1. Written explanations:

1. 1. General introduction to products

Modified on formal types of products, CD1 MD1 series products are compact, light and safe. As popular light hoisting devices, the products feature high convertibility of parts, high lifting ability of single hoist, easy maintenance and wide application.

The electric hoists have fixed type and trolley type. The former type can be installed on the frame directly and is divided into model Al, A2, A3 and A4, as shown in Fig.-3. The latter type can be installed on the track. CD1 is single-speed lifting and MD1 can hoist with regular and slow speed.

The carrying capacity and lifting height of our electric hoists are 0. 25t- 20t and 3m- 30m respectively but we can also provide customized products.

2. Main use

Trolley hoists can be installed on various cranes or suspended on I-steel beams to carry out straight line and curved line hoisting while fixed hoists are installed on fixed supporting objects to conduct hoisting of different angles.

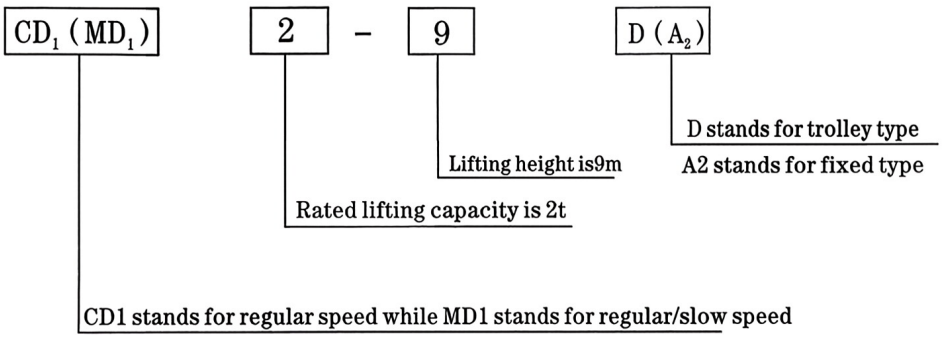
As necessary machines to improve working conditions and efficiency, the products are widely applied in industrial and mining enterprises, railways, docks, warehouses and storing fields

3. Application range and working requirements

Requirements for working environment of the products are: temperature: -25℃-40℃: humidity: <85%: altitude:< 1000m, Working sites should not be close to explosives, corrosive materials or other dangerous materials. It is forbidden to hoist molten metals, inflammables, explosives and poisonous materials. Power supply for the products should be 3-phase AC, 50Hz and 380V. Working grade is medium and rising of working grade by one grade requires 20% decrease of rated hoisting capacity.

4. Specifications and extemal structures of the products.

4. 1. Setting an example for specifications



4.2. Refer to table-4 for specifications, technical data and extemal installation dimensions of CD1MD1 electric hoists.

4.3. Refer to Fig. -1-Fig.- 15 for extermal structures.

5. Driving mechanism and working principles

CD1MD1 electric hoists are composed of three parts: namely, hoisting mechanism, operating mechanism(no fixed mechanisms) and electric mechanisms

5. 1. Hoisting mechanism

The hoisting mechanism works like this: The hoisting motor drive the hollow axis of the decelerator through the coupling to rotate the drum and the steel wire rope wound around the drum forces the hook to rise or descend

When the lifting height is 6m, it is required to use a claw coupling to connect the axis of the motor and the input axis of the decelerator; when the height is 9m or higher, it is required to add a medium axis and a rigid coupling: when the height is 18m or higher, it is required to add a support to strengthen the rigidity of the medium axis to guarantee rotational stability

5.1. 1. Hoisting motor

Hoisting motors adopt motors with conical rotor because they have relatively big starting torque, enabling the products suitable to conduct frequent direct start in the intermittent working process. CD1 electric motor adopts Type-ZD single speed motor while MD1 electric motor adopts Type-ZDS double speed motor and the ratio between the regular and slow speed of Type-ZDS double speed motor is 10: 1.

5. 1.2. Decelerator

The decelerator of the 0.25t electric hoist adopts a straight-teeth planet driving mechanism and other decelerators use helical gear 3-stage decelerating mechanism. The gears and axes are made from alloy or high quality carbon steel and have gone through heat treatment so as to guarantee reliability and service life. The body and cover of the case are made from cast iron and are good in shock absorption and air proof.

5.1.3. Drum mechanism

The drum is made from cast iron or seamless steel and the shell of the drum is soldered with steel plate. The drum passes the driving force through the spline.

The drum is at the central part of the hoist. Its upper part is connected with the operating mechanism through the balance beam, its two ends are connected with the decelerator and the motor respectively and its lower part works together with the hook by way of the steel wire rope. On the front upper part of the cover, a guiding rod of limiter is fixed

5.1.4 Hook mechanism

The hook is made of seamless steel and is connected with the shell by the bearing and the hook beam, enabling operation of the hook flexible Hooks on 5t hoists or lighter ones adopt single pulley and those on 10t hoists or heavier ones adopt double pulley.

5. 2. Operating mechanism

The operating mechanism is composed of the electric trolley, operating motor, operating decelerator and slave trolley. The main machine is suspended on it to conduct reciprocating motion. Operating speed is generally 20m/min but it is also allowed to choose the speed of 30m/min. When the hoisting height is equal to or higher than 12m, a more slave trolley is needed.

5. 3. Electric mechanism

The electric mechanism of CD1 and MD1, electric hoists is composed of control box(no 0.25t), buttons, limiter and connecting wires.

Operating voltage of the buttons is generally 380V or 36V and correct operation of the buttons can control the engagement and disengagement of the relay in the control box and then control the movement of the electric hoist.

Circuit diagrams in this manual should be used together with the diagrams of motors and electric mechanisms in the packing box of the products

6. Installation and adjustment

6. 1. Installation

6. 1. 1. Check and preparations before installation

a)Compare all parts and documents of the product with items on the packing list after the electric hoist is delivered to the place where it is to be installed and check carefully to see whether or not there is any damage or loss.

b)Read the operation instruction manual and other documents carefully to understand the structure of the product.

c)Operating trolley, current lead-in device and hook(excluding 1Ot hoist)are generally packed separately from the main machine and re-assembly is required in installation.

d)Clean oil stains or anti-rust oils on the tread of the electric trolley

e)Fill oils for the lifting and operating decelerator according to Table-9 and Table-12 and seal up the opening to prevent

f)Get a full understanding of the installation site and prepare relevant devices.

6. 1.2. Installation

The track frame for movement of the electric hoist should be selected according to GB706-88 standard by the client or the client can design the frame by himself. During the installation, adjust the adjusting washer to make sure that there is a gap of 3- 5mm between the wheel flange and the edge of track.

Take measures to guarantee that installation orientation is correct and the support frame is safe and reliable in installatio of fixed hoists

6. 1.2. 1. When installing electric mechanism, refer to relevant circuit diagrams for reference according to characteristics of the hoists

6. 1.2.2. Precautions for installation

a)Install resilient buffers on the two ends of the track so as to guarantee that the hoist will not fall off the track or damage the body of the machine.

b)Grounding line should connected to the track or the frame connected to it and the grounding line should be bare copper wire or metal wire $\phi 4 \sim \phi 5$mm with a cross-section larger than 25mm^2.

C) The resistance against ground in all the power and control circuits should not be smaller than 1000 Ω /V.

6. 2. Check and adjustment

6. 2. 1. Check to make sure that conditions of joining parts, assembly, power supply, circuit connection, brake, limiter, operation of rope and trolley and contact of the wheel and track satisfy relevant requirements. Solve the problems immediately once they occur

6. 2.2. Adjustment

6.2.2.1. Adjust the gap between the trolley wheel flange and the track and make sure the gap is 3~5mm.

6. 2.2.2. Adjustment of the moving range of the main axis of the motor

Brake effect will be the best when the moving range of the main axis of the motor with conical rotor is 1.5mm and the following measures should be taken to conduct adjustment if the sliding range of the electric hoist under rated loading condition is too big:

a) Adjusting method for electric hoists of 5t or small ones: take off the tail cover, screw off the 4 screws for the fixing screws, turn the adjusting nut clockwise with a spanner until it can not be moved, turn it for one round anti-clockwise and put on the tightening screws.

b)The adjusting method for 10t and 16t electric hoist is similar to that mentioned in item a). The only difference is that turning directions of the adjusting nut is just the opposite. In other words, clockwise turning will increase the moving range and anti-clockwise tuning will reduce the range

6. 2. 2.3. Adjustment of cut off limiter

Adjustment of the limiter is done by way of adjustment of the two bumping blocks on the limiting rods. The method is: Loosen the screws on the blocks, leave the blocks on the two sides of the clamping plate of the rope guider and the clamping plate can push the blocks freely.Switch on the motor to start lifting and the clamping plate push the upper block to move. Stop lifting when the upper edge of the hook pulley is 150mm~50mm away from the lower edge of the shell of the drum. Press the descending button and stop the machine when the rope guider moves about 10mm back. Move the upper block close to the clamping plate and tighten the screws.

Adjusting method for the lower dead limit is similar to the method mentioned above and the difference is that the adjusting direction is opposite. It is a must that there are more than three circles of steel wire ropes on the drum when the hook is at the lowest position.

Carry out several lifting with empty load after the adjustment to check whether or not the upper and lower dead limits meet the requirements.

7. Test and acceptance

7. 1.Empty-load test

7. 1. 1. Push the buttons to see whether or not movements are correct. If they are, repeat the test two times more.

7.1.2. Raise the hook to the dead limit position to check reliability of limiters.

7. 1.3. Push the button to judge the axial moving range of the axis of the motor with naked eyes and to make sure the range is 1~2mm

Carry out load test if everything goes well in empty-load tests.

7. 2. Still load test

With rated voltage, lift a load 1.25 times heavier than rated load until it is 100mm above the ground. Make the load still for 10 minutes, then unload and check whether or not there is something abnormal.

7.3. Moving load test

With rated voltage, carry out moving load test with a load 1. 1 times heavier than rated load. Test period is 40 seconds: lift for 6 seconds, stop for 14 seconds, lower for 6 seconds and stop for 14 seconds. 15 periods should be conducted and then check whether or not everything is normal

7.4. Brake motor should be adjusted to make sure it can brake the hoist with heavy load suspended in the air. When braking the hoist with rated load, the sliding range is

$$s \leq \frac{VL}{100}\ \text{mm}.$$ VL=lifting speed with rated load (mm/min)

8. Key points for safe operation

8.1.Requirements for operators

8.1.1Has basic knowledge about mechanical and electric operation and is healthy.

8.1.2. Be familiar with structure, performance, safety procedures and manual of the electric hoist.

8.1.3. Has received training and got certificate before becoming an operator.

8.2. Operation is not allowed if any one of the following situations happens:

8.2.1.Overloaded or uncertainty of the load; lifting buried objects or oblique pulling or hoisting;

8.2.2. There is defects or damages affecting safe operation such as malfunction of brake or limiter, damage of tightening device for nut of the hook or the steel wire rope reaches standard of dumping:

8.2.3. Loose binding of load: no gaskets between edges of heavy load and steel wire rope;

8.2.4. Site and load cannot be seen clearly due to poor visibility in the operating site.

8.3. Rules of operation

8.3.1. Every shift should conduct daily operation according to Table-8 before starting to work.

8.3.2. It is not allowed to stop the hoist by means of the limiter; do not adjust the limiter, carry out inspection or repair when load is suspended in the air.

8.3.3. Carry out short-range lifting first when the load reaches or is close to maximum rated load and then lift the load with minimum height. Do not lift loads over people.

8.3.4. For electric hoist without lowering limiter, at least three circles of rope should be around the drum when the hook is at the lowest working position.

8.3.5. It is not allowed to dismantle or modify safety devices of the hoist.

8.3.6. When there is strange sound, follow the procedures of stop, inspect, remove the trouble and restart.

8.4. Requirements on clients (refer to 3.2.2. in standard ZBJ8001 3.7-89 for details) :

8.4. 1. Clients should request local work safety authorities to carry out safety inspection every year.

8.4.2. Clients should set up rules, regulations and procedures for safety operation.

8.4.3. If clients have special application demand, modification is only allowed after agreement of producer and approval of work safety authorities

8.4.4. Clients should establish file of electric hoists, including technical documents when the products leave the factory, installation site and starting time of operation, records of tests and inspections, daily use, maintenance and repair, accident record of equipment and people as well as problems of machine and relevant appraisal.

9. Method for inspection, maintenance, maintain and trouble-shooting

9.1. 1. Trial run test

Trial run test should be carried out upon electric hoist that is newly installed, has just received overhaul or has not been used for more than one year according to relevant rules and regulations.

9.1.2. Daily inspections: Refer to Table-8 for items of inspections.

9.1.3.Monthly inspection.

Inspection periods are determined according to importance, frequency of use of every structure and whether they are liable to damage. Generally, inspections are divided into three grades: Grade-1: Inspection should be done every month: Grade-2: Inspection should be carried out every three months; Grade-3: Inspection is required to be carried out every six months. Refer to Table-10 for items, demands and grades for monthly inspection.

9.1.4. Yearly inspection: It is required to carry out a full inspection on electric hoists even though their working is normal. Refer to Table-1 1 for inspection items and requirements

9. 2. Maintenance

Lubrication and maintenance should be conducted regularly to guarantee reliability and service life of electric hoists. Refer to Fig -30 for lubricating positions and Table-9 and Table-12 for standard of lubrication.

9.3. Use, maintenance and dumping of steel wire rope

Steel wire rope is a key part of the hoisting mechanism of electric hoist and has a direct influcnce on safety. It is liable to be dumped after it is worn out and broken. Keep it in good lubricating conditions and check its ends regularly.

When steel wire rope reaches the conditions stipulated in GB/T5972-86 inspection and dumping standard of steel wire rope used in hoisting machinery or has one of the following conditions, it is required to replace the old the rope with a new one:

a) Concentrated broken wires or broken of one strand;

b) No obvious broken wires but the wear or corrosion of the nominal diameter of the rope reaches 7% of the diameter.

c) Dump the rope when number of broken wires within one length of lay reaches the standard stipulated in Table-I and Table-2

10 Repair

If find any problems in inspections,conduct immediate repair work and the following requirements should be satisfied in the repair:

a)When replacing old components, use components with same characteristics as that of old ones.

b)In welding, materials, welding rods and welding quality should be in accordance with quality standard of original structure

c)Maintenance and repair is not allowed when the electric hoist is working.

