDER				
15	FIXED TUBE	3	33	SOCKET SCREW				
16	HEX BOLT	3	34	BRAKE SPRING				
17	POWDER BEARING	1	35	WIRE HOLE PLUG				
18	TWO-PHASE SHAFT	1	36	PUSH BUTTON SWTTCH				

For GSW-series

ITEM	PART DESCRIPTION	Qty	ITEM	PART DESCRIPTION	Qty	ITEM	PART DESCRIPTION	Qty
1	MOTOR	1	19	KEY WAY	1	37	BRAKE COIL	1
2	BRIDGE TYPE RECTIFIER	1	20	BEARING	1	38	MAGNETIC PAD A	1
3	HEX HEAD CAP SCREW	12	21	GEAR BOX	1	39	BRAKE RUBBER	1
4	SPRING WASHER	12	22	GREASE NIPPLE	1	40	HEX TRANSMISSION HEAD	1
5	MAIN BODY MOUNT	2	23	BEARING	1	41	C-RING	1
6	NUT	3	24	NO. 1 TRANSMISSION PLATE	1	42	MAGNETIC PAD B	1
7	SPRING WASHER	3	25	ONE-PHASE OIL GEAR	2	43	BRAKE COVER	1
8	BEARING	1	26	CLAMP LEVER	2	44	FLAT WASHER	6
9	ROPE WHEEL	1	27	TRANSMISSION SLEEVE	1	45	SOCKET SCREW	3
10	PLUG SCREW	1	28	POWDER BEARING	1	46	SOCKET SCREW	3
11	STEEL ROPE SET	1	29	ONE-PHASE SHAFT	1	47	BRAKE SLEEVE	1
12	TWO-PHASE OIL GEAR	2	30	KEY WAY	1	48	HOOK SET	1
13	BEARING	4	31	BEARING	1	49	WIRELESS REMOTE CONTROL	1
14	CLAMP LEVER	2	32	COIL HOLDER	1	50	CURCUIT BOARD	1
15	FIXED TUBE	3	33	SOCKET SCREW	3	51	RELAY	1
16	HEX BOLT	3	34	BRAKE SPRING	3	52	WIRELESS CONTROL BOX	1
17	POWDER BEARING	1	35	WIRE HOLE PLUG	1	53		
18	TWO-PHASE SHAFT	1	36	PUSH BUTTON SWTTCH	1	54		