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# Technical Specification Press 7”-2000UST

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一、我公司实行包工包料的制作方式，以上价格包含产品的设计、制造的费用。

**The above price includes the material, design, manufacturing, installation, and debugging cost.**

二、技术要求：按双方确认的技术资料制做。

**Technical requirement: made according to the confirmed technical data of both parties.**

三、付款方式：首付设备定金40%，提货前再付设备款的58%，剩余货款在拿到提单复本后付清。

## Quotation Attachment

### 2000UST 铝挤压机主要技术资料

#### 2000UST Aluminium Extrusion Machine Main Technical Data

(短行程、后上料、德国力士乐泵、变频节能系统)

(Conventional, back feeding, German Rexroth pump)

#### 1.1 概述

2000UST卧式单动短行程后上料铝挤压机采用卧式三梁四柱预应力组合框架结构，短行程后上料正向挤压方式，油泵直接驱动，配置先进的机电液控制元件和系统，采用PLC与计算机两级控制，使压机的速度、位置和压力得到精确的控制，适宜挤压2系、5系、6系、7系铝或铝合金制品、利于操作维护，提高生产效率，降低使用成本。

#### 1.1 Overview

**2000UST horizontal single action conventional back feeding aluminum extrusion press with three horizontal beam four-column pre-stressed composite frame structure, after feeding way forward extrusion, oil pump direct drive, configuration of advanced mechanical and electrical hydraulic control components and systems, PLC and computer two level control, the speed of the compressor, the precise control of position and pressure, and suitable for extrusion 2 series, 5 series, 6 series, 7 series aluminum or aluminum alloy products, conducive to operation and maintenance, improve production efficiency, reduce the use of cost.**

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## 1.2 挤压产品品种及材料

### 1.2 Applicable Products and Materials

#### 1.2.1 产品品种

2000UST卧式单动正向短行程后上料铝挤压机能够生产的铝及铝合金典型挤压制品如下：

- 棒材
- 型材

#### 1.2.1 Applicable Products

2000UST horizontal single action forward Conventional back feeding aluminum extruder can produce aluminum and aluminum alloy typical extrusion products are as follows:

- bar
- profile

#### 1.2.2 产品材料

挤压材料的范围：2系、5系、6系、7系、铝或铝合金。

#### 1.2.2 Applicable Materials

Extrusion material range: 2 series, 5 series, 6 series, 7 series, aluminum or aluminum alloy

## 1.3 主要工艺参数要求 1.3 Main process parameters requirements

### 1.3.1 铸锭规格

铸锭直径：φ178mm

铸锭长度范围：400~900 mm

#### 1.3.1 Ingot specifications

Ingot diameter: φ178mm

Length range of ingot: 400 ~ 900 mm

### 1.3.2 制品规格及精度

型材外接圆直径： φ240 mm

扁宽型材最大尺寸： 330 mm

#### 1.3.2 Specifications and accuracy of products

Profile outer circle diameter: φ240mm

Flat wide profile maximum size: 330 mm

### 1.3.3 挤压筒规格

直径:  $\phi 186\text{mm}$

长度:  $1130\text{mm}$

### 1.3.3 Specifications of container

**Diameter:  $\phi 186\text{mm}$**

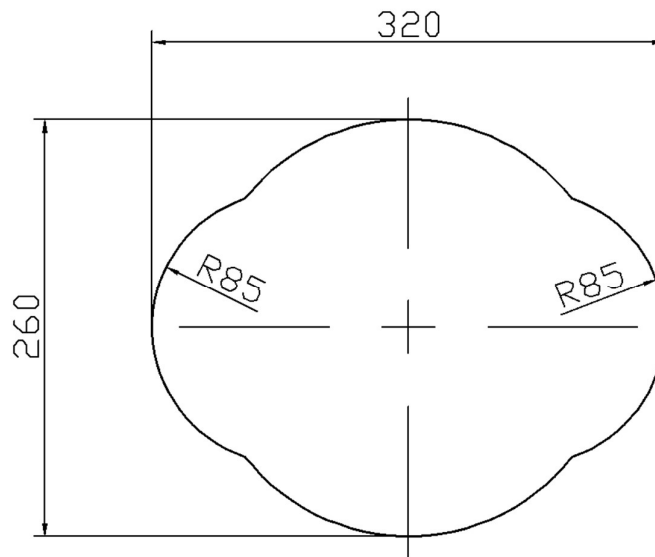
**Length:  $1130\text{mm}$**

1.3.4 模座尺寸 (直径X 厚度)  $\phi 450 \times 450$  (可按客户要求修改)