11. Main parts liable to damage

Parts liable to damage mainly include rope guider, sealing washer, brake ring and high-speed small gear at the axis end of the operating motor.

2. Tables datum parts

Table-I Dumping standard for steel wire rope(within one length of lay)

Safety system of steel wire rope	Dumping standard for steel wire rope			
	6×19=114		6×37=222	
	Cross lay	Lang lay	Cross lay	Lang lay
	12	6	22*	11

*Most hoists adopt rope of 6 x 37 cross lay and the rope should be dumped when broken wires reaches 22 within one length of lay.

It even wear or corrosion occurs on outer wires on any cross section of the rope, dumping standard is reduced according to Table-2.

Table-2 Conversion of wear quantity of wire diameter of rope and number of broken wires

Wcar or corrosion quantity of outer wire (%)	Converted to the standard of number of broken wires within one length of lay in table-I (%)
10	84
15	76
20	68
25	60
30~40	50

Tablr-3Common troubles and adjustments

Trouble	Main causes	Handling method
1. Motor does not rotate to lift load after hoist is powered on	(1) Excessive over loading	Over loading is not allowed
	(2)Voltage is more than 10%lower than rated voltage	Wait until voltage is normal
	(3) Trouble of electric mcchanisms;electric wire is disconnecled or poorly connected	Check and repair electric mechanism and wiring.
	(4) Brake wheel is deadly Locked with rust on the rear end cover.	Take off the brake wheel and remove the rust.
	(5) Conical rotor and stator touch each other	Follow SN.9.
2. Brake is not reliable and slid-ing range is excessive	(1)Spring pressing is smaller due to wear of brake ring or other reasons	Adjust according to 6. 2.2.2.
	(2) Poor contact of brake ring and rear end cover.	Take off it and polish.
	(3) Oil stains on brake surface	Take off and clean it
	(4) Brake ring is loose	Replace brake ring.
	(5) Malfunction of pressing spring.	Replace spring.
	(6) Inflexible movement or dead lock of coupling.	Check the connecting part
3. Excessive high temperature of motor	(1) Over-loaded operation	Not allowed
	(2) Excessjve frequent operation	Follow Fe30% working system
	(3) Brake gap is too narrow and is not released completely in operation.	Re-adjust the gap
4. Excesive loud noise of decelera-tor	(1) Poor lubrication (2) Tooth gap is too wide due to excessive wear. (3) Gear damaged (4) Bearing damaged	Take off and repair.
5. Buzzing sound from motor during operation	(1) Lack of phase of power supply and motor	Repair or replace contactor
	(2) Poor contact of AC contacto	
6. The hoist cannot bere-stated afterbe-ing stopped while loadis in the air.	Excessive low voltage or fluctuation	Re-start after voltage is normal
7. Cannot be stopped after starting or can-not be stopped after reaching dead limit.	(1) Poor contact of AC contactor (2)Break down of limiter	Power off general supply immediately, take off and repair it or replace AC contactor.
8. Oil leakage of decelerator	(1)Poor installation of sealing washer between the box body and cover or the washer is damaged.	Take off and repair it or replace sealing washer.
	(2) Connccting sctew is loose.	Fixing screw
9.Conicalrotor and stator touch each other	Serious wcar of support ring on motor axis and rotor iron core moves axially or stator iron core moves	Replace support ring and he sure that there is even gap between conical surface of rotor and stator(0.35-0.55mm, gap is smaller for small motor)or send the motor back to faclor for repair.

表 4 CD_1MD_1型系列电动葫芦技术性能和外形尺寸主要参数

Table-4 Main technical and dimensional data of CD1MD1 electric hoists

型 号 Type			CD_1 MD_1																			
起重量 Hoisting weight		吨 T	0.25			0.5			1						2							
起升高度 Hoisting height		米 m	3	6	9	6	9	12	6	9	12	18	24	30	6	9	12	18	24	30		
起升速度 Hoisting speed		米/分 m/min	8			8 8/0.8			8 8/0.8						8 8/0.8							
运行速度 Operating speed		米/分 m/min	20(30)			20(30)			20(30)						20(30)							
钢丝绳 Steel wire	绳直径 Rope diameter	毫米 mm	3.6			4.8			7.4						11							
	钢丝直径 Wire diameter	毫米 mm				0.22			0.34						0.5							
	结构型式 Structure type		6×9			D-6× 37+1			D-6× 37+1						D-6× 37+1							
工字梁轨道型号（GB706-88） Type of I-steel track (GB706-88)			16-22b			16-38b			16-28b						20a-32c							
环行轨道最小半径 米 Minimum radius of circular track(m)			0.8			1.5			1.5		2		3		4	2		2.5		3		4
起升电动机 Hoisting motor	型号Type		ZD_112-4			ZD_121-4 $ZDS_10.2/0.8$			ZD_122-4 $ZDS_10.2/1.5$						ZD_131-4 $ZDS_10.4/3$							
	容量 Capacity	千瓦 KW	0.4			0.8 0.2/0.8			1.5 0.2/1.5						3 0.4/3							
	转速 Rotation speed	转/分 Round/min	1380			1380			1380						1380							
	相数 Phase number		3			3			3						3							
	电压 Voltage	伏 Volt	380			380			380						380							
	电流 Current	安培 Ampere	1.25			2.40 72/2.4			4.3 0.72/ 4.3						7.6 1.25/7.6							
	频率 Frequency	周/秒 Round/s	50			50			50						50							
运行电动机 Operating motor	型号Type		DW5024			ZDY_111-4			ZDY_111-4						ZDY_112-4							
	容量 Capacity	千瓦 KW	0.06			0.2			0.2						0.4							
	转速 Rotation speed	转/分 Round/min	1400			1380			1380						1380							
	相数 Phase number		3			3			3						3							
	电压 Voltage	伏 Volt	380			380			380						380							
	电流 Current	安培 Ampere	0.30			0.72			0.72						1.25							
	频率 Frequency	周/秒 Round/s	50			50			50						50							
工作类型及机构级别 Working type and mechanism grade			中级M3 Medium M3			中级M3 Medium M3			中级M3 Medium M3						中级M3 Medium M3							
基本尺寸 ± 2% Basic dimensions ± 2%	H	毫米 mm	~423			~630		~670	~685				~780			~860				~960			
	L2		216			126			159						187							
	L1		175			228/225			269/266						279							
	L C		3921			616	688	760	758	856	955	1150	1346	1542	820	920	1020	1220	1420	1620		
	L M					638	710	782	780	878	976	1172	1368	1564								
	m		104			318	390	462	401	499	597	739	989	1185	418	518	618	818	1018	1218		
	n		130			190			196						240							
	h					120			124						155							
	ϕ		16.5			16.5			19						25							
	B		279~315			~884			~884						~930							
	E		~395			~490			~584						~740							
	F					355/426			354/492						400/562							
总量 15%of 15% total	C	公斤 Kg	44	44.4	44.8	120	125	145	145	158	180	195	208	222	235	248	296	320	340	365		
	M					135	140	160	160	170	200	210	220	230	265	278	326	350	370	395		
	C固 CFixed		30	30.4	30.8	80	85	90	110	120	125	140	150	165	168	180	190	210	230	350		
	M固 MFixed					100	105	110	130	140	145	155	165	180	196	210	220	240	260	280		

型 号 Type			CD_1 MD_1																					
起重量 Hoisting weight		吨 T	3						5						10						16			
起升高度 Hoisting height		米 m	6	9	12	18	24	30	6	9	12	18	24	30	6	12	18	24	30	9	12	18		
起升速度 Hoisting speed		米/分 m/min	8 8/0.8						4 4/0.4 8 8/0.8						7 7/0.7					3.5 3.5/0.35				
运行速度 Operating speed		米/分 m/min	20(30)						20(30)						20(30)					20(30)				
钢丝绳 Steel wire	绳直径 Rope diameter	毫米 mm	13						15						15					17.5				
	丝直径 Wire diameter	毫米 mm	0.6						0.7						0.7					0.7				
	结构型式 Structure type		D-6 × 37+1						D-6 × 37+1						D-6 × 37+1					6 × 37+1				
工字梁轨道型号（GB706-88） Type of I-steel track (GB706-88)			20a-32c						25a-63c						25a-63c					45a-63c				
环行轨道最小半径 米 Minimum radius of circular track(m)			2	2.5	3	4			2.5	3	4	5			2.5	3.5	4	6	7.5	9	3.0	3.5	4.6	
起升电动机 Hoisting motor	型号Type		$ZD_1$32-4 $ZDS_1$0.4/4.5						$ZD_1$41-4 $ZDS_1$0.8/7.5						$ZD_1$51-4 $ZDS_1$1.5/13					$ZD_1$51-4 $ZDS_1$1.5/13				
	容量 Capacity	千瓦 KW	4.5 0.4/4.5						7.5 0.8/7.5						13 1.5/13					13 1.5/13				
	转速 Rotation speed	转/分 Round/min	1380						1380						1400					1400				
	相数 Phase number		3						3						3					3				
	电压 Voltage	伏 Volt	380						380						380					380				
	电流 Current	安培 Ampere	11 2.4/11						18 2.4/18						30 4.3/30					30 4.3/30				
	频率 Frequenncy	周/秒 Round/s	50						50						50					50				
运行电动机 Operating motor	型号Type		$ZDY_1$12-4						$ZDY_1$12-4						$ZDY_1$21-4					$ZDY_1$21-4				
	容量 Capacity	千瓦 KW	0.4						0.8						0.8×2					0.8×2				
	转速 Rotation speed	转/分 Round/min	1380						1380						1380					1380				
	相数 Phase number		3						3						3					3				
	电压 Voltage	伏 Volt	380						380						380					380				
	电流 Current	安培 Ampere	0.25						2.4						2.4×2					2.4×2				
	频率 Frequenncy	周/秒 Round/s	50						50						50					50				
工作类型及机构级别 Working type and mechanism grade			中级M3 Medium M3						中级M3 Medium M3						中级M3 Medium M3					轻级M2 Light M2				
基本尺寸 ± 2% Basic dimensions ± 2%	H	毫米 mm	~985			~1080			~1160			~1310			~1350					~1600				
	L2		230						274						303					同 10t				
	L1		341-343						380/377						429/820					同 10t				
	L C		915	1018	1121	1327	1533	1738	1047	1157	1257	1467	1677	1887	1602	1783	2145	2507	2869	同 10t				
	L M		1059	1169	1269	1479	1682	1899	1969	2150	2512	2874	3236											
	m		448	551	654	580	1066	1272	485	606	695	905	1115	1325	949	1130	1492	1854	2216	949	1130	1492		
	n		264						320						376					375				
	h		173						203						243									
	ϕ		25						31						37					41				
	B		~930						~1058						~1058									
	E		~848						~988						~1068					~1334				
	F		438/642						472/675						612					1055				
总量 15%of 15% total	C	公斤 Kg	280	300	350	380	405	435	445	470	555	590	630	670	1010	1063	1166	1263	1317					
	M		310	330	380	410	435	465	4890	505	590	630	660	705	1100	1153	1256	1323	1407					
	C固 CFixed		220	235	250	275	300	325	355	375	390	425	460	500	759	807	900	987	1032					
	M固 MFixed		250	265	280	305	330	355	390	410	425	460	500	535	849	897	990	1077	1122					

表 5 HC、HM型系列电动葫芦技术性能和外形尺寸主要参数

Table-5 Main technical and dimensional data of HC and HM electric hoists

型 号 Type			HC															
起重量 Hoisting weight		吨 T	16t										20t					
起升高度 Hoisting height		米 m	9	12	16	18	20	24	30	35	40	45	48	9	12	16	18	20	24
起升速度 Hoisting speed		米/分 m/min	3.5（3.5/0.35）											3（3/0.3）					
运行速度 Operating speed		米/分 m/min	17.5											20					
钢丝绳 Steel wire	绳直径 Rope diameter	毫米 mm	28											21.5					
	丝直径 Wire diameter	毫米 mm	1.2											0.9					
	结构型式 Structure type		6 × 37 +1											6 × 37 +1					
工字梁轨道型号（GB706-88） Type of I-steel track (GB706-88)			50a-63c											50a-63c					
环行轨道最小半径 米 Minimum radius of circular track(m)			3.0			3.5				4.6				3.0		3.5			4.6
起升电动机 Hoisting motor	型号Type		ZDX62-6（ZD52-4）											ZDX62-6（ZD52-4）					
	容量 Capacity	千瓦 KW	18.5 18.5/3.0											18.5 18.5/3.0					
	转速 Rotation speed	转/分 Round/min	920（1400）											920（1400）					
	相数 Phase number		3											3					
	电压 Voltage	伏 Volt	380											380					
	电流 Current	安培 Ampere	40											40					
	频率 Frequency	周/秒 Round/s	50											50					
运行电动机 Operating motor	型号Type		ZDY122-4（ZDY121-4）											ZDY121-4					
	容量 Capacity	千瓦 KW	1.5 × 2（0.8×4）											0.8×4					
	转速 Rotation speed	转/分 Round/min	1380											1380					
	相数 Phase number		3											3					
	电压 Voltage	伏 Volt	380											380					
	电流 Current	安培 Ampere	2.4×2											2.4×2					
	频率 Frequency	周/秒 Round/s	50											50					
工作类型及机构级别 Working type and mechanism grade			中级M3 Medium M3											轻级M6 Light M6					
基本尺寸 ± 2% Basic dimensions ± 2%	H	毫米 mm	~3385											~3385					
	L2		470											470					
	L1		396.5											396.5					
	L C		1685	1794	1938	2010	2083	2227	2444	2625	2800	2986	3094	1810	2038	2280	2368	2500	2720
	L M		1700	1809	1953	2025	2098	2242	2459	2640	2815	3001	3109	1935	2053	2295	2383	2515	2735
	m		895	1004	1148	1120	1293	1437	1654	1835	2010	2116	2304	1130	1248	1490	1578	1710	1930
	n		400											400					
	h		435											435					
	ϕ		37											37					
	B		~1058											~1058					
	E		~2265											~2265					
	F		397											860					
总量 15% 15%of total	C	公斤 Kg	1985	2150	2200	2320	2400	2510	2550	2650	2850	3030	3160	2450	2950	3156	3356	3500	3750
	M		2185	2350	2400	2500	2600	2720	2580	2930	3050	3210	3330	2750	3250	3456	3656	3800	4040
	C固 CFixed		1635	1760	1890	2030	2100	2230	2420	2540	2650	2710	2930	1950	2450	2656	2856	3000	3250
	M固 MFixed		1835	1960	2090	2230	2340	2430	2600	27000	2850	2910	3000	2250	2750	2956	3156	3300	3550

