CABR/M

越南永新 2×622MW 燃煤电站工程

SC35 烟囱升降机

Operating Instructions of SC35 Chimney Hoist of Vietnam yunghsin 2×622MW Coal Fired Power Plant

说明书

廊坊凯博建设机械科技有限公司

CABR Construction Machinery Technology Co., Ltd.

目　录

Contents

第一部分　结构部分.....1
Part 1　Structure Division.....1
1.1　概 述/Summary.....2
1.2　烟囱升降机的使用环境要求/Service Environment of Chimney hoist.....2
1.3　设备遵循的技术规范/Technical Code.....2
1.4　技术性能参数及总图/Performance Parameter & General Drawing.....3
1.5　构造原理/Aufbau Principle.....5
第二部分　安装部分.....20
Part 2 Installation.....20
2.1　安装人员要求/Job Requirements.....21
2.2 安装现场的准备/Preparation for Installation Site.....21
2.4　电缆滑车的安装/Installation of Cable Trolley.....29
第三部分　操作运行部分.....30
Part 3 Operation.....30
3.1　使用之前/Preparation I.....31
3.2 操作之前/ Preparation II.....32
3.3　升降机的操作/Operation.....33
第四部分　维护保养部分.....34
Part 4 Maintaining.....34
4.1　润滑/Lubrication.....35
4.2　维修与保养/Care and Maintenance.....36
4.3　调整/Adjustment.....53
4.4　坠落试验/Drop Shutter Test.....56
4.5　防坠安全器/Safety Device.....57
第五部分　故障处理部分.....60
Part 5 Fault Treatment.....60
第六部分　电气部分.....63
Part 6 Electric.....63
6.1　供电电源/Power Supply.....64
6.3　层站、电源箱和中间电箱接线图/Wiring Diagram of Landings, Power Box and Middle Electricity Box.....66

6.4 维护/Electric Maintaining.....67
6.5 安全方面的注意事项/Matters Need Attention.....67
6.6 常见故障及分析和排除/Common Malfunctions and Troubleshooting.....68
6.7 坠落实验/Drop Shutter Test.....70
6.8 电气元件明细表/Detailed Statement of Electrical Element.....71
第七部分 超载保护器的安装.....72
Part 7 Installation of overload device.....72
引言 Introducion.....73
7.1 工作原理/Work principle.....73
7.2 功能及特点/Function and feature.....74
7.3 技术参数/Technical parameter.....74
7.4 系统组成及安装方法/Composition and installation.....76
7.5 接线图/Connection diagram.....78
7.6 操作说明/Operating instruction.....79
7.7 常见故障及处理/Malfunction and treatment.....83
第八部分 附录.....84
Part 8 Addendum.....84
8.1 主要易损件明细表/ Detailed Statement of Main Wearing Parts.....85
8.2 主要外购件明细表/ Detailed Statement of Main Purchased parts.....85
8.3 备品备件及专用工具一览表/ Detailed Statement of Spare parts and Special Tools.....85
8.4 一年运行用备品备件/ Spare parts for 1 year operation.....86
8.5 一年检修用备品备件/ Spare parts for 1 year overhaul.....86
8.6 两年运行用备品备件/ Spare parts for 2 years operation.....86

第一部分　结构部分

Part 1　Structure Division

1.1 概 述/Summary

SC35 烟囱升降机是由廊坊凯博建设机械科技有限公司根据越南永新 2×622MW 燃煤电站工程项目烟囱的相关尺寸专门设计制造的。SC35 烟囱升降机是根据齿轮、齿条啮合传动原理，专为维修人员及小型物料而设计的垂直输送设备。

SC35 Chimney hoist is designed and manufactured by The Institute of Building Mechanization of China Academy of Building Research and CABR Construction Machinery Technology Co., Ltd. The design of the special vertical conveyor is according to the relation dimension of Vietnam yunghsin 2×622MW Coal Fired Power Plant. Its design philosophy is based on the theory of gear rack mechanism.

1.2 烟囱升降机的使用环境要求/Service Environment of Chimney hoist

烟囱升降机的使用环境温度：-20℃～+50℃

工作状态风速：≤20m/s（升降机顶部风速）

安装、接高及拆卸状态风速：≤13m/s（升降机顶部风速）

Working environment temperature: -20℃～+50℃

Wind speed on state of working: ≤20m/s （on top of hoist）

Wind speed on state of installation: ≤13m/s （on top of hoist）

1.3 设备遵循的技术规范/Technical Code

GB10055-2007《施工升降机安全规程》

GB10054-2005《施工升降机》

GB3811《起重机设计规范》

GB10055-2007 *Safety code for builder's hoist*

GB10054-2005 *Builder's hoist*

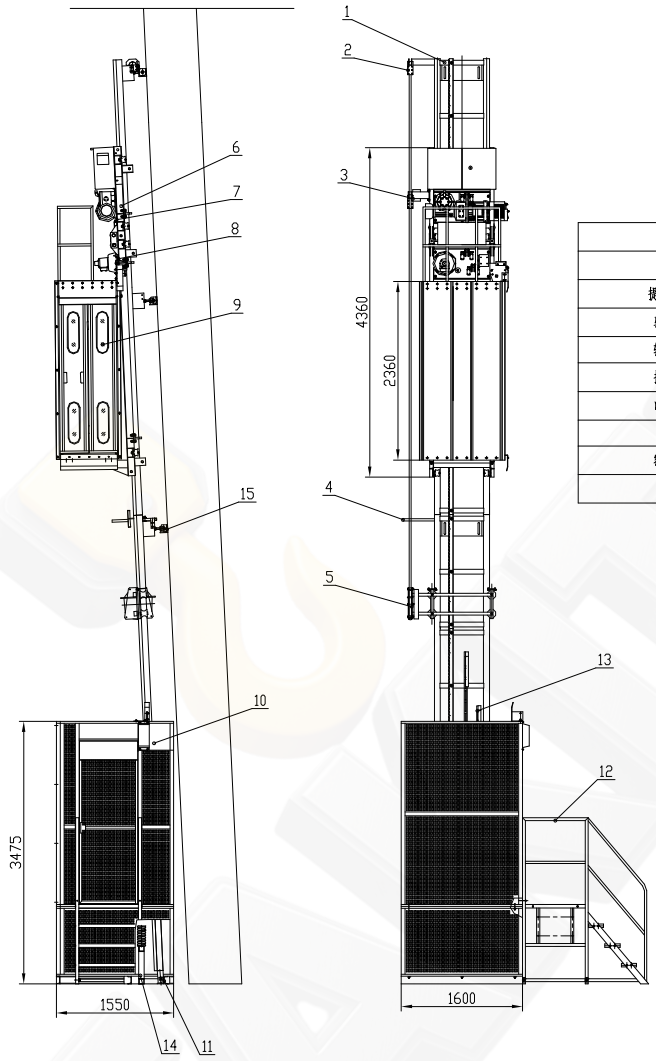
GB3811 *Design rules for cranes*

1.4 技术性能参数及总图/Performance Parameter & General Drawing

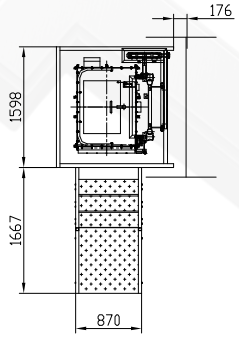
表一 主要性能参数表/**Table 1 Performance Parameter**

序号 Numbers	项 目 Items	单 位 Units	参 数 Parameters
1	传动形式 Transmission Type		齿轮齿条传动，m＝6 Gear rack mechanism, m＝6
2	型号 Model		SC35
3	额定载重量 Payload	kg	350 或 3 人 350kg or 3 persons
4	额定提升速度 Lifting Speed	m/min	30
5	导轨架高度 Height	m	160
6	减速器速比 Velocity Ratio		16
7	轿厢内空尺寸 （长×宽×高） Size inside cage (length *width*height）	㎜×㎜×㎜	1040×780×2200
8	工作电流 Working Current	A	23.5
9	电机型号及功率 Motor Model		YZEJ132M-4, 11kw
10	安全器型号 Safety Device Model		SAJ30-1.2
11	层站 Landings	层 Layers	5

SC35



技术参数	
项目	参数
提升总高度	160m
驱动形式	齿轮齿条式
轿厢内空	约1040x780x2200(mm)
提升速度	33m/min
电机功率	11kW
标准节	650x3016片式
额定载荷	350kg
层数	5



序号	代号	名称	数量	材料	单件重量	总计重量	备注
15	SC35.15	附着	55	部件			
14	SC35.14	缓冲装置	1	部件			
13	SC35.13	限位装置	1	部件			
12	SC35.12	登机平台	1	部件			
11	SC35.11	底架	1	部件			
10	SC35.10	层站	5	部件			
9	SC35.9	轿厢	1	部件			
8	SC35.8	安全器座板	1	焊件			
7	SC35.7	驱动板	1	焊件			
6	SC35.6	驱动架	1	部件			
5	SC35.5	电缆滑车	1	部件			
4	SC35.2	电缆导架	28	部件			
3	SC35.4	电缆臂	1	部件			
2	SC35.3	电缆拔杆	1	部件			
1	SC35.1	标准节	55	部件			

标记	处数	更改文件号	签字	日期	总图	潍坊凯腾建设机械科技有限公司
设计			工艺	卢宗伟	图样标记 / 数量 / 重量 / 比例	上海电气-施南永新烟囱升降机
制图			标准		1 / 1:40	SC35
校对		李志国	批准	王琴和	共 张 第 张	
审核			日期			

1.5 构造原理/Aufbau Principle

本机由金属结构、驱动系统、安全保护装置和电气系统等组成。简介如下：

This equipment comprises metal construction, driving system, safety protection device and electrical system. Description below.

1.5.1 金属结构/ Metal construction

主要包括：导轨架、轿厢、底架、缓冲架、层站、附着装置、电缆导向系统等。

The metal construction contains mast sections, cage, underbed, buffer, Tie-in and cable orientation system.

1.5.1.1 导轨架/Guide rail

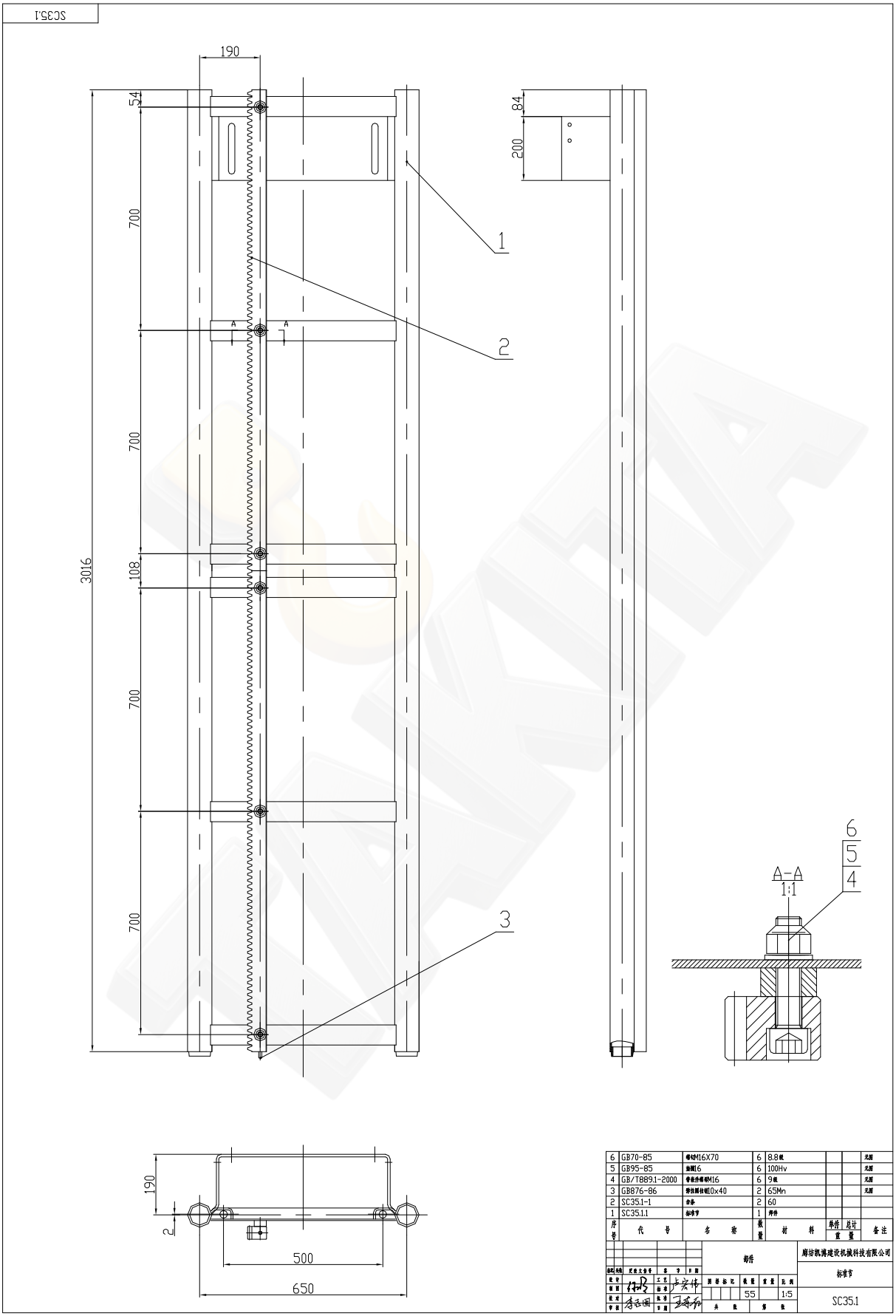
导轨架是轿厢上下运行的轨道。导轨架由标准节通过 M22×230 的 8.8 级的高强螺栓联接而成。每节标准节的高度为 3016mm，由钢管、角钢焊接而成，片式结构。齿条通过内六角螺栓紧固在标准节侧面，互换性好。标准节两根主弦管下端焊有止口，齿条下端设有弹性圆柱销，安装时确保定位准确。

Mast sections act as the guide rail for the hoist. They are connected by M22 × 230 high strength bolts which is 8.8 level. Every mast section is welded with steel tubes and angle irons. The height is 3016 mm, and the section is 650mm. The bolt-on rack which is interchangeable good is tightened on one 650mm side of mast section. There is a seam allowance under each steel tube and an elastic cylindrical pin under each rack on the purpose of insuring the fixed position.

1.5.1.2 轿厢/Cage

轿厢为全封闭结构，采用不锈钢制作。轿厢门采用双页内侧转门的型式，不锈钢制作，设有机械和电气联锁装置，处于开启状态时轿厢不能运行以保证司乘人员的安全。轿厢内部有操作控制面板、照明灯、应急照明、通风装置等。顶部有用于安装维修人员上下的门及护栏，轿厢门上有玻璃便于观察。

The cage is enclosed totally made of stainless steel, with a folding door which can be open forward inside. There is an electric interlock on the cage to make sure hoist cannot move while the folding door is being opened. There is a control panel, a emergency lighting, and a ventilation device inside the cage. A escape door is set up on the top of cage so as to maintain the equipment or escape from emergency. There is a guardrail on the top so maintenance personnel won’t fall out. The external environment can be observed from inside cage through the glass on the folding door and a skirt board.



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6	GB70-85	螺钉M16X70	6	8.8级			无图
5	GB95-85	垫圈16	6	100Hv			无图
4	GB/T889.1-2000	带嵌件螺母M16	6	9级			无图
3	GB876-86	销轴销轴10x40	2	65Mn			无图
2	SC35.1-1	标准节	2	60			
1	SC35.1.1	标准节	1	焊件			

部件	廊坊凯鸿建设机械科技有限公司
标准节	
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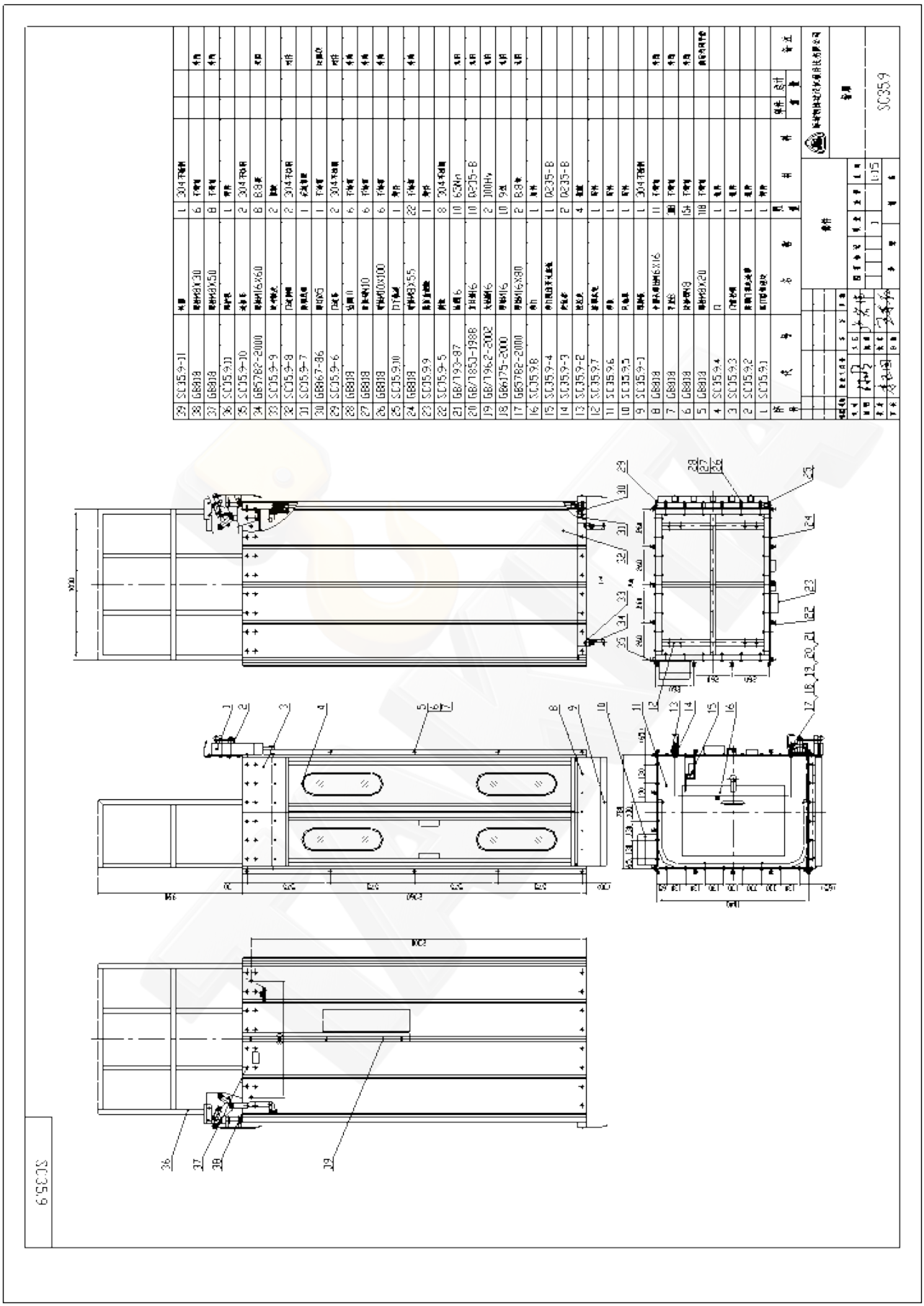
SC35.1	

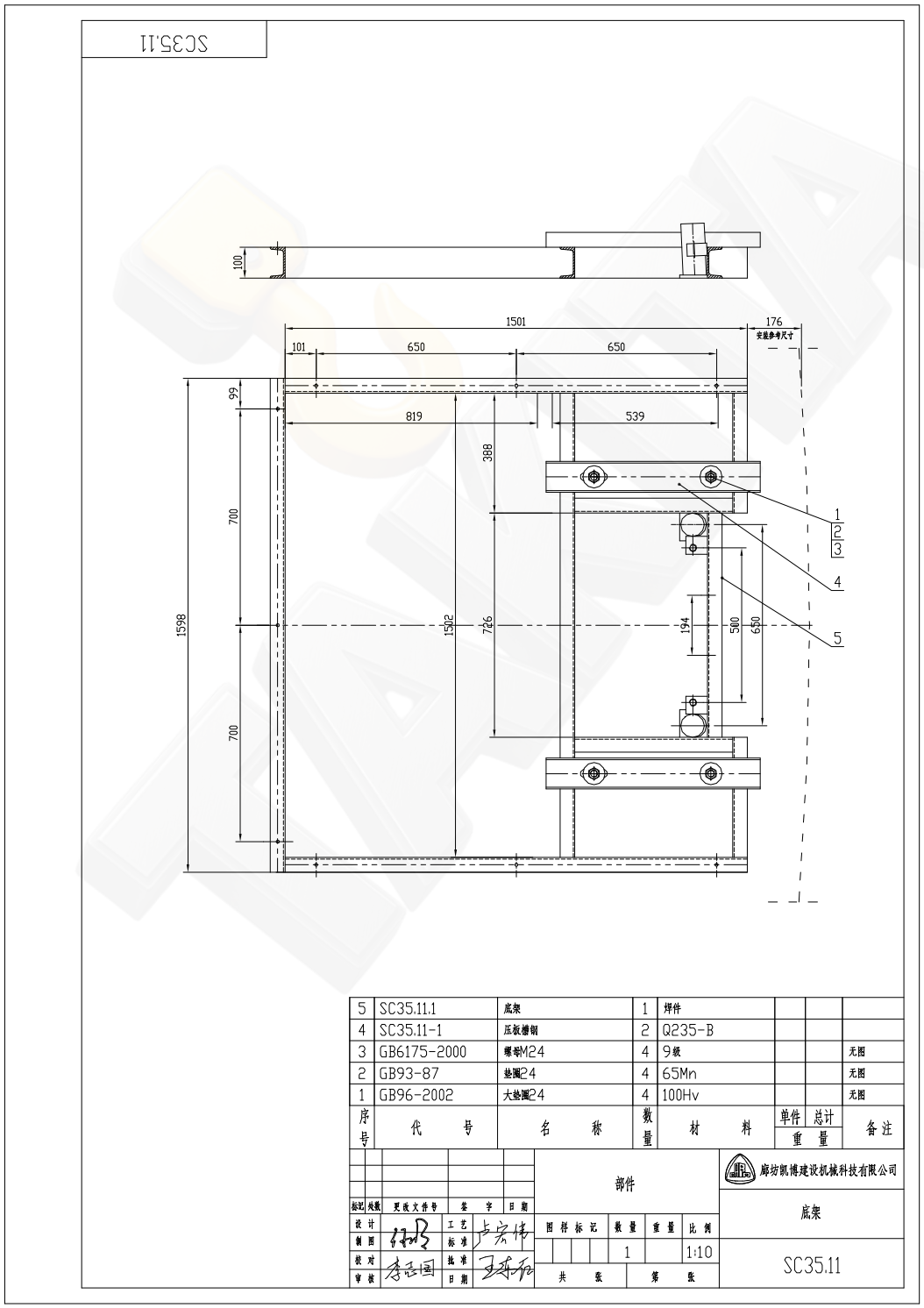


序号	代号	名称	数量	材料	单重	总计	备注
39	SC35.9-11	支撑	1	304不锈钢			
38	GB818	螺柱M8X30	6	不锈钢			
37	GB818	螺柱M8X50	8	不锈钢			
36	SC35.9.11	销轴	1	不锈钢			
35	SC35.9-10	支架	2	304不锈钢			
34	GB5782-2000	螺栓M16X60	8	8.8级			
33	SC35.9-9	护板组	2	钢			
32	SC35.9-8	压板组	2	304不锈钢			
31	SC35.9-7	护板组	1	不锈钢			
30	GB96.7-86	垫圈5	1	不锈钢			
29	SC35.9-6	压板	2	304不锈钢			
28	GB818	弹簧10	6	不锈钢			
27	GB818	螺柱M10	6	不锈钢			
26	GB818	螺柱M10X100	6	不锈钢			
25	SC35.9.10	销轴	1	不锈钢			
24	GB818	螺柱M8X55	22	不锈钢			
23	SC35.9.9	限位挡板	1	钢			
22	SC35.9-5	滑块	8	304不锈钢			
21	GB/T93-87	垫圈6	10	65Mn			
20	GB/T853-1988	开槽M6	10	Q235-B			
19	GB/T96.2-2002	大垫圈M6	2	100HV			
18	GB/T75-2000	螺钉M6	10	5级			
17	GB5782-2000	螺栓M16X30	2	8.8级			
16	SC35.9.8	销	1	不锈钢			
15	SC35.9-4	内侧导轨支架	1	Q235-B			
14	SC35.9-3	外侧支架	2	Q235-B			
13	SC35.9-2	导轨支架	4	钢			
12	SC35.9.7	滑轮支架	1	钢			
11	SC35.9.6	销	1	钢			
10	SC35.9.5	导轨架	1	钢			
9	SC35.9-1	吊架	1	304不锈钢			
8	GB818	内六角圆柱头螺钉M6X16	11	不锈钢			
7	GB818	平垫6	11	不锈钢			
6	GB818	螺柱M8X9	154	不锈钢			
5	GB818	螺柱M8X20	118	不锈钢			
4	SC35.9.4	内侧导轨	1	钢			
3	SC35.9.3	外侧导轨	1	钢			
2	SC35.9.2	限位挡板组件	1	钢			
1	SC35.9.1	标牌	1	钢			

1.5.1.3 底架/Underbed

底架由槽钢和钢板拼焊而成，与导轨架用螺栓联接成一体，并通过地脚螺栓与升降机底部的承重平台联接在一起。底架可承受全部垂直载荷，并将载荷传递给承重平台。

The underbed is welded with U-steel and steel plate. It is connected to the mast section with high strength bolts. It is also connected to the load-bearing platform with foundation bolts. The underbed supports the whole vertical load and transfers it to the load-bearing platform.



