
Instruction of Traction Machine

SAFETY TRUSTINESS NATUAL INNOVATION

Permanent Magnet Synchronous Gearless Traction Machine

MTA50000X

PREFACE

Thanks for choosing the Permanent Magnet Synchronous Gearless Traction machine!

As a new technique of electronic motor, permanent magnetic synchronous machine technology brings up a revolution of elevators' traction machine since its first application in 1990s. This series traction machines employ outer-rotor structure and the block brake, with the newest developed technology of vertical manned elevator.

This series traction machines we created fulfill any national statement about design details. Every machine is strictly checked of braking strength, insulate pressurization, vibration, noise etc. before delivery according to our company's standard paper < Q/MT 001-2009 >. Through that, we can make sure every product has good quality and performance.

This manual is one part of our product, please keep it and read it carefully before installation, debugging, employment and reparation. If you have any problems about our products, please contact us without hesitation. We don't take the responsibility of damage caused by misuse, improper use or unauthorized repairs and modifications.

We reserve the right to modify or update the information of this paper without prior notice.

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This paper is only for your reference. The final explanation right is reserved.

Contents

PREFACE

1 SAFETY - 1 -

2 PRODUCT DESCRIPTION - 1 -

2.1 Introduction - 1 -

2.2 Working conditions - 1 -

2.3 Protection class - 2 -

2.4 Main parameters - 3 -

2.5 SPARES - 7 -

3 TRANSPORTATION, STORAGE AND HOISTING - 7 -

4 INSTALLATION - 8 -

4.1 Inspection before used - 8 -

4.2 Installation tips - 8 -

4.3 Installation and operation of remote brake-loosing device - 9 -

4.3.1 Installation - 9 -

4.3.2 Operation - 10 -

4.4 ELECTRIC WIRING - 11 -

4.5 ENCODER	- 12 -
4.5.1 Encoder 1387	- 13 -
4.5.1.1 Installation and removal of Encoder 1387	-13-
4.5.1.2 Wiring instruction. of Encoder	-14-
4.5.2 Huitong encoder E158C9.25-2048-SA5N4T	- 15 -
4.5.2.1 Encoder connection	-15-
4.5.3 Tamagawa encoder TS5213N2531	-16-
4.5.3.1 Tamagawa encoder installation and disassembly	-16-
4.5.3.2 Encoder connection	-16-
4.5.4 HENGSTLER encoder RS20/2048AA.OKS0	-16-
4.6 BRAKE	- 17-
4.6.1 The notice	- 17-
4.6.2 The removal	- 17-
4.6.3 The installation	- 17-
4.6.4 The clearance adjustment	- 18-
4.6.5 Adjustment of brake micro switch	- 19-
4.6.6 The adjustment of brake noise	- 21-
4.6.7 Braking torque adjustment	- 21-
4.7 INSTALLATION AND OPERATION OF JIGGER SWITCH	- 22-

5 MAINTENANCE	23-
5.1 Daily maintenance	23-
5.2 Motor maintenance.....	23-
5.3 Brake maintenance	23-
5.4 Turning gear maintenance	24-
6 TROUBLE SHOOTING	24-

1 SAFETY

Pay attention to the following ICONS where fitted. Please read the meaning carefully.



Danger

If you operate against the rules, it could result in serious injury or death.



Attention

A procedure, condition, or statement should be strictly followed. Otherwise it could cause human hurt or device damage.

2 PRODUCT DESCRIPTION

2.1 Introduction

A traction machine is the power source of an elevator, which consists of permanent magnet motor, brake system, speed/position feedback device, wheel device and the frame. It is driven by the friction of traction rope and traction wheel, holding the characteristics of energy saving, small-scale, high efficiency, safe and reliable. This type tractors have two kinds of installation methods, both machine room and room-less type are available. Those type tractors are intended for use in machine room, well road, bottomless pit and other installation methods.

2.2 Working conditions

- The altitude should not exceed 1,000 m;
- The ambient temperature should stay the range of 5°C~40°C, the relative humidity should not exceed 90%;
- The power supply voltage fluctuation and rating deviation should not exceed the range of $\pm 7\%$;
- Ambient environment should not contain corrosive, flammable and explosive gas; the power of a traction machine must be supplied by the control cabinet. The specified parameters depend on its nameplate, it is

strictly prohibited to supply power directly;

- The surface of drag rope and traction wheel rope groove shouldn't have lubricant and other litter which will influence the drag ability.



Attention

We reserve the right to refuse the damage compensation caused by any deflection of the above conditions.

2.3 Protection class

According to the details of national standard GB4942.1-2001 about protection classification of rotating electric motor hulls, the protection class of this series is IP40, the insulation class is class F. When doing electrical installation, ensure that the incoming cable of terminal box is sealed correctly.