型 号 Type			HC（HM）																			
起重量 Hoisting weight		吨 T	25t						32t						50t							
起升高度 Hoisting height		米 m	9	12	16	18	20	24	9	12	16	18	20	24	9	12	16	18	20	24		
起升速度 Hoisting speed		米/分 m/min	2.4(2.4/0.24)						2.4(2.4/0.24)						2(2/0.2)							
运行速度 Operating speed		米/分 m/min	21.5						21.5						24							
钢丝绳 Steel wire	绳直径 Rope diameter	毫米 mm	20						26						26							
	丝直径 Wire diameter	毫米 mm	0.9						1.7						1.7							
	结构型式 Structure type		6 × 37 +1						6 × 37 +1						6 × 37 +1							
工字钢轨道型号（GB706-88） Type of I-steel track (GB706-88)			50a-63c						50a-63c													
环形轨道最小半径 米 Minimum radius of circular track(m)			3.0		3.5		4.6															
起升电动机 Hoisting motor	型号Type		ZDX62-6（ZD52-4）						ZDX62-6						ZDX62-6							
	容量 Capacity	千瓦 KW	18.5 18.5/3.0						18.5 18.5/3.0						18.5 18.5/3.0							
	转速 Rotation speed	转/分 Round/min	920（1400）						920						920							
	相数 Phase number		3						3						3							
	电压 Voltage	伏 Volt	380						380						380							
	电流 Current	安培 Ampere	40						40						40							
	频率 Frequenncy	周/秒 Round/s	50						50						50							
运行电动机 Operating motor	型号Type		ZDY$_1$21-4						ZDY$_1$22-4													
	容量 Capacity	千瓦 KW	0.8×4						1.5×4													
	转速 Rotation speed	转/分 Round/min	1380						1380													
	相数 Phase number		3						3													
	电压 Voltage	伏 Volt	380						380													
	电流 Current	安培 Ampere	2.4×2						2.4×2													
	频率 Frequenncy	周/秒 Round/s	50						50													
工作类型及机构级别 Working type and mechanism grade			轻级M6 Light M6						轻级M3 Light M3						轻级M3 Light M3							
基本尺寸 ± 2% Basic dimensions ± 2%	H	毫米 mm	~3385																			
	L2		470						470						470							
	L1		396.5						396.5						396.5							
	L C		2060	2280	2412	2566	2830	3116	2048	2264	2553	2697	2842	3131	2300	2571	2932	3113	3293	3654		
	L M		2075	2295	2427	2581	2845	3131	2063	2279	2568	2712	2857	3146	2315	2586	2947	3128	3308	3669		
	m		1270	1490	1622	1776	2040	2326	1258	1474	1763	1907	2050	2341	1510	1781	2142	2323	2503	2864		
	n		400						400						400							
	h		435						435						435							
	ϕ		37						50						50							
	B		~1058																			
	E		~2265						~2265						~2265							
	F		980						860						980							
总量 15% 15%of total	C	公斤 Kg	2600	2800	3000	3300	3500	3900	3200	3406	3712	3918	4124	4330								
	M		2900	3100	3300	3600	3800	4200	3500	3706	4012	4218	4424	4630								
	C固 CFixed		2100	2300	2500	2800	3000	3400	2600	2806	3112	3318	3524	3730	5460	5920	6380	6820	7280	7860		
	M固 MFixed		2400	2600	2800	3100	3300	3700	2900	3006	3312	3518	3724	3930	5860	6320	3780	7220	7680	8266		

表 6 CD_1、MD_1电动葫芦轴承明细表

Tabil-6 List of bearing of CD1、MD1 electric hoists

所属装配部门 Place of installation		0.25吨(t)			0.5吨(t)			1 吨(t)			2 吨(t)			3 吨(t)			5 吨(t)			10-16吨(t)		
		轴承代号 Code	数量 Quantity		轴承代号 Code	数量 Quantity		轴承代号 Code	数量 Quantity		轴承代号 Code	数量 Quantity		轴承代号 Code	数量 Quantity		轴承代号 Code	数量 Quantity		轴承代号 Code	数量 Quantity	
			CD_1	MD_1		CD_1	MD_1		CD_1	MD_1		CD_1	MD_1		CD_1	MD_1		CD_1	MD_1		CD_1	MD_1
1	减速器 Decelerator	206	1		4084105	1	1	4084105	1	1	4084106	1	1	4074109	1	1	4074111	1	1	4074113	2	2
		160506	1		4074105	1	1	4074105	1	1	42307	1	1	42308	1	1	4074109	1	1	50407	1	1
		160501	1		180510	1	1	180510	1	1	180512	1	1	380515	1	1	180516	1	1	221	1	1
		201	1		150504	1	1	160504	1	1	190505	1	1	160506	1	1	160506	1	1	160507	1	1
		滚针轴承 Needle bearing	6		50303	4	4	50303	4	4	50305	3	3	50506	3	3	50406	3	3	50408	2	2
		941115									50303	1	1	50305	1	1	50405	1	1	50409	1	1
2	连接架(H:12~30m) Connecting fame (H: 12-30m)				UG30	2	2	UG30	2	2	UG40	2	2	UG40	2	2	UG50	2	2	UG60*1	2	2
3	吊钩装置 Hook mechanism	80203	1		80204	1	1	60305	2	2	60307	2	2	60308	2	2	60313	2	2	60313	4	4
					8202	1	1	8205	1	1	8205	1	1	8207	1	1	8209	1	1	8312	1	1
4	运行装置 Operating mechanism 电动小车(20、30m/mim) Electric trolley (20、30m/min)	203	4		305	4	4	305	4	4	407	4	4	407	4	4	408	4	4	408*2	8	8
		103	4		50202	1	1	50202	1	1	50202	1	1	50202	1	1	50204	1	1	50204	2	2
		160505	1		50205	1	1	50205	1	1	50205	1	1	50205	1	1	50206	1	1	50206	2	2
5	双轮小车(H:12~30m) Double-winwiedtrolley (H: 12-30m)				305	2	2	305	2	2	407	2	2	407	2	2	408	2	2	408*3	2	2
6	慢速驱动装置 Low speed driving mechanism				104		1	104		1	104		1	205		1	205		1			
					113		1	113		1	115		1	118		1	119		1			
7	常速起升电动机 Constant speed hoisting				32204	2	2	32204 32205	1	1	32206	2	2	32207	2	2	32208	2	2	32209	2	2
					8107	1	1	8108	1	1	8109	1	1	8111	1	1	8112	1	1	8113	1	1
					150212	1	1	150212	1	1	150213	1	1	150215	1	1	150218	1	1	60318	1	1
8	慢速起升电动机 Low speed hoisting motor				32203		2	32203		2	32203		2	32204		2	32204		2	32208 32211 32204		1
					8105		1	8105		1	8105		1	8107		1	8107		1	8108		1
9	运行电动机 Operating motor				32203	2	2	32203	2	2	32203	2	2	32204	2	2	32204	2	2	32204	4	4
					8105	1	1	8105	1	1	8105	1	1	8105	1	1	8107	1	1	8107	2	2

注：(1)*1 10t 为 UG50　　*2 16t 为 409　　*3 16t　　(2)16t 平衡轮内装 210 轴承 2 套

Notes:(1)*1 10t is UG50　　*2 16t is 409　　*3 16t　(2) 2 sets of 210 bearings are installed in 16t balance wheel

表 7工字钢号与调整垫圈数量p

Table-7 Type of I-steel and number of adjusting washers p

工字钢规格 GB706-88 Type of I-steel GB706-88	0.25t	0.5~1t		2~3t		5t		10t	16t	备注Remarks
	3~12m	0.5t 1t6-9m	1t 12m以上	6~9m	12m以上	6~9m	12m以上	9~30m	9~18m	
16	6	5	10							1、轮沿与工字钢沿间隙为 3 ~ 5mm。 2、0.25t垫圈厚度为2mm。 3、0.5~16t垫圈厚度为3mm。 4、1t~5t 12m以上及10t 16t随机带有穿钉套所用垫圈数参考用穿钉套因素。 5、表中数据仅供参考 1. Gap between wheel flange and I-steel edge is 3-5mm。 2. Washer thickness of0.25t hoist is 2mm 3. Washer thickness of 0.5~16t hoists is 3mm 4. For 1~5t 12m over hoists as well as 10t and 16t hoists sleeves are provided for bolt installation so this factor is considered in determining data of washers 5. Data in this table is for reference only.
18	7	6	11							
20a	9	7	12	3	9					
20b	10	7	12	5	9					
22a	11	9	13	5	10					
22b	12	9	14	6	11					
25a		9	14	6	11	1	5	5		
25b		10	15	7	12	1	5	5		
28a		10	15	7	12	2	6	6		
28b		11	16	8	13	3	6	6		
32a				8	14	4	9	9		
32b				9	14	4	9	9		
32c						4	10	10		
36a						5	10	10		
36b						5	10	10		
36c						5	11	11		
40a						6	11	11		
40b						6	11	11		
40c						6	12	12		
45a						7	12	12	11	
45b						7	13	13	12	
45c						8	13	13	12	
50a						8	14	14	13	
50b						9	14	14	13	
50c						9	14	14	13	
56a						10	15	15	14	
56b						10	15	15	14	
56c						10	16	16	15	
63a						11	17	17	16	
63b						12	17	17	16	
63c						12	17	17	17	

该表数据为一根螺钉单侧所需垫圈数

Note: Data in this table is number of washers needed on one side of a bolt.

表 8 电动葫芦日常检查项目及其要求
Table-8 Items of daily inspection of electric hoist and relevant requirements

检查项目 Item Requirements	要　　求 order
作业地点 Operating site	在操作者步行范围内无障碍物 There should be no obstacles within the working range of the operator.
运行轨道 Operating track	由地面观察轨道上不应有异常 Observe from the ground and make sure there is nothing abnomal on the track.
按钮装置(手电门) Buttons	起升、下降、左右运行动作应灵敏、准确;同时按动组按钮电动葫芦不得动作 Movement of hoist in all directions should be flexible and accurate and the hoist should not move if more than one button is pressed at the same time.
限位器 Limiter	空载吊钩上升至极限位置时,限位应准确可靠 Limiting should be accurate and reliable when hook moves to upper limit without load.
吊钩装置 Hook mechanism	吊钩在圆周360° 与垂直180° 范围内应转动灵活，滑轮转动时无卡阻和碰擦，吊钩螺母防松装置无异常，钩口闭锁装置正常 Hook should be free to move 360° horizontally and 180° vertically;No obstruction or bumping in the traveling of pulley: Tightening device for hook nut should be normal and locking device of the hook mouth should work normally
钢丝绳 Steel wire rope	按GB5972中2.4.1.1条进行日常观察 Carry out daily observation according to 2.4.1.1 in G B5972
制动器 Brake	起升、下降及运行的制动应灵敏可靠 Brake is reliable and flexible in hoisting, lowering and horizontal movement
导绳器及其它安全装置 Rope guider and other safety devices	运作正常，安全可靠 Action is normal, safe and reliable

表 9 不同吨位起升和运行减速器加入润滑油容量表
Table-9 List of lubricant volume of hoisting and operating decelerators of different hoists

型号 Type	CD_1 MD_1							HC HM				
起重量 Hoisting weight	0.25	0.5	1	2	3	5	10 16	16	20	25	32	50
起重减速器(升) Hoisting decelerator(liter)	0.2	0.45	0.65	1.15	1.65	2.35	3.55	20	20	20	20	20
运行减速器(升) Operatingdecelerator(liter)	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2		

表10 电动葫芦检查项目及其要求和等级

Table-10 Items of monthly inspection of electric hoist and relevant requirements

检查项目 Item		要　　求 Requirements	等级 Grade
运行轨道（工字钢） Operating track (I-steel)	运行范围内障碍物 Obstacles in the range of operation	运行范围内与建筑物及其它设备的最小间距应不小于100mm In the range of operation，gap between the hoist and buildings or other equipments should not be shorter than 100mm	I
	轨道端部止档及连接螺栓或焊缝 Blocks on track ends and connecting bolt or welding seam	轨道端部止档不准有变形、破损等缺陷，其连接螺栓不得松动，采用焊接连接，焊缝不得有裂 No deformation or damage of blocks, no loosening of connecting bolt and no cracks omwelding seam	I
	固定轨道的连接螺栓 Connecting bolt used to fix track	螺栓不得有松动。 Bolt should not be loose.	III
	轨道接头焊缝 Welding seam at track connector	焊缝不得有裂纹等缺陷. No cracks or other problem.	III
	轨 道 磨 损 Wear of track	轨道与车轮踏而及轮缘接触处不得有局部异常变形及磨损. No abnormal deformation or wear in contacting place between track and wheels.	III
吊钩装置 Hook mechanism	滑　　轮 Pulley	滑轮槽不得有异常磨损，轮缘完整不得有损伤。 No abnormal wear in pulley groove and no damage in flange.	I
	外　　观 Appearance	滑轮罩壳不得有损伤，挡轴板挡圈及销不得有松动，钩口闭锁装置应动作正常。 No damage on pullcy cover No slackness of blocking ring and pin of the blocking axs; Working of the locking mechanism of the hook mouth should be normal.	I
	工作状态 Working state	滑轮回转应平滑、灵活。 Movement of pulley should be smooth and flexible.	III
平衡滑轮 Balance pulley	外　　观 Appearance	滑轮不得有损伤，装配连接牢固。 No damage，assembly and connection should be firm.	III
	墙　　板 Wall plate	连接螺栓不得有松动。 Connecting bolt should not be loose.	III
	车　　轮 Wheel	踏面和轮缘不得有异常的磨损和伤痕。 No abnormal wear or damage on tread or flange.	III
钢丝绳 Steel wire rope	绳端固定状况 Fixing of rope end	钢丝绳各尾端同定应牢固可靠,不得有异常。 Fixing of all rope ends should be firm and normal.	I
	外　　观 Appearance	不得有扭结、灼伤及明显的松散、腐蚀等缺陷，绳上应有润滑油脂。 No defects such as twisted knot, burn and obvious slackness. There should be lubricating grease on rope.	I
	使用的安全程度(报废标准) Use safety level (Dumping standard)	按GB5972中2.5.1-2.5.11条的规定执行。 As required in articles 2.5.1-2.5.11 in GB5972.	I
齿轮 Gear	齿轮润滑善 Lubrication	开式齿轮表面应定期加油脂,闭式齿轮应定期加机油。 Apply grease or machine oil regularly to open-type and closed-type pulley respectively.	II
电缆 Electric cable	外　　观 Appearance	电缆不得有外伤、异常的弯曲或扭转、老化等缺陷。 No defects such as damage, ageing abnormal curve or twisting.	II
	装配状况 State of assembly	电缆与开关的连接不得有松动，中线环不得脱离滑道；支承钢丝两端不得有松动。 Connection between cable and switch should be firm; central ring should not be out of sliding groove; two ends of supporting steel wire should be firm.	III
集电器 Collcctoe	工作状况 Working state	集电滑轮回转应灵活，不得有明显磨损。 Pulley of collector should be flexible and there should be no obvious wear.	II
	外　　观 Appearance	连接螺栓不得有松动，绝缘体不得松动和破损，弹簧不得失去弹性。 Connecting bolt and insulator should be firm and not damaged and elasticity of spring should be good.	III