1.3.4 Die base size (diameter X thickness)  $\phi 450 \times 450$  (can be modified according to customer requirements) add nitrogen hole

1.3.5 前梁开口尺满足买方产品的最大极限值尺寸的前梁承压垫开口尺寸:

1.3.5 Front beam opening ruler: Opening size of front beam bearing pad that meets the maximum limit size of buyer's product:



### 1.4 2000UST卧式单动正向短行程后上料铝挤压机主要技术参数

#### 挤压系统

最高挤压力	1873T
工作介质最高压力	26 MPa
主工作缸最高挤压力	1699T
侧缸挤压力	174T
回程力	132T
最大行程	1300 mm

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挤压速度	0.2~20.6 mm/s
挤压速度精度	
0.2-2 mm/s	±5% (压力变化不计)
>2-20 mm/s	±3% (压力变化不计)
空程速度:	386 mm/s
回程速度:	456 mm/s

#### **1.4 Main technical parameters of 2000UST horizontal single action forward Conventional back feeding aluminum extruder**

##### **Extrusion system**

<b>Maximum extrusion pressure</b>	<b>1873T</b>
<b>Working medium maximum pressure</b>	<b>26 MPa</b>
<b>The maximum extrusion pressure of the main cylinder</b>	<b>1699T</b>
<b>Side cylinder extrusion pressure</b>	<b>174T</b>
<b>The return force</b>	<b>132 T</b>
<b>Maximum stroke</b>	<b>1300 mm</b>
<b>Extrusion speed</b>	<b>0.2 ~ 20.6mm /s</b>
<b>Accuracy of extrusion velocity</b>	
<b>0.2-2 mm/s ±5% (excluding pressure change)</b>	
<b>&gt; 2-20 mm/s ±3% (excluding pressure change)</b>	
<b>Idle speed:</b>	<b>386 mm/s</b>
<b>Return speed:</b>	<b>456 mm/s</b>

##### **挤压筒**

锁紧力	128T
回程力	128T
挤压筒行程	1250mm
挤压筒内孔直径	φ186 mm
挤压筒长度	1130 mm
挤压筒闭合速度	222 mm/s
挤压筒回程速度	374 mm/s

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### Container

<b>Clamping force</b>	<b>128 T</b>
<b>The return force</b>	<b>128 T</b>
<b>Container stroke</b>	<b>1250mm</b>
<b>The diameter of the inner hole of the container <math>\phi</math>186 mm</b>	
<b>The length of the container</b>	<b>1130 mm</b>
<b>The closing speed of the container</b>	<b>222 mm/s</b>
<b>The return speed of the container</b>	<b>374 mm/s</b>

### 主剪

剪切力	40T
主剪行程	700 mm
下降速度	455 mm/s
回程速度	602 mm/s

### The main shear

<b>shear force</b>	<b>40 T</b>
<b>Main shear stroke</b>	<b>700 mm</b>
<b>Descending speed</b>	<b>455 mm/s</b>
<b>Return speed</b>	<b>602 mm/s</b>

### 移动模架

回程力	25T
移动模架行程	1430 mm
移动速度	232 mm/s

### Mobile formwork

<b>Return force</b>	<b>25 T</b>
<b>Movable die frame stroke</b>	<b>1430 mm</b>
<b>Moving speed</b>	<b>232 mm/s</b>

### 油泵站

传动介质	抗磨无灰液压油N68 ISO VG
3台高压变量主泵	总供给量约为 840 L/min

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主泵额定最高工作压力	26 MPa
单台泵额定流量	280 L/min
单台泵驱动功率	110 KW
3台辅助泵	总供油量600L
单台泵额定流量	200 L/min