2.4 Main parameters and Configuration installation dimension

Type	Load (kg)	Speed (m/s)	Roping	Motor						Brake			Sheave Diameter (mm)	
				Rated power (kW)	Rated Torque (N.m)	Rated Voltage (V)	Rated Current (A)	Rated Speed (RPM)	Rated Frequency (Hz)	pole	Current (A)	Voltage (V)		Braking Torque (N.m)
MY05-320A/050K	320	0.5	2:1	1.1	175	380	2.6	60	10	20	2X1.5	DC110	2'400	320
MY05-320A/100K		1		2.2			5.2	120	20				2'400	
MY05-320A/150K		1.5		2.9			9	180	30				2'400	
MY05-320A/180K		1.6		3.1			9	192	32				2'400	
MY05-320A/175K		1.75		3.4			9	210	35				2'400	
MY05-450A/050K	450	0.5		1.5	230		3.5	60	10				2'400	
MY05-450A/100K		1		3			6.8	120	20				2'400	
MY05-450A/150K		1.5		4.3			12	180	30				2'400	
MY05-450A/180K		1.6		4.6			12	192	32				2'400	
MY05-450A/175K		1.75		5			12	210	35				2'400	
MY05-630A/050K	630	0.5		2	320		4.7	60	10				2'400	
MY05-630A/100K		1		4			10	120	20				2'400	
MY05-630A/150K		1.5		6			16.5	180	30				2'400	
MY05-630A/180K		1.6		6.4			16.5	192	32				2'400	
MY05-630A/175K		1.75		7			16.5	210	35				2'400	
MY05-320A/050K.2	320	0.5	1.1	175	220	4.8	60	10	20	2X1.5	DC110	2'400	320	
MY05-320A/100K.2		1	2.2			9	120	20				2'400		
MY05-320A/150K.2		1.5	2.9			14.2	180	30				2'400		
MY05-320A/180K.2		1.6	3.1			14.2	192	32				2'400		
MY05-320A/175K.2		1.75	3.4			14.2	210	35				2'400		
MY05-450A/050K.2	450	0.5	1.5	230		6	60	10				2'400		
MY05-450A/100K.2		1	3			12	120	20				2'400		
MY05-450A/150K.2		1.5	4.3			20	180	30				2'400		
MY05-450A/180K.2		1.6	4.6			20	192	32				2'400		
MY05-450A/175K.2		1.75	5			20	210	35				2'400		
MY05-630A/050K.2	630	0.5	2	320		8	60	10				2'400		
MY05-630A/100K.2		1	4			16.5	120	20				2'400		
MY05-630A/150K.2		1.5	6			28	180	30				2'400		
MY05-630A/180K.2		1.6	6.4			28	192	32				2'400		
MY05-630A/175K.2		1.75	7			28	210	35				2'400		

Table 1 ϕ 320mm Sheave Main parameters

Type	Load (kg)	Speed (m/s)	Roping	Motor						Brake			Sheave Diameter (mm)	
				Rated power (kW)	Rated Torque (N.m)	Rated Voltage (V)	Rated Current (A)	Rated Speed (RPM)	Rated Frequency (Hz)	poles	Current (A)	Voltage (V)		Braking Torque (N.m)
MY05-630/050K	630	0.5	2:1	2	400	380	4.8	48	9.6	24	2x1.5	DC110	2x560	400
MY05-630/100K		1		4			9.6	95	19				2x560	
MY05-630/150K		1.5		6			14.5	143	28.6				2x560	
MY05-630/160K		1.6		6.4			14.5	152	30.4				2x560	
MY05-630/175K		1.75		7			16.5	167	33.4				2x560	
MY05-800/050K	800	0.5	2:1	2.5	510	380	6	48	9.6	24	2x1.5	DC110	2x560	400
MY05-800/100K		1		5			12	95	19				2x560	
MY05-800/150K		1.5		7.8			18.5	143	28.6				2x560	
MY05-800/160K		1.6		8			18.5	152	30.4				2x560	
MY05-800/175K		1.75		9			21	167	33.4				2x560	
MY05-800/200K	1000	2	4:1	11	640	380	25	191	38.2	24	2x1.5	DC110	2x710	400
MY05-800/250K		2.5		13.5			32	239	47.8				2x710	
MY05-1000/050K		0.5		3.2			7.8	48	9.6				2x710	
MY05-1000/100K		1		6.4			15	95	19				2x710	
MY05-1000/150K		1.5		9			22	143	28.6				2x710	
MY05-1000/160K	1050	1.6	2:1	10	670	220	22	152	30.4	24	2x1.5	DC110	2x710	400
MY05-1000/175K		1.75		11			26	167	33.4				2x710	
MY05-1000/200K		2		13.5			31.5	191	38.2				2x710	
MY05-1000/250K		2.5		17			39	239	47.8				2x710	
MY05-1050/050K		0.5		3.5			8	48	9.6				2x710	
MY05-1050/100K	2000	1	4:1	7	680	220	16	95	19	24	2x1.5	DC110	2x710	400
MY05-1050/150K		1.5		10.5			24	143	28.6				2x710	
MY05-1050/160K		1.6		11			24	152	30.4				2x710	
MY05-1050/175K		1.75		12			28	167	33.4				2x710	
MY05-2000/050K		0.5		6.4			15	95	19				2x710	
MY05-630/050K.2	630	0.5	2:1	2	400	220	8.2	48	9.6	24	2x1.5	DC110	2x560	400
MY05-630/100K.2		1		4			16.5	95	19				2x560	
MY05-630/150K.2		1.5		6			24	143	28.6				2x560	
MY05-630/160K.2		1.6		6.4			26	152	30.4				2x560	
MY05-630/175K.2		1.75		7			28	167	33.4				2x560	
MY05-800/050K.2	800	0.5	2:1	2.5	510	220	10.5	48	9.6	24	2x1.5	DC110	2x560	400
MY05-800/100K.2		1		5			21	95	19				2x560	
MY05-800/150K.2		1.5		7.8			31	143	28.6				2x560	
MY05-800/160K.2		1.6		8			32.5	152	30.4				2x560	
MY05-800/175K.2		1.75		9			36	167	33.4				2x560	
MY05-800/200K.2	1000	2	4:1	11	640	220	42.5	191	38.2	24	2x1.5	DC110	2x710	400
MY05-800/250K.2		2.5		13.5			54	239	47.8				2x710	
MY05-1000/050K.2		0.5		3.2			13	48	9.6				2x710	
MY05-1000/100K.2		1		6.4			26	95	19				2x710	
MY05-1000/150K.2		1.5		9			38	143	28.6				2x710	
MY05-1000/160K.2	1050	1.6	2:1	10	670	220	41	152	30.4	24	2x1.5	DC110	2x710	400
MY05-1000/175K.2		1.75		11			44	167	33.4				2x710	
MY05-1000/200K.2		2		13.5			53	191	38.2				2x710	
MY05-1000/250K.2		2.5		17			67	239	47.8				2x710	