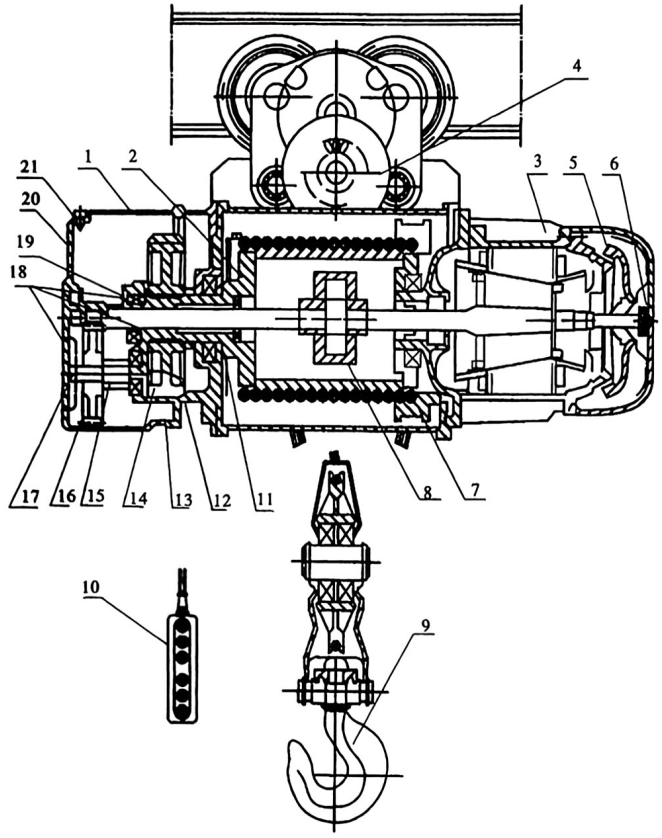
表11 电动葫芦年检查项目及要求

Table-1 1 Items of yearly inspection of electric hoist and relevant requirements

检查项目 Item		要 求 Requirements
运行轨道（工字钢）Operating track (I-steel)	踏面清洁度 Tread cleanness	不得有附着的油污及大量的灰尘 No oil stains or too much dust
	倾斜度 Gradient	不大于1/1000 Not bigger than 1 / 1 0 0 0
	接头 Connector	焊缝及轨道不得有裂纹，上下及两侧偏移量不得大于 1mm No cracks on welding seams or track; deflection in all direetions should not be bigger than 1mm
	磨损状况 Wearing condotion	踏面磨损量不大于原尺寸的10%,宽度磨损量不大于原尺寸的5% Wear of tread should not be bigger than 10% of the original size and wear of width should not be bigger than 5% of the original size.
车轮 Wheel	轮缘 Flange	轮缘厚度的磨损量不得超过原厚度的50%,轮缘与轨道侧向总间隙应小于车轮踏面宽度的50% Thickness wear of flange should not be bigger than 50% of the original thickness and total lateral gap between flange and track should be smaller than 50% of the width of wheeL
	踏面 Tread	按踏面直径测量磨损量应小于原尺寸的5%,踏面直径差应小于公称直径的1%,圆度差应小于0.8mm Wear measured by tread diameter should be smaller than 5% or the original size; Diameter difference of tread should be smaller than 1% of nominal diameter: circular difference should be smaller than 0.8mm.
	外观 Appearance	不得有裂纹、损伤 No cracks or damage
制动器 Brake		按月检要求重复检查 Conduct repetitive inspection according to requirements of monthly inspection
钢丝绳 Steel wire rope		按月检要求重复检查 Conduct repetitive inspection according to requirements of monthly inspection
齿轮 Cear	起升机构齿轮的磨损 Wear of gear of hoisting mechanism	第一级齿轮允许磨损量应小于原齿厚的10%；其它齿轮应小于20% Wear of first grade gear should be smaller than 10% of tooth thickness and the number for gears of other grade is 20%
	运行机构齿轮的磨损 Wear of gear of operating mechanism	第一级齿轮允许磨损量应小于原齿厚的15%,其它齿轮应小于25%,开式齿轮应小于30% Wear of first grade gear should be smaller than 15% of tooth thickness and the number for gears of other grade is 25% For open gear the number is 30%
	齿面缺陷检查 Tooth surface inspection	齿部不得有裂纹、断齿,齿面点蚀损坏不得大于啮合面的30%，且深度不得超过原齿厚的10% No cracking or broken tooth; Corrosive pitting of tooth surface should not be larger than 30% of engagement surface and the depth should not be bigger than 10% of the thickness of tooth
吊钩 Hook	外观 Appearance	表面不得有裂纹，螺纹部分、危险断面及颈部不得有塑性变形,缺陷不得补焊 No cracks on surface; no plastic deformation on screw thread, dangerous section or neck of hook; re-welding on place of defect is not allowed
	危险断面磨损量 Wear of dangerous section	不得超过原尺寸的5%[1)] Should not be bigger than 5% of the original size.[1)]
	开口度 Width of hook mouth	不得超过原尺寸的10%[1)] Should not be bigger than 10% of the original size.[1)]
	扭转变形 Deformation	不得超过10° Should not be larger than 10°
滑轮 Pulley		轮槽不均匀磨损小于3mm，轮槽壁厚磨损量小于原壁厚的20%,轮槽底部磨损小于钢丝绳直径的25%不得有其它损害钢丝绳的缺陷 Uneven wear of wheel groove should be smaller than 3mm. Wear of wheel groove wall thickness should be smaller than 20% of the original thickness.Wear of wheel groove bottom should be smaller than 25% of the diameter of rope; no other defects that damage the rope
轴 Axis	齿轮轴的磨损 Wear of gear axis	磨损量不得超过原轴颈的1% wear should not be bigger than 1% of original axle neck.
	其它的轴的磨损 Wear of other axes	磨损量不得超过原轴颈的2% Wear should not be bigger than 2%o of original axle neck
卷筒 Drum		不得有裂纹，筒壁磨损量小于原壁厚的10% No cracks.Wear of drum wall should be smaller than 10% of the original thickness.
键 Key		键与键槽连接不得有松动和变形以及异常磨损 Connection between key and key slot should be firm and there should be not deformation or abnormal wear.
花键 Spline		不得有异常磨损及变形 No abnormal wear or deformation
滚动轴承 Rolling bearing		不得有破损及裂纹 No damage or cracks
油封 Oil seal		配合面不准有裂纹 No cracks on matched surface
电缆 Electric cable		按月检要求重复检查 Conduct repetitive inspection according to requirements of monthly inspection
集电器、开关 Collector, switch		按月检要求重复检查 Conduct repetitive inspection according to requirements of monthly inspection
回路的对地绝缘电阻 Insulation resistance of circuit against ground		不得小于1.5MΩ Should not be smaller than 1. 5Ω
带电体与接地螺钉间电阻 Resistance between electrified body and grounding bolt		不得大于0.1Ω Resistance between electrified body and grounding bolt

注：1)根据GB10051.3的规定(According to standards stipulated in GB10051.3)

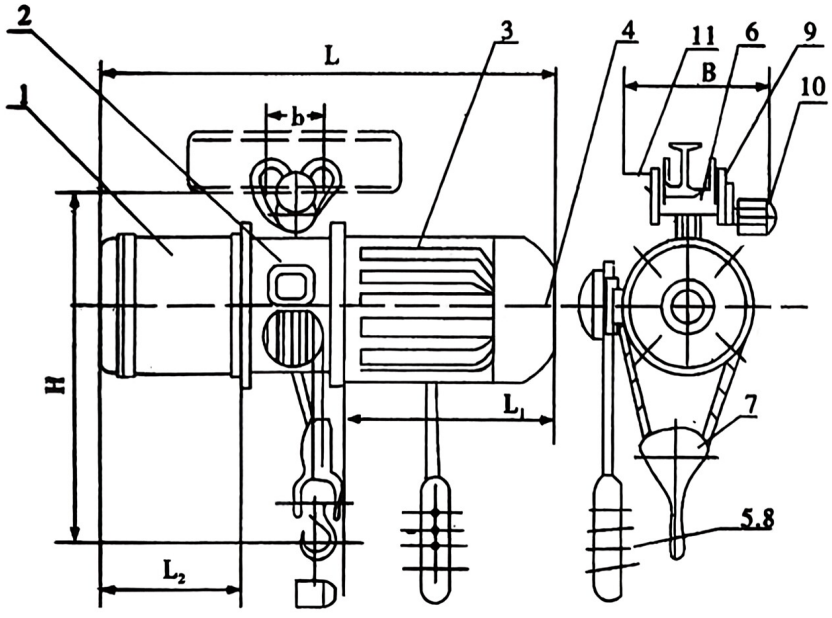
三、图示部分 3.Figures parts



1减速器；Decelerator
2卷筒装置；Drum mechanism
3起升电机；Hoisting motor
4电动小车；Electric trolley
5锥形制动器；Conical brake
6调整螺母；Adjusting nut
7导绳器；Rope guider
8联轴器；Coupling
吊钩装置；Hook mechanism
10控制按钮；Control button
11空心轴；Hollow axis
12箱体；Case body
13密封圈；Sealing washer
14 09齿轮；09gear
15 06齿轮轴；06 gear axIs
16 05齿轮；05gear
17 04齿轮轴；04 gear axIs
18球轴承；ball bearing
19滚针轴承；Needle bearing
20箱盖；Case cover
21透气塞；Ventilation plug

图1 CD_1型电动葫芦机械传动结构图

Fig.–I Diagram of mechanical driving structure of CD1electric hoist



1、起升机构减速器；
Decelerator of hoisting mechanism
2、卷筒装置；Drum mechanism
3、起升电动机； Hoisting motor
4、制动调节器；Brake regulator
5.8、电气按钮装置
Electric button mechanism
6、电动小车；Electric trolley
7、吊钩装置；Hook mechanisn
9、运行机构减电器；
Decelerator of operating mechanism
10、运行电动机；Operating motor
11、电缆引入器；Electric wire guider

图2 CD_1型0.25t3–12m电动葫芦外形结构图

Fig. –2 Diagram of external structure of CD10.25t, 3–12m electric hoist

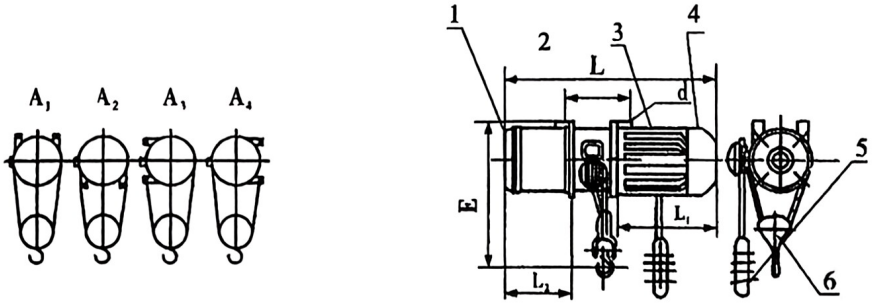


图3 CD_1 型0.25t 3-12m固定式电动葫芦外形结构图

Fig-3 Diagram of external structure of fixed type CD_i0.25t, 3-12m electric hoist

1、起升机构减速器
Decelerator of hoisting mechanism

2、卷筒装置
Drum mechanism

3、起升电动机
Isting motor

4、制动调节器;
Brake regulator

5、电器按钮装置
Button mechanism for electric mechanism

6、吊钩装置
Hook mechanism

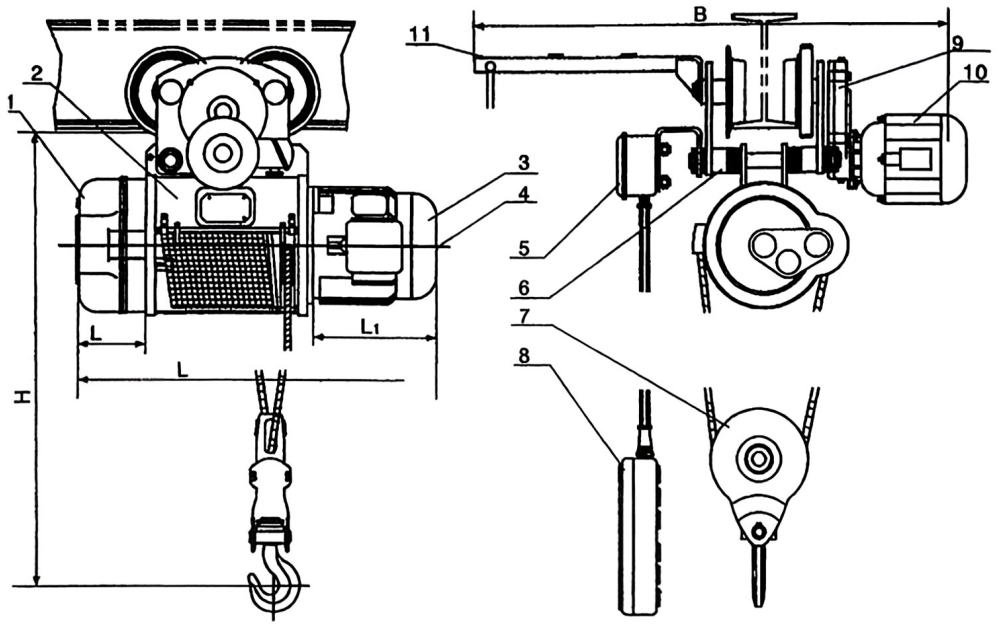


图 4 CD_1型0.5-5t 6~9m电动葫芦外形结构图

Fig.-4 Diagram of external structure of CD_1, 0.5t-5t 6-9m electric hoist

1、起升机构减速器； Decelerator of hoisting mechanism
2、卷筒装置； Drum mechanism
3、起升电动机； Hoisting motor
4、制动调节器； Brake regulator
5、电器装置； Electric mechanism
6、电动小车； Electric trolley
7、吊钩装置； Hook mechanism
8、按钮开关； Button switch
9、运行机构减速器;Decelerator of operating mechanism
10、运行电动机； Operating motor
11、软缆电流引入器； Soft cable current lead- indevice