**Oil pump station**

**Transmission medium      anti-wear ash free hydraulic oil N68 ISO VG**

**The total supply of the 4 high-pressure variable main pumps      840 L/min**

**The rated maximum working pressure of the main pump      23 MPa**

**The rated flow of each pump      280 L/min**

**The driving power of single pump      110 KW**

**The total oil supply of 3 auxiliary pumps      600L**

**The rated flow of each pump      200 L/min**

**冷却循环系统, 约为**

1台过滤冷却泵流量      300 L/min

冷却水压力      0.3—0.6 MPa

冷却水消耗量      80 m<sup>3</sup>/h

冷却水温度      ≤32 °C

过滤精度      10μm

板式换热器      30m<sup>2</sup>

**Cooling circulation system, approximately**

**The flow rate of one filter cooling pump      300 L/min**

**Cooling water pressure 0.3-0.6mpa**

**Cooling water consumption      80 m<sup>3</sup>/h**

**Cooling water temperature      ≤32 °C**

**Filter precision      10μm**

**Plate heat exchanger      30m<sup>2</sup>**

**挤压筒组件**

单区电阻加热      ~45 KW

最高加热温度 500°C

**Container assembly**

Double zone resistance heating ~ 45kW

Maximum heating temperature 500°C

**电气装置功率**

装机总功率 406 KW

**Power of electrical installation**

The total installed power is 406 KW

**供电电源**

电源频率及波动范围 AC 50 Hz±0.5 Hz

电压及波动范围 380V+10%, -5%

**Power supply**

Power frequency and fluctuation range AC 50 Hz±0.5 Hz

Voltage and fluctuation range 380V± 10%, -5%

环境最高相对湿度 85 %

**The highest relative humidity of the environment** 85%

环境温度 0~40 °C

**Ambient temperature** 0~40 °C

**1.5、主要配置元件**

名称	型号	数量	生产厂家	备注
电机	110KW-6极	3台	东莞电机	
变频驱动	NE300-4T1320G-QS-01	3台	日本尼德科艾默生	
柱塞泵	A15VSO280	3台	德国力士乐	
辅助柱塞泵	SQP43-60-38-86DD	2台	日本东京计器	
辅助柱塞泵	SQP4-38-86DD	1台	日本东京计器	
导压电机	7.5KW-6P	1台	东莞电机	

保压电机	5.5KW-6P	1台	东莞电机	
导压泵	YB-E63叶片泵	1台	广液液压	
保压泵	A2F12柱塞泵	1台	德克液压	
液压件	换向阀、溢流阀、插装阀 阀芯、逻辑阀	1套	德国Rexroth	
PLC控制器		1台	日本三菱	
触摸屏	10寸	1台	昆仑通态	
交流接触器		1套	施耐德	
行程开关	光电感应开关	1套	AUTONICS	
温控表	智能温控表	1只	BKCAUTO	
发热管	直插式	1套		18X2.5KW= 45KW

### 1.5. Main configuration components

Item	Model	Quantity	Manufacturer	Remarks
Motor	YE3-315M-110KW-6P	3 sets	Dongguan Motor	
Variable frequency drive	NE300-4T1320G-QS-01	3 sets	Nideko Emerson, Japan	
Plunger pump	A15VSO280	3 sets	Germany Rexroth	Original Import packing
Auxiliary vane	SQP43-60-38-86DD	2 sets	TOKYO KEIKI	
Auxiliary vane	SQP4-38-86DD	1 sets	TOKYO KEIKI	
Impulse motor	7.5KW-6P	1 set	Dongguan	
Pressure hold motor	5.5KW-6P	1 set	Dongguan	
Impulse pump	YB-E63	1set	Guangye hydraulic	
Pressure hold	A2F12	1 set	Deke hydraulic	



<b>pump</b>				
<b>Hydraulic parts</b>	<b>Reversing valve, relief valve, cartridge valve spool, logic valve</b>	<b>1 set</b>	<b>Germany Rexroth</b>	
<b>PLC controller</b>		<b>1 set</b>	<b>Japan's Mitsubishi</b>	
<b>Touch screen</b>	<b>10 inch</b>	<b>1 set</b>	<b>Kunlun state</b>	
<b>Ac contactor</b>		<b>1 set</b>	<b>Schneider</b>	
<b>Travel switch</b>	<b>Photoelectric induction switch</b>	<b>1 set</b>	<b>AUTONICS</b>	
<b>Temperature control meter</b>	<b>Intelligent temperature control meter</b>	<b>1 pcs</b>	<b>BKCAUTO</b>	
<b>Heat pipes</b>	<b>Direct plug-in</b>	<b>1 set</b>		<b>18x2.5KW=45KW</b>