Table 2 ϕ 400mm Sheave Main parameters

Type	Load (kg)	Speed (m/s)	Ropings	Motor						Brake			Sheave Diameter (mm)										
				Rated power (KW)	Rated Torque (N.m)	Rated Voltage (V)	Rated Current (A)	Rated Speed (RPM)	Rated Frequency (Hz)	Current (A)	Voltage (V)	Braking Torque (N.m)											
MY05-1150B/050K	1150	0.5	2:1	3.7	820	380	9	43	8.6	24	2x1.2	DC110	2x1254	450									
MY05-1150B/100K		1		7.5			17	85	17														
MY05-1150B/175K		1.75		13			30	149	29.8														
MY05-1150B/200K		2		15			33.5	170	34														
MY05-1150B/250K		2.5		18.5			43	212	42.4														
MY05-1150B/300K	3	22	50.5	255	51																		
MY05-1350B/050K	1350	0.5	2:1	4.5	960	380	10	43	8.6	24	2x1.2	DC110	2x1254	450									
MY05-1350B/100K		1		9			20	85	17														
MY05-1350B/175K		1.75		15			34	149	29.8														
MY05-1350B/200K		2		17			40	170	34														
MY05-1350B/250K		2.5		21.5			49	212	42.4														
MY05-1350B/300K	3	26	59	255	51																		
MY05-1600B/050K	1600	0.5	2:1	5	1140	380	12	43	8.6	24	2x1.2	DC110	2x1254	450									
MY05-1600B/100K		1		10			23	85	17														
MY05-1600B/175K		1.75		18			41	149	29.8														
MY05-1600B/200K		2		21			47	170	34														
MY05-1600B/250K		2.5		26			57	212	42.4														
MY05-1600B/300K	3	31	70	255	51																		
MY05-1150B/050K.2	1150	0.5	2:1	3.7	820	220	14.5	43	8.6	24	2x1.2	DC110	2x1254	450									
MY05-1150B/100K.2		1		7.5			29	85	17														
MY05-1150B/150K.2		1.5		11			44	127	25.4														
MY05-1150B/160K.2		1.6		11.7			44	135	27														
MY05-1150B/175K.2		1.75		13			50	149	29.8														
MY05-1150B/200K.2		2		15			59	170	34														
MY05-1150B/250K.2		2.5		18.5			71	212	42.4														
MY05-1150B/300K.2		3		22			85	255	51														
MY05-1350B/050K.2		1350		0.5			2:1	4.5	960						220	17	43	8.6	24	2x1.2	DC110	2x1254	450
MY05-1350B/100K.2				1				9								34	85	17					
MY05-1350B/150K.2	1.5		13	51	127	25.4																	
MY05-1350B/160K.2	1.6		14	51	135	27																	
MY05-1350B/175K.2	1.75		15	57	149	29.8																	
MY05-1350B/200K.2	2		17	69	170	34																	
MY05-1350B/250K.2	2.5		21.5	83.5	212	42.4																	
MY05-1350B/300K.2	3		26	100	255	51																	
MY05-1600B/050K.2	1600		0.5	2:1	5	1140		220		21	43	8.6	24	2x1.2		DC110	2x1254	450					
MY05-1600B/100K.2			1		10					42	85	17											
MY05-1600B/150K.2		1.5	15.2		63		127		25.4														
MY05-1600B/160K.2		1.6	16.5		63		135		27														
MY05-1600B/175K.2		1.75	18		72.5		149		29.8														
MY05-1600B/200K.2		2	21		82		170		34														
MY05-1600B/250K.2		2.5	26		100		212		42.4														
MY05-1600B/300K.2		3	31		118		255		51														

Table 3 ϕ 450mm Sheave Main parameters

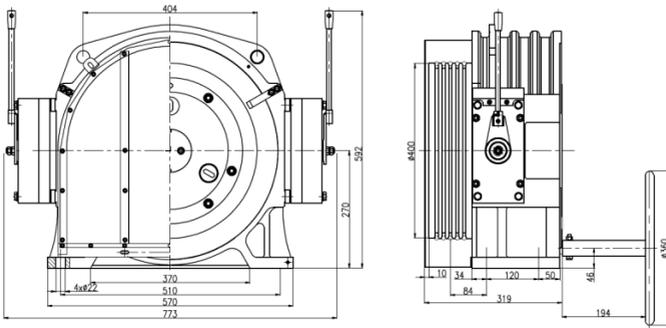


Figure 1 φ320mm Sheave Configuration installation dimension

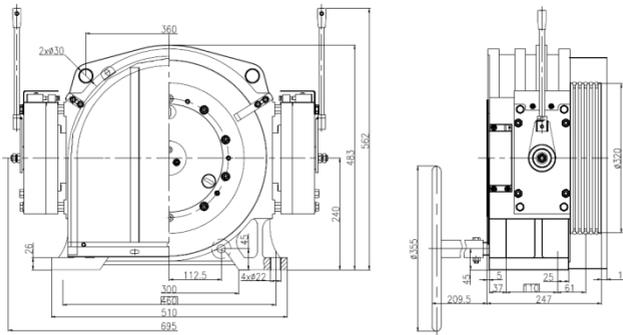


Figure 2 φ400mm Sheave Configuration installation dimension

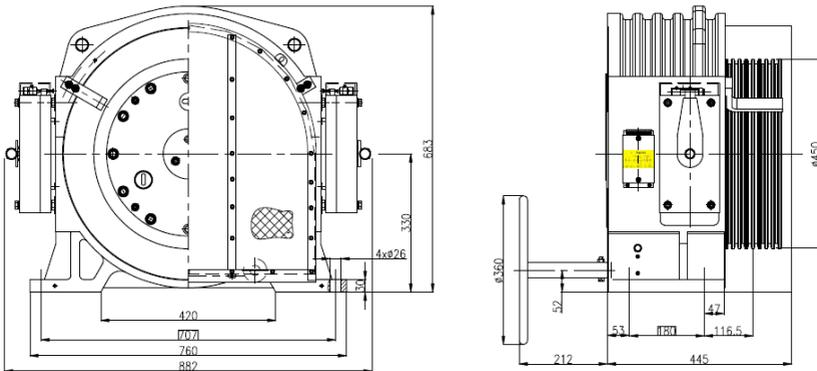


Figure 3 ϕ 450mm Sheave Configuration installation dimensi

2.5 Spares

The table below shows spares available for purchasing:

S/N	Selected parts name	Quantity	Remark
1	Encoder	1	
2	Remote brake release device	1	
3	One line encoder	1	
4	Barring gear	1	
5	Turning hand-wheel	1	
6	Turning switch	1	
7	Brake switch	1	
8	The traction wheel cover	1	
9	Loose brake distance	2	
10	Manual brake release lever	2	

3 TRANSPORTATION, STORAGE and HOISTING

Traction machines in the process of transportation, storage or installation



Danger

should strictly comply with the following specifications:

- Comply with the guidance in the case label when transporting or hoisting

the machine, stacking one machine to another is forbidden;

- The design of hoisting rings depended on machine's weight, hoisting machines with their foundation are not allowed;
- Keep the machine stable when hoisting, stay no collision
- Store the machine in a dry, dustless, ventilated inner room. When the storage time is longer than 6 months, it is need to rotate the machine forward and backward at a low speed (<20 r/min) to lubricating bearings evenly with grease.

4 INSTALLATION

4.1 Inspection before used

- When unpacking the case, please check the nameplate to see if it is your chosen pattern;
- Check parts in the packing list to confirm if there are some lost, damaged parts or not;
- Important fasteners are marked by red paint before leaving the factory. Please check if the paint was broken or moved;
- Measuring the insulation resistance of winding (the value should not less than $1M\Omega$ in the $500M\Omega$ level);

4.2 Installation tips

- Tractors protection class is IP40, the installation environment must be in accordance with the standard requirements;
- Ensure that the surface of frame for installation is flat, the maximum allowable deviation is 0.1 mm;
- As the installation is completed, the rotating parts should be carried on a preservative treatment according to GB7588-2003 "elevator manufacturing and installation safety norms";
- Carrying on self learning in no load condition, ensure the angles accurately.

4.3 Installation and operation of remote brake-loosing device

4.3.1 Installation

①The control mechanism is arranged before delivery, only customers should do is to install the stopping wire: take the other side of stopping wire, let the screw tube into the U-flute of brake-loosing foundation, use M12 nuts to fix both sides, use the mating screw to fix the upper side. As show in figure 4 below:

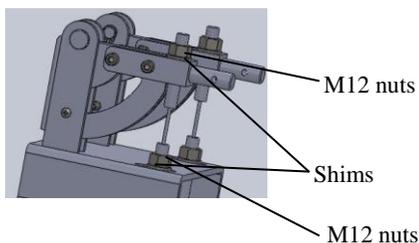


Figure 4

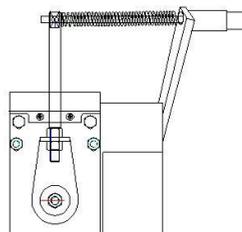


Figure 5

②Here does not show the install procedure of brake-loosing mechanism, as it was installed and debugged before delivery. The result is shown as figure 5:

③The mounting dimension of brake-loosing foundation is shown as figure 6 and 7:

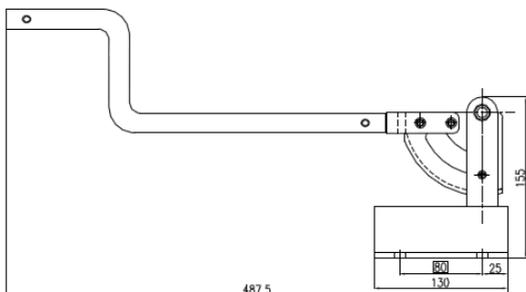
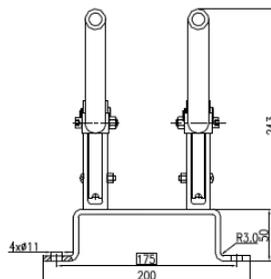


Figure 6



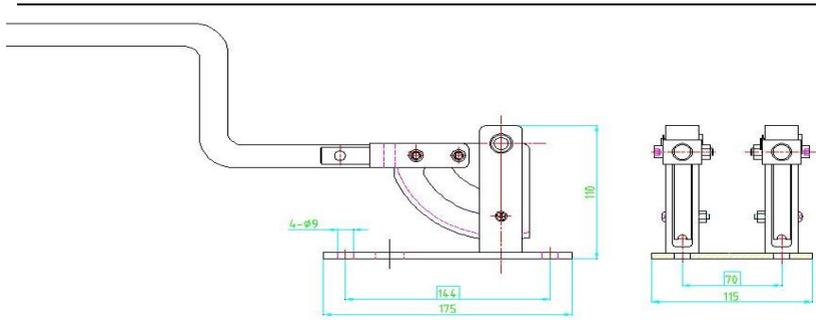


Figure 7



Attention

The radius should be larger than 1 meter when bending the stopping line to prevent the danger of rolling backwards or can't loosen the brake.

4.3.2 Operation

- ① Confirm the main electric source is power off before operation.
- ② Pull out the position-limit screw (if not, the arc wheel lever couldn't rotate). Shown as figure 8:

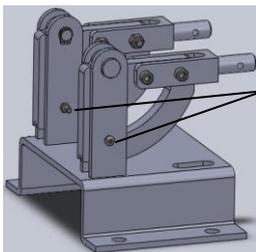


Figure 8

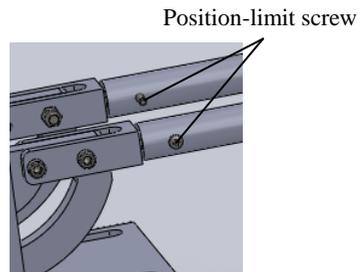


Figure 9

③ Connect the handle with the control mechanism, let the pulled out position-limit screw into the connection holes as shown in figure 9:

④ Pull the handle to rotate round the shaft, as the brake opened, the brake-loosening movement is finished. Be shown as figure 10:

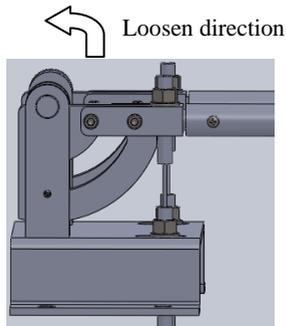


Figure 10

⑤ Every component should be reset to place coming from when finishing the brake loosening.