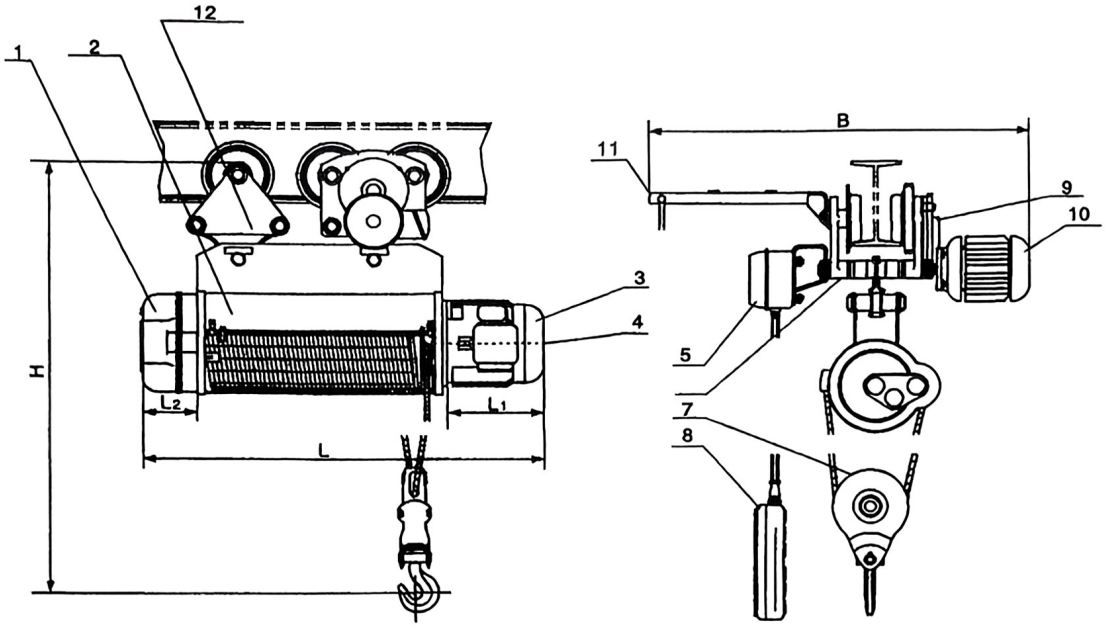


图 5 CD_1型0.5–5t 12~30m电动葫芦外形结构图

Fig.–5 Diagram of external structure of CD_1, 0.5t–5t 12–30m electric hoist

1、起升机构减速器；Decelerator of hoisting mechanism
2、卷筒装置；Drum mechanism
3、起升电动机；Hoisting motor
4、制动调节器；Brake regulator
5、电器装置；Electric mechanism
6、电动小车；Electric trolley
7、吊钩装置； Hook mechanism
8、按钮开关；Button switch
9、运行机构减速器；Decelerator of operating mechanism
10、运行电动机； Operating motor
11、软缆电流引入器；Soft cable current lead– –in device
12、从动小车；Slave trolley

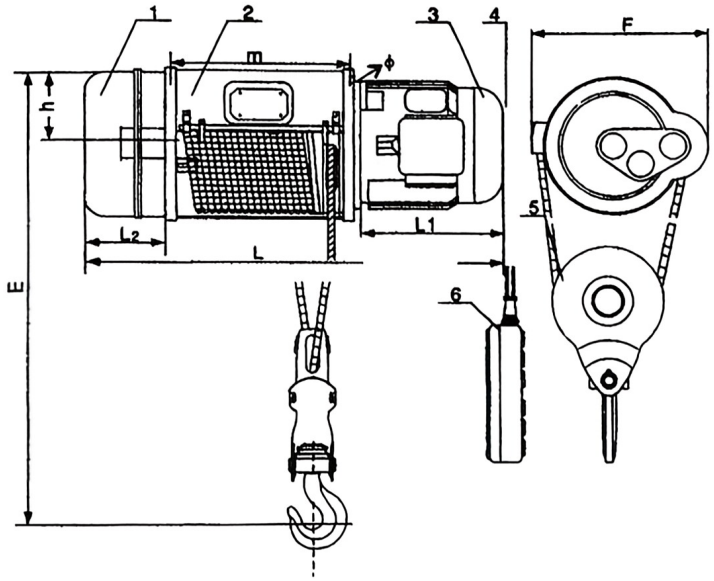


图 6 CD_1型 0.5–5t 6~30m固定式电动葫芦外形结构图

Fig.–6 Diagram of external structure of fixed type CD_1, 0.5t–5t 6–30m electric hoist

1、起升机构减速器；Decelerator of hoisting mechanism
2、卷筒装置；Drum mechanism
3、起升电动机；Hoisting motor
4、制动调节器；Brake regulator
5、吊钩装置；Hook mechanism
6、按钮开关；Button switch

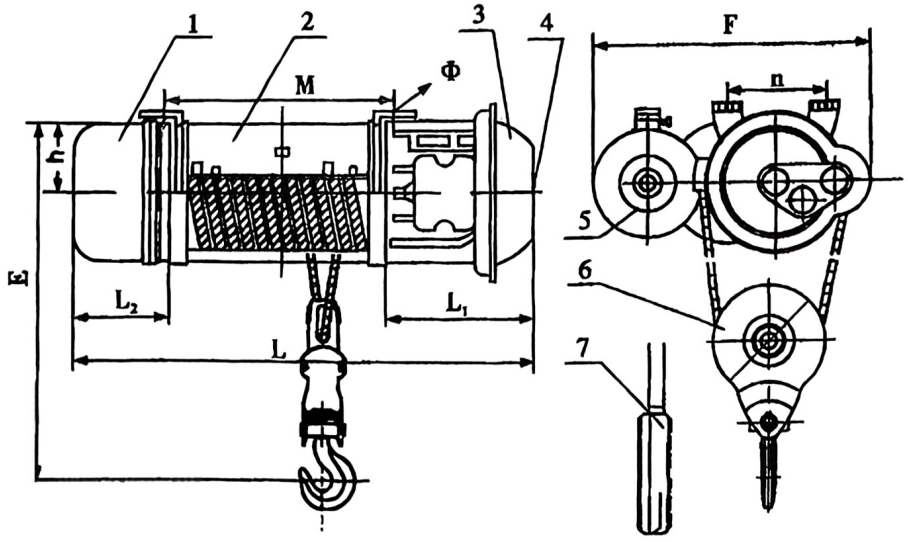


图 7 MD_1型 0.5t-5t 6~30m固定式电动葫芦外形结构图

Fig.-7 Diagram of external structure of fixed type MD_1, 0.5t~5t 6~30m electric hoist

1、起升机构减速器；Decelerator of hoisting mechanism
2、卷筒装置；Drum mechanism
3、起升电动机； Hoisting motor
4、制动调节器；Brake regulator
5、慢速电动机；Low speed motor
6、吊钩装置； Hook mechanism
7、按钮开关；Button switch

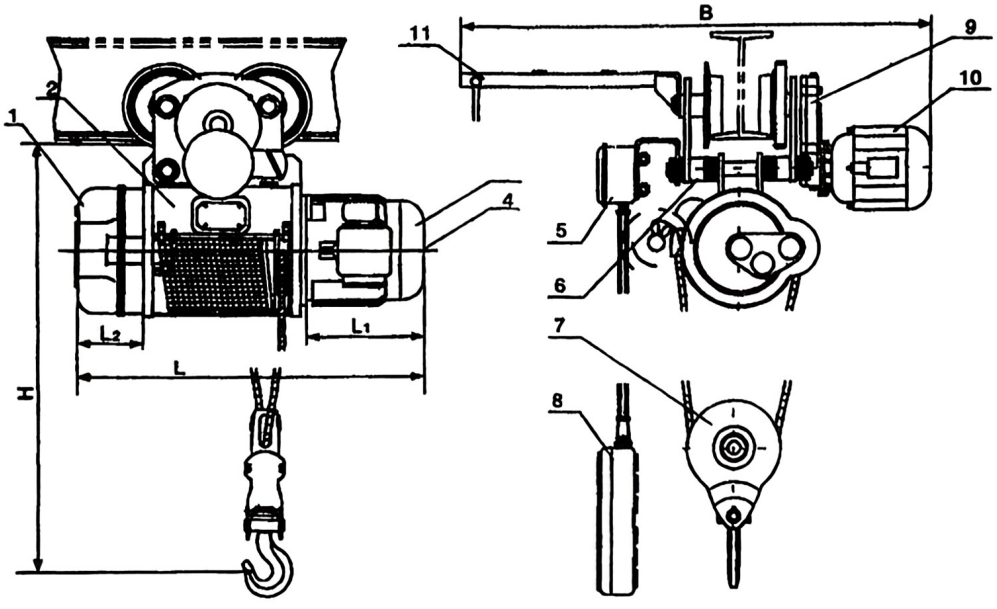


图 8 MD_1型 0.5t-5t 6~9m固定式电动葫芦外形结构图

Fig.-8 Diagram of external structure of MD_1, 0.5t~5t 6~9m electric hoist

1、起升机构减速器；Decelerator of hoisting mechanism
2、卷筒装置；Drum mechanism
3、起升电动机；Hoisting motor
4、制动调节器；Brake regulator
5、电器装置；Electric mechanism
6、电动小车；Electric trolley
7、吊钩装置；Hook mechanism
8、按钮开关；Button switch
9、运行机构减速器；Decelerator of operating mechanism
10、运行电动机；Operating motor
11、软缆电流引入器；Soft cable current lead- in device

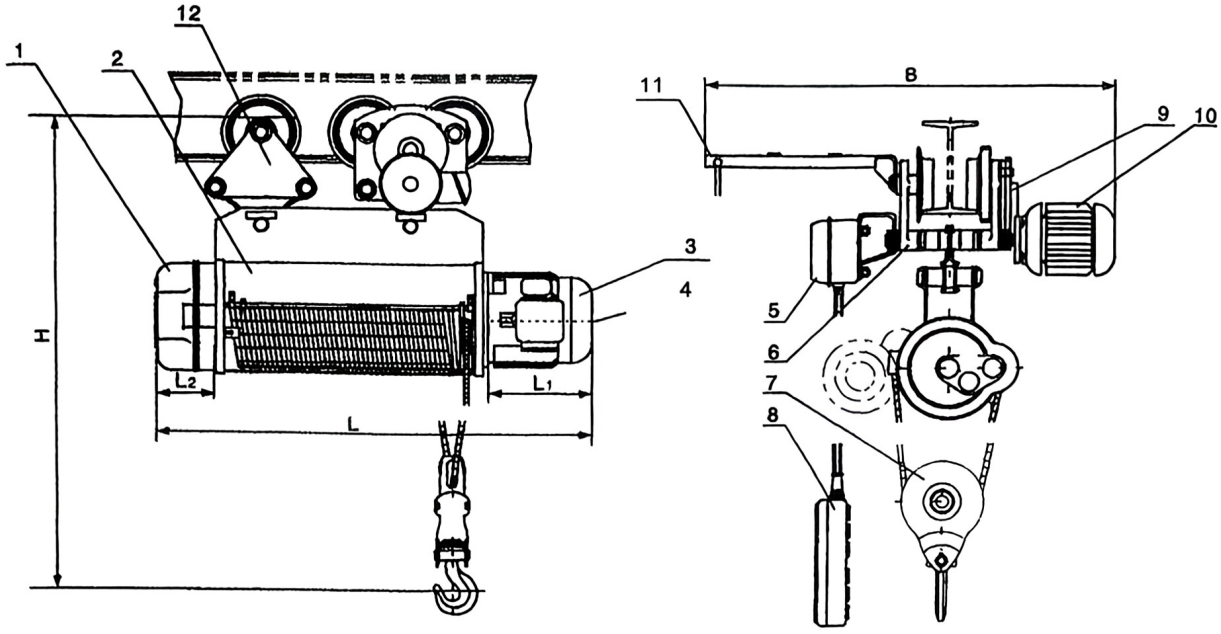


图 9　MD_1型 0.5t~5t　12~30m电动葫芦外形结构图

Fig.-9 Diagram of external structure of MD_1, 0.5t-5t 12-30m electric hoist

1、起升机构减速器；Decelerator of hoisting mechanism
2、卷筒装置；Drum mechanism
3、起升电动机；Hoisting motor
4、制动调节器；Brake regulator
5、电器装置；Electric mechanism
6、电动小车；Electric trolley
7、吊钩装置；Hook mechanism
8、按钮开关；Button switch
9、运行机构减速器；Decelerator of operating mechanism
10、运行电动机；Operating motor
11、软缆电流引入器；Soft cable current lead-in device