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5	SC35.11.1	底架	1	焊件			
4	SC35.11-1	压板槽钢	2	Q235-B			
3	GB6175-2000	螺母M24	4	9级			无图
2	GB93-87	垫圈24	4	65Mn			无图
1	GB96-2002	大垫圈24	4	100Hv			无图

标记	处数	更改文件号	签字	日期
设计		工艺		
制图		标准		
校对		批准		
审核		日期		

部件

图样标记	数量	重量	比例
	1		1:10

共 张 第 张

廊坊凯博建设机械科技有限公司

底架

SC35.11

1.5.1.4 缓冲架/Buffer

在导轨架底部装有防止轿厢撞底的缓冲弹簧和缓冲架，缓冲架通过螺栓和底架相联接，其上装有缓冲弹簧。

There is a buffer at the bottom of guide rail. The bumper bracket is connected to the underbed and the buffer spring is put on the bumper bracket.

1.5.1.5 附着装置/Tie-in

每间隔大约 3016mm 做一道附着。将附墙座与烟囱上的预埋件联接，以保证导轨架的稳定性。

Every 3016mm, a tie-in must be set so as to ensure the stability of guide rail. The tie-in is connected to the embedded part inside the chimney.

1.5.1.6 层站/ Landings

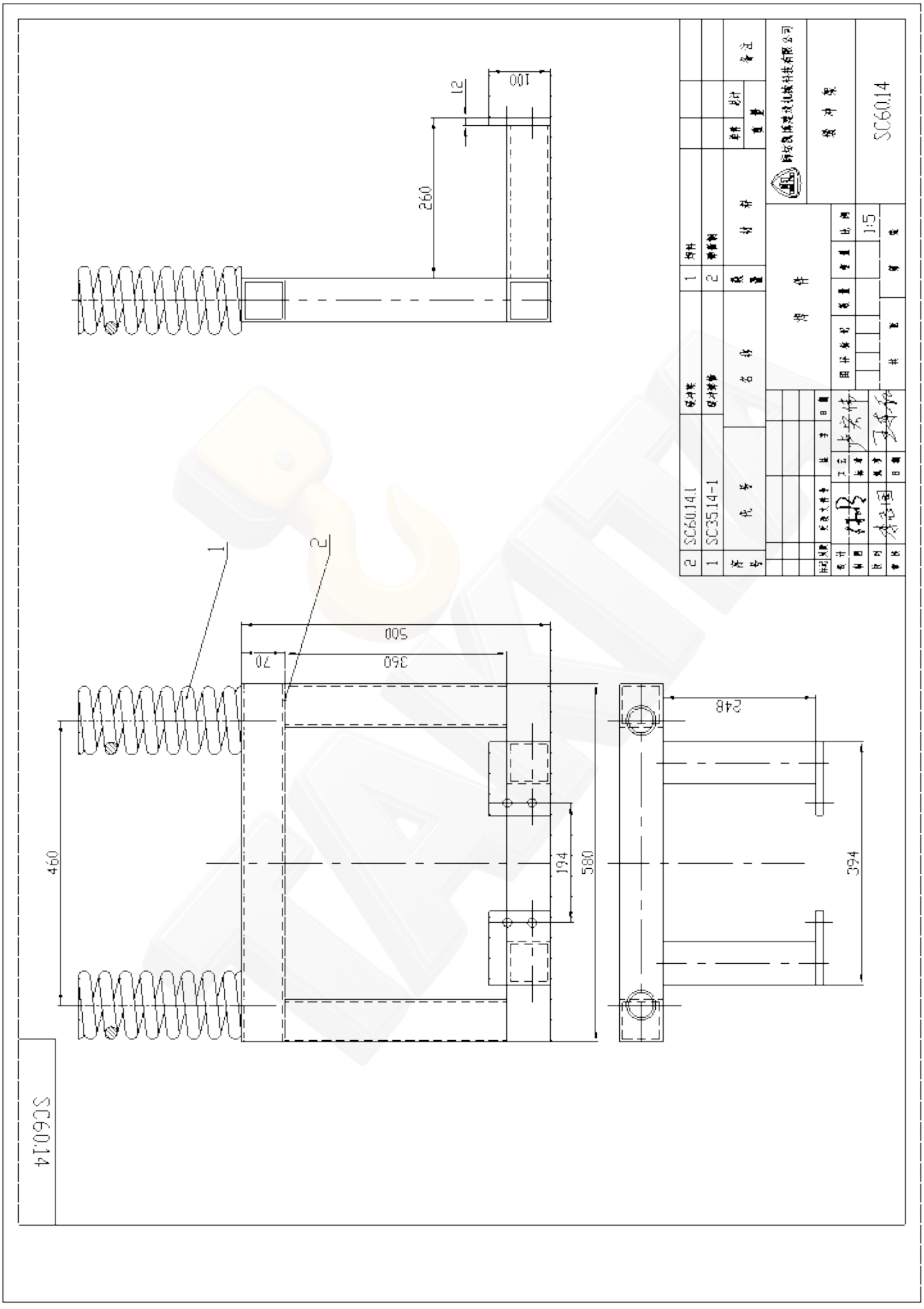
SC35 烟囱升降机共设 5 个层站。层站由围栏，层门和机电联锁装置组成。层门及围栏为保护人员的安全而设，由角钢和冲孔铝板组成，通过螺栓连接。在升降机未到达该层站时层门无法打开，只有当升降机轿厢到达指定层站时，层门才能开启。当任何一个层门打开时，升降机将自动停止运行。层门采用双页外侧转门型式，方便人员进出。各层站备有呼叫装置。

This SC35 chimney hoist sets 5 landings. Landings are constituted with fences, landing gates and electro mechanical interlocking devices. The landings are set on the purpose of protecting staff. It is made of angle iron and punching aluminium plates and connected with bolts. Only if the cage arrives the landing, the landing door can be opened. The hoist will automatic stop whichever landing door is opened. The landing door can be open forward outside in order to get in and out expediently. There is a calling device at each landing.

1.5.1.7 电缆导向系统/Cable orientation system

为了解决 SC35 烟囱升降机在风力较大或环境温度较低的情况下使用，同时为了减小动力电缆本身的压降以及解决电缆自身强度带来的问题，SC35 烟囱升降机选用带滑车的电缆导向系统。电缆滑车系统采用中间供电方式，利用滑车系统存储电缆。电缆滑车系统包括电缆滑车、电缆挑杆、电缆臂、电缆护架、滑车轨道等。

The cable orientation system is put in use on the purpose of not only adapting the wind-force and a low ambient temperature but also solving the strength problems from the cable itself. The power supply mode of cable orientation system is center supply. The cable is stored in the cable orientation system. It contains cable trolley, cable ram, cable arm and cable guide.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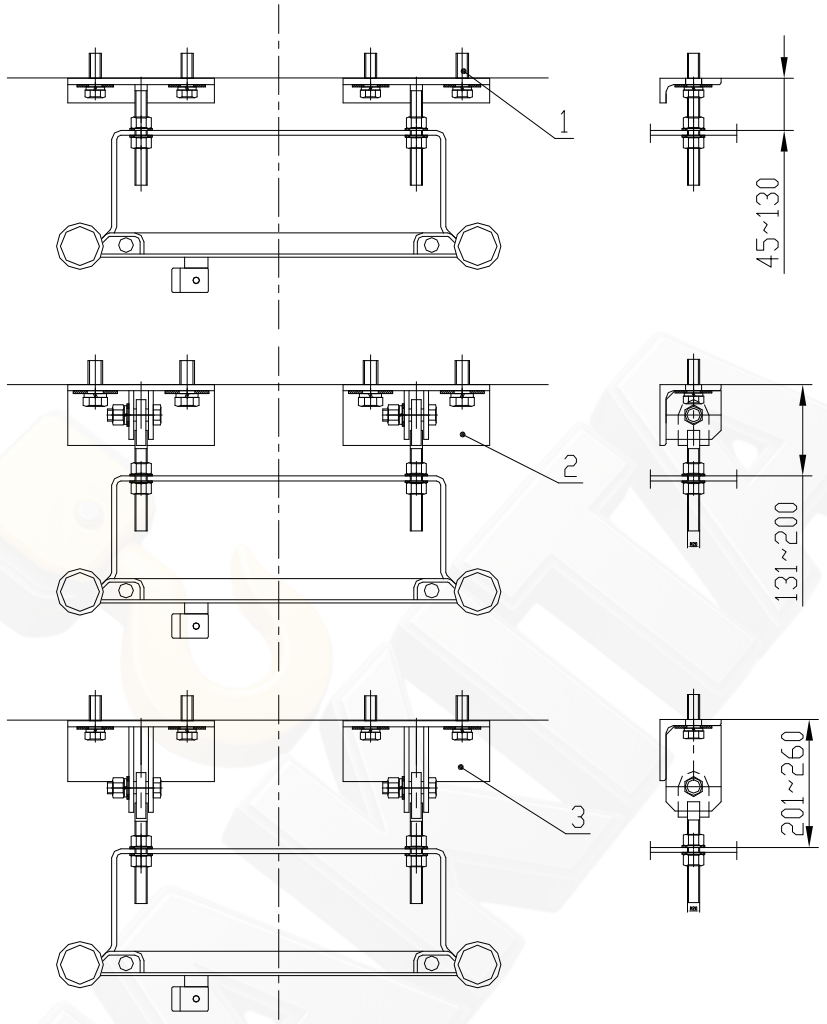

共55道附着

序号	代号	名称	数量	材料	单件重量	总计重量	备注
3	SC35.15.3	附着三	9	组件			
2	SC35.15.2	附着二	37	组件			
1	SC35.15.1	附着一	9	组件			

标记	处数	更改文件号	签字	日期

设计		工艺	卢宗伟	部件	廊坊凯博建设机械科技有限公司
制图		标准			附着
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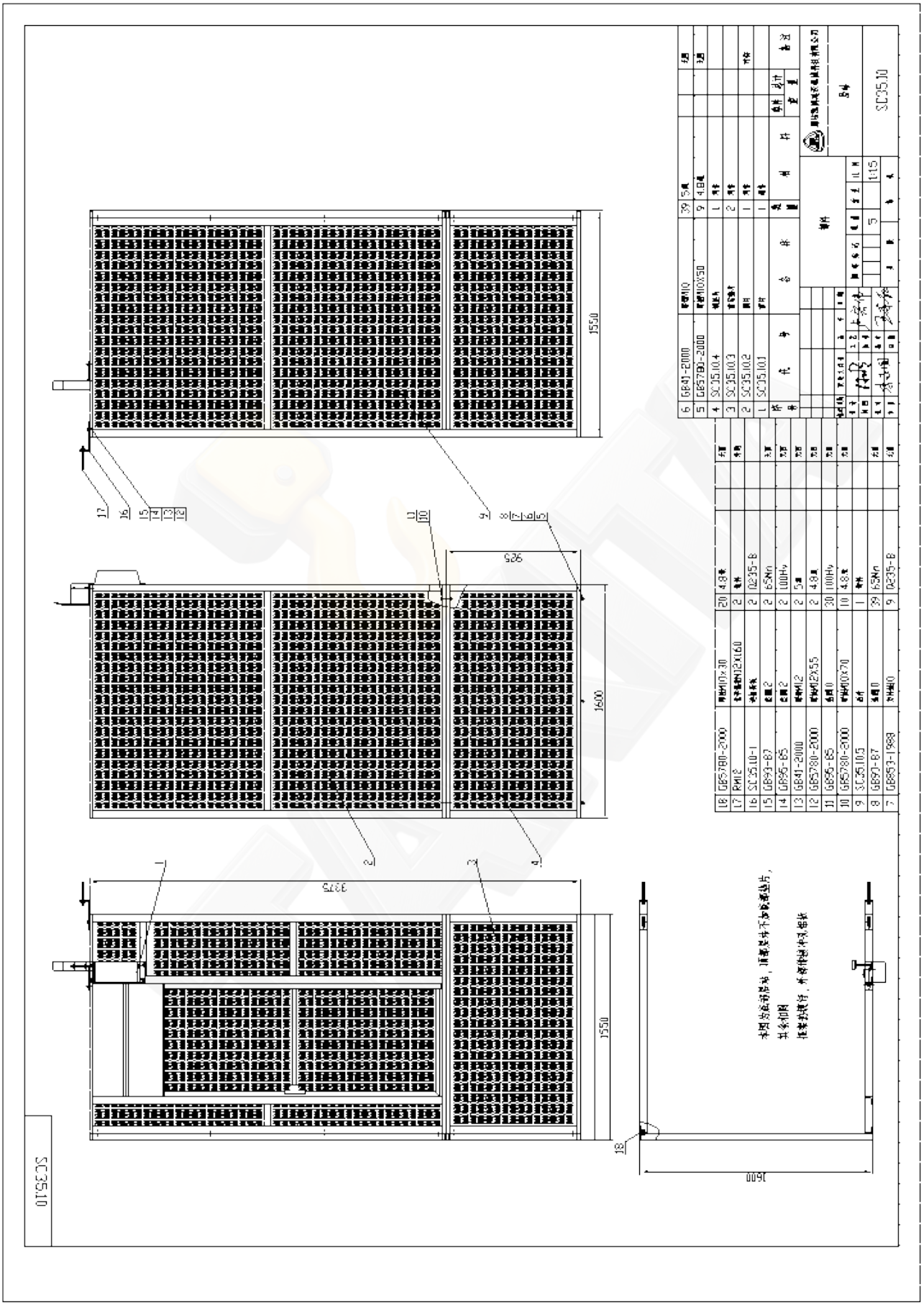
审核		日期		共 张 / 第 张	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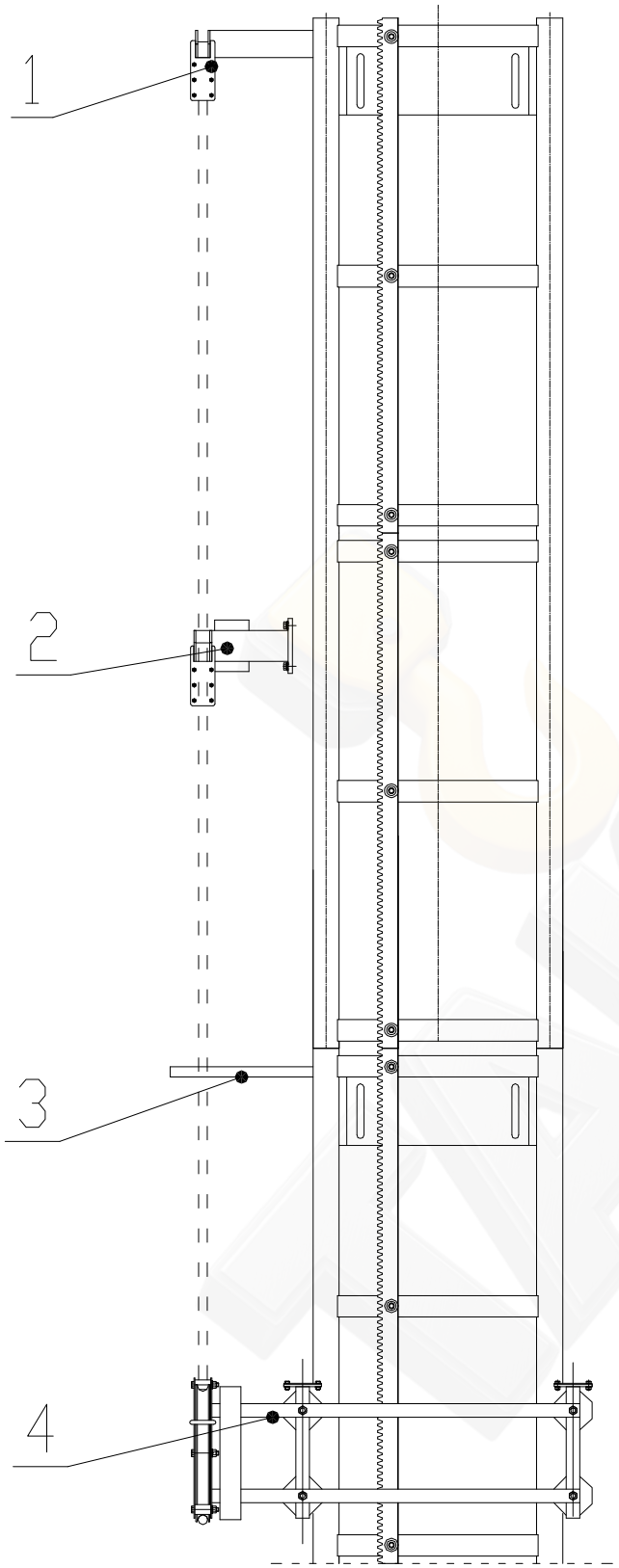


电缆导向系统

Cable orientation system

1.电缆挑杆/ Cable ram；

2.电缆臂/ Cable arm；

3.电缆导架/Cable guide；

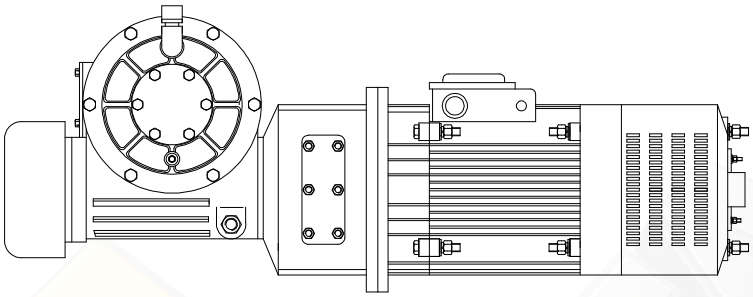
4.电缆滑车/Cable trolley；

1.5.2 驱动系统/ Driving system

驱动系统位于轿厢顶部，由驱动单元、驱动板、驱动架组成。

The driving system is on the top of cage, it is composed with driver element, drive plate and drive bay.

1.5.2.1 驱动单元/ Driver element



驱动单元是升降机运行的动力来源，驱动轿厢上下运行。驱动单元由驱动齿轮、电机、制动器减速机等组成。减速器为斜齿、伞齿传动形式，具有结构紧凑、承载能力高、传动效率高、使用寿命长、啮合噪音小、工作平稳等特点，该套机构的型号为 YZEJ132M-4，11kW，速比为 16。该套机构带有制动手动释放功能，在供电异常或有故障的情况下，可通过手动功能实现升降机的向下运动。

The driver element is the power source of hoist. It is combined with driving gear, motor and gear units. The gear units applies the helical gear transmission which is compact, capable, efficient, efficient and stability. The model is YZEJ132M-4, with a power of 11kW and a velocity ratio of 16. It can be manual released when power supply is abnormal or in some other troubles.

1.5.2.2 驱动板/ Drive plate

驱动板用于联接驱动单元及驱动架。其背面装有一个背轮，调整背轮偏心套可调节背轮和齿条之间的间隙，以确保齿轮与齿条正确啮合（出厂时减速机输出齿轮与齿条的啮合间隙已调整合适），使轿厢运行更加平稳。驱动板与驱动架浮动联接，垫有橡胶垫以减小机械振动。

The drive plate is used to connect the driver element and the drive bay. There is a back wheel on the plate. Its effect is to adjust the gap between rack and itself in order to insure the gear rack meshing accurately. The adjustment is already finished before leaving factory. The connection of driver element and drive bay is floating so as to reduce vibration.

1.5.2.3 驱动架/Drive bay

驱动架承受轿厢传递的全部载荷，由槽钢和钢板焊接而成，其上装有 18 个滚轮。滚轮内装有偏心轴和滚动轴承，可独立调整。通过　　调整偏心轴可控制驱动架与导轨架的相对

位置。驱动架上装有安全钩，防止因滚轮脱落或安装时操作不当造成驱动架倾翻，齿轮脱离导轨架。

The drive bay supports the whole load of the cage. It is welded with U-steel and steel plate. There are 18 eccentric rollers on it. Adjusting the eccentric shaft inside the eccentric rollers can adjust the relative position between the drive bay and guide rail. There are also a certain amount of safety hooks on the drive bay in order to prevent tip-over which can be occurred while the roller is fall out because of misoperation.

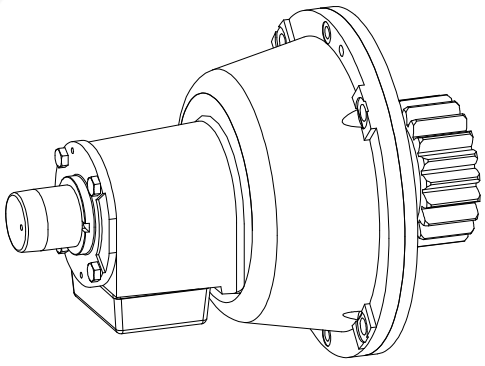
1.5.3 安全保护装置/Safety protection devices

SC35 烟囱升降机配有完善可靠的安全装置。主要包括 SAJ30-1.2 型渐进式防坠安全器、机电联锁保护装置、超载保护装置、供电系统断相错相保护、轿厢慢速移动装置、上下限位极限装置、撞底缓冲装置、各门限位开关、防脱安全钩、应急照明等。

There are perfect and reliable safety protection devices on SC35 chimney hoist. Mainly includes SAJ30-1.2 safety device, electro mechanical interlocking device, overload protection device, power supply phase failure protection device, slow motion device, top and bottom travel limited device and final limit device, cushioning device, limit switch, safety hook and emergency lighting.

1.5.3.1 SAJ30-1.2 型渐进式防坠安全器/ SAJ30-1.2 safety device

SAJ30-1.2 型渐进式防坠安全器为中国建筑科学研究院建筑机械化研究分院专利产品，运用了甩块啮入无冲击、无需拆机检验磨损量等先进技术，当升降机意外超速下降时可平稳制停并断开电源，确保人员及设备安全。该安全器在升降机接高和拆卸过程中仍起安全保护作用。安全器的动作速度在出厂时都已调整正确并打好铅封，用户不得擅自打开安全器，否则后果自负。在安全器铭牌上标有使用期限，当达到使用期限后应送交国家质量监督部门认可的专门机构进行重新校验标定。标定期限 1 年。安全器固定在安全器座板上。



防坠安全器/ safety device

The SAJ30-1.2 safety device is a patented product from The Institute of Building Mechanization of China Academy of Building Research. It uses the advanced technology of shock-free flail block and testing abrasion loss dispense with taking apart device. While if there were an accident and the cage were falling down, the safety device can apply

the brake reposefully and cut the power off so as to protect personnel and equipment. It can also play a protective action while the hoist is being installed or dismantled. The adjustment of the safety device is already finished and it is also lead sealed before leaving factory. The users cannot open it arbitrarily or it'll be at your own risk. The operating life of this device is marked on the nameplate. When it becomes due it must be recommissioned by special agency. The demarcating time limit is 1 year. The safety device is set on safety device plate.

1.5.3.2 机电联锁保护装置/ Electro mechanical interlocking device

轿厢门和层门上设有机电联锁保护装置，当轿厢门和层门打开时，该装置将切断控制电路，使轿厢停止运行；同时当轿厢未停止到停层位置时，轿厢门和层门将打不开，从而保护了人员的安全。

The electro mechanical interlocking devices are set on cage door and landing doors. While any of these doors is open, the device will cut out the control circuit to make the hoist stop moving. Meanwhile, each of the doors could not be opened until the cage arrive the appointed landing. So the operating staff is safe.