⑥ The stopping wire is ordered to be fixed by special wire-compressing components(for cable or bundle strap), if fixed too tight, it is possible to result in action failure because of blocking.

⑦ After finishing the installation, do several run tests to ensure the mechanism runs flexibly, resets automatically. If any problem happens, don't use this device until adjusting it up to your satisfaction.



Attention

Take care of the vehicle speed and elevator car leveling, loosen the handle to stop loosening right away when leveling completed.

4.4 Electric wiring

The motor's electric wiring is shown in figure 11 (when it is a machine for room-less, port 3 and 4 are no need to connect)

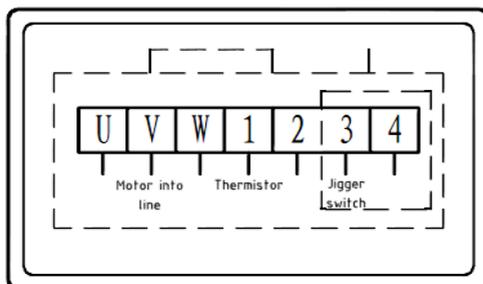


Figure 11

φ 320mm sheave series,each brake is installed with situation monitor switch (micro-switch), the input voltage of brake is DC110V, the ports are 1 and 2, the inlet ports of the micro-switch is 3、4、5, the connection is shown in figure 12:

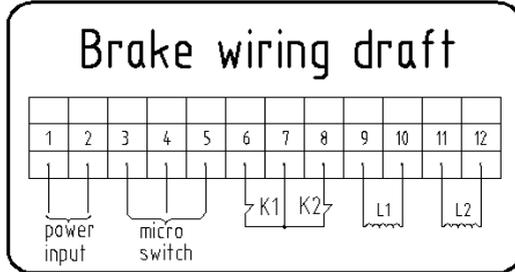


Figure 12

φ 400mm and φ 450mm sheave series,Each brake is installed with situation monitor switch (micro-switch), the input voltage of brake is DC110V, Terminals for the pie chart, wiring principle as shown in figure 13: see the junction box labeled or contact our after-sales service.

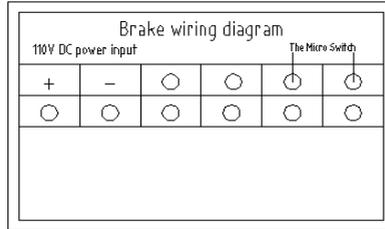


Figure 13

4.5 Encoder

If there is no special command from consumers, we will provide the imported Heidenhain sine encoder ERN1387 from Germany, with a 7 meter-long wire. Use standard DB 15-pin 3-row joints to connect other terminals.

Here we give some parameters of encoder wire for



Figure 14

customers as a reference: Pulse2048p/r, Power source voltage DC5V \pm 5%, Signal sin-cos.

4.5.1 Encoder 1387

4.5.1.1 Installation and removal of Encoder 1387

Installation

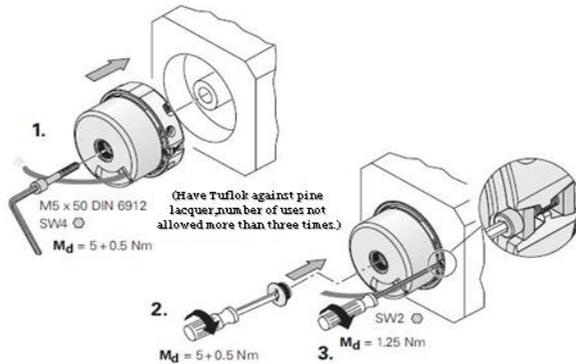


Figure 15

Removal

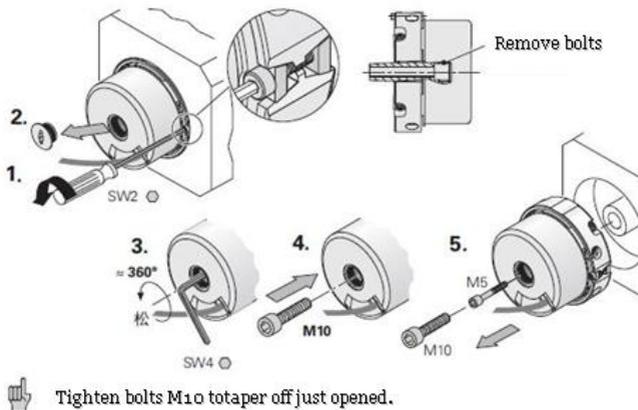


Figure 16

4.5.1.2 Wiring instruction. of Encoder

The encoder connection pin description:

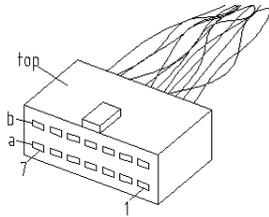


Figure 17

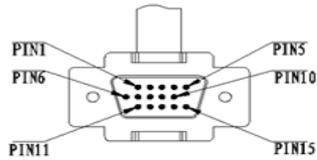


Figure 18

Encoder	6b	2a	3b	5a	4b	4a	7b	1a	2b	6a	1b	7a	5b	3a
Pulse signal	A		B		R		C		D		Up+5 v	A eri al	0 V	A eri al
	+	-	+	-	+	-	+	-	+	-				

Table 5

The inverter side connector pins with:

Pin No.	Signal	Pin No.	Signal
PIN1	B—	PIN9	5V
PIN2	Aerial	PIN10	C—
PIN3	R+	PIN11	C+
PIN4	R—	PIN12	D+
PIN5	A+	PIN13	D—
PIN6	A—	PIN14	Aerial
PIN7	0V	PIN15	Aerial
PIN8	B+		

Table 6

Users should make sure seriously that the pins signals of the chosen frequency transformer are in accordance with the pins signals of the encoder's line connecting to the transformer. If not, please let



the professionals rearrange the pins and install.