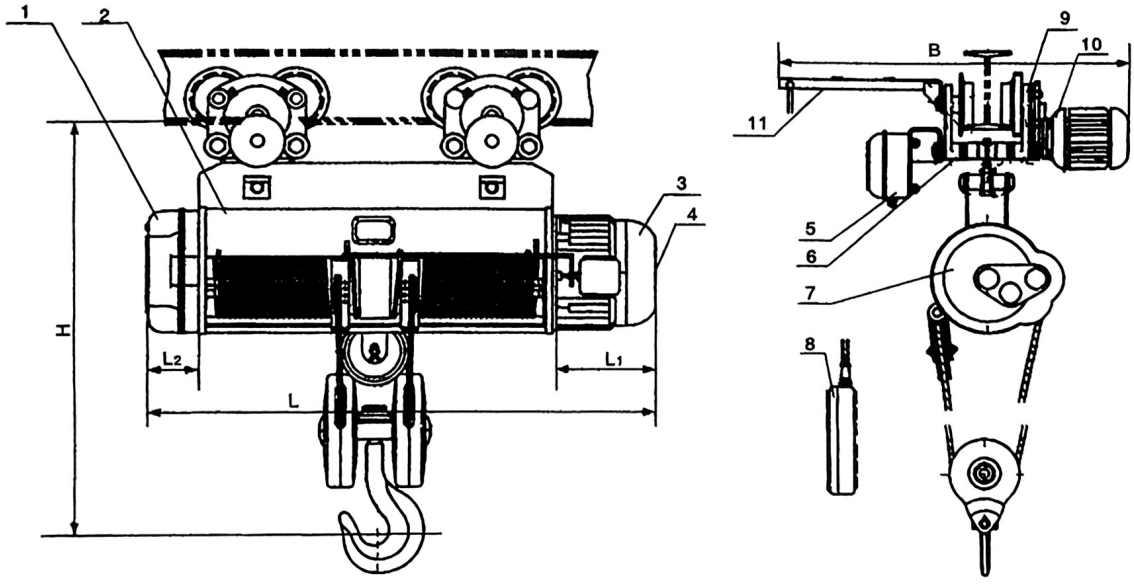


图 10　CD_1型 10t　9~30m电动葫芦外形结构图

Fig.-10 Diagram of external structure of CD_1, 10t 9~30m electric hoist

1、起升机构减速器；Decelerator of hoisting mechanism
2、卷筒装置；Drum mechanism
3、起升电动机；Hoisting motor
4、制动调节器；Brake regulator
5、电器装置；Electric mechanism
6、电动小车；Electric trolley
7、吊钩装置；Hook mechanism
8、按钮开关；Button switch
9、运行机构减速器；Decelerator of operating mechanism
10、运行电动机；Operating motor
11、软缆电流引入器；Soft cable current lead-in device

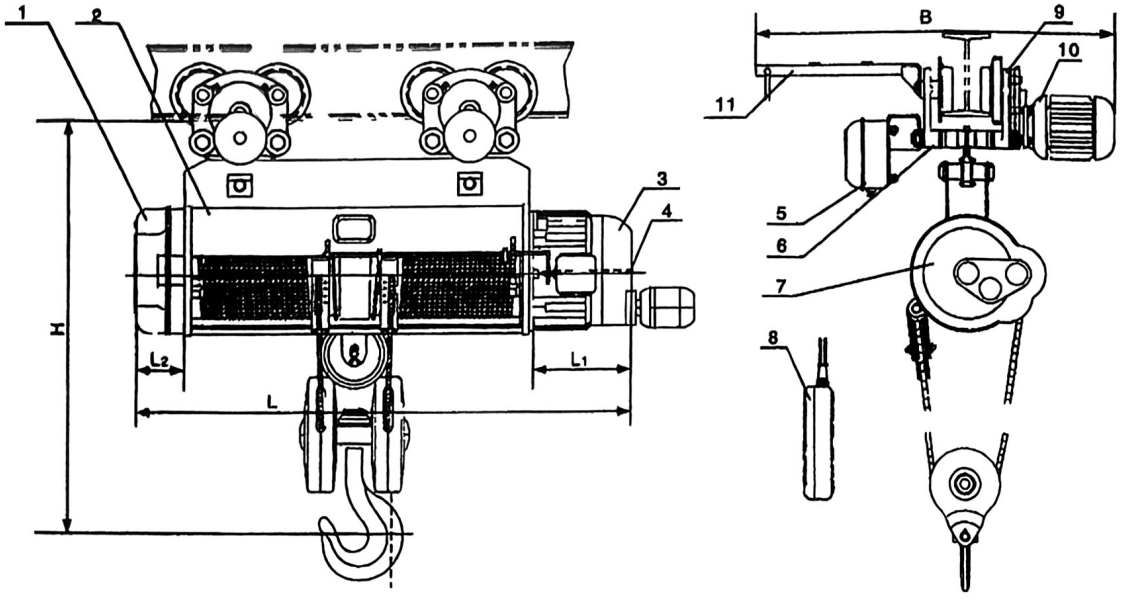


图 11　MD_1型 10t　9~30m电动葫芦外形结构图

Fig.-11 Diagram of external structure of MD_1, 10t 9~30m electric hoist

1、起升机构减速器；Decelerator of hoisting mechanism
2、卷筒装置；Drum mechanism
3、起升电动机；Hoisting motor
4、制动调节器；Brake regulator
5、电器装置；Electric mechanism
6、电动小车；Electric trolley
7、吊钩装置；Hook mechanism
8、按钮开关；Button switch
9、运行机构减速器；Decelerator of operating mechanism
10、运行电动机；Operating motor
11、软缆电流引入器；Soft cable current lead- in device

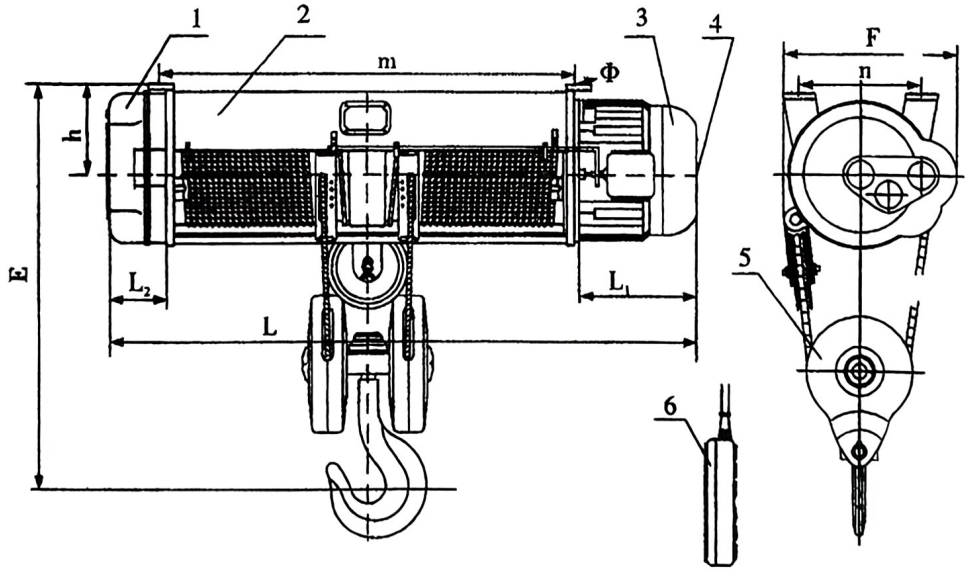


图 12 CD_1型 10t　9~30m固定电动葫芦外形结构图

Fig.-12 Diagram of external structure of fixed type CD_1, 10t 9~30m electric hoist

1、起升机构减速器；Decelerator of hoisting mechanism
2、卷筒装置；Drum mechanism
3、起升电动机；Hoisting motor
4、制动调节器；Brake regulator
5、吊钩装置；Hook mechanism
6、按钮开关；Button switch

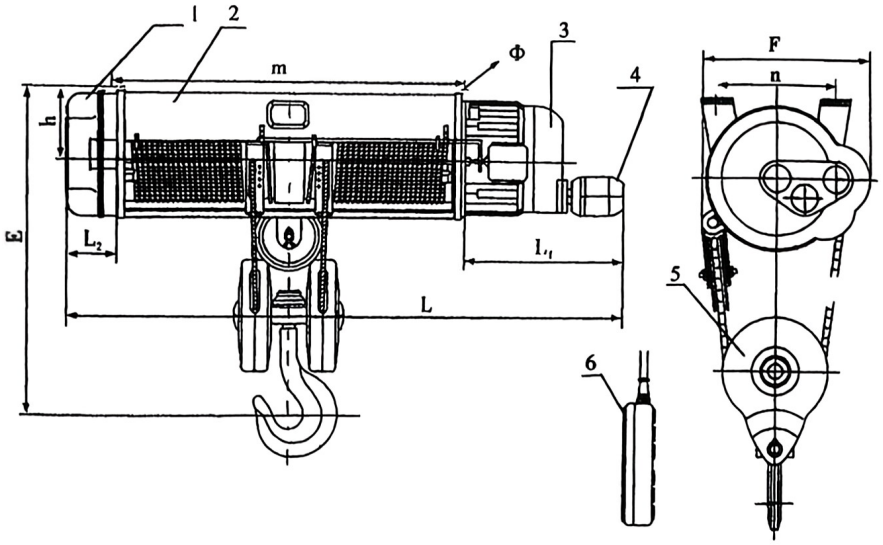


图 13 MD_1型 10t 9~30m 固定式电动葫芦外形结构图

Fig.-13 Diagram of external structure of fixed typeMD_1, 10t 9~30m electric hoist

1、起升机构减速器；Decelerator of hoisting mechanism
2、卷筒装置；Drum mechanism
3、起升电动机；Hoisting motor
4、制动调节器；Brake regulator
5、吊钩装置；Hook mechanism
6、按钮开关；Button switch

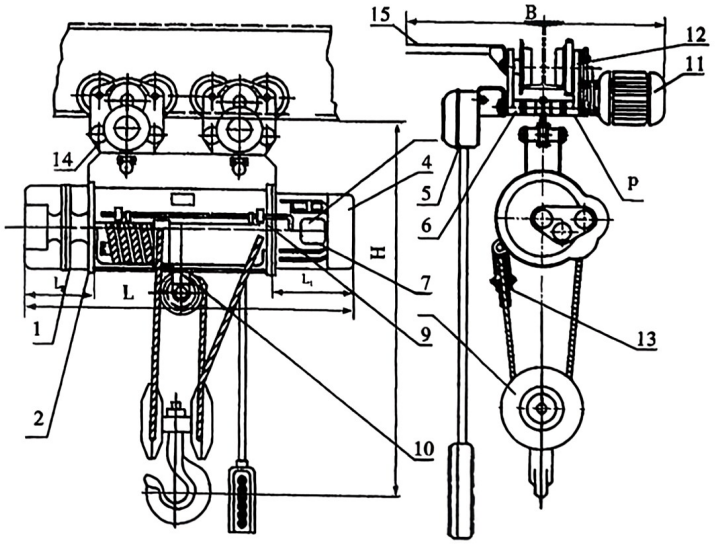


图 14 CD型 16t电动葫芦外形结构图 9~18m

Fig.-14 Diagram of external structure of CD 16t9~18m electric hoist

1、起升减速器；Decelerator of hoisting mechanism
2、卷筒装置；Drum mechanism
3、断火限位器；Cut-off limiter
4、起升电机；Hoisting motor
5、电器控制箱；Electric mechanism control box
6、电动小车；Electric trolley
7、限位杆；Limiting rod
8、吊钩装置；Hook mechanism
9、停止块；Stopper
10、导绳器装置；Cable guider mechanism
11、运行电机；Operating motor
12、运行减速器；Operating decelerator
13、平衡轮装置；Balance wheel mechanism
14、平衡梁；Balance beam
15、软缆引入器；Soft cable lead- in device

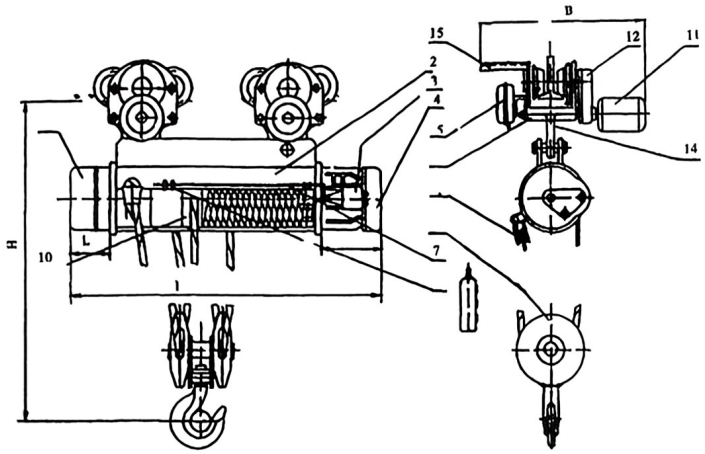


图15 CD、MD_1型16t9-40m电动葫芦外形结构图

Fig.-15 Diagram of external structure of CD MD_1 1 6t 9~40m electric hoist

1、起升减速器; Decelerator of hoisting mechanism
2、卷筒装置; Drum mechanism
3、断火限位器;Cut- off limiter
4、起升电机; Hoisting motor
5、电器控制箱; Electric mechanism control box
6、电动小车; Electric trolley
7、限位杆; Limiting rod
8、吊钩装置; Hook mechanism
9、停止块; Stopper
10、导绳器装置; Cable guider mechanism
11、运行电机; Operating motor
12、运行减速器; Operating decelerator
13、平衡轮装置 Balance wheel mechanism
14、平衡梁; Balance beam
15、软缆引入器; Soft cable lead- in device

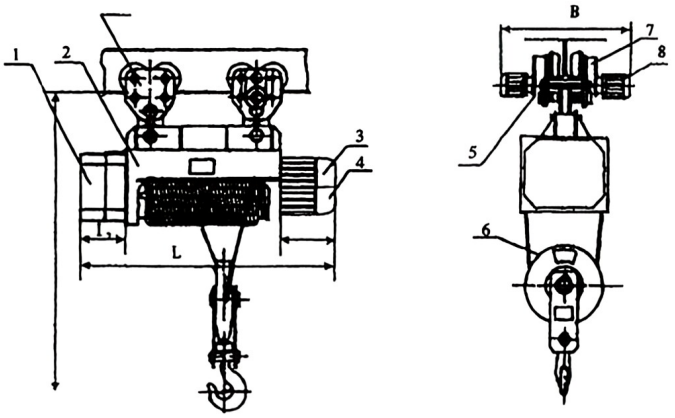


图16 HCHM162型 16t 9-48m电动葫芦外形结构图

Fig.-16 Diagram of external structure of HC HM162 16t 9~48m electric hoist

1、起升机构减速器;
Decelerator of hoisting mechanism
2、卷筒装置； Drum mechanism
3、起升电动机； Hoisting motor
4、制动调节器； Brake regulator
5、电动小车; Electric trolley
6、吊钩装置; Hook mechanism
7、运行机构减速器； Decelerator of operating mechanism
8、运行电动机; Operating motor
9、从动小车; Slave trolley