1.5.3.3 超载保护装置/ Overload protection device

在轿厢驱动架上设有超载保护装置。轿厢静止时，当载荷达到 630kg 时，该装置将发出报警信号，当超载达到 10%以上时将自动切断控制电源，升降机不能启动。

The overload protection device is set on the drive bay. When the cage is at a standstill and the load reaches 630kg, the device will give out an alerting signal. When it is overload with 110% burthen, the device will cut off the control source, the hoist would not work.

1.5.3.4 供电系统断相错相保护/ Power supply phase failure protection device

本机设有相序保护装置，当供电系统出现断相、错相时，该装置将起作用，使设备无法启动，直到相序调整正确为止。

The power supply phase failure protection device will work when loss of phase or phase failure occurs. It will adjust the system until the phase sequence is correct.

1.5.3.5 轿厢慢速下放装置/ Slow motion device

该装置设在驱动单元上，当升降机出现故障时，人员可上到轿厢顶部，通过扳动驱动单元端部的扳把，缓慢将轿厢下移至层站或地面，使人员离开。

The slow motion device is set on the driver element. When stoppage appears, operator can get onto the top of cage, then pull the knob on the driver element, the cage will move to the ground

slowly.

1.5.3.6 上下限位极限装置/Top and bottom limited device and final limit device

上、下极限及上、下限位均为保证升降机上不冒顶、下不撞底的电气保护装置。包括上、下行程限位碰块及上、下行程极限碰块，上、下行程限位碰块保证轿厢运行至上、下指定位置时自动切断电源使升降机停止运行。极限碰块保证轿厢在运行至上、下限位后如因限位开关故障而继续运行时立即切断主电源，使轿厢制停，保证轿厢往上运行不冒顶、往下运行不撞底。极限开关为非自复位式，只有通过手工操作才能复位。

上限位、下减速、下限位、上减速以及极限开关等用螺栓联接在驱动架上，限位和极限碰块安装在导轨架上，每次标准节接高或转移工地都必须重新调整碰块位置，确保升降机安全运行。升降机正常运行时应经常检查碰块和相应开关之间的位置是否准确，以保证开关动作准确。

导轨架顶部还设有机械式防冒顶装置，当轿厢冲过上极限位置后，到达该装置，齿轮将空转，轿厢不再上升，防止了冒顶事故的发生。

Top and bottom travel limited device and final limit device are set both on the purpose of keeping the cage away from running out or dashing against bottom. The action of top and bottom travel limit device is to stop the cage when it arrives assigned address. The action of top and bottom final limit device is to stop the cage and cut off power when the travel limit device doesn’t work. The final limit switch is a non-self-reset component. It must be reset by hand.

The travel limit switches and final limit switch are set on drive bay. The travel limit device and the final limit device are set on guide rail. The travel limit device and the final limit device must be reset while heightening guide rail. The order of accuracy of travel limit device and final limit device must be checked frequently during normal operation in order to make sure the switch motion is exact.

On the top of guide rail a mechanical running out protection device is set on the mast section. When if the cage runs above the extreme position, the drive gear will idling and the cage will stop move.

1.5.3.7 底部缓冲装置/ Cushioning device

底部缓冲装置由底部缓冲弹簧和缓冲架组成，其作用是当升降机下限位、下极限限位都失灵时，而设置的最后一道保护，升降机撞到缓冲弹簧上减速停止，有效避免了轿厢直接墩底损坏，保护了设备和人员的安全。

The cushioning device is the buffer at the bottom of guide rail. It is composed with a bumper bracket and a buffer spring. It is the last protection of hoist when both bottom travel limited device and final limit device don't work. It can slow the cage down and cushion the impact to the foundation so as to protect the staff and equipment.

1.5.3.8 各门限位开关/Limit switches

轿厢门、轿厢顶门以及层门上均设有安全开关，如任一门开启或未关闭，轿厢均不能运行。

Limit switches are set on cage door and landing doors. While any of these doors is open, the cage cannot move.

1.5.3.9 防脱安全钩/Safety hook

防脱安全钩安装在驱动架上，可确保意外情况下驱动架不倾翻，驱动齿轮和安全器齿轮与齿条不脱离啮合。

Safety hooks are set on the U-steel of drive bay. It protects the drive bay from rolling over and the gear rack from demeshing.

1.5.3.10 应急照明/Emergency lighting

轿厢内的照明系统采用双系统，一套为正常照明系统，一套为应急照明系统。当供电故障时，正常照明系统无法使用，备用的蓄电池将启动应急照明系统，保证轿厢内的照明。

There is a dual system of lighting in the cage. One is normal lighting system, the other is emergency lighting system. While the normal lighting system is power failure, the storage battery will start the emergency lighting system.

1.5.4 电气系统/Electric System

电气系统包括上电气箱、下电气箱、笼内操作盒、中间接线箱、动力电缆、主控制电缆及各种限位、极限开关等。（详见第六部分：电气部分）

The electric System contains upper electrical cabinet, nether electrical cabinet, inside operating box, power cable, control cable and various kinds of travel limit switches and final limit switches.

The specifics of electric System can be consult in Part 6 of this operating instruction.

第二部分　安装部分
Part 2 Installation

2.1 安装人员要求/Job Requirements

（1）参加安装人员必须经过专门培训，熟悉升降机的机械性能和结构特点，具备熟练的操作技术和排除一般故障的能力。

（2）安装人员需身体健康，且具有一定的文化程度。

（3）安装人员必须配戴安全帽、安全带等安全保护设备。

（4）安装过程应听指挥，不得各行其是。

（5）安装人员应在指定的岗位上工作，不得擅自离开岗位。

（1） The installation personnel must be trained specially. They should be familiar with the mechanical behavior and construction features of the hoist. They should also have the operation technique and the skills to clearing minor failure.

（2）The installation personnel must be in health. They must be instructed.

（3）The installation personnel must to outfit with safety helmet and safeguard device.

（4）The installation personnel must obey the command.

（5）The installation personnel must stand fast and remain at his post.

2.2 安装现场的准备/Preparation for Installation Site

（1）安装之前，应熟读本机使用说明书。

（2）升降机的基础必须是专门浇注的混凝土基础。

（3）在浇注基础时，按照要求的位置及尺寸浇注固定好地脚螺栓，注意要保护好地脚螺栓的螺纹。

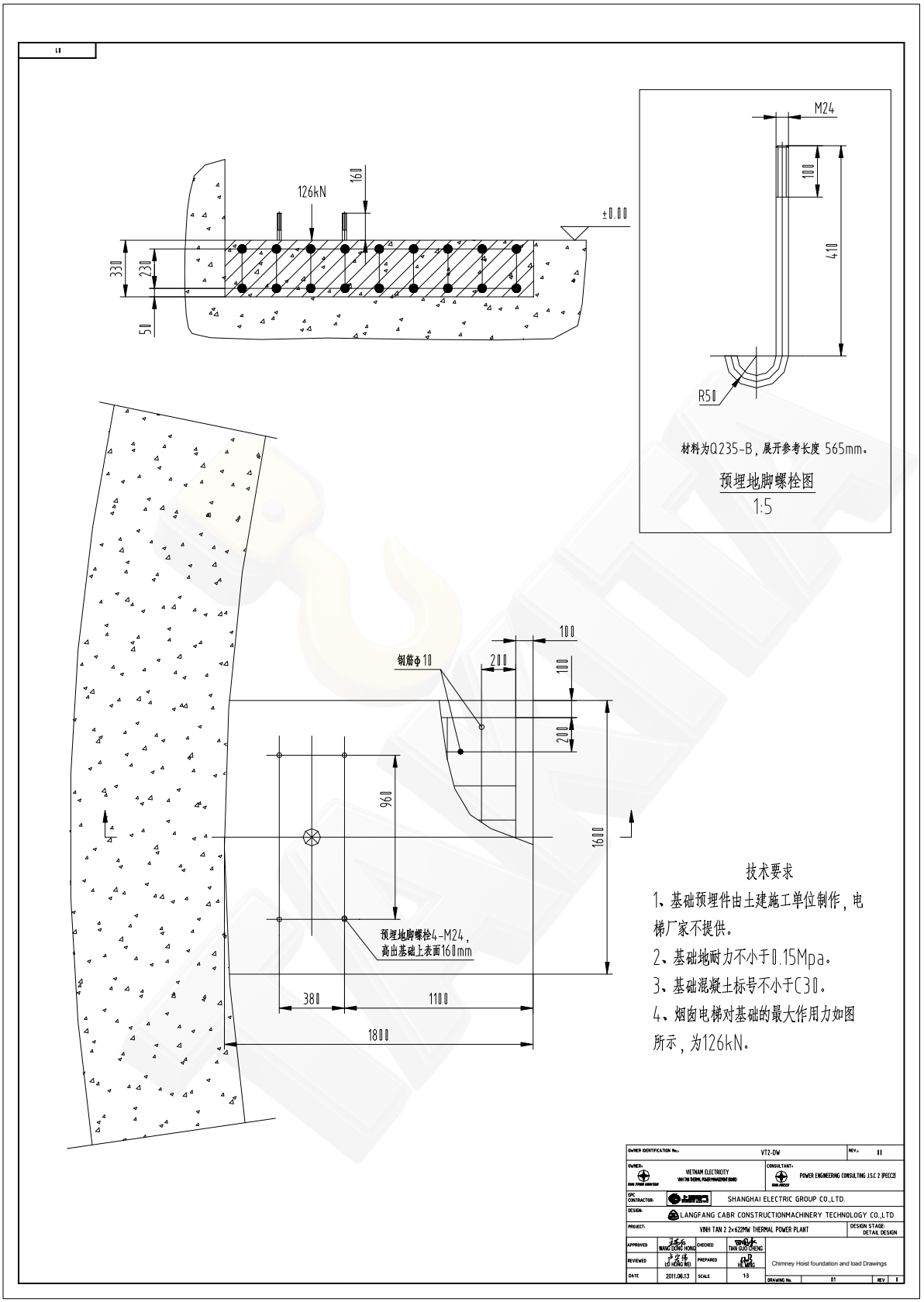
（4）在浇注基础时，还应当考虑排水措施，不得使升降机底架部分长期浸泡在水中，以免腐蚀而影响其正常工作。

（1）The installation personnel read the operating instruction carefully before installation.

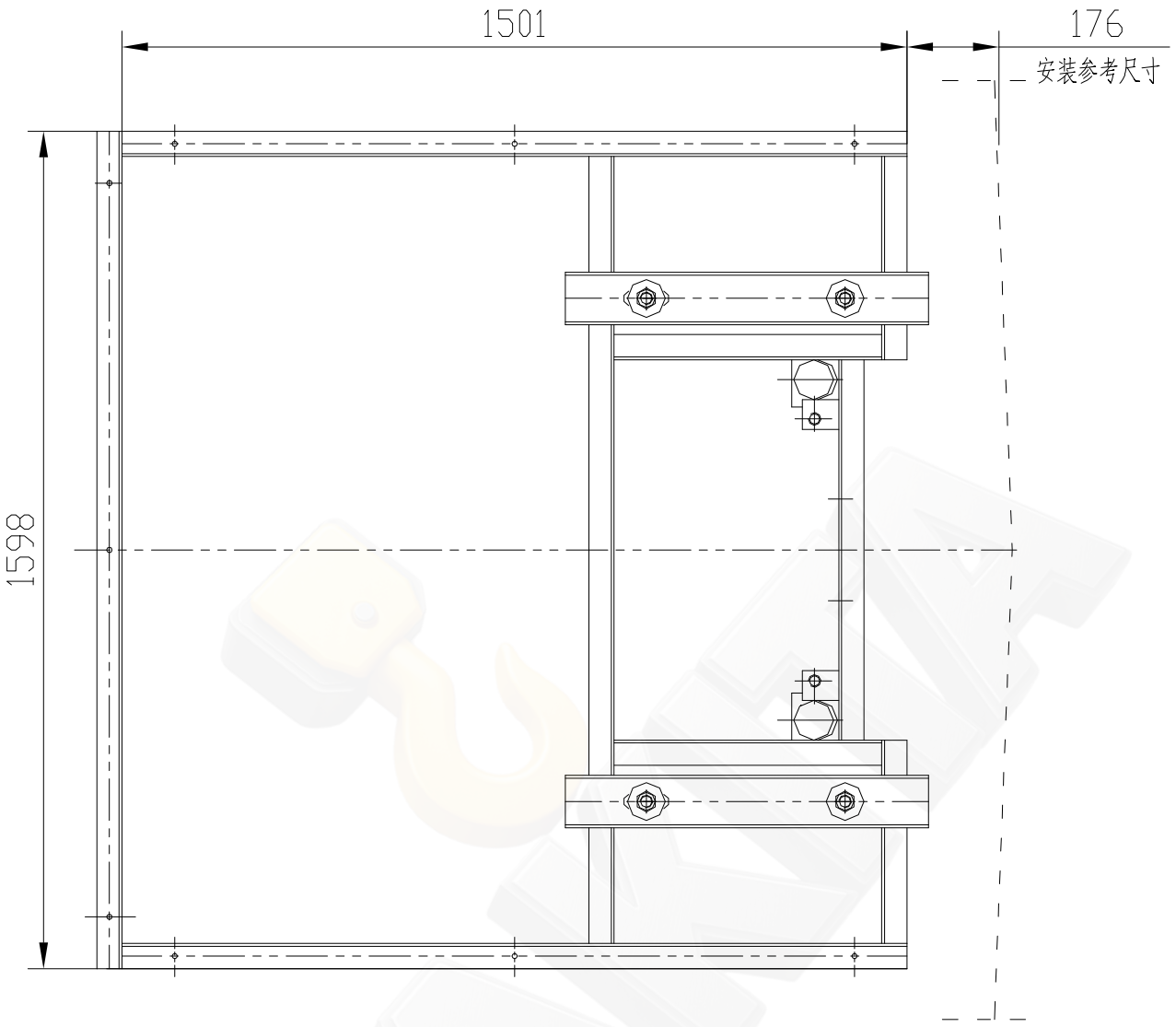
（2）The base of chimney hoist must use concrete foundation.

（3）The foundation bolts must be set according to the requirement of location and measurement. The screw thread of bolts must be protected properly.

（4）A drainage measure must be set in the base. The chimney hoist cannot be soaked in water for a long time, or it will be corroded.



升降机基础图/Foundation drawing



升降机底架位置/Location

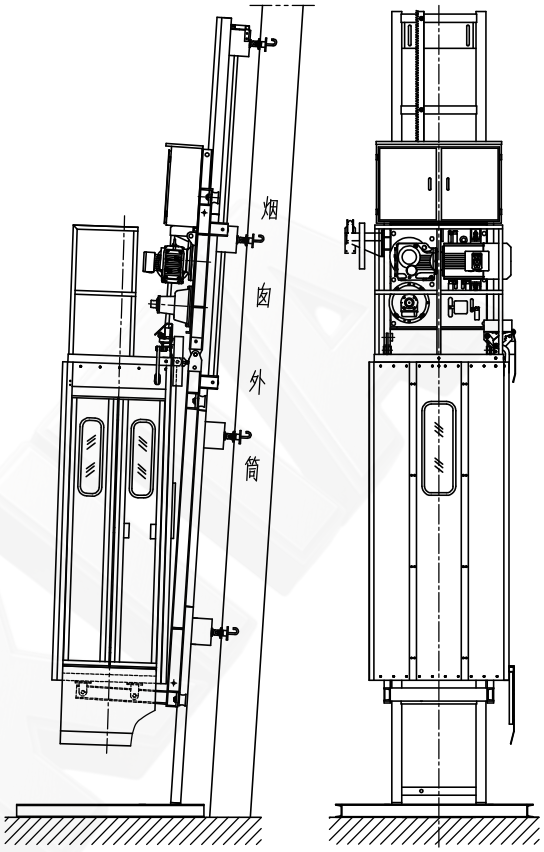
2.3 正式安装/Installation

当各项工作准备就绪，确认基础符合要求后，可以进行升降机的安装。安装作业空间不得有障碍物和坠物，遇有雨、雪、大雾及风力超过 13m/s 时不得进行拆装作业。

While all preparation work is done and the base is up to the mustard, the installation can start. During the process of installation exercise, any stumbling block or dropping goods could not rush out. The dismounting work should not proceed while there is a rain, snow, dense fog or wind-force above 13m/s.

（1）用辅助起重设备将升降机的基本部分（含有三个标准节及主底架部分和轿厢等）起吊后安装就位。放在浇注好的砼基础上，此时先不要固定地脚螺栓（见安装图 1）。

Use an auxiliary hoisting equipment to crane the essential part of hoist to appointed position. The essential part contains three mast sections, a underbed and a cage. Put the essential part onto the foundation and don't fix the foundation bolts at the moment, as the interface of Installation diagram 1.



安装图 1/ Installation diagram 1

（2）用经纬仪检查并调整导轨架，并按表二要求检查其垂直度。

Check the verticality of guide rail with a theodolite. Adjust it according to the demand in Table 2.

表二 导轨架垂直度要求/Table 2 Demand of guide rail verticality

导轨架安装高度 H Height of guide rail: H （m）	＜70	70～100	100～150	＞150
垂直度误差值 δ error of perpendicularity: δ （mm）	＜H/1000	70	90	110

（3）如果垂直度符合要求，这时可以将升降机的基础用地脚螺栓固定好。

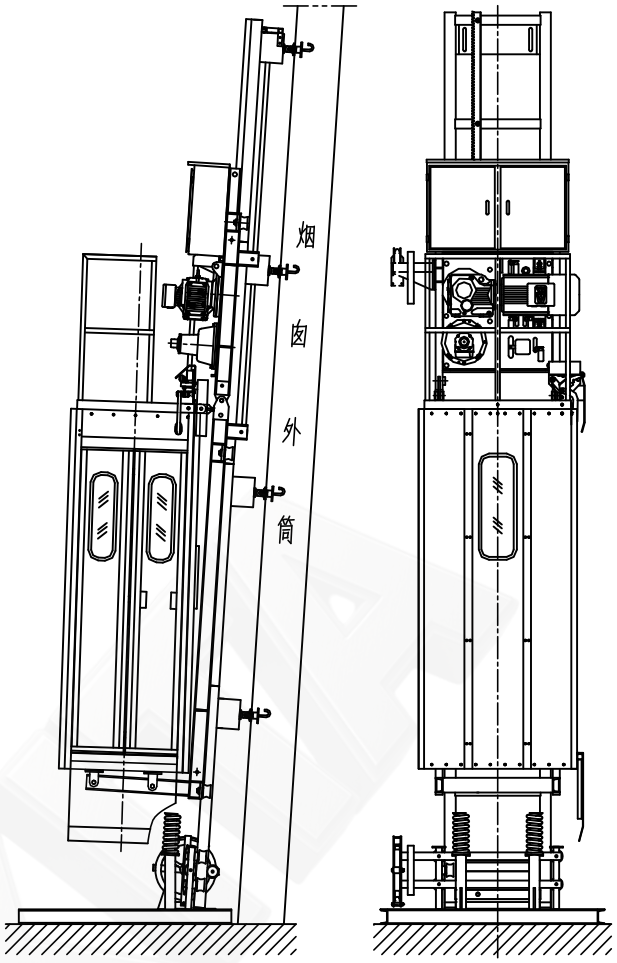
Fix the underbed with foundation bolts if the verticality be up to the mustard.

（4）将缓冲架安装在轿厢的下部，固定好滑车导轨并安装滑车（见安装图 2）。

Install the buffer under the cage. Fix the trolley guide rail and install the two cable trolleys, as the Interface of installation diagram 2.

（5）给升降机接通电源，注意相序不要错了。有关电缆架设的操作方法见件本部分“**2.4 电缆滑车的安装**”。

Connect the hoist to power, pay attention to the phase sequence. The details of installing cable is in this part: *2.4 Installation of Cable Trolley.*



安装图 2/ Installation diagram 2

（6）确保各个动作准确无误后，应首先将下限位碰块和下极限碰块装好，以防止轿厢撞底。下限位碰块的安装位置，应保证轿厢满载向下运行时，开关触及下限位碰块后自动切断控制电源而停车后，距离下极限还有一段距离。下极限碰块的安装位置应保证极限开关在下限位开关动作之后动作而且轿厢不能撞缓冲簧。

Make sure that all the actions are correct, then install the bottom final limit device to protecting the cage from arriving underbed.

The position of bottom travel limited device must content the demand that when the travel limit switch touches the bottom travel limited device and stop the cage, there is still a certain distance between travel limited device and final limited device.

The position of final limited device must content the demand that when the final limited device works, there is a certain distance between cage and buffer.

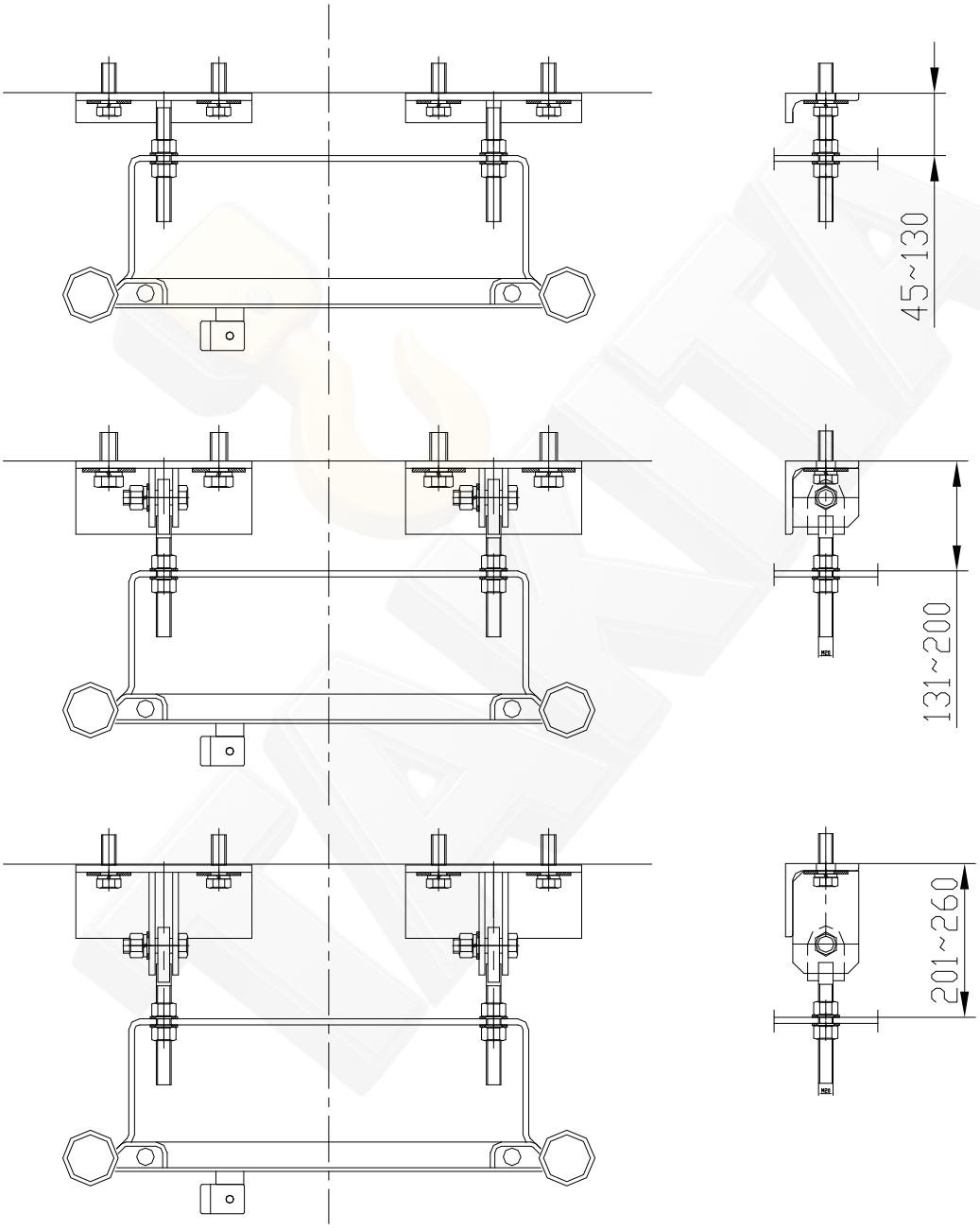
（7）限位开关及极限开关调整合适后，便可进行导轨架接高及附着架安装作业。安装时应将所有螺栓紧固可靠。**注意：每次接高时应给标准节止口涂上黄油，以免生锈。**继续进行升降机的接高作业，直到需要的工作高度。附着架的安装高度按照附着布置图的要求每隔 3016mm 布置一道（见安装图 3）。每次安装一套附着架，都要用经纬仪测量一下导轨架的垂直度，如果超出表二中的要求，必需进行校正。

The heightening of guide rail and installing of tie-ins start after the adjustment of travel limit

switch and final limit switch. All bolts must be tightened. **Attention: all the seam allowance of mast section must be coated with butter in order to keep away from rusting.**

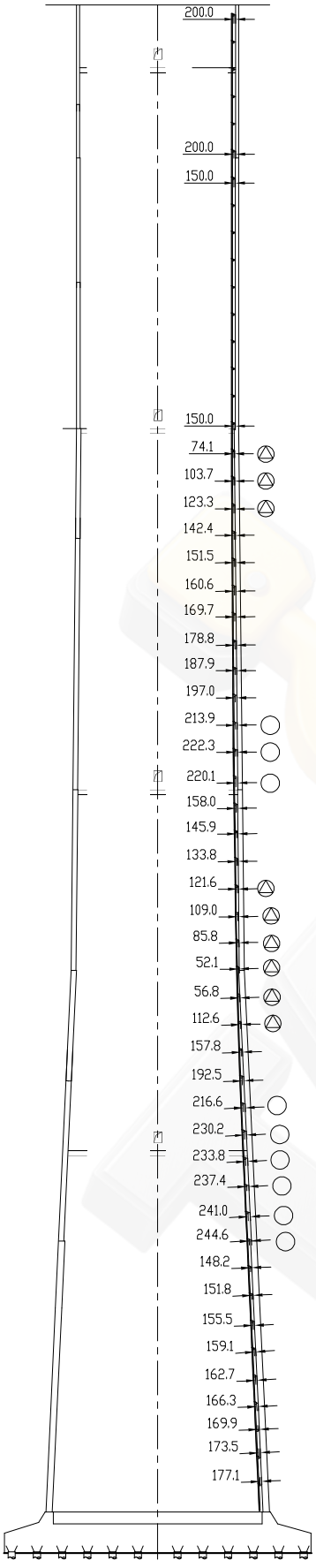
The heightening work will continue on to the requisite height. According to the layout diagram, the installation of tie-in is fixed up every 3016mm, as the interface of Installation diagram 3.