The encoder cable installation:

The front end of the encoder cables according to 20 to 30 degrees Angle range card into the groove, as shown in figure 19.

After the front card into the slot, compr cable front-end position make the complete card into the slots, as shown in figure 20.

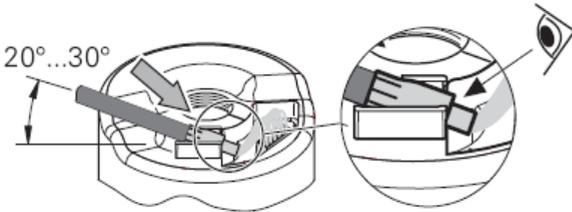


Figure 19



Figure 20

4.5.2 Huitong encoder E158C9.25-2048-SA5N4T

Huitong encoder installation and disassembly and Heidenhain 1387, refer to Figure 15.

4.5.2.1 Encoder connection

Encoder connection pin:

Pin No.	5	6	8	1	3	4	11	10	12	13	9	7	2	14	15
Pulse Signal	A		B		R		C		D		Up+5	0	A	A	A
	+	-	+	-	+	-	+	-	+	-	v	V	eri	eri	eri
													al	al	al

Table 7

4.5.3 Tamagawa encoder TS5213N2531

4.5.3.1 Tamagawa encoder installation and disassembly as shown in Figure 21

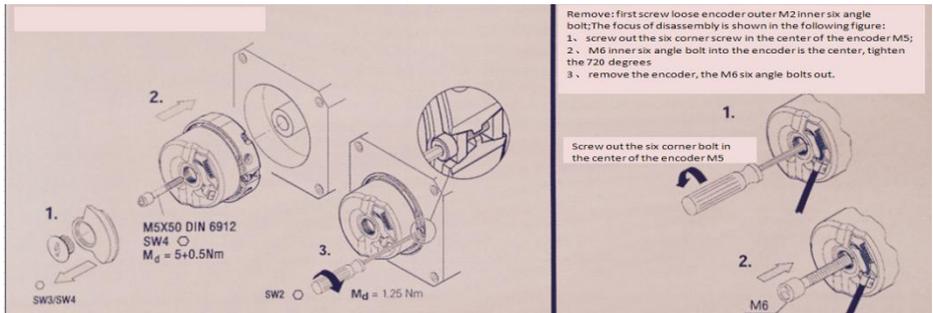


Figure 21

4.5.3.2 Encoder connection

Encoder connection pin:

Pin number	5	6	8	1	3	4	11	10	12	13	9	7	2	14	15
Pulse signal	A		B		R		C		D		Up	0	Aerial	Aerial	Aerial
	+	-	+	-	+	-	+	-	+	-	+5v	V			

Table 8

4.5.4 HENGSTLER encoder RS20/2048AA.0KS0

1. Remove and install the same method with the Tamagawa encoder, please refer to figure 21.
2. The encoder connection is in agreement with Heidenhain 1387, please refer to table five and table six

4.6 Brake

4.6.1 The notice

- Grease, dirt and other foreign objects shouldn't left on the surface of brake wheel, otherwise it will make the braking force fall down rapidly;
- According to the brake wiring diagram, connect the power supply type and voltage properly;
- Maintenance is forbidden when the traction machine is running;
- Caution about the high temperature of the brake surface.

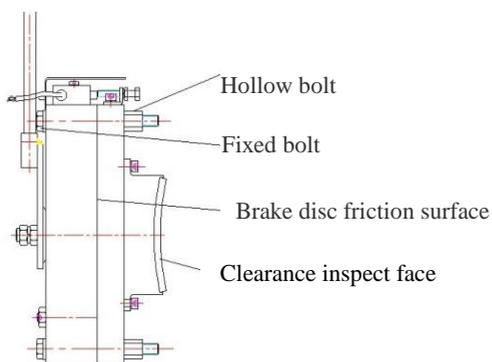


Figure22

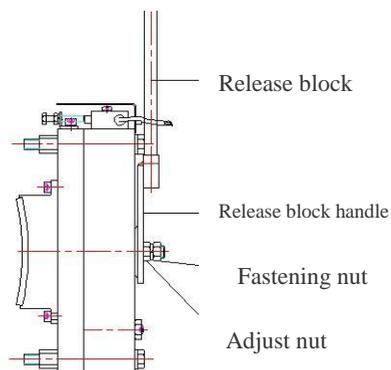


Figure23

4.6.2 The removal, as shown in figure 23

- ① Loosen the hollow bolt: rotate the hollow bolt 2 circles anticlockwise;
- ② Screw out the fastening bolt: rotate the set bolt 2 circles a time anticlockwise until the bolt brakes away from the end cover of the motor;

Before the fastening bolt completely leave the machine, hold the brake with your hand to prevent the falling brake from hurting someone or damaging the machine.



4.6.3 The installation

① Check the brake: check the friction surface to see if there are oil dirt, water logging, rusty spot and solvent etc, if so, use industrial alcohol or rosin water to remove them all, ensure that coil's outgoing lines keep no damage;

② Fix the brake: take 4 pieces of M10x110 inner-hexagon fastening-screw through the elastic cushion 10 and flat gasket 10 into the brake mounting hole, then fix the 4 screws in the corresponding hole on the left side of motor, fix the brake onto the bedplate, tighten the bolts symmetrically.