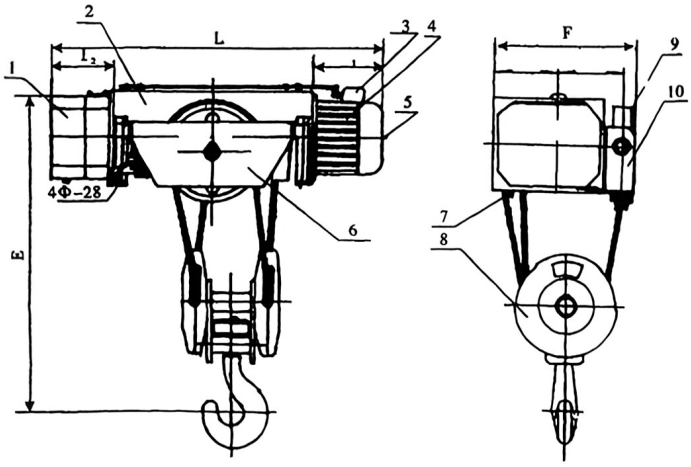


图17 HC HM164型 20t、32t 9-48m固定式电动葫芦外形结构图

Fig.-17 Diagram of external structure of fixed type HC HM164 20t、32t 9~48m electric hoist

1、起升机构减速器； Decelerator of hoisting mechanism
2、卷筒装置； Drum mechanism
3、限位断电器； Position limiting cut-off device
4、起升电动机; Hoisting motor
5、制动调节器; Brake regulator
6、滑轮横梁; Pulley beam
7、固定钢丝绳横梁; Beam for fixing steel rope
8、吊钩装置; Hook mechanism
9、动滑轮; Movable block
10、动滑轮装置; Movable block mechanism

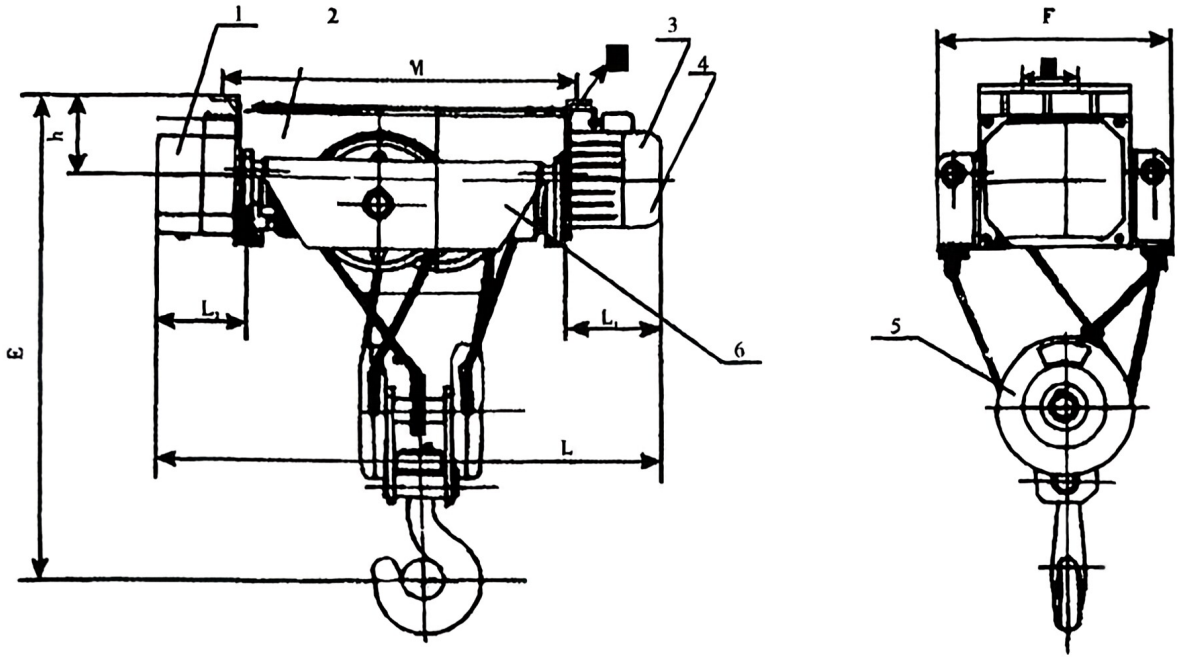


图18　HC　HM165 型 25t、50t　9–24m固定式电动葫芦外形结构图

Fig.–18 Diagram of external structure of fixed type HC HM165 25t, 50t 9~24m electric hoist

1、起升机构减速器; Decelerator of hoisting mechanism
2、卷筒装置; Drum mechanism
3、起升电动机; Hoisting motor
4、制动调节器; Brake regulator
5、吊钩装置; Hook mechanism
6、动滑轮横梁; Movable block beam

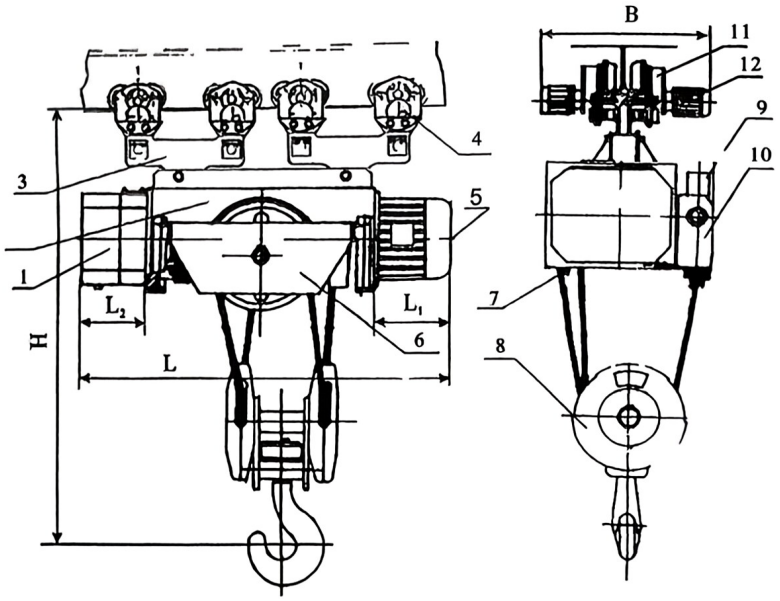


图19　HC、HM164 型 20t 9-24m电动葫芦外形结构图

Fig.-19 Diagram of external structure of HC HM164 20t 9~24m electric hoist

1、起升机构减速器; Decelerator of hoisting mechanism
2、卷筒装置; Drum mechanism
3、平衡梁; Balance beam
4、运行装置; Operating mechanism
5、起升电动机; Hoisting motor
6、滑轮横梁; Pulley beam
7、固定钢丝绳横梁; Beam for fixing steel rope
8、吊钩装置; Hook mechanism
9、动滑轮; Movable block
10、动滑轮装置; Movable block mechanism
11、运行减速器; Operating decelerator
12、运行电动机; Operating motor

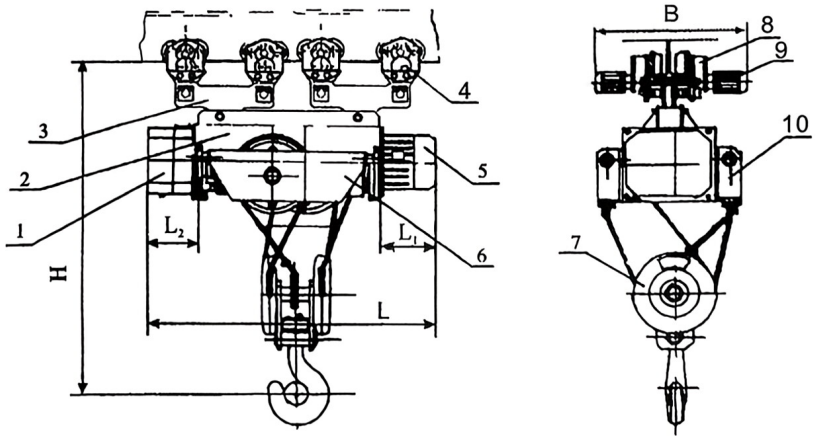


图 20　HC/ HM165型 25t 9-24m电动葫芦外形结构图

Fig. -20 Diagram of external structure of HC/ HM165 25t9~24m electric hoist

1、起重机构减速器; Decelerator of hoisting mechanisn
2、卷筒装置; Drum mechanism
3、平衡梁; Balance beam
4、运行装置; Operating mechanism
5、起升电动机; Hoisting motor
6、滑轮横梁; Pulley beam
7、吊钩装置; Hook mechanism
8、运行减速器; Operating decelerator
9、运行电动机; Operating motor
10、动滑轮装置; Movable block mechanism

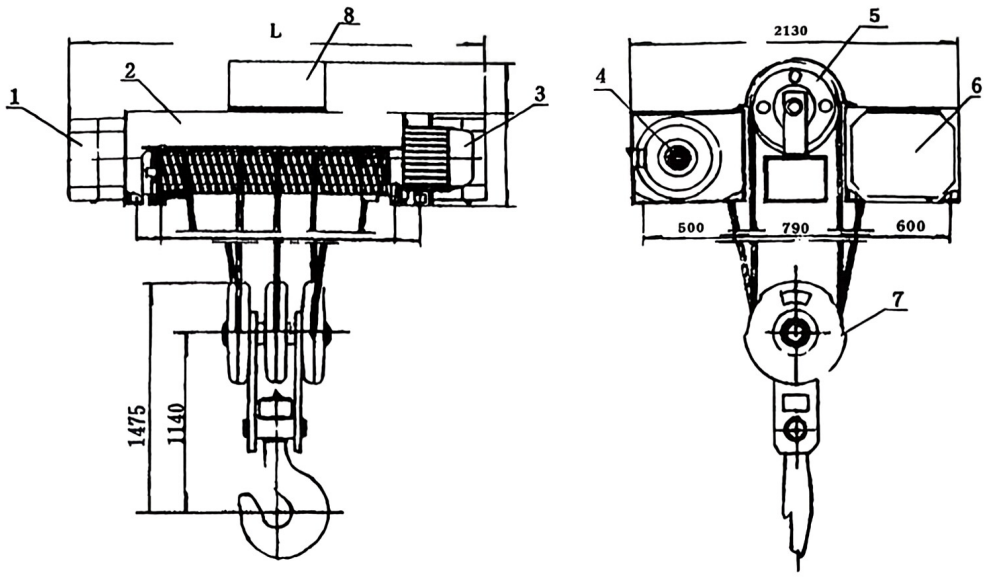


图21 HC、 HM2 × 163A40t固定式电动葫芦外形结构图

Fig. -21 Diagram of external structure of fixed type HC, HM2 × 163A40t electric hoist

1、6起升机构减速器； Decelerator of hoisting mechanism
2、卷筒装置； Drum mechanism
3、4起升电动机； Hoisting motor
5、8动滑轮装置; Movable block mechanism
7、吊钩装置； Hook mechanism

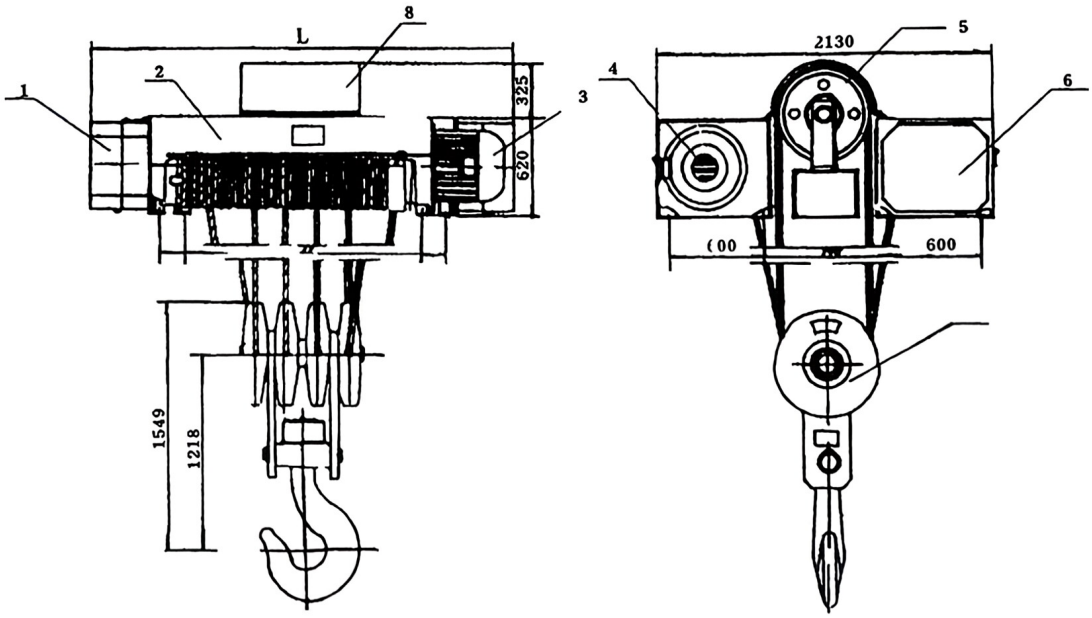


图 22 HC、 HM2 × 164A63t 固定式电动葫芦外形结构图

Fig. -22 Diagram of external structure of fixed type 22HC, HM2 × 164A63t electric hoist

1、6起升机构减速器； Decelerator of hoisting mechanism
2、卷筒装置; Drum mechanism
3、4起升电动机; Hoisting motor
5、8动滑轮装置； Movable block mechanism
7、吊钩装置; Hook mechanism

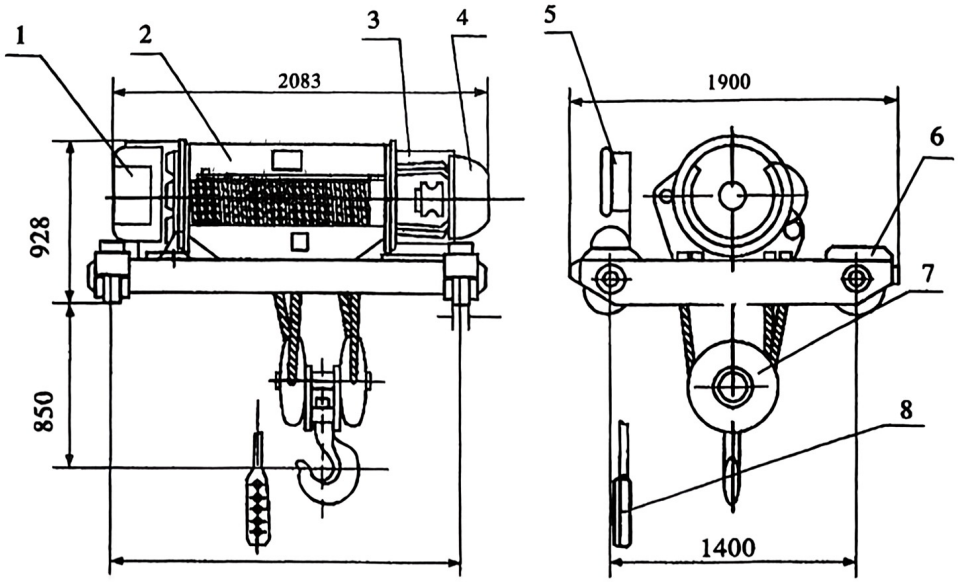


图23　HN20-12D型　电动葫芦外形结构图

Fig.-23 Diagram of external structure of HN20- 12D electric hoist

1、起升机构减速器; Decelerator of hoisting mechanism
2、卷筒装置；Drum mechanism
3、起升电动机; Hoisting motor
4、制动调节器; Brake regulator
5、电器装置; Electric device mechanism
6、电动小车; Electric trolley
7、吊钩装置; Hook mechanism
8、按钮开关; Button switch