Check the verticality of guide rail with a theodolite after installation of every tie-in. Adjust it according to the demand in Table 2.



安装图 3

Installation diagram 3


200.0
200.0
150.0
150.0
74.1
103.7
123.3
142.4
151.5
160.6
169.7
178.8
187.9
197.0
213.9
222.3
220.1
158.0
145.9
133.8
121.6
109.0
85.8
52.1
56.8
112.6
157.8
192.5
216.6
230.2
233.8
237.4
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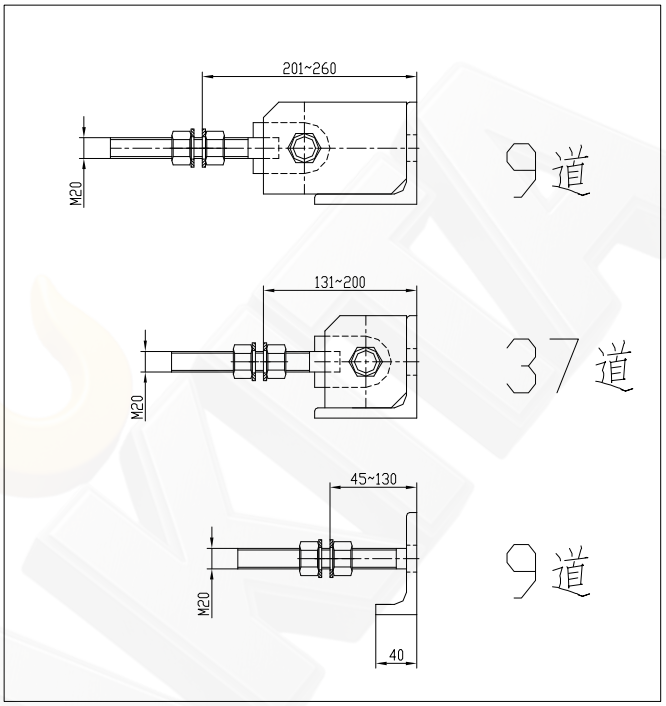
177.1


201~260
M20
9道
131~200
M20
37道
45~130
M20
40
9道

（8）安装到每一层时，应将相应的层站装好，以免意外发生。地面层站的安装：通过螺栓将围栏组成的框架联接在底架上。

While the heightening of guide rail arrives the servicing platforms, the landing must be fixed up in order to avoid accident. Connect guardrails with bolts as a pane. Fix the pane on the underbed.

（9）地面层站安装好后安装登机平台。

Install the boarding platform as base landing is fixed.

（10）其他层站的安装：安装方式和地面层站安装方式基本相同，通过螺栓将层门与支杆组成的框架用螺栓连接联接在升降机预留孔上或焊接上。

Installation of other landings is almost similar with the base landing. Connect a landing door and two trestles with bolts as a pane. Connect the pane to the hoist preformedhole with bolts or welding.

（11）当导轨架高度达到要求高度时，最后需将上限位碰块、上极限碰块及各停层碰块安装好，首先是安装上极限碰块，该碰块的安装位置应保证轿厢向上运行至极限开关碰到极限碰块而停止后，轿厢底高出最高层约 150～200mm，并且轿厢顶部安全越程不小于 1.0m。然后安装上限位碰块。上限位碰块的安装位置应保证轿厢向上运行至限位开关停止后，轿厢底与最高层平齐。各停层碰块的安装位置应保证轿厢运行至各层停止后，轿厢底与最高层平齐。

Fix top travel limit device, top final limit device and all landing limit devices when the heightening work is over. The position of top final limit device should meet the demand that when the device works, there is still a distance about 150 to 200mm between the servicing platform and the bottom of cage, and there is also a distance above 1.0m between the top of guide rail and the top of cage. The position of top travel limit device and the landing limit devices should meet the demand that when the cage stops, it is felicitous to land.

（12）限位碰块安装完后，应反复试验三次以校验其动作的准确性和可靠度。

Run the hoist three times after all limit devices are fixed already in order to make sure they can work precisely and reliably.

（13）将各层的机电联锁装置、控制电缆、通讯电缆、照明等电气设备接好。

Fix electro mechanical interlocking devices, control cables, communication cables and lightings of all landings.

（14）当所有安装工作结束后，应检查各紧固件有无松动，是否达到了规定的拧紧力矩，

然后进行载荷试验及轿厢坠落试验并将安全器正确复位。（见“安全器及其复位”）

Check all fastening pieces to make sure they are locked-in after all installation work. Then experiment load test and drop shutter test. Reset the safety device after drop shutter test. The specifics of reset can be consult in Part *4.5 Safety device*.

2.4 电缆滑车的安装/Installation of Cable Trolley

（1）将电缆的一端穿过滑车导轮，再穿过电缆臂与轿厢内的接线盒接好，另一端穿过电缆挑杆一接入下电箱内（接线时要确保供电电源是断开的），其余电缆在地面盘好。

Pull one side of the power cable through the guide wheel of cable trolley respectively and fixed it on cable arm, then connect then to the electrical connector. Pull the other side of the cable through the cable ram and connect it to bottom electricity box. Make sure the power is cut off during connecting cable. The polymerous cable must be put away properly on the ground.

（2）每隔约 6m 安装一套电缆护驾。

Fix cable guide every 6 meters.

（3）将电缆挑杆安装在整机高度一半以上的位置，调整电缆长度使电缆滑车运行至最低位置时距基础面还有一定距离，将接入下电箱一端的电缆沿标准节固定以防刮损。

Fix cable ram at an established position about more than half of the tatal height. Adjust the cable to fit the position of cable trolleys. Fix the cable from cable ram to bottom electricity box to mast sections.

（4）至此，电缆滑车系统安装完毕，开车慢速运行几次，确保电缆滑车工作可靠，电缆无刮损现象，最后润滑轨道。

Thus the installation of cable orientation system is completed. Run the hoist slowly for several times to make sure it works reliably and safety. Lubricate the guide rail.

第三部分　操作运行部分
Part 3 Operation

3.1 使用之前/Preparation I

登机升降机使用之前，需检查以下几个项目：

Before production use, check the items below.

（1）检查各螺栓紧固件有无松动现象，如有松动应及时拧紧各螺栓。

Check all the studs fasteners if they become flexible, fix them in time.

（2）检查升降机电气系统工作是否正常，各交流接触点吸合情况以及导线接头情况等。

Check the electrical system of hoist if it would work abnormally, check the alternating junction points and conductor joints.

（3）检查各种安全限位开关动作是否灵活，各限位碰块有无移位。

Check all the limit switches if they were not flexible, check the limit devices if they were moved.

（4）检查升降机轿厢运行通道上有无突出物，确保轿厢运行安全。

Check the running enterclose of hoist if there were some stumbling blocks, make sure the cage runs safety.

（5）检查各部位润滑情况，及时加注润滑脂（请参考升降机的润滑部分）。

Check the lubrication of every part, fill lubricating grease in time. The specifics of lubrication can be consult in Part *4.1Lubrication.*

（6）检查轿厢进出门开启是否灵活，检查各限位开关动作情况。

Check the cage door if it would open or close inflexible, check the switch motion of all related travel limit switches.

（7）检查各滚轮、背轮的调整间隙及齿轮与齿条的啮合间隙是否正常，如不符合要求应及时进行调整。

Check all the back lash of rollers, back wheels and gear rack if they were abnormal, adjust it in time.

（8）检查防坠安全器的动作是否可靠，这可通过轿厢坠落试验来完成。

Check the safety device if it don't act reliably, it can be done by a drop shutter test of the cage.

3.2 操作之前/ Preparation II

3.2.1 升降机操作之前，应进行以下工作：

Before operating, check the items below.

（1）认真阅读说明书。

Read the operating instruction in real earnest.

（2）检查下电箱的电源开关是否切断。

Check the power switch of bottom electricity box if it were not cut off.

（3）检查运转部分、轨道的使用和润滑状况。

Check the machinery, guide rail and the lubrication.

（4）检查齿轮、齿条的啮合间隙。

Check the back lash of gear rack.

（5）检查各限位开关、操作开关、急停按钮是否正常。

Check all the limit switches, console switches and jerk button.

3.2.2 升降机的操作，必须按以下操作规程进行：

The operation of hoist must obey the operation specifications below.

（1）操作者必须身体健康，无心脏病或高血压病。

The operator must be in good health, cardiopath and hypertensive are not allowed to work on hoist.

（2）操作者应受过专门培训。

The operator must be instructed specially.

（3）不可超载、偏载运行。

Overload or unbalance loading is not allowed.

（4）严禁酒后操作。

Strictly prohibit drunk operation.

（5）使用结束后，必须关掉电源开关，作好记录，并将登机门、电箱门等锁好。

When the operation is finished, the electrical power must be cut off. Lock the electricity box and the cage door. Record the operation.

3.3 升降机的操作/Operation

升降机操作面板共有 2 个位置：轿厢内面板和轿厢顶面板。

There are 2 operation panels of the hoist：the operation panel in cage and operation panel on cage top .

3.3.1 轿厢顶操作/Operating on cage top

轿厢顶、厢内与层站操作，轿厢顶操作具有优先权。在架设、安装和检修时，应在轿厢顶操作，将笼顶/笼内转换开关置于笼顶位置。扳动上升、下降按钮，升降机将上、下运行，松开扳把，升降机将停止运行。

Among operating on cage top, in cage and at landing, the priority belongs to operating on cage top. While erecting mast section, installing hoist or doing self-check, the operation must be on cage top. Pull the button “Top/Cage” on “Top” position, control the cage run up or down with the “Up/Down” button.

3.3.2 轿厢内操作/ Operating in cage

（1）升降机的操作面板设在轿厢内部，升降机运行前应先按下“启动/电铃”按钮，然后才能操作其他按钮。

The operation panel is set in the cage. Press “START/BELL” button before running. Then press other buttons to start the function you need.

（2）在正常使用时，按轿厢内操作面板上的 1~5 按钮，升降机自动运行到指定的停层处。

In normal use, press 1 to 5, the cage will get to the appointed landing.

（3）在自动平层不准或者平层碰快未安装时，按轿厢内操作面板上的“上升、下降”按钮，升降机运行，松开按钮，升降机止运行。遇到紧急情况时，按下“紧急停止”按钮，升降机将停止运行。

While if the landing limit devices work abnormally, press “UP/DOWN” button to control the cage. Press “EM.STOP” if there were an emergency, and the cage would stop.

（4）灯开关、风扇开关均设在操作面板上。

The control button of light and fan are set on the operation panel.

第四部分　维护保养部分

Part 4 Maintaining

（注：所有的维护保养工作必须在地面进行）

（**Attention：all maintaining work must be operated on ground**）

4.1 润滑/Lubrication

登机升降机润滑一览表/Lubrication of hoist

间隔 Frequency	润滑部位 lubricant housings	润滑剂 Type of lubricant	说明 Remarks
40 工作小时或三个月一次 40 working hours or 3 months	1.减速器 Gear Units		检查油位 Check the oil level
	2.齿条 rack	3#锂基润滑脂 3# lithium base grease	上润滑脂时降下升降机并停止使用 2-3 小时，使润滑脂凝结 Run down the cage while filling lubricant, then stop using hoist for 2~3 hours.
	3.安全器 Safety device	3#锂基润滑脂 3# lithium base grease	油咀加注 Fill with nozzle tip
40 工作小时或一年 1 次 40 working hours or 1 year	4.滚轮 Roller	3#锂基润滑脂 3# lithium base grease	油咀加注 Fill with nozzle tip
	5.背轮 Back wheel	3#锂基润滑脂 3# lithium base grease	油咀加注 Fill with nozzle tip
	6.门导轮 Door guide roller	20#齿轮油 20# gear compound	滴注 Instill
一年 1 次 1 year	7.电箱门铰链 Hinge of electricity box	20#齿轮油 20# gear compound	滴注 Instill

从产品出厂时，已应用了上述质量的润滑油，当然也可以使用品质相当润滑油。如减速器更换不同牌号的润滑油，第一次必须仔细清洗减速器内部。

The lubrication is already finished before the hoist leaving factory. The type of lubricant can be changed to other appropriate variety. If the type of lubricant of gear units is going to be changed for the first time, the inside part of gear units must be cleaned carefully.

4.2 维修与保养/Care and Maintenance

4.2.1 定期保养/Scheduled maintenance

升降机的正确保养，对于减少机器的故障发生率，延长机器的使用寿命至关重要。除进行日常保养外，还应按下面程序定期进行保养。

It is important to maintain hoist exactly. It is a pivotal to reduce breakdown and extend service life. Besides current maintenance, the scheduled maintenance must be taken as below.

间隔 Frequency	部件 Unit part	说明 Directions
40 工作小时或不论时间至少每月一次 Every 40 hours of operation or at least 1 month	1．防坠安全器 Safety device	如果安全器无故上档或运行时有异常响声，应停机检查，送交制造厂检查 Stop operating and check the device if it work abnormally or if there is an abnormal sound
	2．标牌 Brand	保证机器上所有标牌清晰、完整 Make sure the brand is clear and intact
	3．减速器 Gear units	检查润滑油有无泄漏，检查减速箱油位，必要时加注润滑油 Check the sealing element and oil level, add lubrication oil if necessary
	4．滚轮及背轮 Rollers and back wheels	保证所有螺栓联接紧固、无松动 Make sure all bolts are screwed
	5．驱动板 Drive bay	保证所有螺栓联接坚固、无松动 Make sure all bolts are screwed
	6．电气系统 Electrical system	检查各接线柱及接触器等联接有无松脱 Check cable connection and contactor
	7．电缆 Cable	检查电缆有无磨损或扭曲 Check if there is an attrition or warping
	8．齿条 Rack	齿面涂润滑脂 Lubricate it on the surface
100 工作小时--不论时间至少每年 6 次 Every 100 hours of operation or	9．标准节联接螺栓 Attachment bolt of mast section	检查有无松动现象，及时坚固 Check the flexible part, screw it in time
	10．附墙联接螺栓 Attachment bolt of tie-in	检查有无松动现象，及时坚固 Check the flexible part, screw it in time
	11．限位、极限开关及其碰块 Limit switch and device	检查开关动作是否灵活，各碰块是否移动位置 Check the flexibility ratio and position

at least 2 months	12．齿轮、齿条 Gear rack	按“磨损和调整极限”检查磨损量 Check the abrasion loss according to the demand of limitation
	13．润滑间隔 Lubrication	按润滑要求进行 Lubricate in accordance with demand
400 工作小时--不论时间至少一年 4 次 Every 400 hours of operation or at least 3 months	14．滚轮 Rollers	检查滚轮与立柱管的间隙及磨损量 Check the interval and abrasion loss
	15．安全装置 Safety device	按照坠落试验要求做坠落试验 Take drop shutter test according to the demand
	16．电机 Motor	参照“电动机“介绍部分 Consult *Maintenance of motor*
	17．腐蚀和磨损 Corrosion and attrition	检查整个设备，对于经常腐蚀的部位，必须采取相应的保护措施 Check the whole equipment and take corresponding protection

4.2.2 电机的维护/Maintenance of motor

4.2.2.1 升降机的电机维护周期如下/Inspection and maintenance intervals

注意：（1）只能根据现行零件清单使用原厂备件。

Use only genuine spare parts in accordance with the valid parts list!

（2）更换制动线圈时，制动控制装置要一起更换。

Always install a new brake control system at the same time as replacing the brake coil!

（3）电机在工作过程中温度可能会变得非常高：有烫伤的危险。

Motors can become very hot during operation danger of burns!

（4）紧固或者降低升降机驱动装置(有坠落的危险)。

Secure hoist drives or lower them(danger of falling).

（5）在开始维护电机和制动器之前，要先切断电源，并采取措施防止意外接通。

Isolate the motor and brake from the supply before starting work, safeguarding them against unintentional power-up!

设备/设备部件 Unit/Unit part	时间间隔 Frequency	应做些什么？ What to do?
制动器/Brake：	当用作工作制动器时： 至少每隔 3000 工作小时检查一次。 **If used as a working brake:** At least every 3000 hours of operation 当用作停机制动器时： 视负荷状况而定，每隔 2～4 年检查一次。 **If used as a holding brake:** Every 2 to 4 years, depending on operating conditions	**检查制动器/Inspect the brake:** a） 测量摩擦片厚度 b） Measure the brake disk thickness c） 摩擦片 d） Brake disk, lining e） 测量和调整工作气隙 f） Measure and set working air gap g） 压板 h） Pressure plate i） 花键套 / 啮合 j） Carrier/gearing k） 止推环 l） Pressure rings m） 吸除磨损粉尘 n） Extract the abraded matter o） 检查开关触点，需要时更换(例如当烧损时) p） Inspect the switch elements and change if necessary(e.g. in case of burn-out)
电机 Motor	每隔 10000 工作小时检查一次 Every 10,000 hours of operation	**检查电机/Inspect the motor：** a） 检查球轴承，需要时更换 b） Check ball bearings and change if necessary c） 更换轴密封圈 d） Change the oil seal e） 将散热空气通道清理干净 f） Clean the cooling air passages
配有逆止器的电机 Motor with backstop		更换逆止器的低粘度润滑脂 Change the low-viscosity grease in the backstop
测速发电机 Tacho-generator		根据操作手册进行检查/维护 Inspection/maintenance as described in the enclosed operating instructions
驱动装置 Drive	不同(取决于外部因素) Varies(depending on external fators)	修补或更换表面涂层 / 防锈涂层 Touch up or renew the surface/anticorrosion coating

4.2.2.2 电机和制动器维护之前的准备工作

Preliminary work for motor and brake maintenance

在开始维护电机和制动器之前，要先切断电源，并且采取措施防止意外接通。

Isolate the motor and brake from the power supply before starting work, safeguarding them against unintentional power-up!

4.2.3 减速器维修与保养/Inspection and maintenance of gear units

4.2.3.1 减速器的检查与维护周期/ Inspection and maintenance intervals

时间间隔/Frequency	应做些什么？/ What to do?
最长每 6 个月或者工作 3000 小时 Every 3000 machine hours, at least every 6 months	检测油以及油位 Check oil and oil level 检测油封处是否有泄漏 Check the seals visually for leakage 带扭矩臂的减速器：检测橡胶缓冲块，必要时进行更换 For gear units with a torque arm: Check the rubber buffer and change it, if necesssary
根据不同的工作条件，最长每三年。 根据油温决定 Depending on the operating conditions (see chart below), every 3 years at the least According to oil temperature	更换矿物油 Change mineral oil
	更换轴承润滑油脂（推荐） Replace anti-friction bearing grease (recommendation) 更换油封 Replace oil seal (do not install it in the same track)
根据不同的工作条件，最长每五年。 根据油温决定 Depending on the operating conditions (see chart below), every 5 years at the least According to oil temperature	更换人工合成油 Change synthetic oil
	更换轴承润滑油脂（推荐） Replace anti-friction bearing grease (recommendation) 更换油封 Replace oil seal (do not install it in the same track)
不定期检查（取决于外部环境因素） Varying (depending on external factors)	改善或者更换表面防护漆/防锈漆 Touch up or renew the surface/anticorrosion coating

4.2.3.2 减速器的检查与维护/Inspection and maintenance of the gear unit

不同的润滑油禁止相互混合使用!

Do not intermix synthetic lubricants and do not mix synthetic and mineral lubricants together!

标准润滑油为矿物油。

The standard lubricant is mineral oil.

油位检查/Checking the oil level

（1）切断减速电机的电源。防止触电！等待减速器冷却！

De-energize the gearmotor and secure it to prevent it from being switched on inadvertently!

Wait until the gear unit has cooled off –Danger of burns!

（2）对于配有油位螺塞的减速器：拧开油位螺塞，检查加油高度，必要时补充润滑油旋入油位螺塞。

For gear units with an oil level plug: Remove the oil level plug, check the fill level and correct it if necessary. Screw the oil level plug back in.

润滑油检查/Checking the oil

（1）切断减速电机的电源．防止触电！等待减速器冷却！

De-energize the gearmotor and secure it to prevent it from being switched on inadvertently !

Wait until the gear unit has cooled off-Danger of burns!

（2）拧开油位螺塞，取出一些油样。

Remove a little oil from the oil drain plug.

（3）检查润滑油的连续性：a.粘度；b.如果润滑油看上去被污染，则建议立即更换润滑油。

Check the oil consistency.

-Viscosity

-if you can see that the oil is heavily contaminated, we recommend that you change the oil even if this is outside the service intervals specified in “Inspection and maintenance periods”.

（4）对于配有油位螺塞的减速器：拧开油位螺塞，检查加油高度．必要时补充润滑油，旋入油位螺塞。

For gear units with an oil level plug: Remove the oil level plug, check the fill level and correct it if necessary. Screw the oil level plug back in.

更换润滑油/Changing the oil

请在减速器尚有工作余温时更换机油。

Only change the oil when the gear unit is at operating temperature.

切断减速电机的电源，防止触电！

De-energize the gearmotor and secure it to prevent it from being switched back on inadvertently!

等待减速器冷却！

Wait until the gear unit cools down-Danger of burns!

提示：减速器内润滑油必须仍然温热因为过冷的高粘度润滑油的流动性差，影响正常排放。

Note: The gear unit must still be warm otherwise the high viscosity of excessively cold oil will make it harder to drain the oil correctly.

带有放油螺塞以及油位螺塞/With oil drain plug / oil level screw

（1）将容器放在放油螺塞下方。

Place a container underneath the oil drain plug.

（2）去掉油位螺塞、减压阀、放油螺塞和其它螺塞。

Remove the oil level plug, breather plug/breather valve and oil drain plug .

（3）将润滑油排净。

Drain all the oil.

（4）旋入放油螺塞。

Screw in the oil drain plug.

（5）通过排气孔加入同类型的新润滑油。不允许混合使用不同的润滑油。

加油量根据安装方式而定或者根据铭牌上的标称加注。

检查润滑油是否加注到位。

Pour in new oil of the same type through the vent hole. Do not mix synthetic lubricants.

–Pour in the volume of oil in accordance with the mounting position or as specified on the nameplate.