4.6.4 The clearance adjustment

Brake clearance detection: Use a feeler to measure the clearance inspection face (shown as figure 22), if the gap is less than 0.25 mm (may have a danger of friction between brake surface and rotor) or more than 0.5 mm (may cause the brake not act), it is needed to adjust clearance;

Brake clearance adjustment theory: the dimension of clearance is decided by fastening bolts and hollow bolts: the fastening bolt is for big adjustment, the hollow bolt is for smaller one. When the hollow bolt keeps motionless, rotate the fastening bolt clockwise will make the clearance decreased, conversely it will be increased, when the fastening bolt keeps motionless, rotate the hollow bolt clockwise will make the clearance size increased, conversely it will be decreased. The brake will be well adjusted before delivery, it is no need to be adjusted again. If needed during maintenance, adjust the clearance to 0.35 mm (our reasonable working clearance is from 0.3 mm to 0.4 mm)

① The adjust method when the brake clearance is shorter than 0.35 mm: using a spanner to relax the fastening bolt anticlockwise about 60° , rotate the hollow bolt clockwise properly, with a feeler to enlarge clearance to 0.35mm, then lock the fastening bolt, use the same method to adjust the other three corners;

② The adjust method when the Brake clearance is longer than 0.35 mm: rotate the hollow bolt anticlockwise to shorten clearance until 0.35mm, then lock the fastening bolt, use the same method to adjust the other three corners;

③ After finish the Brake clearance adjustment, the release rod must be able to

turn right or left about 15° flexibly, if can't it is need to adjust (shown as figure 23) , otherwise, it will affect the braking function. The adjust method: keeping the fastening nut static, then rotate the adjust nut clockwise to fasten the release rod, anticlockwise to relax the rod. Lock the fastening nut finally after adjustment completed.

4.6.5 Adjustment of brake micro switch

The micro switch mechanism of the brake is composed of ①Cover plate,②Outside hex bolts,③Hexagon nut,④Leaf spring,⑤Micro switch board,⑥Switch mechanism bracket,⑦Micro switch component(shown as figure 24) .The adjustment of the adjustment of the components of the brake switch mechanism, After the component is provided with a micro switch component and a fixed switch mechanism, The reliable operation of the micro switch can be ensured by adjusting the position of the six angle bolt to change the size of the stroke of the six angle bolt. Loosen the fixing screw and remove the ①cover plate before adjusting the micro switch mechanism.

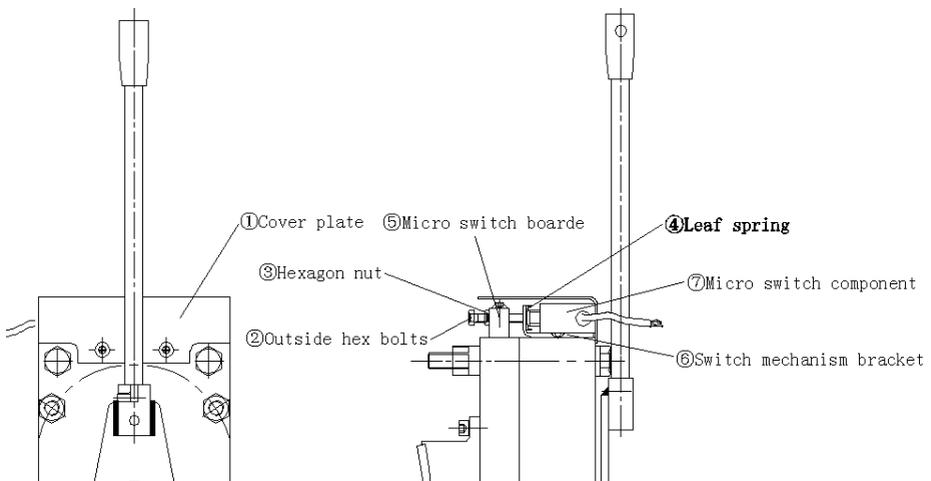


Figure 24

1. Action check of micro switch mechanism:

The left and right brake should be checked separately, and the two brakes are not allowed at the same time. Each time the amount of adjustment can not be more

than 0.1mm, It will make spring deformation, The maximum stroke of the outer six angle bolt can not exceed 0.3mm.

① Will 0.1mm into dynamic and static feeler plate (near switch below), and the single brake is operating for electricity pull, view the action of micro switch brake.

② Will 0.15mm into dynamic and static feeler plate (near switch below), and the single brake is operating for electricity pull, view the action of micro switch brake.

2. Signal judgment:

① Micro switch mechanism normal operation: At the same time to meet the 1- ①operation, the micro switch action, and according to 1- ②operation, the micro switch is not action.

② Micro switch mechanism is not normal: Not by 1 in the①or②action.

3. Micro switch mechanism adjusting step:

The micro switch mechanism should be adjusted when the external Outside hex bolts action is not enough or excessive.

3.1 Outside hex bolts action stroke is not enough

Press 2 to determine the micro switch action, the switch does not move, need to be adjusted as follows.

① Loosen the Hexagon nut of the Outside hex bolts, and rotate the Outside hex bolts forward (clockwise).

② Lock Hexagon nut, according to step 2 operation, check the micro switch action (repeated check 3-4 times).

③ Micro switch does not move, then repeated the appeal ①-③ steps until the micro switch action.

④ After the switch is reliable, the Hexagon nut is locked tightly.

3.2 Excess of Outside hex bolts action stroke

According to the 2 step operation, micro switch operation, the push rod mechanism is adjusted as follows.

① Loosen the Hexagon nut of the lock push rod and rotate the top rod backward (counter clockwise).

② Lock Hexagon nut, according to step 1 operation, check the micro switch

action (repeated check 3-4 times).

- ③ Micro switch action, then repeated the appeal ①-③ steps until the micro switch does not move.
- ④ After the micro switch is reliable, the Hexagon nut is locked tightly.
- ⑤ According to 1, 3 after the completion of the operation, the completion of a single brake micro switch mechanism adjustment, according to this method to adjust the other side of the brake.

4.6.6 The adjustment of brake noise

The size of the brake noise judgment: when the brake action has obvious clang, cushioning for brake level is low;

Low damping pad adjustment method:

Will brake the Allen screw in the number ① position of lending;

1. Will the elevator maintenance operation, mainly in order to brake off;
2. Will use Allen key number ① position within four screws tighten, power properly;
3. To remove the four number ① socket head mount.