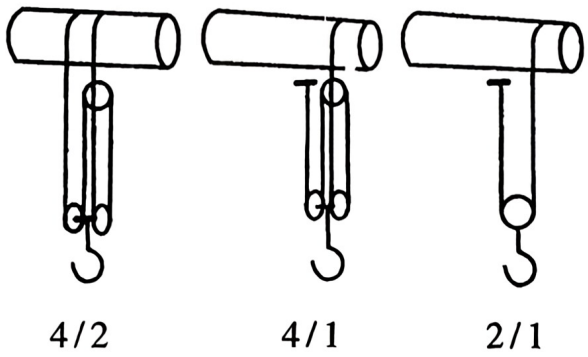


图24　CD_1　MD_1型电动葫芦绕绳制式示意图

Fig.-24 Schematic diagram of steel rope winding models of CD1 MD1 electric hoist

图25　CD_1型　0.5t~5t 葫芦低压控制接线图

Fig.-25 Schematic diagram of wiring of low voltage control device of CD_1 0.5t-5t electric hoist

K	总开关 General switch		TC	变压器 Trans-former				
$SA_2$1-4	限位开关 Limiting switch		ANH	按钮盒 Button box		M_2	左右运行电机 Left and right operating motor	
KM_1-KM_5	交流接触器 AC contactor		SB_1-SB_6	按钮 Button		M_1	升降电机 Hoisting motor	
代号 Code	名称 Name		代号 Code	名称 Name		代号 Code	名称 Name	

DY	电源引入器 Power supply guider
QD	起升电动机 Hoisting motor
YD	运行电动机 Operating motor
AK	控制按钮 Control button
XW	重锤限位器 Weight limiter

图26　CD_1型　0.25t电动葫芦接线原理图

Fig. -26 Schematic diagram of wiring of CD, 0.25t electric hoist

K	总开关 General switch		TC	变压器 Trans-former		M_3	左右运行电机 Left and right operating motor	
$SA_2$1–4	限位开关 Limiting switch		ANH	按钮盒 Button box		M_2	左右运行电机 Left and right operating motor	
KM_1–KM_7	交流接触器 AC contactor		SB_1–SB_6	按钮 Button		M_1	升降电机 Hoisting motor	
代号 Code	名称 Name		代号 Code	名称 Name		代号 Code	名称 Name	

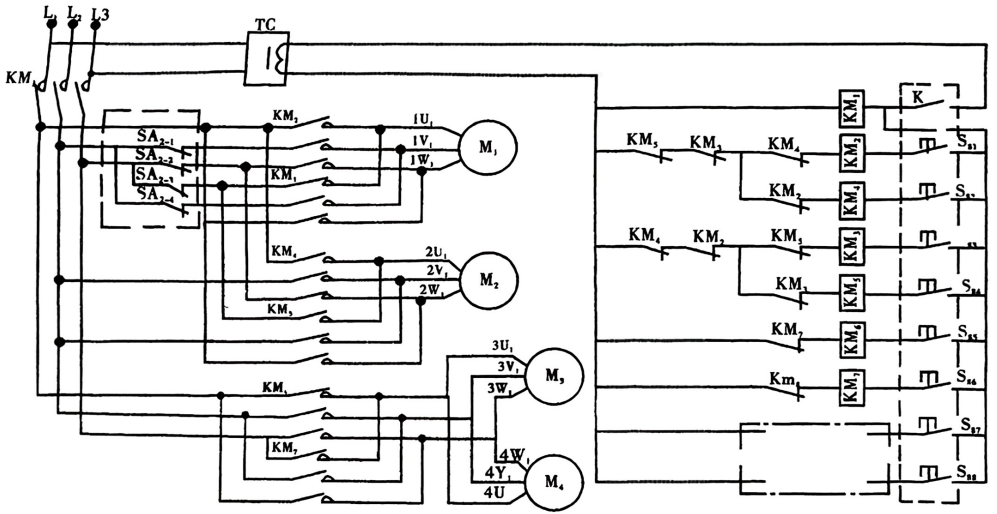
图27 MD1型 0.5t~5t 葫芦低压控制箱接线原理图

Fig. -27 Schematic diagram of wiring of low voltage control box of MD1 0.5t~5t hoist

K	总开关 General switch		TC	变压器 Transformer				
$SA_{3}1-4$	限位开关 Limiting switch		ANH	按钮盒 Buttonbox		M_2、M_3	左右运行电机 Left and right operating motor	
KM_1-KM_5	交流接触器 AC contactor		SB_1-SB_6	按钮 Button		M_1	升降电机 Hoisting motor	
代号 Code	名称 Name		代号 Code	名称 Name		代号 Code	名称 Name	

图28　CD_1型　10t~16t　葫芦控制箱接线原理图

Fig.-28Schematic diagram of wiring of control boxof CD_1 10t- 16t hoist



K	总开关 General switch		TC	变压器 Transformer		M_3、M_4	左右运行电机 Left and right operating motor	
$SA_2$1–4	限位开关 Limiting switch		ANH	按钮盒 Buttonbox		M_2	快速升降电机 High speedhoisting motor	
KM_1–KM_7	交流接触器 AC contactor		SB_1–SB_8	按钮 Button		M_1	慢速升降电机 Low speed hoisting motor	
代号 Code	名称 Name		代号 Code	名称 Name		代号 Code	名称 Name	

图29 MD_1型 10t~16t 葫芦控制箱接线原理图

Fig.-29 Schematic diagram of wiring of control box of MD_1 10t~16t hoist

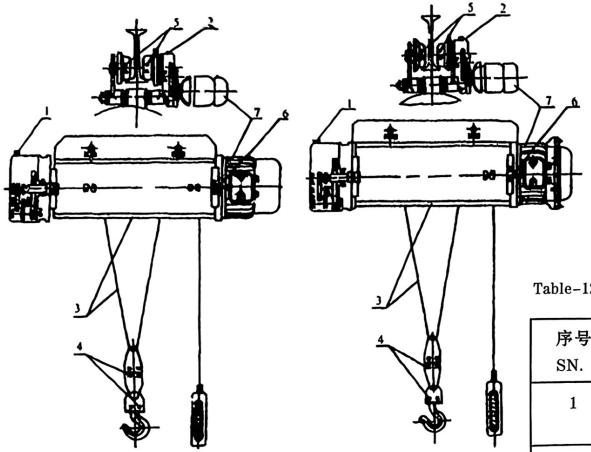


图30　CD_1　MD_1型葫芦润滑示意图

Fig-30 Schematic diagram of lubrication of CD_1MD_1hoist

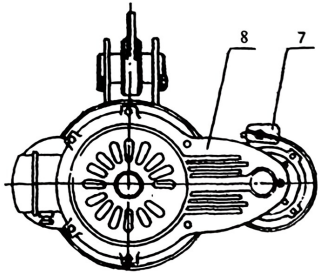
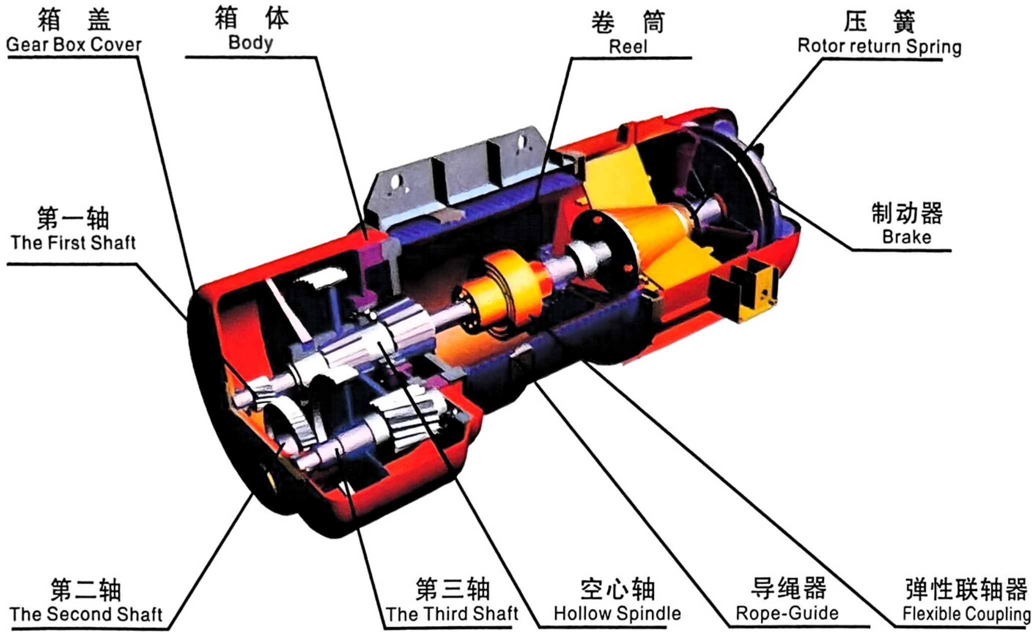
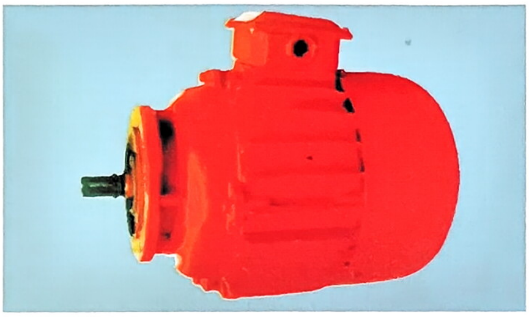


表 12　CD_1　MD_1型电动葫芦润滑规范(注油量见表9)

Table-12 Lubrication standard for CD_1 MD_1electric hoist(Refer to Table-9 for filling quantity of oil)

序号 SN.	部位名称 Component name	润滑方法 Lubricating method	润滑油脂名称 Name of lubricating grease	时间 Time
1	起升机构减速器 Decelerator of hoisting mechanism	自上部孔注入 Fill in from the opening at the top	齿轮油HL-20或机械油HJ-50 Gear oil H L -20or machine oil H J-50	三个月一次 Once every 3 months
2	运行机构减速器 Deceelerator of operating machanism	自上部孔注入 Fill in from the opening at the top	钙基润滑脂ZG-3 Lime grease Z G-3	三个月一次 Once every 3 months
3	钢丝绳及卷筒槽 Steel wore rope and drum groove	涂抹表面 Coat the surface	钢丝绳油绳 Oily steel rope	半个月一次 Once every 15 days
4	吊钩推力轴承及滑轮处轴承 Pushing bearing of the hook and bearing at the pulley	涂抹表面 Coat the surface	钙基润滑脂ZG-3 Lime grease Z G-3	六个月一次 Once every 6 months
5	走轮轴承 Traveling wheel bearing	涂抹表面 Coat the surface	钙基润滑脂ZG-3 Lime grease Z G-3	六个月一次 Once every 6 months
6	卷筒轴承 Drum bearing	涂抹表面 Coat the surface	钙基润滑脂ZG-3 Lime grease Z G-3	六个月一次 Once every 6 months
7	起升和运行电机轴承 Bearing of hoisting and operating motor	挤　入 Squeeze into	钙基润滑脂ZG-3 Lime grease Z G-3	六个月一次 Once every 6 months
8	慢速箱体 Low speed case body	挤　入 Squeeze into	钙基润滑脂ZG-3 Lime grease Z G-3	六个月一次 Once every 6 months





ZD$_1$型锥形转子制动电动机：

--CD$_1$型电动葫芦起升用的电机，具有优良的性能，可靠的制动。

ZDY$_1$型锥形转子制动电动机：

--电动小车、行车等行走用电机，可简化减速机的结构。

主要技术数据
Main Technical Date

型号 Model	功率 Power KW	额定电压 Rated Voltage V	额定转速 (转/分) Rated R.P.M	额定电流 Rated Current A	功率因数 Power factor (Cosφ)	功率 Efficiency (%)	起动电流 Starting Current A	起动转矩/额定转矩 Startingtorque/Raredtorque	最大转矩/额定转矩 Maxtorque/Ratedtorque	转子飞轮转矩 Rotorflywheel torque kgf.m	[illegible]	[illegible]	[illegible]
ZD$_1$11.4 ZDY$_1$11.4	0.2	380/220	1380	0.72/1.25		0.65	4	2.0	2.0	0.006	10	0.2	[illegible]
ZD$_1$12.4 ZDY$_1$11.4	0.4	380/220	1380	1.25/2.16		0.67	7	2.0	2.0	0.007	15	[illegible]	[illegible]
ZD$_1$21.4 ZDY$_1$21.4	0.8	380/220	1380	2.4/4.16		0.70	13	2.5	2.5	0.030	24		Y/△
ZD$_1$22.4	1.5	380/220	1380	4.3/7.46	0.74	0.72	24	2.5	2.5	0.045	36	2.0	Y/△
ZD$_1$31.4	3.0	380/220	1380	7.6/13.2	0.77	0.78	42	2.7	2.7	0.130	74	4.3	Y/△
ZD$_1$32.4	4.5	380/220	1380	11/19.03	0.80	0.78	60	2.7	2.7	0.160	98	4.4	Y/△
ZD$_1$41.4	7.5	380/220	1400	18/31	0.80	0.79	100	3.0	3.0	0.390	153	10.0	Y/△
ZD$_1$51.4	13	380/220	1400	30/52	0.82	0.80	165	3.0	3.0	0.70	198	18.8	Y/△
ZD$_1$52.4	18.5	380/220	1400	41.7/52.1	0.82	0.82	229	3.0	3.0	1.15	204	25	Y/△
ZDR$_1$12.4	1.5	380	1350	4.3	0.75	0.70	转子电流(A) 8.7		转子电压(V) 130				