-Check at the oil level plug.

（6）旋入油位螺塞。

Screw the oil level plug back in.

（7）旋入减压阀及其它螺塞。

Screw in the breather plug/breather valve.

油封的更换/Changing the oil seal

（1）切断减速电机的电源，防止触电！等待减速器冷却。

De-energize the gearmotor and secure it to prevent it from being switched on inadvertently!

Wait until the gear unit has cooled off –Danger of burns!

（2）在更换油封时要注意，确保油封的双唇之间有适量的润滑脂。

When changing the oil seal, ensure that there is a sufficient grease reservoir between the dust lip and protective lip, depending on the type of gear unit.

（3）若采用双油封形式，两油封之间的空间内须注入约占该空间 1/3 的油脂。

If you use double oil seals, the space has to be filled one-third with grease.

4.2.4 减速机的更换/Changing the gear unit

当吊笼在运行过程中减速机出现异常发热、漏油、梅花形弹性橡胶块损坏等情况而使机器运转出现振动或减速机由于吊笼撞底而使齿轮轴发生弯曲等故障时，须对减速机或其零部件进行更换，步骤如下：

（1）将轿厢落至底护栏用方木块垫稳。

（2）拆掉电动机线，松开电机制动器，拆下背轮。松开驱动板联接螺栓，将驱动板从驱动架上取下，置于轿厢顶部或地面。

（3）取下电机箍，松开减速器与驱动板间的联接螺栓，取下驱动单元。

（4）松开电动机与减速器之间的法兰盘联接螺栓，将减速器与电动机分开。

（5）将减速箱内剩余油放掉，取下减速器输入轴的半联轴器。

（6）新减速箱输入轴擦洗干净并涂油，装好半联轴器。注意：如联轴器装入时较紧，切勿用锤重击，以免损坏减速器。

（7）将新减速箱与电机联好（注意要正确装配橡胶缓冲块），拧好连接螺栓。

（8）将新驱动单元装在驱动板上，螺栓紧固，装好电机箍。

（9）安装驱动板，用 20Kgm 力矩拧紧驱动板联接螺栓，安装背轮，安装用 30Kg.m 力矩

拧紧背轮联接螺栓。

（10）重新调整好齿轮与齿条之间的啮合间隙，给电机重新接电。

（11）恢复电动机制动，接电试运行。

The reducer should be replaced when the hoist is vibrating because the reducer is overheating, oil leaking or nylon coupling broken. Procedure of reducer replacement as follows:

（1）Lower the cage to ground and put the wood at bottom of cage.

（2）Disconnect the cable of motor and release the brake, dismantle pinch roller. Unscrew bolts of driving board. Remove the board from driving frame and put it on ground or cage roof.

（3）Remove motor hoop, unscrew the bolts between reducer and driving board, then dismantle the driving unit.

（4）Unscrew the flange bolts between motor and reducer, then separate them.

（5）Drain the rest oil of reducer. Remove the half coupling of reducer input shaft.

（6）Clean shaft of the new reducer and lubricate it, install the half coupling. Caution: if the coupling is closed when installing, don't hit it by hammer.

（7）Connect new reducer with motor(notice: install rubber buffer correctly) then fasten the screw.

（8）Install the new driving plate on driving frame and fasten bolts, install motor hoop.

（9）Install driving plate, fasten the link bolt with moment of 200N.M, install pinch roller with moment of 300N.M.

（10）Readjust the clearance of rack and pinion. Give power to motor.

（11）Resume the motor brake and connect the cable of motor and brake

4.2.5 减速器驱动齿轮的更换/Changing the drive gear

当减速器驱动齿轮齿形磨损已达到极限时（参考“调整与磨损极限”）必须进行更换，方法如下：

When there is a form of gear tooth overproof attrition (See Table “Wear limit of drive gear”) of the driving gear, change it as follows.

（1）将轿厢降至地面并用木块垫稳。

Pull the arrester to lower the cage to ground, cushion the bottom with a wood brick.

（2）拆掉电机接线，松开电动机制动器，拆下背轮。然后松开驱动板联接螺栓，将驱动板从驱动架上取下，置于笼顶或地面。

Take the wiring down, pull the brake, take down the back wheel. Unscrew the attachment bolt of drive plate and put it away.

（3）拆下减速机驱动齿轮外的螺栓，拔出小齿轮。

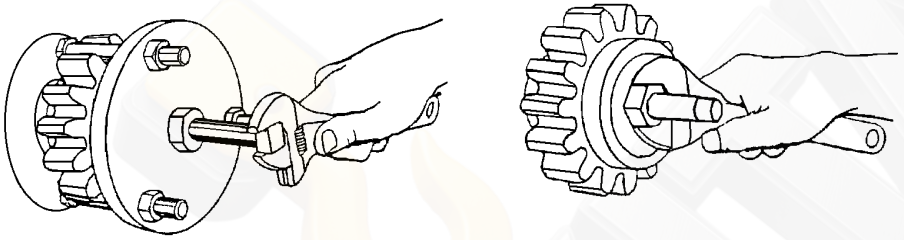
Unscrew the bolt of drive gear, take down the drive gear.

（4）将轴径表面擦洗干净并涂上黄油。

Clean the output shaft of gear units, coat it with grease.

（5）将新齿轮装到轴上，上好螺栓和垫片。更换齿轮方法见下图。

Fix a new gear on the output shaft, screw it with a bolt.



（6）将驱动板装回驱动架上，穿好联接螺栓（先不要拧紧）并安装好背轮。

Fix the drive plate back to the drive bay, fix the back wheel, put on the attachment bolts and don’t screw them momentarily.

（7）调整好齿轮啮合间隙。将背轮联接螺栓拧紧（拧紧力矩 30kgm）以及驱动板联接螺栓拧紧（拧紧力矩 20kgm）。

Adjust the back lash of gear rack. Screw the attachment bolt of back wheel with a tightening torque of 30kgm. Screw the attachment bolts of drive plate with a tightening torque of 20kgm.

（8）恢复电机制动并接好电机及制动器接线。

Recover the brake and connect the wiring renewedly.

（9）通电试运行。

Test run the hoist.

4.2.6 滚轮的更换/Changing the roller

当滚轮轴承损坏或滚轮磨损超差（参考“调整与磨损极限”）时必须更换。方法如下：

When there is a bearing failure or overproof attrition (See Table “Wear limit of roller”), change the roller or bearing as follows.

（1）将轿厢落至地面用木块垫稳。

Pull the arrester to lower the cage to ground, cushion the bottom with a wood brick.

（2）用扳手松开并取下滚轮联接螺栓，取下旧滚轮。

Unscrew the attachment bolt of the roller, take the worn roller off.

（3）装上新滚轮，调整好滚轮与导轨架立柱管之间的间隙，最后拧紧滚轮联接螺栓，拧紧力矩 20kgm。

Fix a new roller, adjust the interval between the roller and mast section. Screw the bolt with a tightening torque of 20kgm.

4.2.7 背轮的更换/Changing the back wheel

当背轮轴承损坏（型号 309）或背轮外圈磨损超差（参考“调整与磨损极限”）时，必须进行更换，方法如下：

When there is a bearing (type 309) failure or overproof attrition (See Table “Wear limit of back wheel”), change the back wheel or bearing as follows.

（1）将轿厢降至地面用木块垫稳。

Pull the arrester to lower the cage to ground, cushion the bottom with a wood brick.

（2）将背轮联接螺栓松开，取下旧背轮。

Unscrew the attachment bolt of the roller, take the worn back wheel off.

（3）重新装好新背轮并调整好齿条与齿轮的啮合间隙，拧紧背轮联接螺栓，拧紧力矩 30kgm。

Fix a new back wheel, adjust the interval between the back wheel and mast section. Screw the bolt with a tightening torque of 30kgm.

4.2.8 驱动单元的更换/Changing the driver element

当轿厢在运行过程中出现异常发热、漏油等情况而使机器运转出现振动或减速机由于轿厢撞底而使齿轮轴发生弯曲等故障时，须对驱动单元或其零部件进行更换，步骤如下：

When there is a unusual fever or oil leak and the motor is vibrating, or the gear shaft is bend because of the cage falling down, the driver element or its components and parts must be changed as follows.

（1）将轿厢落至底护栏用方木块垫稳。

Pull the arrester to lower the cage to ground, cushion the bottom with a wood brick.

（2）拆掉电动机线，松开电机制动器，拆下背轮。松开驱动板联接螺栓，将驱动板从驱动架上取下，置于轿厢顶部或地面。

Take the wiring down, pull the brake, take down the back wheel. Unscrew the attachment bolt

of drive plate and put it away.

（3）取下电机箍，松开减速器与驱动板间的联接螺栓，取下驱动单元。

Take down the motor hoop, unscrew the attachment bolts of gear units, take down the driver element.

（4）将新驱动单元装在驱动板上，螺栓紧固，装好电机箍。

Fix a new driver element on the drive plate, screw it with bolts, fix the motor hook.

（5）安装驱动板，用 20kgm 力矩拧紧驱动板联接螺栓，安装背轮，安装用 30kgm 力矩拧紧背轮联接螺栓。

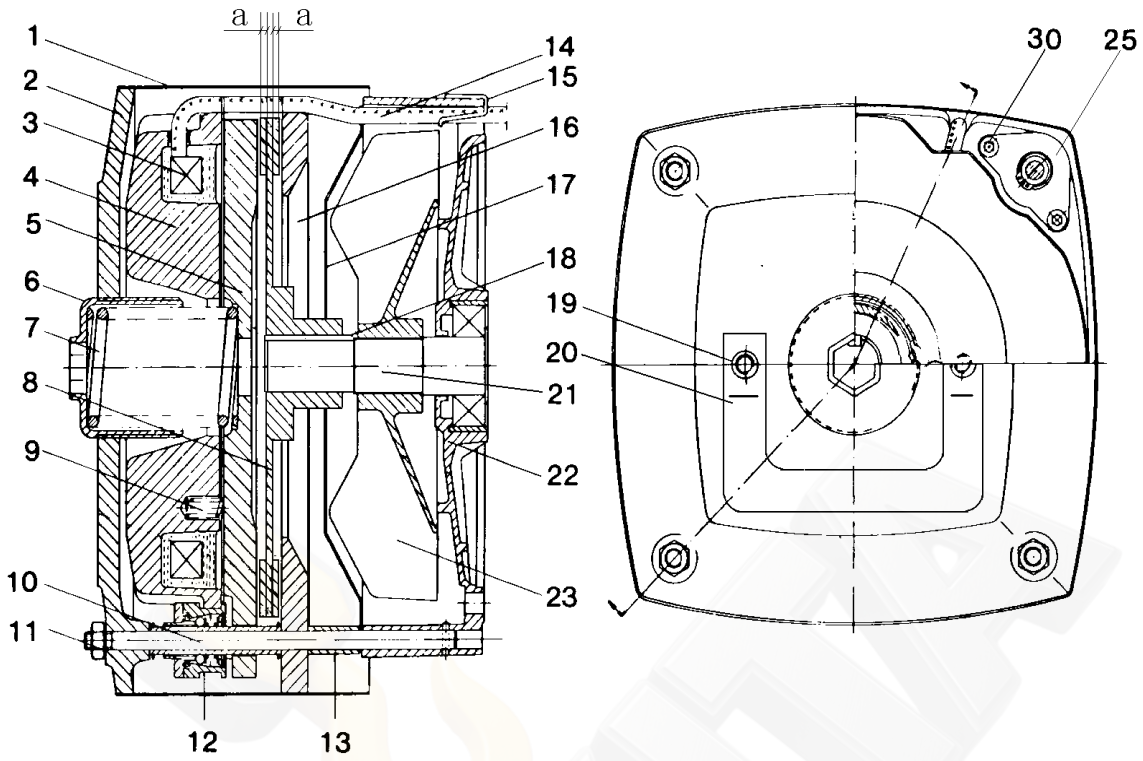
Fix the drive plate back to the drive bay, screw the attachment bolts with a tightening torque of 20kgm. Fix the back wheel, screw the attachment bolt with a tightening torque of 30kgm.

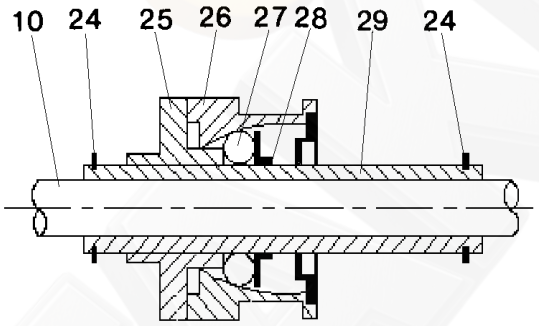
（6）重新调整好齿轮与齿条之间的啮合间隙，给电机重新接电。

Adjust the back lash of gear rack, connect the wiring renewedly.

（7）恢复电动机制动，接电试运行。

Recover the brake. Test run the hoist.





锥套总成

1.防护罩	2.端盖	3.电磁线圈	4.电磁铁座	5.电磁衔铁	6.调整套
7.制动弹簧	8.旋转制动盘	9.压缩弹簧	10.螺栓	11.螺母	12.锥套总成
13.隔套	14.线圈电缆	15.电缆夹	16 固定制动盘	17.风扇罩	18.键
19.制动螺栓	20 释放手柄	21.主轴	22.后罩	23.风扇	24.轴用挡圈
25.托架	26.锥套	27.滚珠	28.压簧	29.套管	30.螺母

1.Shield	2.End frame	3.Electromagnet coil	4.Electromagnet frame	5.Armature	6.Adjustable shaft sleeve
7.Brake spring	8.Turnable brake disc	9.Compressed spring	10.Bolts	11.Nut	12.Taper sleeve subassembly
13.Separate sleeve	14.Coil cable	15.Cable clamp	16.Fixed brake disc	17.Fan cover	18.Key
19.Brake bolt	20.Releasing handle	21.Main axis	22.Back cover	23.Fan	24.Spring collar
25.Bracket	26.Taper sleeve	27.Ball bearing	28.Compressed spring	29.Sleeve	30.Nut

4.2.9 制动盘的更换/Changing the brake disc

旋转制动盘（8）为易损件，当其磨损到磨擦材料单面厚度 a 接近 1mm 时，必须更换制动盘。步骤如下：

（1）卸下防护罩（1）和机械释放手柄（20），测定并记录调整套（ 6 ）的位置，以便更换制动盘后能保持原制动力矩。

（2）拆下调整套（6），取出制动弹簧（7），松开螺母（11），将端盖（2）取下。

（3）拆下电磁铁座（4）和衔铁（5），注意磨擦面向上放置，拆下旧制动盘，换上新盘。

（4）重新装入电磁铁座（4）和衔铁（5），并使衔铁靠近新的旋转制动盘（8）。

（5）把电磁铁座（4）和衔铁（5）装到固定螺栓（10）上，电缆凹槽要正对固定制动盘（16）上的凹槽；慢慢旋紧螺母（11），防止磁铁座和衔铁在螺栓上翘曲。

（6）装好端板（2），拧紧螺母（11），重新装好弹簧（7）和调整套（6），并旋紧到上述 1 步骤测定的位置。

（7）使制动器工作若干次，检查工作是否正常。

（8）最后装上防护罩（1）及释放手柄（20），注意（19）绝对不能拧紧。

注意：在投入正常使用前要对制动器进行多次试验，如制动器不能松闸，应检查：

—— 整流桥是否正常

—— 接触器是否正常

—— 测量线圈电压值（额定直流电压 195 伏），如线圈有故障，则需更换带线圈的电磁铁座。

Brake disc (8) must be replaced before distance between the armature (5) and turnable brake disc (8) is less than 1mm. with methods as follows:

（1）Remove the shield (1) and releasing handle (20), Measure and tag position of adjusting shaft sleeve (6), to ensure it mounted to original position after replacing pieces.

（2）Unscrew and remove adjusting shaft sleeve (6), pull out brake spring (7). Release nut(11) and remove the end frame (2).

（3）Unscrew Electromagnet frame(4) and armature(5), place the friction surface upwards, remove old brake and install anew one.

（4）Reinstall the Electromagnet frame(4) and armature(5), make the armature near to the turnable brake disc.

（5）Fix electromagnet frame (4) and armature(5) on fixing bolt(10),aim the cable fillister at

fillister of fixed brake disc(16). To prevent them warping on bolt fasten nut(11) slowly, install end frame(2) and fasten nut(11), reinstall spring(7) and adjustable sleeve(6) to original position according to step(1).

（6）Take the brake on trial for several times to ensure it in good condition.

（7）At last, install shield(1) and releasing handle (20). Caution: don't fasten nut (19).

Caution: before put the brake into normal use you should test it several times, if the brake can not release you should check follows:

The rectifier work well or not.

The contactor work well or not.

Measure the voltage of coil(rated DC is 195V), if the coil failure you mast replace electromagnet frame with coil.

4.2.10 磁铁座的更换/Changing the electromagnet frame

（1）拆下防护罩（1）和机械释放手柄（20），拆下电缆（14）和电缆夹（15），测定并记录好调整轴套（6）的位置，以便重装时复位。

（2）用六角扳手拆下轴套（6）和制动弹簧（7），拆下螺母（11），取下端盖（2）和磁铁座（4），并将磁铁座竖放。

（3）拆下螺钉（30），磁铁座工作面向上。

（4）拆下四个弹簧卡圈（24），取出衔铁（5），拆掉弹簧（9）。注意：切勿把套管（29）从锥套（26）中拉出。

（5）从磁铁座上取出止退器（包括件（25）、（26）、（27）、（28）、（29）），装入新磁铁座，小心别让套管拉出锥套。

（6）装好弹簧（9）。

（7）把衔铁（5）穿在套管上，使其凹槽对着线圈电缆（14）。

（8）装好弹簧卡圈（24）。

（9）把磁铁座压向衔铁（5），装上隔套（28）和螺钉（30）。

（10）确保磁铁座和衔铁间间隙均匀，尺寸为 1.6±0.1㎜。

（11）把磁铁座和衔铁装到固定螺栓（10）上，电缆凹槽要对正固定制动盘（16）上的凹槽。

（12）端盖（2）装到固定螺栓（10）上，慢慢拧紧螺母（11），防止磁铁座和衔铁在螺

栓上翘曲。

（13）装好制动弹簧（7）和调整套（6），按第 1 步骤记下的位置旋紧调整套（6）。

（14）接好线圈电缆（14），给制动器通电上闸几次，检查工作是否正常。

（15）装上防护罩（1）和释放手柄（20），注意（19）绝对不能拧紧。

（1）Remove the shield (1) and releasing handle (20), dismantle cable(14) and cable clamp(15). Measure and tag position of adjusting shaft sleeve (6), to ensure it mounted to original position after replacing pieces.

（2）Dismantle shaft sleeve (6) and brake spring (7) by hex wrench, unscrew nut(11), remove end frame (2) and electromagnet frame(4), put it upright.

（3）Dismantle screw (30), make working face of electromagnet frame upwards.

（4）Dismantle four spring collars (24) and pull out armature(5), dismantle spring (9). Caution: do not pull out sleeve (29) from tape sleeve(26).

（5）Pull out anti-withdraw device(conclude: (25)、(26)、(27)、(28)、(29)from electromagnet frame，then install new armature. Do not pull out sleeve.

（6）Install spring (9).

（7）Fix armature (5) on sleeve, make the flute right to coil cable (14).

（8）Install spring collar (24).

（9）Press electromagnetic frame to armature(5), install (28) and screw(30).

（10）Make sure that the clearance between electromagnetic frame and armature equality, and the dimension is 1.6±0.1mm.

（11）Fix electromagnet frame and armature on fixing bolt(10). Aim the cable fillister at fillister of fixed brake disc(16).

（12）Fix end frame(2) on fixing bolt (10)to prevent electromagnet frame and armature warping on bolt; fasten nut(11) slowly.

（13）Install brake spring(7) and adjustable sleeve(6) to original position according to step(1).

（14）Connect coil cable(14), Take the brake on trial for several times to ensure it in good condition.

（15）At last, install shield(1) and releasing handle (20). Caution: don’t fasten nut (19).

4.2.11 止退器的更换/Changing the stop-withdrawing device

（1）按“磁铁座的更换”中所述，拆下制动器。

（2）从需要更换的调节机构的盘上拆下螺钉。

（3）拆下弹簧卡簧（24）。

（4）将托架（25）压向锥套（26），松开套管。

（5）不要将套管拉出锥，将衔铁取下，径向取下调节机构。

（6）把新的自调机构装到磁铁座上，装好衔铁。

（7）按“磁铁座的更换”装上电磁铁和其它零件。

（1）Dismantle brake according to “replacement of electromagnetic frame” steps.

（2）Dismantle screw from adjustable device disc which need replace.

（3）Dismantle spring collar(24).

（4）Press bracket(25) to tape sleeve(26) then release sleeve.

（5）Remove armature, do not pull out sleeve from tape sleeve, remove adjustable device radially.

（6）Install new adjustable device on electromagnetic frame then install armature.

（7）Install electromagnetic iron and other parts according to “replacement of electromagnetic frame”.

4.2.12 安全器的更换/Changing the safety device

按照防坠安全器国家标准中关于安全器报废标准的规定，报废后新安全器的更换可按下面过程进行：

Change the discard as useless safety device according to the rule of *Building hoist-Pinion and cone progressive type safety device* as follow.

（1）拆下安全器下部开关罩，拆下微动开关接线。

Take down the switch cover of safety device. Take down the wiring of microswitch.

（2）松开安全器与驱动板之间的联接螺栓，取下安全器。

Unscrew the attachment bolts, take down the safety device.

（3）装上新安全器，用 20kgm 力矩拧紧联接螺栓，调整安全器齿轮与齿条之间的啮合间隙。

Fix a new safety device, screw the attachment bolts with a tightening torque of 30kgm. Adjust the back lash of gear rack.

（4）接好微动开关线，装好上开关罩。

Connect the wiring of microswitch. Fix the switch cover.

（5）按坠落实验说明进行坠落试验，检查安全器的制动情况。

Take a drop shutter test of cage according to the description of test. Check the condition of brake.

（6）按安全器复位说明进行复位。

Reset the safety device according to the description.

（7）润滑安全器。

Lubricate the safety device.

注意：拆装过程中勿用锤重击。

Note: Do not thump the safety device during dismounting.

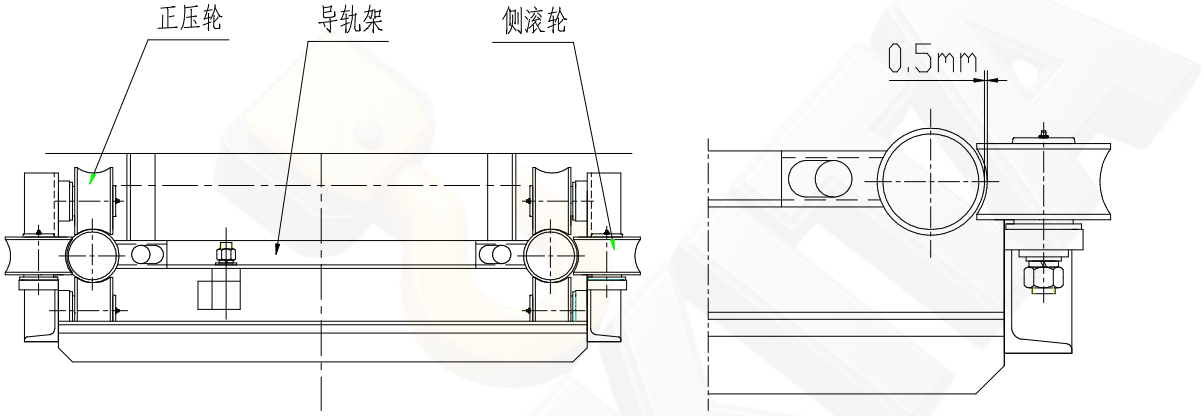
4.3 调整/Adjustment

4.3.1 侧滚轮的调整/Adjustment of side roller

要成对调整导轨架立柱管两侧的对应导向滚轮。转动滚轮的偏心使侧滚轮与导轨架立柱管之间的间隙为 0.5mm 左右，调整合适后用 20kgm 力矩将其联接螺栓紧固。

Adjust both sides of the side rollers. Turn the eccentric shaft to make the interval between the roller and mast section is about 0.5mm. Screw the attachment bolts with a tightening torque of 20kgm.