#### 1.6、主要零部件材质说明

名称	规格	材质	备注
主油缸		35#钢	锻打
主油缸座	厚度L=800mm	35#钢	铸造
主柱塞	Φ970mm	35#钢	合金冷硬铸铁
前横梁	厚度800mm	35#铸钢	铸造
张力柱	Φ260mm	42CrMo	锻钢调质处理
蝴蝶头	320mm	35#铸钢	铸造
盛锭筒外壳		35#铸钢	铸造
盛锭筒外套		5CrMnMo	锻钢热处理
盛锭筒内胆		H13	锻钢热处理

油箱		Q235钢板	焊接成型
机架		Q235钢板	焊接并退火处理
机械手	平移爪式	Q235钢板	伺服电机驱动

### 1.6. Material description of main parts

Item	Specifications	Materials	Remarks
The main oil cylinder		35 # steel	forging
The main oil cylinder block	Thickness L = 800 mm thick	35 # steel	casting
The main plunger	Φ970mm	35 # steel	Surfacing stainless steel 2Cr13
Front beam	Thickness 800mm	35 # steel casting	casting
Tension pillar	Φ260mm	42CrMo	Quenching and tempering treatment of forged steel
Walking beam	320mm	35 # steel casting	casting
Container out-shell		35 # steel casting	casting
Container cover		5CrMnMo	Wrought steel heat treatment
Container body		H13	Wrought steel heat treatment
The fuel tank		Q235 steel plate	Welding forming
Rack		Q235 steel plate	Welding and annealing treatment
manipulator	Translation claw type	Q235 steel plate	

### 1.7、挤压机其它主要技术参数

1.7.1 1800 T 手机，机身颜色按客户要求。

1.7.2 铝棒使用规格：Φ 178mm×（400-900）mm。

1.7.3 模具使用规格：Φ 400mm×400 mm（双模座）。

1.7.4 出料口尺寸：Φ260×320 mm。

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1.7.5 设备离地面中心高度: 900 mm 。

1.7.6 设备额定功率: 406kW 。

### **1.7. Other main technical parameters of extrusion press**

**1.7.1 2000UST mobile phone, body color according to customer requirements.**

**1.7.2 Aluminum rod specifications: φ 178mm× (400-900) mm.**

**1.7.3 Die specification: φ 400mm×400 mm (double mold seat).**

**1.7.4 Outlet size: φ 260 × 320 mm.**

**1.7.5 Height of the device from the ground center: 900 mm.**

**1.7.6 Rated power: 406kW.**

**1.7.7 voltage: 380V**

附件三: 设备技术描述

### **Appendix 3: Technical description of the equipment**

#### **2.1 设备用途**

2000UST卧式单动短行程后上料铝挤压机主要适用于铝及铝合金型材和棒材的正向挤压加工。

#### **2.1 Device Usage**

2000UST horizontal single action Conventional back feeding aluminum extruder is mainly used for forward extrusion processing of aluminum and aluminum alloy profiles and bars.

#### **2.2 短行程后上料铝挤压机的优点:**

#### **2.2 Advantages of Conventional back feeding aluminum extruder:**

##### **2.2.1结构的优点:**

1) 短行程挤压机的挤压行程比常规挤压机缩短1/3, 机架开档减小1/6, 使受力框架具有更高的刚度。

2) 主侧缸容积减小, 减少了液压油的使用量, 从而提高了速度控制精度和压力控制精度。也缩短了升、卸压时间, 降低了能耗和减轻卸压时油的冲击。

3) 取消垫片循环系统, 减少无功作业时间, 降低生产线的功率消耗。非挤压辅助时间减少15%。

4) 采用固定挤压垫片, 可以使挤压垫片保持恒定的温度。

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### 2.2.1 Advantages of structure:

- 1) The extrusion stroke of the Conventional extruder is shortened by 1/3 than that of the conventional extruder, and the opening of the frame is reduced by 1/6, so that the stressed frame has higher stiffness.
- 2) The volume of the main side cylinder is reduced, reducing the use of hydraulic oil, thus improving the speed control accuracy and pressure control accuracy. It also shortens the lifting and unloading time, reduces energy consumption and reduces the impact of oil when unloading pressure.
- 3) Cancel the gasket circulation system, reduce reactive operation time, reduce the power consumption of the production line. Non-extrusion assist time reduced by 15%.
- 4) Using fixed extrusion gasket, can keep the extrusion gasket constant temperature.