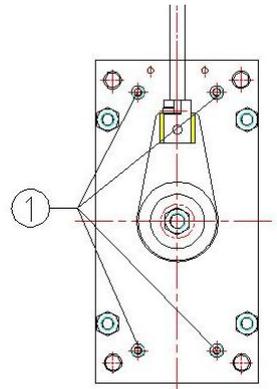


Figure25

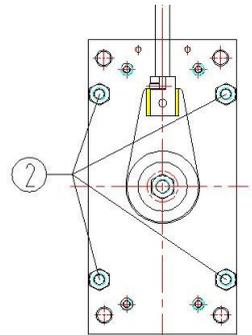
4.6.7 Braking torque adjustment

Braking force detection: when no-load capsules on row, elevator stop, brake, brake, single arm observation can brake braking elevator, can stop for braking meet, cannot stop for insufficient braking system;

Insufficient braking adjustment method:

1. In the condition of the elevator maintenance, will be the number ② position M12 nuts demolition;
2. Will the number ② position within the four hexagonal screw press screw

Grain direction is turned into a quarter circle;



3. The braking test again, check whether single arm brake, failed to system still need to install the step 2 again, until can one-armed brake;
4. Another brake installed this method;
5. Tighten M12 nuts all installed.

Figure 26

4.7 Installation and operation of jigger switch

Jigger mechanism consists of jigger gear ring and the small gear of jigger handle, with safety controlling switch, which is protecting the emergency rescuers when helping people by hands. The following show the procedures of jigger when doing manual rescue:

1. Dismantle the jigger hole cover with a cross screw-driver, at the same time, the contacts tore apart, main circuit disconnected, shown as figure 27;
2. Use a screw to connect the small gear and jigger handle together, shown as figure 28;
3. Insert the components into the jigger hole, shown as figure 29;
4. Turn the handy loosening board of brake to loosen the brake, then you can turning the machine by hand;
5. It is ordered to amount the jigger hole cover back to bedplate after the rescue. Pay attention to align the position of moving and fixed contacts. Only the screws tightened can we adjust and run the traction machine.

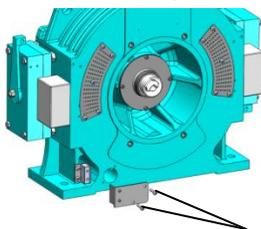


Figure 27

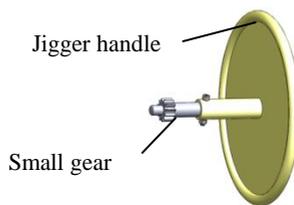


Figure 28

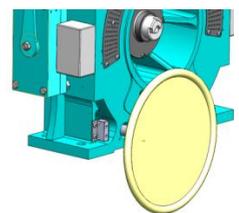


Figure 29

5 Maintenance

5.1 Daily maintenance

- Keep the machine room clean and dry;
- Keep the surface of traction machine clean;
- Check the working condition of every part regularly. Please contact the producer in time if any abnormal situation happens, especially unusual high temperature of brake and electric motor;
- For this series, lubricate the bearings with grease gun through the oiling hole, 300ml a time. (grease mark: Mobil MP2 mix lithium-based grease), dosage is about 0.4kg;

5.2 Motor maintenance

- Monitor the working voltage and current one time a month, to see the figure is in the range of rated numerical value on the nameplate or not, if current significantly larger than rating data, it is need to locate the encoder Angle again;
- If there is a room, clean the room and traction wheel's surface regularly, and don't forget to dislodge the dampness;
- Check whether there is cable being bare and loose every six months a time.

5.3 Brake maintenance

Brake inspection cycle is generally six months.

- (1) Test the brake periodically, make sure the brake gap is in the reference amount between 0.3 mm and 0.4 mm.
- (2) When the brake have used more than 2 million times or noise is quite big, the shock-absorbing pad should be changed.
- (3) When the friction plate is thinner than 1 mm, it should be changed in time.
- (4) Test about braking force should be carried on at least 6 months a time during

the motor is on service. Keep the motor running 10 minutes without slipping under the condition of 150% of full load.

5.4 Turning gear maintenance

Every six months to check the situation of wear and tear, If there is only one single groove is wearing, it is need to adjust the tension strength of steel rope till the strength is well-distributed. If several grooves are wearing, it is need to reconfirm whether the traction machines match with the weight of elevator system and the hardness of steel rope.

6 Trouble shooting

Common faults and Remedies:

No.	Fault	Remedy
1	Brake can't snap-action	Check the wiring and the voltage value using the multi-meter
2	Too noisy when brake act	Adjust the braking clearance, see appendix 2
3	Brake coils become too hot	Check the coils voltage, which should not exceed the 106% of rated value. Add a strong excitation circuit into the control system to cut down the running voltage when necessary.
4	The motor is quaking with a noise when it starts	<ol style="list-style-type: none">1. Make sure the earth connection is correct2. Adjust the gain parameters of the inverter3. Adjust the fold and unfold time of the inverter
5	The motor becomes too hot	<ol style="list-style-type: none">1. Check the current of inverter, to see whether it is obviously larger than rated value.

		<ol style="list-style-type: none"> 2. Check the temperature of environment is too high or not. 3. Check the brake is fully unfolded or not when the motor is running.
6	The current of motor is obviously larger than rated value.	<ol style="list-style-type: none"> 1. The encoder moves in the installing position, fix it again and do the self learning on default values(through the inverter) 2. Check the load of elevator, if overloaded, find the reason. 3. Check the balance coefficient of elevator, whether it is in the range of 0.4 and 0.5.
7	The traction machine begins reversing when stopping	<ol style="list-style-type: none"> 1. Increase the zero speed time of inverter 2. Increase the low speed gaining of inverter.
8	Running away when the motor starts up	Check the encoder is fixed tightly or not
9	Turning gear wears abnormally	<ol style="list-style-type: none"> 1. Change the steel rope if it is not suitable with the turning gear 2. Check the tension of steel rope 3. Checking calculate the specific pressure of steel rope.
10	The tractor shakes slightly	The frame is not flat or lack of stiffness.

Table 9