4.3.2 上下滚轮的调整/Adjustment of top and bottom rollers



松开上下滚轮联接螺栓，转动偏心轴，调整上下滚轮中心与标准节主弦杆相对位置，正压轮紧压主弦杆。将滚轮与标准节调整后用 25kgm 力矩将螺栓紧固。

上下滚轮应均匀受力，使驱动板上的减速箱齿轮和安全器齿轮同齿条啮合沿齿长方向不小于 50%。

Unscrew the attachment bolts of top and bottom rollers, turn the eccentric shaft to adjust the relative position between the rollers and mast section. The direct pinch roller must compress the mast section. Screw the attachment bolts with a tightening torque of 25kgm.

The top and bottom rollers must under balance stress. Make sure the gear of gear units and the gear of safety device is more than 50% superposition along the rack.

4.3.3 背轮的调整/Adjustment of back wheel

撬动驱动板背后的安全钩板，使背轮与齿条背脱离，转动背轮偏心套调整间隙，使驱动齿轮与齿条的啮合侧隙为 0.3～0.5mm，啮合接触面沿齿高不小于 40%，调整后用 30kgm 力矩将背轮螺栓紧固。

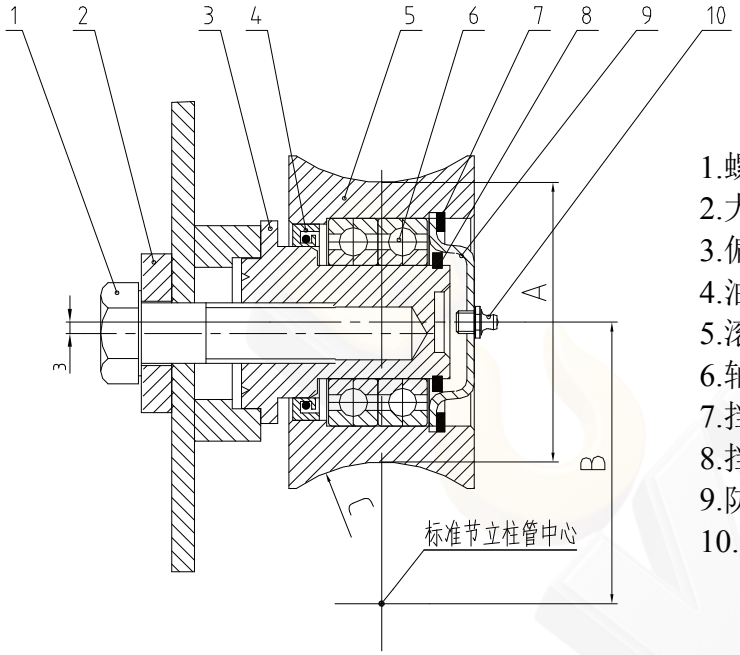
注意：背轮、滚轮的联接螺栓绝对不允许用普通螺栓代替。

Pry the safety hook on the back of drive plate so as to separate the back wheel from

rack back. Turn the eccentric bushing, adjust the mesh backlash of gear rack from 0.3 to 0.5mm and the field of conjugate action is more than 40% of tooth depth. Screw the attachment bolts with a tightening torque of 30kgm after adjustment.

Note: The attachment bolts of back wheels and rollers can not be replaced with commercial bolts.

4.3.4 滚轮的磨损极限（用游标卡尺测量）/Wear limit of roller (use a vernier caliper)



滚轮结构示意图
Structure diagram of roller

1.螺栓/Bolt M16×65
2.大垫圈/Big gasket
3.偏心轴/ Eccentric bushing
4.油封/ Grease seal PD40X52X7
5.滚轮/Roller
6.轴承/ Bearing 106
7.挡圈/ Check ring 55
8.挡圈/ Check ring 30
9.防尘盖/ Shield
10.油杯/ Grease cup M6

滚轮的磨损极限/Wear limit of roller

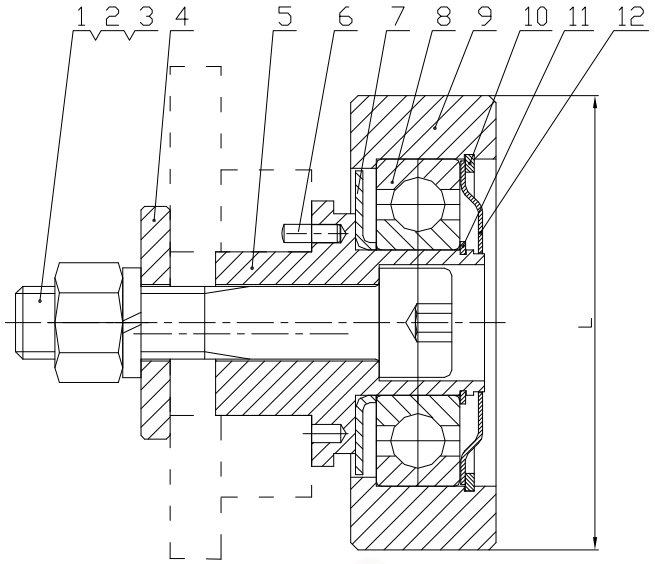
测量尺寸/ measurement	新滚轮/A new roller(mm)	磨损的滚轮/ Wear limit (mm)
A	Φ74	最小Φ72
B	75±3	最小 72
C	R40	最大 R42

4.3.5 背轮的磨损极限（用游标卡尺测量）

Wear limit of back wheel (use a vernier caliper)

背轮磨损极限/Wear limit of back wheel

新背轮外圈/ Housing washer L	Φ125mm
最大磨损背轮/Wear limit L	Φ120mm



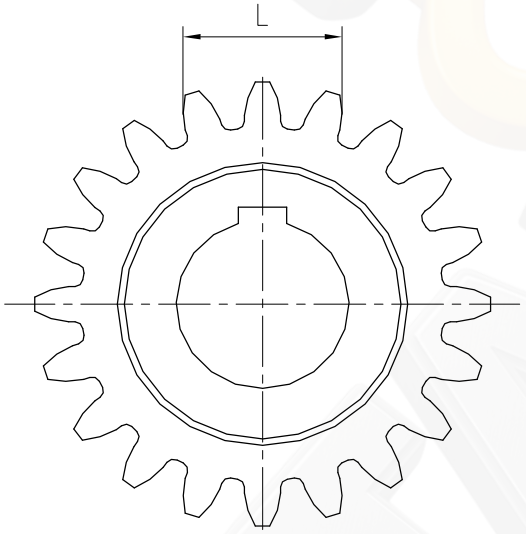
背轮结构示意图

Structure diagram of back wheel

1.螺母/Nut M20
2.螺栓/bolt M20×110
3.垫圈/ Gasket 20
4.大平垫/ Big gasket
5.偏心套/ Eccentric bushing
6. Φ5×15 弹性圆柱销/
Φ5×15elastic cylindrical pin
7.压板/ Platen
8.轴承/Bearing 6308
9.背轮/Back wheel
10.挡圈/ Check ring 90
11.挡圈/ Check ring 40
12.端盖/ Shell cover

4.3.6 驱动齿轮和安全器齿轮的磨损极限（跨测 3 齿，用游标卡尺测量）

Wear limit of driving gear and safety device gear (use a vernier caliper)



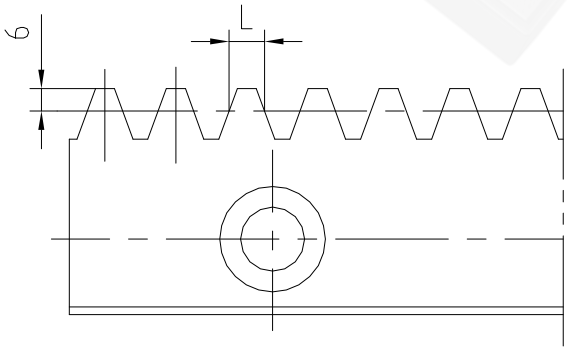
驱动齿轮与安全器齿轮的磨损极限

Wear limit of driving gear and safety device gear

新齿轮 **A new gear L**	45.9624mm
最大磨损齿轮 **Wear limit L**	44.1mm

4.3.7 齿条的磨损极限（用齿厚游标卡尺测量 L）

Wear limit of rack (use a gear tooth vernier caliper)



齿条磨损极限

Wear limit of rack

新齿条 **A new rack L**	9.425mm
最大磨损齿条 **Wear limit L**	8.7mm

4.4 坠落试验/Drop Shutter Test

凡新安装的升降机都应进行轿厢额定载荷的坠落试验，以后至少每三个月进行一次。升降机正常工作时，安全器自发制停或发出噪声，立即停止操作，并通知生产厂。

A drop shutter test should be taken after installation, and it should be taken every 3 months. If the safety device works abnormal or it is noisy during proper functioning, stop working and contact manufacturer.

坠落试验时，轿厢内不得载人，确认升降机各个部件无故障时方可进行：

Make sure nobody there is in the cage and no fault is in the hoist during the drop shutter test. Take the test as follow.

（1）断电源，将地面控制按钮盒的电线接入上电箱，理顺电缆，防止轿厢升降时卡断电缆。

Cut the power supply off, connect the control line to upper electricity box. Straighten out the cable so as to avoid JAM.

（2）在轿厢内装好额定载荷 350kg 后接通主开关，在地面操纵按钮盒，使轿厢上升约 10 米停止。

Put 350kg load in the cage. Set power on and control the hoist on ground. Run the cage to height 10m.

（3）按下“坠落”按钮并保持之，此时电机制动器松脱不起作用，轿厢呈自由状态下落，达到安全器动作速度时，轿厢将平稳地制停在导轨架上。注意：如果轿厢底部在距地面 4 米左右时，轿厢仍未被安全器制停，此时应立即松开“坠落”按钮，使电机恢复制动，以防轿厢撞底。

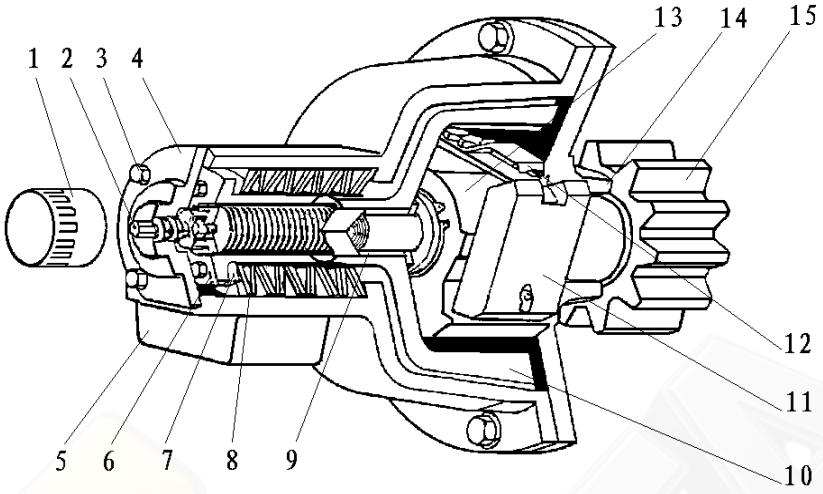
Press button “Drop” for a certain time. Then the brake will not work and the cage will be a freely-falling body. When the falling speed arrive a limit numerical value, the cage will stop. Note: If the height is only about 4m and the cage is still running down, disentwine the button “Drop” immediately. Recover the braking in order to avoid dashing against bottom.

（4）试启动轿厢向上不应动作，因为此时安全器微动开关已将控制电路切断，如仍然能够动作，则应重新调整微动开关。

Experimental start the cage run up, the hoist should not work. If it can still run up, adjust the micro switch.

4.5 防坠安全器/Safety Device

4.5.1 安全器结构/Structure of safety device



1.罩盖/Shroud； 2.顶浮螺钉/ Float screw； 3.螺钉/Screw； 4.后盖/ Rear cover；
5.开关罩/ Switch cover； 6.螺母/Nut； 7.防转开关压臂/Anti-rotation switch arm；
8.蝶形弹簧/ Belleville spring； 9.轴套/ Shaft sleeve； 10.旋转制动毂/Braking hub；
11.甩块/ Flail block； 12.定位簧片/ Location reed； 13.甩块座/ Flail block base；
14.轴套/ Shaft sleeve；15.齿轴/Tooth axle

4.5.2 工作原理/Working principle

SAJ3.0-1.2 安全器为单向作用渐进式安全器，其制动距离为 0.25～1.2m，轿厢以正常速度运行时，安全器随动，开关处于接通状态。顶浮螺栓旋紧，旋转制动毂与外毂间无压力，甩块处于收回状态。当作坠落试验或由于意外原因，升降机超速下降达标定速度时，甩块甩开，与旋转制动毂上的棘齿啮合，同时定位簧片使甩块保持张开状态，随升降机的继续下降，齿轴旋转带动旋转制动毂旋转，推开顶浮螺栓，两毂接触，螺母压缩碟簧，开关压臂使开关动作切断电源，轿厢随摩擦力增大制停。安全器动作后应按“安全器复位”说明进行复位。如安全器动作不可靠、误动作或有异常噪声，应立即停机与生产厂联系，此时升降机不能继续工作。注意：安全器一定要定期润滑。

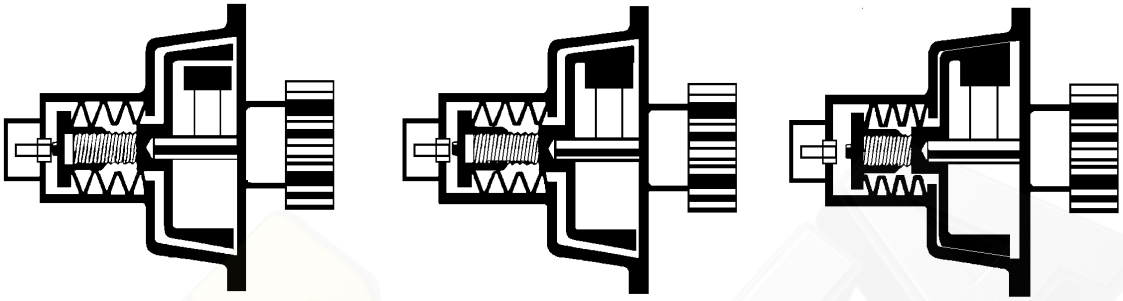
SAJ3.1-1.2 safety device is unidirection progressive. The braking length is 0.25 to 1.2 meters. When the cage is moving at normal speed, the safety device is follow-up, the switch is on-state. The float screw is screwed, the braking hub loads no pressure, and the flail block is in compression.

While the cage is overspeed falling because of a drop shutter test or an accident, the flail block will popping and mesh the ratchet of the braking hub. The float screw will be burst through and the

nut will compress the belleville spring. The anti-rotation switch arm will push the micro switch so as to cut off electric power, the cage will stop by the brake.

The safety device must be reset according to "*Reset of safety device*". If the safety device works abnormal, stop working and contact manufacturer.

Note: Lubricate the safety device termly.



安全器工作原理/ Working principle of safety device

4.5.3 安全器的复位/Reset of safety device

坠落试验后，应对防坠安全器进行复位。步骤如下：

Reset the safety device after drop shutter test as follow.

（1）旋出罩盖螺钉（1），拿掉罩盖（2），取下螺钉（3）。

Unscrew the bolts (1), take away the shroud (2), take away bolts (3).

（2）用复位工具（5）和手柄（4）旋出螺母 （7），直到销（6）的尾部和壳体端面平齐，此时微动开关应处于接通状态。

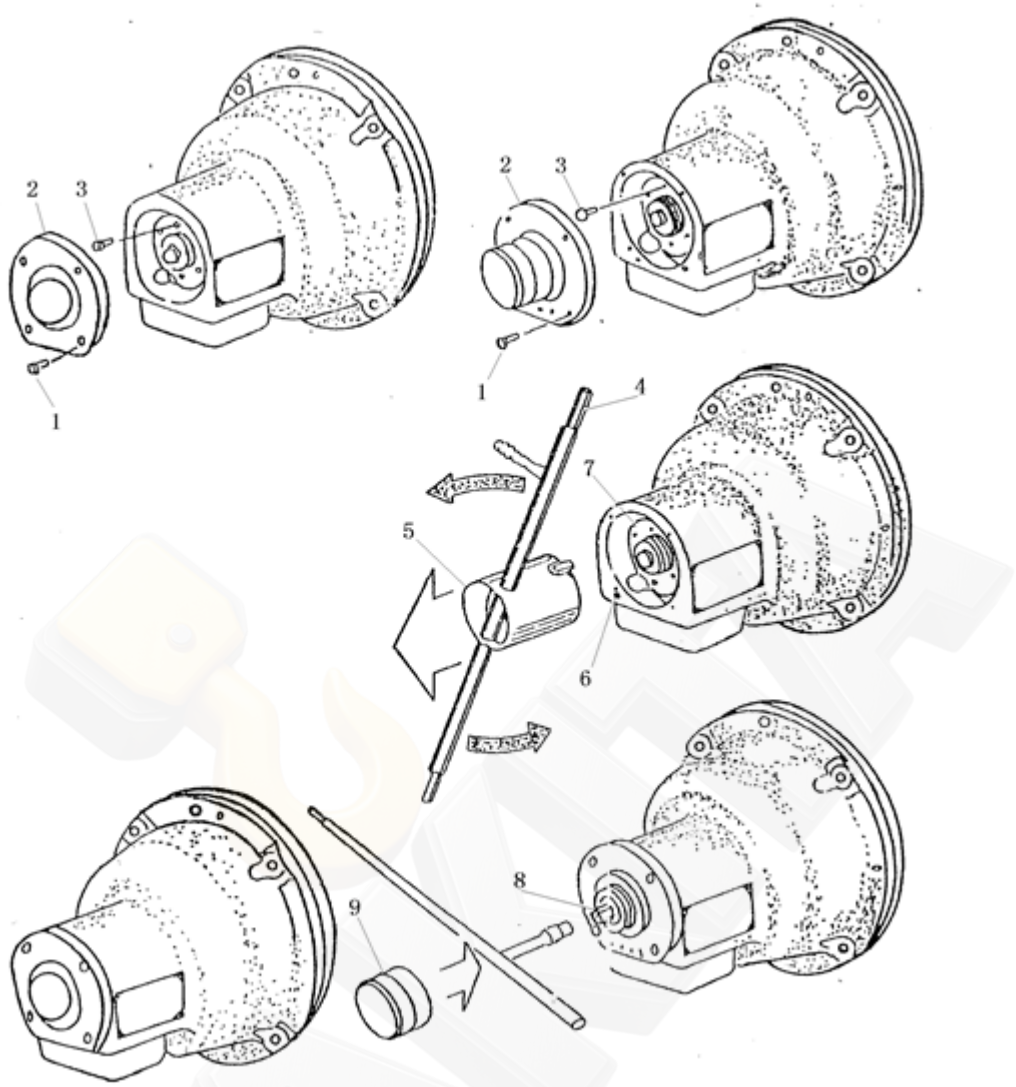
Unscrew the nut (7) with resetting tool (5) and hand shank (4) until the cylindrical pin (6) is parallel and level the shell end face. Right now the micro switch is on state.

（3）安装螺钉（3）和罩盖（2），取下罩盖（9），用手尽可能拧紧螺栓（8），然后用工具将螺栓（8）拧紧 30°，装好罩盖（9）。

Screw the bolts (3) and fix the shroud (2), take away shroud (9). Screw bolts (8) manually as far as possible, then screw it again about 30° with a tool. Fix the shroud (9).

（4）接通主电源后, 必须向上开动升降机约 200mm 以上，以使离心甩块与磨擦锥齿脱离，轿厢即可正常运行。

Switch on main power source and run up hoist about more than 200mm so as to separate the flail block from braking hub. The hoist will work normally.



安全器的复位/Reset of safety device

1.罩盖螺钉/Bolt；2.端盖/Shroud；3.螺钉/Bolt；

4.手柄/Hand shank；5.复位专用工具/Resetting tool；

6.销/Cylindrical pin；7.螺母/Nut；8.螺栓/Bolt；9.罩盖/Shroud

第五部分　故障处理部分
Part 5 Fault Treatment

常见故障与分析/Common fault and analysis

	故障现象/ Fault phenomenon	故障分析/Fault analysis
1	总电源开关合闸即跳 MCCB cannot switch on	电路内部损伤，短路或相线接地 Cable damaged, short circuit or phase terminals grounded
2	电源正常，但主接触器不吸合 The main electric power is normal but the contactor cannot be actuated	1.有限位开关没复位/Limit switch is not reset 2.相序接错/ Phases relay not actuated 3.元件损坏或线路开路断路/ Component broken or open circuit
3	操作按钮置于上下运行位置，但接触器无动作 Operating button id on position but contactor don’t work	1.上下限位不通/Top or bottom limit switch is actuated 2.操作按钮线路断路/Circuit of operation button is not connect well
4	电机启动困难，并有异常响声 Electric motor start difficultly with no abnormal noise	1.制动器没有打开/Brake cannot work 2.严重超载/Overload 3.电机缺相/One motor reverse
5	上下运行时限位开关不起作用，但极限开关起作用 Travel limit switch don’t work but final limit switch works	1.上下限位开关损坏/Travel limit device broken 2.限位碰块移位/Travel limit device is not on position 3.接触器粘接/Contactor is faulted
6	交流接触器释放时有延时现象 A.C.contator release backward	接触器复位受阻或粘连/Contactor is suffocated or faulted
7	电路正常，但操作时有时动作正常，有时不正常 Circuit is normal, but operating is abnormal now and then	有线路接触不好或虚接/Circuitry connection is Loosened
8	轿厢不能起动，电动机堵转 Cage cannot start run	1.制动器未打开/ Brake is not synchronized 2.超载、供电电压低于 400 伏或供电阻抗过大/Overload, power supply voltage under 400V or impedance oversize

9	轿厢上下运行时有自停现象 The cage stops suddenly	1.超载运行,热继电器动作/Thermal relays actuated due to overload 2.线路接触不良/Circuitry connection is loosened 3.轿厢门未关好,门限位开关接触不好/The door is not closed or door limit switch loose contact
10	传动机构温升过大 Transmission mechanism is too hot	1. 润滑油不足或变质/Lubricating oil short or bad 2. 轿厢运行时有异常阻力/Unusual resistance exist
11	正常运行时安全器动作 Safety device works during normal operation	1.标定速度太低/Demarcate speed is too low 2.离心甩块弹簧松脱/ Flail block spring fetched way
12	电机制动器不脱开 Brake cannot work	1.升、降接触器辅助触点损坏/ Assistant contact point of Up or down contactor is damaged. 2.制动器线圈损坏/Brake coil damages 3.整流桥损坏/ Rectifier damages
13	轿厢运行时有抖动现象 Shake exist in working	1.齿轮啮合侧隙太小或太大/Interval between pinion and rack is big or small. 2.滚轮间隙过小或过大/Interval of roller is big or small.

第六部分　电气部分

Part 6 Electric

电气控制系统采用目前国际上最先进的微电脑可编程序控制器(PLC)。使用可编程序控制器控制，提高了控制系统智能化程度，可靠性和准确性。

The electrical control system of SC35 chimney hoist is the most advanced PLC. The PLC improves the intelligence, the reliability and the veracity of control system.