### 2.2.2 工艺的优点:

- 1) 供锭时，坯锭中心与挤压筒中心一致，实现无摩擦装料（尤其适合表面要求高的型材挤压）。
- 2) 缩短非挤压辅助时间。

### 2.2.2 Advantages of the process:

- 1) When the ingot is supplied, the center of the billet is consistent with the center of the container, so as to achieve friction-free charging (especially suitable for profile extrusion with high surface requirements).
- 2) Shorten the non-extrusion auxiliary time.

### 2.3 技术特点:

- 1) 主机采用预应力组合框架结构，计算机三维有限元优化设计，设备结构紧凑、合理，刚性好，导向精度高，挤压制品质量高。
- 2) 快速换模装置。
- 3) 独特的主剪剪刀片结构。

### 2.3 Technical Features:

- 1) The main machine adopts pre-stressed composite frame structure, computer three-dimensional finite element optimization design, the equipment is compact and reasonable, good rigidity, high precision guidance, high quality extruded products.

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2) Quick die changing device.

3) Unique main shear blade structure.

#### 2.4 挤压机设备组成

2000UST卧式单动短行程后上料铝挤压机，由挤压机本体、液压传动与控制系统、机械化设备、自动检测与控制装置和电气控制系统等组成。

#### 2.4 Composition of extrusion press

2000UST horizontal single action Conventional back feeding aluminum extrusion press is composed of extrusion press body, hydraulic transmission and control system, mechanized equipment, automatic detection and control device and electrical control system.

##### 2.4.1 挤压机本体结构型式与特点

挤压机采用固定挤压垫、短行程后上料结构。本体由预应力组合框架、主工作缸、侧缸、挤压梁装置、挤压筒装置、挤压筒锁紧缸、移动模架装置、主剪装置、快换模装置、下导向架装置等部件构成，座于前、后横梁的基础垫板上。

挤压机设计采用计算机三维有限元分析软件，对挤压机的关键零部件，如预应力结构组合框架、主缸、组合挤压筒等进行结构优化设计和应力场、位移场、温度场分析。

##### 2.4.1 Structure and characteristics of extrusion press body

The extrusion press adopts fixed extrusion pad and Conventional before feeding structure. The body is composed of pre-stressed composite frame, main working cylinder, side cylinder, extrusion beam device, container device, container locking cylinder, mobile die frame device, main shear device, quick die change device, lower guide frame device and other components, which are mounted on the foundation plate of the front and rear beams.

The design of the extruder uses the computer three-dimensional finite element analysis software, the key parts of the extrusion press, such as the pre-stressed structure composite frame, the master cylinder, the combination of container, structural optimization design and stress field, displacement field, temperature field analysis.

##### 2.4.1.1 预应力组合框架

挤压机本体的受力框架由整体式前梁和后梁、拉杆、方形压套组成一个封闭的预应力组合框架。采用专用液压预紧工具对拉杆全长施加超压拉力负荷，同时对压套施加压应力，从而使整个框架处于应力预紧状态。张力柱预应力在最大载荷的15%以上。预应力框架还具有以下

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优点：（1）框架四根受力拉杆的中心间距对称于压机中心，使得整个机架受力均匀。进而可提高挤压制品的精度。（2）由于机架具有较大的抗弯截面，在挤压力的作用下，机架伸长和弯曲变形小，因此在下机架上可固定挤压梁、挤压筒下部水平和垂直导向的导轨，对于挤压梁、挤压筒和模具之间的对中调整非常方便，上机架可作为挤压筒的X型移动导轨。（3）在后梁下部设有两套弹性锚固装置与基础锚固，使后梁固定可靠。