6.1 供电电源/Power Supply

现场供电电源系统要求供：三相五线制供电.3phases +N+E

供电电源容量：≥36KVA

供电电源电压 P： 400V±10%

供电电源频率：50Hz±2%

工作电流： 23.2.A

启动电流： 79A

主电源电缆型号：3X10.0+2X6.0mm^2

Power supply：3phases +N+E

Power capacity：≥36KVA

Power Voltage: 400V±10%

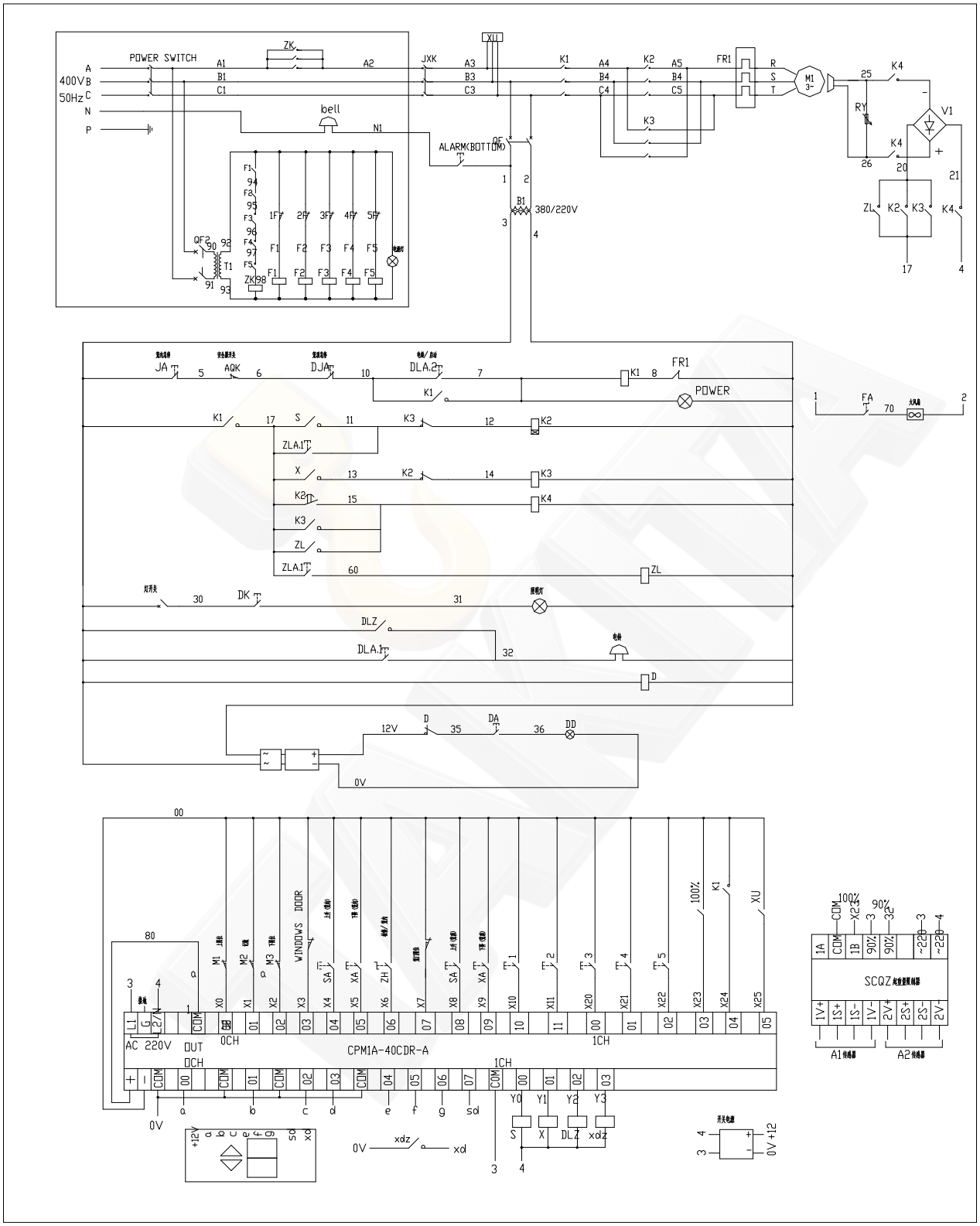
Power frequency: 50Hz±2%

Current cont. duty: 23.2.A

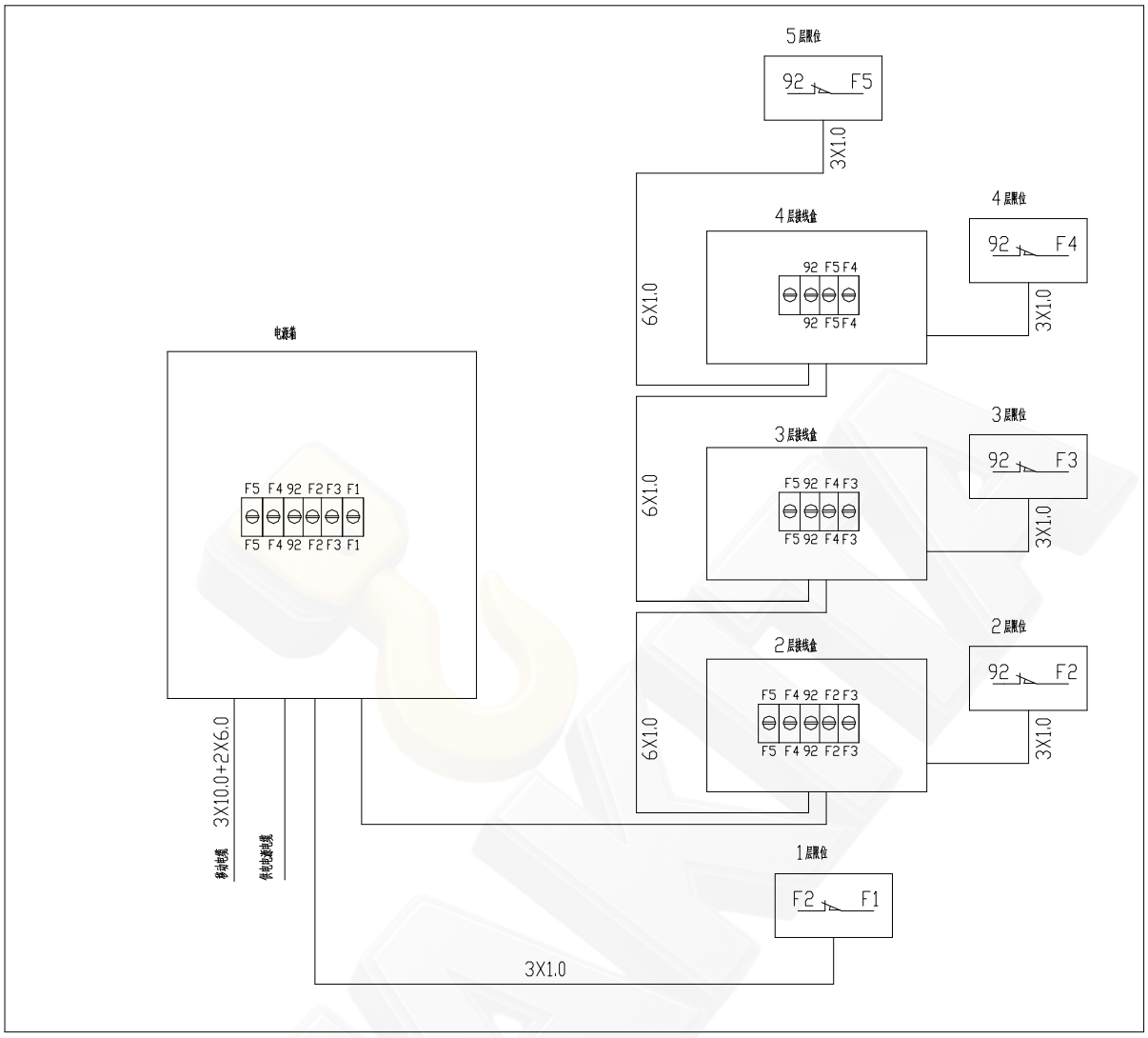
Starting current : 79A

Power cable model:3×10.0+2×6.0 sq.mm

6.2 电气原理图/Electrical Principal Diagram



6.3 层站、电源箱和中间电箱接线图/Wiring Diagram of Landings, Power Box and Middle Electricity Box



6.4 维护/Electric Maintaining

电气控制系统需作日常与定期维护检查，以使升降机运行更稳定安全。 做维护保养检查时，请务必切断交流电源供应。

The maintenance routine of electrical control system must be taken in order to make the hoist run steadily. The alternating current power supply must be cut off before maintenance.

1）控制电箱温度在-10～45℃之间，湿度在 90%RH 以下。确认控制电箱内通风是否良好。冷却风扇有无异常震动，声音，是否有灰尘杂屑堆积。一经发现更换冷却风扇，清除杂物。

The temperature of control box is between -10℃and 45℃,and the humidity is below 90%RH. Make sure it is ventilated inside the control box. Clean the cooling fan if there is cumulate dust in it. Change the cooling fan if there is unusual shake or noise in it.

2）多雨季节，要经常检查控制电箱的防水情况，一经发现漏水，立即处理。

Check the control box during rainy season to inspect if there is water in it. Get rid of the leakage as soon as possible.

3）PLC 的接地线是否松动，接地良好。定期拧紧所有电气接线端子，尤其应定期拧紧极限开关、电机、电阻箱内的接线端子。

Check the earth wire of PLC. Screw down all the binding posts at regular intervals, especially the limit switches, motor and resistance box.

4）避免尘埃、铁粉、腐蚀性、可燃性气体和盐分的接触，避免阳光直接照射。如无法避免要定时清扫电路板及散热器上的灰尘。

Avoid come into contact with the dust, iron powder, causticity gas, combustible gas, salinity and insolation. Clean the dust at regular intervals if it is unavoidable.

6.5 安全方面的注意事项/Matters Need Attention

1）请勿使用 PLC 的+24V 端子从外部供给电源，空端子从外部布线。

Do not use the +24V terminal to connect the power source. The empty terminal must be wiringed outside.

2）遇紧急情况按操作盒上的红色急停按钮。

Press the scram button while there is an accident.

3）升降机停止使用时，切断电源箱的空气开关。极限开关仅在紧急情况下断开总电源。非紧急情况下严禁操作极限开关。

Cut off the air switch when the hoist is out of use. The final limit switch must be only work when there is an accident.

4）由于电气控制系统是高技术产品，操作人员必须进行上岗培训，有故障必须由专业技术人员排除。非专业人员请勿修改可编程控制器的程序。

The electrical control system is a high-tech product. The operating personnel must be trained. The problem must be get rid of by professional. Laypeople must not recompose the procedure.

6.6 常见故障及分析和排除/Common Malfunctions and Troubleshooting

可编程序控制器具有状态监控及显示功能，从控制器的指示灯能读出升降机的运行状态。

The electrical control system is composed with PLC. While there is a stoppage, there wiil be a reason display on the LCD. The PLC can monitoring and display the running status of hoist.

可编程序控制器 CPM1A-30CDR。

1）主机指示灯/ Indicator light

LED	内容/Items	运行状态/Running status
POWER	亮/On	通电状态/On position
RUN	亮/On	运行模式/Running mode
COMM	亮、闪烁/On, twinkling	通讯故障，程序错误/ communication fault

2）输入输出点状态显示及故障排除/ Status display and trouble removal

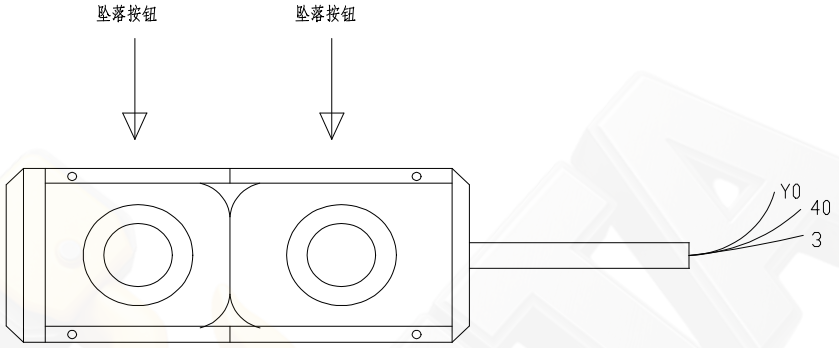
LED（灯）	内容/Items	运行状态/Running status
输入 0CH00（灯亮） Input 0CH00 (on)	上限位开关动作 Top december switch act	升降机不能向上运行 Cannot run up
输入 0CH01（灯亮） Input 0CH01 (on)	停层开关动作 Landing switch act	在自动状态时，停止在指定的楼层，自动记数用 Stop at landing
输入 0CH02（灯亮） Input 0CH02 (on)	下限位开关动作 Bottom december switch act	升降机不能向下运行 Cannot run down
输入 0CH03（灯亮） Input 0CH03 (on)	1～5 层站限位开关继电器都动作 1~5 landings relay act	说明 1～5 层站的门都已经关闭，升降机可以运行 Landing door closed, hoist can move
输入 0CH04（灯亮） Input 0CH04(on)	轿厢内面板“上升”按钮按下 Up contactor	向上点动运行 Move up
输入 0CH05（灯亮） Input 0CH05 (on)	轿厢内面板“DOWN”按钮按下 Down contactor	向下点动运行 Move down

输入 0CH06（灯亮） Input 0CH06 (on)	“笼内/检修”开关置于“检修”位置 “check/ normal ” at check	只能在笼顶处于操作有效 Can control on cage top
输入 0CH07（灯亮） Input 0CH07(on)	轿厢门限位开关、天窗门限位开关动作 Cage door, skylight door limit swith work	轿厢门和天窗门关闭，轿厢才能运行 Close the doors, hoist can move
输入 0CH08（灯亮） Input 0CH08 (on)	轿厢顶面板“上升”按钮按下 Up button at top act	向上点动运行 Move up
输入 0CH09（灯亮） Input 0CH09 (on)	轿厢顶面板“下降”按钮按下 Down button at top act	向下点动运行 Move down
输入 0CH10（灯灭） Input 0CH10 (on)	轿箱内面板上“一”按钮动作 Button 1 inside cage act	在“笼内/检修”开关置于“笼内”位置，轿箱停在第二、三、四、五层站时，将自动运行到第一层站 At "in cage" position, move to landing 1
输入 0CH11（灯亮） Input 0CH11 (on)	轿箱内面板上“二”按钮动作 Button 2 inside cage act	在“笼内/检修”开关置于“笼内”位置，轿箱停在第一、三、四、五层站时，将自动运行到第二层站 At "in cage" position, move to landing 2
输入 1CH00（灯亮） Input 1CH00 (on)	轿箱内面板上“三”按钮动作 Button 3 inside cage act	在“笼内/检修”开关置于“笼内”位置，轿箱停在第一、二、四、五层站时，将自动运行到第三层站 At "in cage" position, move to landing 3
输入 1CH01（灯亮） Input 1CH01 (on)	轿箱内面板上“四”按钮动作 Button 4 inside cage act	在“笼内/检修”开关置于“笼内”位置，轿箱停在第一、二、三、五层站时，将自动运行到第四层站 At "in cage" position, move to landing 4
输入 1CH02（灯亮） Input 1CH02 (on)	轿箱内面板上“五”按钮动作 Button 5 inside cage act	在“笼内/检修”开关置于“笼内”位置，轿箱停在第一、二、三、四层站时，将自动运行到第五层站 At "in cage" position, move to landing 5
输入 1CH03（灯亮） Input 1CH03 (on)	110%超载限制器报警动作 110% load alarm	轿厢不能运行，并且声音报警 Hoist cannot move, audible alarm
输入 1CH04（灯亮） Input 1CH04 (on)	80%载重量输出 800% load output	
输入 1CH05（灯亮） Input 1CH05 (on)	50%载重量输出 50% load output	
输出 0CH00~07（灯亮） Output 0CH00~07 (on)	数字显示层站输出 Digital display landing output	数字显示轿厢的位置 Digital display cage location
输出 1CH00（灯亮） Output 1CH00 (on)	“S”小继电器吸合 S small relay work	轿厢向上运行 Hoist move up
输出 1CH01（灯亮）	“X”小继电器吸合	轿厢向下运行

Output1CH01 (on)	X small relay work	Hoist move down
输出 1CH01（灯亮） Output 1CH02 (on)	超载传感器动作时报警 Overload Test Sensor alarm	超载，不能运行 Overload, cannot move

6.7 坠落实验/Drop Shutter Test

顶
行



安全器的复位:拆下坠落试验盒的接线，将安全器复位，直到控制电箱内的主接触器吸合，说明安全器微动开关复位，在轿厢顶转换开关置于笼顶位置，上行 500 ㎜，安全器复位成功。

Load 350kg weight counterbalance in the cage. Switch on the drop shutter test control handle. Select the control position to on the top of cage. Control the handle and run up the cage to 10m height. Press “DROP” button. Then the brake will open, and the cage will be a freely-falling body. When it arrives the rated speed, the safety device will brake the cage, and the cage will stop running down.

Reset of safety device: Cut off the connection of control handle. Reset the safety device till the master contactor in the electricity control box can work. Run up the cage for 500mm. then the reset is succeed.

6.8 电气元件明细表/Detailed Statement of Electrical Element

Code	Name	Type	Qty.	Mark
EL	ceiling lamp		1	220V 60W
FR1、FR2	thermorelay	3UA59 00-2D	3	20-32A
H1	signal lamp		1	～220V
JXD	Phase protection relay	380V	1	
K1、K2、K3、K4	a.c. contactor	LC1-D65	4	～220V
K5	a.c. contactor	LC1-D09	1	～220V
LD	bell	UC-75	1	～220V
M1、M2	motor	YZEJ132M-4	2	11/13KW 23.2A
QF1	RCD	DZ158L1-100A	1	100A
QF2	small circuit breaker	C45N C3 1P	1	
QF3、QF4	small circuit breaker	C45AD D3 2P	2	
	Final limit switch	QS5-100P/4T	1	100A
QS2	button	PBC-A1W10	1	light
	PLC	CPM1A-30CDR		
F1、F2、F3、F4、F5、MK1、MK2、MK3、MK4、MK5、HK1、HK2、HK3、HK4、HK5、S、X、JL	intermediate relay	H52P	18	
	botton	DZ47-60 D3	1	E.M.stop
	Time relay	SK4-320P	1	
	Duplex button box	COB-601	1	Drop test
	button	ZB2-BA4C+ZB2-BZ102C	9	top
	E.M.stop	ZB2-BS54C+ZB2-BZ102C	7	
	button	ZB2-BD2C+ZB2-BZ101C	1	check/ normal
	Cage door limit switch	LXK3-20S/T	3	
	Top door limit switch	LXK3-20S/T	1	
	Landing door limit switch	LXK3-20S/T	1	
M1、M2、M3	Limit switch	LXK3-20S/T	2	Up, down
	Microswitch	LXW5-11Q1	1	Safety device
T1	control transformer	JBK1-100C	1	380V/220V
B1	control transformer	JBK1-400C	1	380V/220V
V1	rectifier bridge		1	1600V/35A

第七部分　超载保护器的安装

Part 7 Installation of overload device

引言 Introducion

施工升降机国家标准 GB/T10054-2005 节 5.2.9.1 中规定：

超载检测应在吊笼静止时进行，超载保护装置应在载荷达到额定载重量的 90%时给出清晰的报警信号，并在载荷达到额定载荷的 110%前中止吊笼起动（对于货用施工升降机可以不设报警功能）

In builder's hoist national standard GB/T10054-2005, segment 5.2.9.1 provides:

Overload detection should be proceed when the cage is still, the overload protective device should give off clear alarm sign when the load comes to 90% rated load, and the cage should stop starting before the load comes to 110% rated load(Needn't set alarm function for material hoist).

SCQZ-1 施工升降机起重量限制器的功能：4 种重量继电器输出点，110%额定重量输出，90%额定重量输出，50%额定重量输出，20%额定重量输出，(额定重量可以在面板上设定)。90%额定重量声音报警。防超载称重保护器由控制器和两个称重传感器组成。控制器采用高性能的 AVR 单片机控制，16 位 A/D 转换器，采用光电隔离的脉冲输出重量数值，继电器触点输出超载信号，90%重量时声音报警和继电器触点输出。

The function of SCQZ-1 builder's hoist weight limitator is as follows: 4 kinds weight relay output point, 110% rated load output, 90% rated load output, 50% rated load output, 20% rated load output, (the rated load can set on panel) 90% rated load sound alarm. Overload limitator consists of controller and two weighting sensors. The controller adopt high performance AVR single chip processor and 16 bit A/D convertor, and adopt photoelectric isolation pulse output weight values. The relay touch spot outputs overload signal, when reach the 90% rated load, audible alarm and output touch spot action.

7.1 工作原理/Work principle

SCQZ-1 施工升降机起重量限制器，与施工升降机专用称重传感器配合使用。

专用称重传感器在弹性范围内，物体的变形和所受到的外力成正比。贴在物体上并组成平衡电桥的电阻应变片在物体受到外力时变形，自身阻值改变，电桥因此失去平衡输出和外力成正比的微弱电压信号。将此信号放大,并经过模拟量到数字量的 AD 转换送给微处理器 CPU，CPU 与事先设定好的数值比较，从而获得所需的各种信号（满载报警，超载信号）。

起重量限制器同时输出与载荷相等的脉冲。这种脉冲信号将起重量提供给其它电子设备控制用。

SCQZ-1 builder's hoist weight fits to use with hoist's special weight sensor.

The deformation of the special weight sensor is in proportion to its bearable forces in elastic range. Resistance that resistance strain gage is sticked to part and formed balance bridge changes because of its force's deformation, so the bridge loses weak volume sign in proportion to the efforts. Magnify the sign, send CPU by AD transition from analog quantity to digital quantity, the CPU compare with preset value, thus gain various kinds sign(fully loaded alarm, overload sign)

7.2 功能及特点/Function and feature

- 该装置采用数字显示，实时显示载荷的重量，直接显示载荷的千克数（Kg）数. 直观明了
- 采用微机智能控制，简便易学。所有调整操作通过按键和菜单操作完成，无需人工调节电路板上的元器件参数。
- 手动清 0 功能，现场调试简单。
- 满载报警值和超载载荷值可根据实际情况通过菜单操作，随意设置，灵活方便。同时输出与载荷相等的脉冲
- 自带超载报警蜂鸣器, 当载荷超过满载设定值时, 蜂鸣器间断鸣叫, 当载荷超过超载设定值时，蜂鸣器一直鸣叫. 以提示升降机操作人员注意已经超载.
- 具有辅助故障诊断功能, 通过菜单 7 的调试功能进行调试和故障判断.
- Realtime display load value (Kg) by digital display, simple and clear.
- Easy to study by microcomputer intelligent control. All adjustment is finished by button and menu, need't adjust compoment parameter on PCB.
- Manual reset, simply debug on-site.
- Set fully load alarm value and overload value by menu according to actual situation, flexible and convenient, at the same time, output impulse equal to the load.
- Install overload alarm buzzle. When the load exceeds the fully load value the buzzle tweet discontinuity, when the load exceeds the overload value the buzzle always tweet, so that warn hoist's operator.
- Auxiliary fault diagnosis functions, proceed to debug and fault diagnosis by menu 7

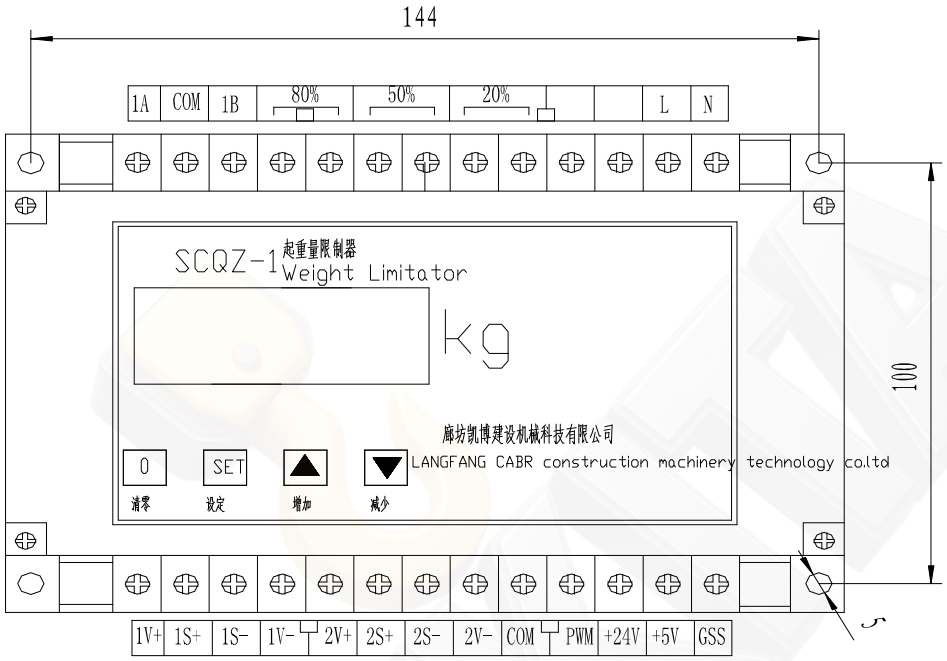
7.3 技术参数/Technical parameter

- 电源电压：AC 220V 50～60HZ（ 电压允许波动范围-10%～+10 ）
- 继电器开关量输出负载能力 :220V 10A
- 输出的脉冲：DC24V，与内部电路通过光耦隔离。
- SCQZ-1 限制器外型尺寸：长×宽×高=110×155×65 (单位:mm)
- Supply voltage: AC 220V 50～60HZ(Allow range: -10%～+10)

- Output load capacity of relay switching value: 220V 10A
- Output impulse: DC24V, insulate with internal circuit by optocoupler
- Dimension of SCQZ-1 limitator: L×W×H=110×155×65(Unit: mm)

起重量限制器尺寸及安装图 Dimension and installation drawing

（一）固定安装尺寸/Fixed installing dimension

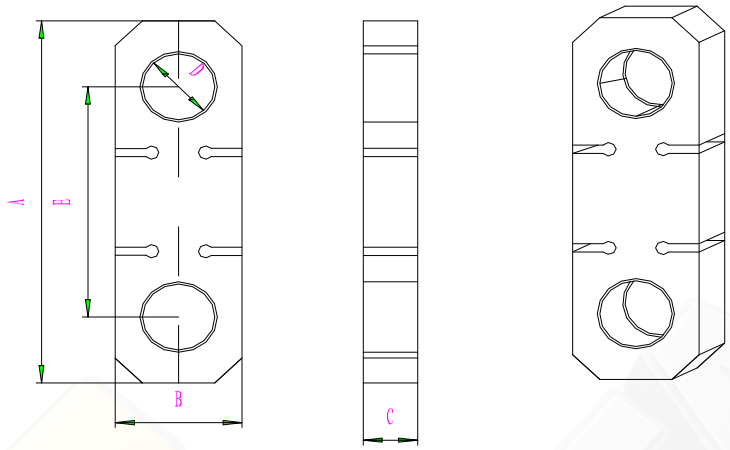


（二）可以用 35MM 的卡轨安装。Install with 35mm trapped rail.

7.4 系统组成及安装方法/Composition and installation

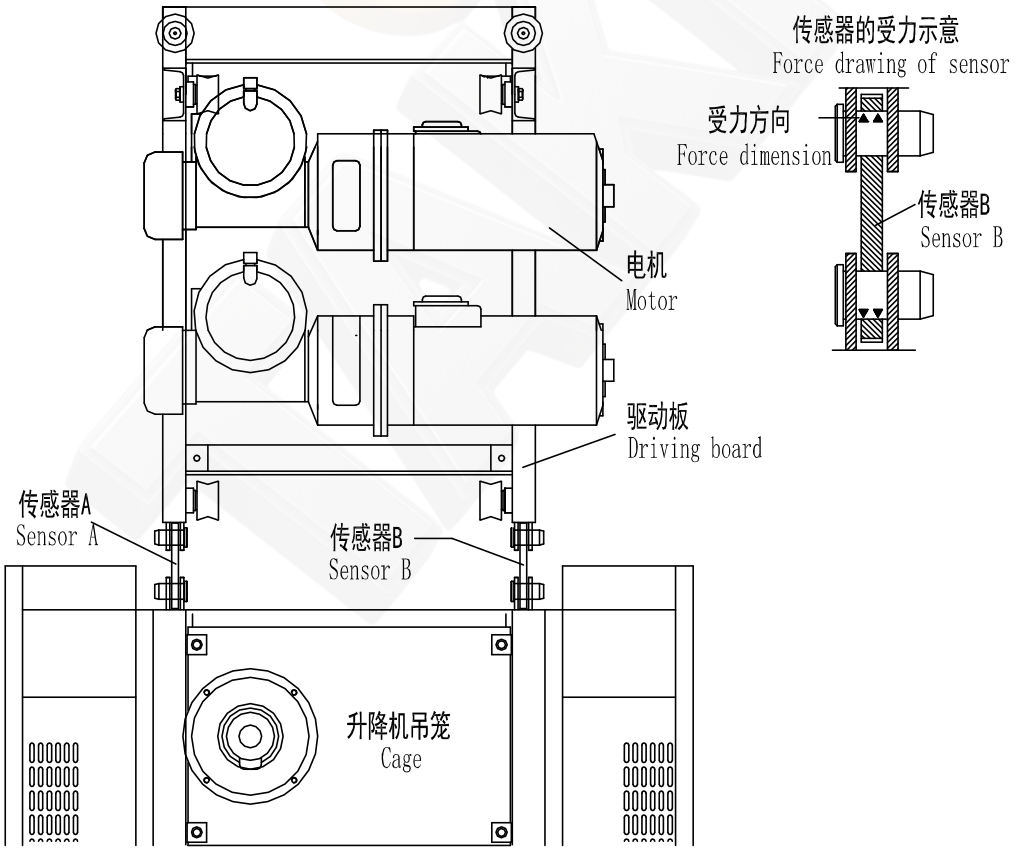
7.4.1 采用拉板式传感器/Plate ring tension sensor

外形尺寸/Dimension



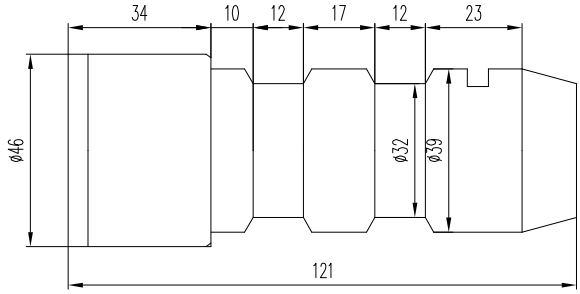
A	B	C	D	E
200	65	20	40	130

安装示意图/Installation drawing



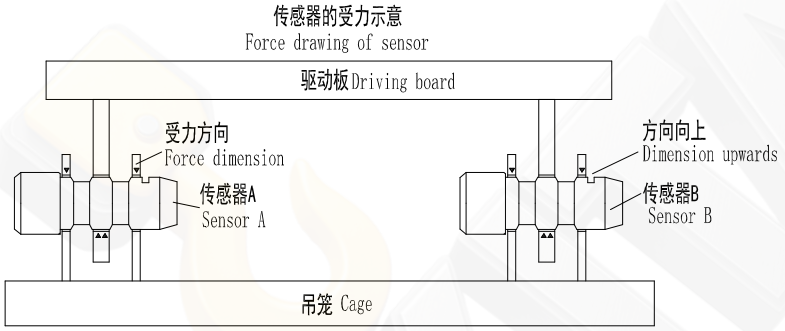
7.4.2 采用销轴式传感器/Pin roll sensor

外形尺寸/Dimension

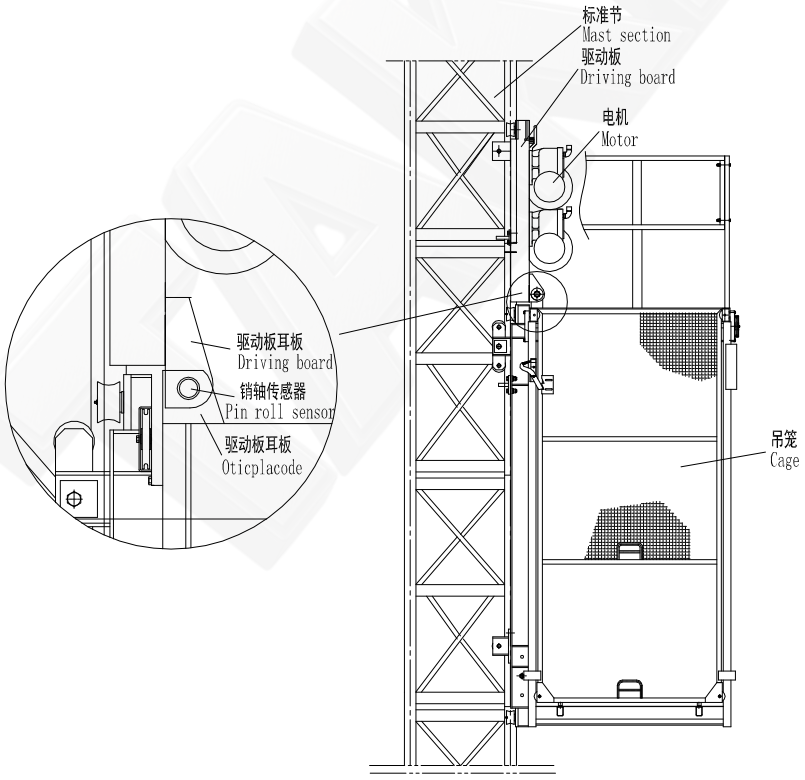


传感器外形尺寸：（以额定载荷为 4000kg 的传感器为例）采用两只该型号传感器适用于 3200kg 的施工升降机。

Dimension: (Take sensor of rated load 4000Kg for example) Adopt the two sensors apply to SC 320.



销轴式传感器现场安装示意图/Installation drawing:

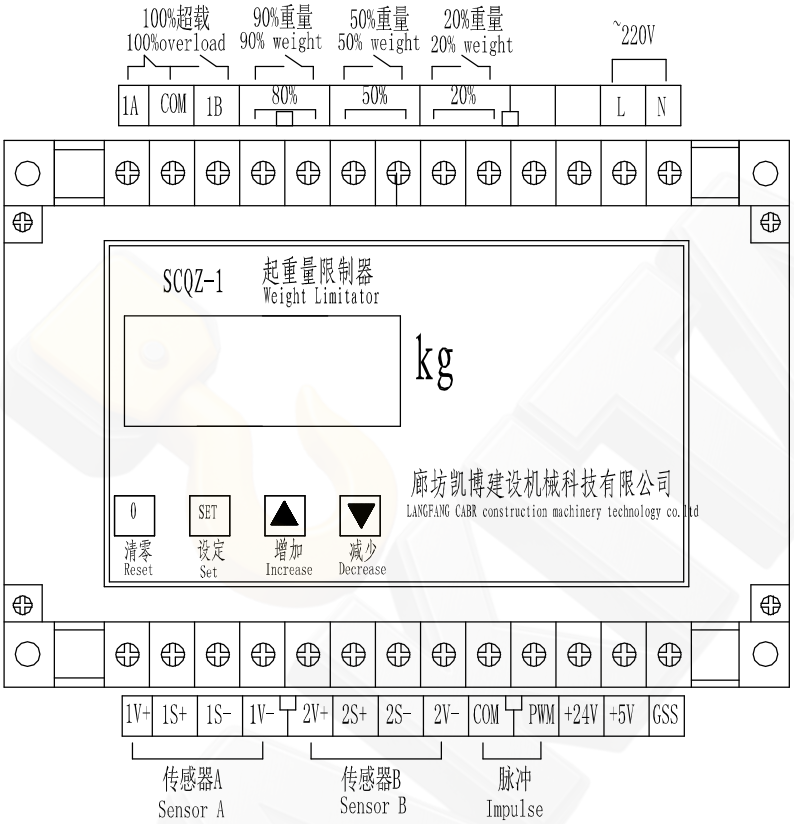


7.5 接线图/Connection diagram

起重量限制器和称重传感器、电源，继电器开关量信号的接线见下面的图示：

Connection diagram of weight limitator, weight sensor, power and relay switching sign is as follows:

接线端子说明/Connecting terminal introduction:



1：端子：L、N　AC220V 电源

1: Terminal: L、N　AC220Vpower

2：端子：20%重量输出　20%重量继电器常开点输出

2: Terminal: 20% weight output　20% normally open contact output of weight relay

3：端子：50%重量输出　50%重量继电器常开点输出

3: Terminal: 50% weight output　50% normally open contact output of weight relay

4：端子：90%重量输出　90%重量继电器常开点输出

4: Terminal: 90% weight output　90% normally open contact output of weight relay

5：端子：110%重量输出　110%重量继电器常开点 1B、常闭点 1A 输

5: Terminal: 110% weight output　110% normally open contact 1B output and normally close 1A output of weight relay

6：端子：传感器 A　1V+　传感器电　源（+）——接称重传感器的红线。

1S+ 传感器信号（+）——接称重传感器的黄线。

1S- 传感器信号（—）——接称重传感器的白线。

1V- 传感器电源（—）——接称重传感器的蓝线。

6:Terminal: Sensor A 1V+ Sensor power(+)—To red wire of weight sensor

1S+ Sensor sign(+)—To yellow wire of weight sensor

1S- Sensor sign(-)—To white wire of weight sensor

1V- Sensor sign(+)—To blue wire of weight sensor

7：端子：传感器 B 1V+ 传感器电源+ 接称重传感器的红线。

1S+ 传感器信号+ 接称重传感器的黄线。

1S- 传感器信号— 接称重传感器的白线。

1V- 传感器电源— 接称重传感器的蓝线。

7:Terminal: Sensor B 1V+ Sensor power(+)—To red wire of weight sensor

1S+ Sensor sign(+)—To yellow wire of weight sensor

1S- Sensor sign(-)—To white wire of weight sensor

1V- Sensor sign(+)—To blue wire of weight sensor

8：端子：脉冲 COM PWM 脉冲输出

8:Terminal: Impulse COM PWM impulse output

7.6 操作说明/Operating instruction

超载称重保护器参数设定步骤：

Parameter setting of overload limitator is as follows:

四个功能键： 1. 清零键 0

2. 设定键 RESET

3. 增加 ▲

4. 减少 ▼

Four function keys： 1. Reset key

2. Set key

3. Increase▲

4. decrease ▼

称重保护器设定的操作方法/Setting method of weight limitator

1）清零/Reset

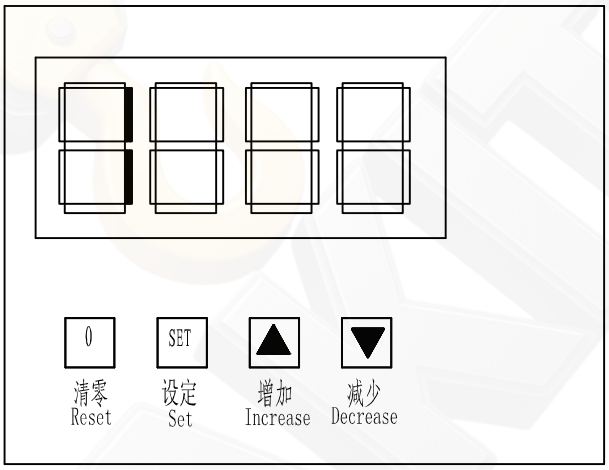
使吊笼处于空载状态，吊笼底部悬空，使传感器只承受空吊笼的重量。起重量限制器在正常显示状态，按下清零键 0，十几秒后松开，控制器上显示的重量为“0000”。即完成了清零去皮的操作。

Make the cage no-load and the bottom hang in the air, the sensor only supports the weight of empty cage. When the weight limitator works well, press “reset” key several seconds and loose, the display weight should be “0000”, thus finish “reset” operation.

2）设定最大载重量/Set Max. load

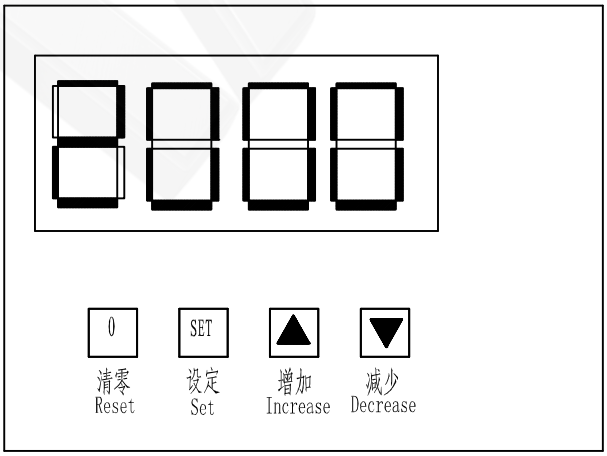
按一下 SET 键 ，进入功能菜单。左侧第一位显示“1”，

Click “SET” key, enter function menu, first display on the left side should be “1”.



几秒后，控制器上的显示重量值为“2000（默认）”并闪烁。

After several seconds, the value displayed on the controller should be “2000(default)” and blink.



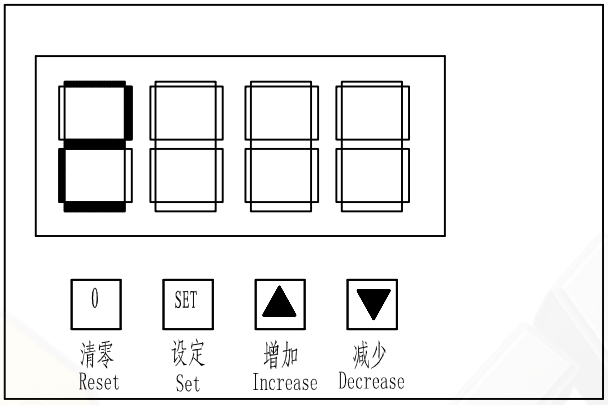
按 “增加 ▲ 、减少 ▼ ”键，设定施工升降机的额定载重量。

Press “INCREASE ▲, DECREASE ▲”key and set the rated load of the hoist.

3）传感器量程设置/Measuring range setting of the sensor

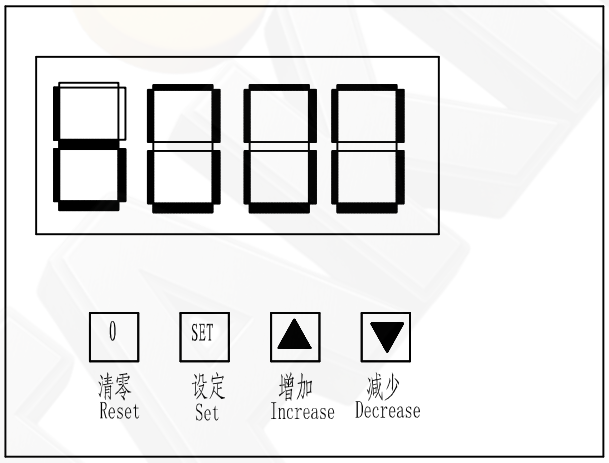
按一下 SET 键 ，进入功能菜单。左侧第一位显示“2”，

Click “SET” key and enter function key, now first display on the left side should be “2”.



几秒后，控制器上的显示重量值为“6000（默认）”并闪烁。

After several seconds, the value displayed on the controller should be “6000(default)” and blink.



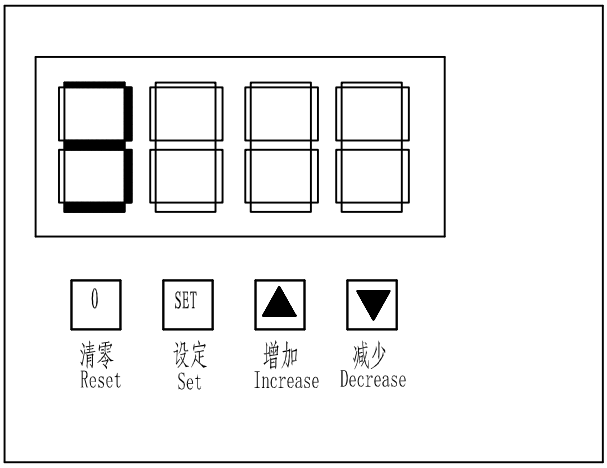
按 “增加 ▲ 、减少 ▼”键，设定传感器的额定载重量。

Press “INCREASE ▲, DECREASE ▲”key and set the rated load of the hoist.

4）重量系数校正调整 Correction adjustment of weight ratio

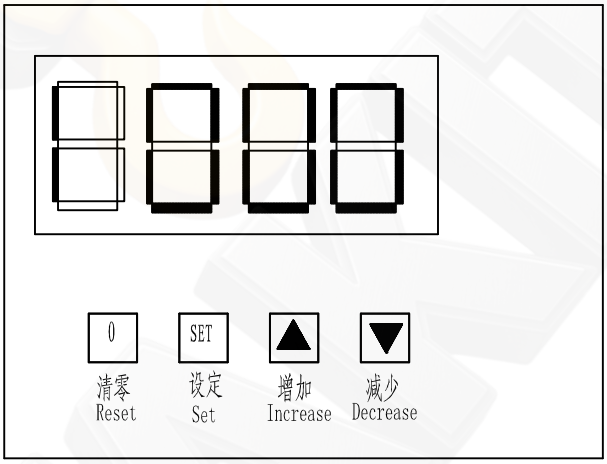
按一下 SET 键 ，进入功能菜单。左侧第一位显示“3”，

Click “SET” key and enter function key, now first display on the left side should be “3”.



几秒后，控制器上的显示重量值为“1000（默认）”并闪烁。

After several seconds, the value displayed on the controller should be “1000(default)” and blink.



显示的重量值与施工升降机内的砝码的实际重量不相等，调整校正系数。显示的重量值大于施工升降机内的砝码的实际重量 ，按“减少 ▼ ”键， 然后按 SET 键，回到显示重量的状态，使显示的重量值与施工升降机内的砝码的实际重量相等。显示的重量值小于施工升降机内的砝码的实际重量 ，按“增加 ▲”键， 然后按 SET 键，回到显示重量的状态，使显示的重量值与施工升降机内的砝码的实际重量相等。

If the display value is not equal to the actual weight of the hoist, adjust correction ratio. If the display is bigger than the actual, click “DECREASE ▼”, then click “SET”key and return to the state of display weight, and make the display is equal to the actual. If the display is smaller than the actual, click “INCREASE ▲”, then click “SET”key and return to the state of display weight, and make the display is equal to the actual.

7.7 常见故障及处理/Malfunction and treatment

序号 No.	故障 Malfunction	原因 Reason	故障处理 Treament
1	数码管显示不亮 Display of digitron is off	没有电源，电源板故障 Without power, power board is out-of-order	检查 AC220V 电源 更换电源板 Check AC220V power Replace power board
2	数码管数字不变化 Digit of digitron is inalterability	没有称重传感器的输入信号，信号线接错。 Without input sign of weight sensor, connection of sign wire is wrong	检查称重传感器接线 Check connection of weight limitator
3	继电器触点没有输出 Relay contact is no output	设置的最大载重量太大 Max. load set is too large	重新设置参数 Reset parameter
4	重量增加，数码管显示变小 Load increases but display of digitron is lessening	称重传感器的输入信号线接反。 Input sign connection of weight sensor is reverse	调换输入信号线 Change input sign wire
5	没有 90%重量的声音报警 Without sound alarm of 90% weight	设置的最大载重量错误 Max. load set is wrong	重新设置参数 Reset parameter
6	100%重量的继电器触点没有输出 Without relay contact output of 100% load	设置的最大载重量错误 Max. load set is wrong	重新设置参数 Reset parameter
7	按设置键，数码管显示不变化 Click “SET” key but display of digitron is no vary	按键故障 Key is wrong	更换按键 Replace key

第八部分　附录
Part 8 Addendum

8.1 主要易损件明细表/ Detailed Statement of Main Wearing Parts

序号 Serial number	名称 Name	规格型号 Specification or type
1	驱动齿轮 Driving gear	模数 6,齿数 20 Modulus 6, teeth number 20
2	背轮 Back wheel	外径Φ124mm External diameter Φ124mm
3	滚轮 Roller	底径Φ74mm Base diameter Φ74mm
4	开关 Switch	上升、下降、急停 Up, down, EM.stop

8.2 主要外购件明细表/ Detailed Statement of Main Purchased parts

序号 Serial number	名称 Name	数量 Quantity	型号 Type
1	减速电机 Gear units	1	YZEJ132M-4，i=16
2	安全器 Safety device	1	SAJ3.0-1.2
3	电缆 Power cable	1	YX 3×10+2×6
4	PLC	1	CPM1A-30CDR

8.3 备品备件及专用工具一览表/ Detailed Statement of Spare parts and Special Tools

序号 Serial number	名称 Name	数量 Quantity	规格型号 Specification or type
1	驱动齿轮 Driving gear	1	m=6，Z=20
2	滚轮 Roller	2	Φ74
3	背轮 Back wheel	1	Φ124
4	滚轮扳手 Roller	1	
5	背轮调节扳手 Back wheel wrench	1	
6	安全器复位工具 Safety device resetting tool	1	

8.4 一年运行用备品备件/ Spare parts for 1 year operation

序号 Serial number	名称 Name	数量 Quantity	规格型号 Specification or type
1	驱动齿轮 Driving gear	1	m=6，Z=20
2	滚轮 Roller	2	Φ74
3	背轮 Back wheel	1	Φ124

8.5 一年检修用备品备件/ Spare parts for 1 year overhaul

序号 Serial number	名称 Name	数量 Quantity	规格型号 Specification or type
1	驱动齿轮 Driving gear	1	m=6，Z=20
2	滚轮 Roller	2	Φ74
3	背轮 Back wheel	1	Φ124

8.6 两年运行用备品备件/ Spare parts for 2 years operation

序号 Serial number	名称 Name	数量 Quantity	规格型号 Specification or type
1	驱动齿轮 Driving gear	1	m=6，Z=20
2	滚轮 Roller	2	Φ74
3	背轮 Back wheel	1	Φ124
4	行程开关 Travel limit switch	1	欧姆龙 Omron
5	按钮 Button	2	施耐德 Schneider
6	摩擦片 Friction plate	1	上海张江 Zhangjiang