#### 2.4.1.1 Pre-stressed composite frame

The stress frame of the extruder body consists of a closed pre-stressed composite frame composed of integral front beam and rear beam, tie rod and square pressing sleeve. The special hydraulic pretension tool is used to apply overpressure tension load to the whole length of the pull rod, and at the same time to apply pressure stress to the pressure sleeve, so that the whole frame is in a state of stress pretension. The pre-stress of the tension column is above 15% of the maximum load. The pre-stressed frame also has the following advantages : (1) the center spacing of the frame's four stress pull rods is symmetrical to the center of the press, so that the whole frame is stressed evenly. Then the precision of extruded products can be improved. (2) because the frame has a larger bending section, under the effect of extrusion, elongation and bending deformation is small, so can be fixed on the next frame beam and container lower horizontal and vertical direction of the guide rail, for between beam and extruding cylinder and mould of the adjustment is very convenient, the frame can be used as a container of X mobile guide rail. (3) The lower part of the rear beam is provided with two sets of elastic anchorage devices and foundation anchorage, so that the rear beam is fixed reliably.

#### 2.4.1.2 主工作缸/侧缸

主工作缸为柱塞缸，通过四个压块固定于后梁中心。缸体材质为35#锻钢，采用锻焊结构。主柱塞直径为 $\Phi 970\text{mm}$ ，为合金冷硬铸铁，外表面硬度45~52HRC，表面粗糙度 $Ra \leq 0.8\mu\text{m}$ 。缸上装有放水塞和带排气的测压接头。柱塞密封采用特制的V型圈组合密封。

两个活塞式侧缸( $\Phi 220/\Phi 160\text{ mm}$ )水平固定在后梁主工作缸的两侧。活塞杆密封V型圈组合密封。

#### 2.4.1.2 Main working cylinder/side cylinder

The main working cylinder is a plunger cylinder, which is fixed in the center of the rear beam by four pressing blocks. The material of the cylinder is 35# forged steel, and the forging welding structure is adopted. The main plunger diameter is  $\phi 970\text{mm}$ , alloy chilled cast iron, external

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surface hardness is 45 ~ 52HRC, surface roughness  $Ra \leq 0.8\mu\text{m}$ . The cylinder is equipped with a drain plug and a pressure measuring joint with exhaust. The plunger seal adopts special v-ring combination seal.

Two piston-type side cylinders ( $\phi 220 / \phi 160$  mm) are fixed horizontally on both sides of the main working cylinder of the rear beam. Piston rod seal v-ring combination seal.

#### 2.4.1.3 挤压筒锁紧缸:

四个活塞式挤压筒锁紧缸固定在后梁主工作缸的上下两侧。活塞杆密封采用V型圈组合密封。

#### 2.4.1.3 Locking cylinder of container:

Four piston type container locking cylinders are fixed on the upper and lower sides of the rear beam main working cylinder. The piston rod seal adopts v-ring combination seal.

#### 2.4.1.4 挤压梁装置

挤压梁装置是由挤压梁、挤压垫板和挤压杆夹紧装置组成的传力构件，通过螺钉和圆螺母等紧固件。

#### 2.4.1.4 Extrusion beam device

Extrusion beam device is a force transmission component composed of extrusion beam, extrusion plate and extrusion rod clamping device, through screws and round nuts and other fasteners.

#### 2.4.1.5 挤压筒装置

挤压筒装置将挤压筒组件固定在挤压筒外壳中心，并通过圆螺母将外壳和挤压筒锁紧缸活塞杆连接成一体。在外壳后端设置有挤压筒组件快速更换装置，挤压筒外壳通过设置于立柱上的水平和垂直导向面导向，在导向结构中内置有导向间隙调整装置，同时在上方的立柱上设有外斜面辅助导向。

挤压筒加热采用直管电阻式电热元件、轴向加热方式，由热电偶测量和反馈温度，并在操作台上显示。挤压筒组件与外壳之间添有隔热材料

挤压筒组件中，内衬材质为H13,外套材质为5CrMnMo。挤压筒内衬不能加工用于吊装的起吊螺孔。

#### 2.4.1.5 Container device

The container device fixes the container assembly in the center of the container shell, and connects the shell and the piston rod of the locking cylinder of the container through the round nut. The rear end of the shell is provided with a container assembly rapid replacement device,

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the container shell is guided by the horizontal and vertical guide surface arranged on the column, the guide gap adjustment device is built in the guide structure, and the upper column is provided with an external inclined plane auxiliary guide.

The container is heated by straight tube resistance electric heating element and axial heating method. The temperature is measured and fed back by thermocouple and displayed on the operating table. Insulation material is added between the container assembly and the housing

In the container assembly, the lining material is H13, and the outer material is 5CrMnMo. The lifting screw hole for lifting cannot be processed in the lining of container.

#### 2.4.1.6 前梁总装件

##### 1) 下导向架装置

下导向架装置由螺钉和键水平固定在前梁后立面上，为模架移动装置提供支承和导向。

##### 2) 模架移动装置

模架移动装置水平布置在下导向架装置上，由一个带有滑块的活塞缸驱动做横向移动，用做换模和制品剪切。

##### 3) 快换模装置

快换模装置则设置在前梁左侧，由另一个活塞缸驱动做纵向移动。换模时，一套处于挤压中心模座内即将被更换的模具由模架移动缸驱动，另一套处于换模位模座内的预热好的模具由快换模缸驱动，两个油缸按照规定的程序交叉换位，即可实现模具的快速更换。

##### 4) 主剪装置

主剪装置为正装活塞缸驱动，采用矩形导向滑块，由螺钉和键垂直安装固定在前梁中心正上方，用于制品和压余的分离。在主剪设有打压余装置，打料力和打料角度必须保证压余与剪刀片不粘接。

主剪缸和压模缸的组合式活塞杆密封采用V型圈组合密封，并均由铜套导向。

#### 2.4.1.6 Final assembly of front beam

##### 1) Lower guide frame device

The lower guide frame device is fixed horizontally on the rear facade of the front beam by screws and keys to provide support and guidance for the formwork moving device.

##### 2) Die frame moving device

The moving device of the die frame is arranged horizontally on the lower guide frame device,



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and is driven by a piston cylinder with a slider to move horizontally, which is used to change the die and shear the product.

### 3) Quick die change device

The quick die change device is arranged on the left side of the front beam and is driven longitudinally by another piston cylinder. When changing a mold, a mold that is about to be replaced in the extrusion center of the mold seat is driven by the moving cylinder of the mold frame, and the preheated mold that is in the mold seat of the mold change position is driven by the quick change mold cylinder. Two oil cylinders are crossed and transposed in accordance with the prescribed procedures to achieve the rapid change of the mold.

### 4) Main shear device

The main shear device is driven by a piston cylinder with a rectangular guide slider mounted vertically above the center of the front beam by screws and keys for the separation of products and pressure residues. In the main shear is provided with a press device, the force and Angle of the material must ensure that the press and scissors pieces do not stick.

The combined piston rod seals of the main shear cylinder and the die cylinder are v-ring combined seals, and are guided by copper bushing.

#### 2.4.2.1 泵站

挤压机的泵站采用集成化设计，集中布置在压机后部无顶棚的半地坑内，由进口德国 Rexroth(力士乐)电液比例控制轴向柱塞变量泵、日本东京计器叶片泵和循环过滤冷却系统构成。各主泵供油系统通过连通管从上油箱吸油。各主泵的高压出油直接通向设置于油箱顶上的泵头循环阀组。管路系统设计采用了必要的缓冲、防震措施，如设缓冲垫、软管或避震喉，能吸收振动的可曲挠式橡胶管接头。

主系统由德国REXROTH公司的3台电液比例控制变量泵和3台叶片泵设计按一定组合形式排列、匹配使用，可产生26Mpa压力，满足主、侧工作缸、挤压筒锁紧缸的运行速度要求，实现0.2-20.6mm/s挤压速度的闭环调节。

各油泵组间设计有隔离阀，如果两个机构按程序需同时动作时，可以互不干扰。泵头阀组由方向、压力元件构成，可实现泵间隔离、空载启动、压力调节和过载保护等功能。

主控制系统油泵3台

辅助控制系统油泵3台

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### 2.4.2.1 pumping station

The pump station of the extruder adopts integrated design, which is centrally arranged in the half pit without ceiling at the back of the press. It is composed of imported German Rexroth(Rexroth) electro-hydraulic proportional control axial piston variable pump, Japan Tokyo meter blade pump and circulating filtration cooling system. The oil supply system of each main pump absorbs oil from the upper tank through the connecting pipe. The high-pressure discharge of each main pump leads directly to the pump head circulating valve set arranged on top of the tank. The design of piping system adopts necessary cushioning and shock proof measures, such as cushioning pad, hose or shock absorber throat, flexible rubber pipe joint that can absorb vibration.

The main system is arranged and matched by 3 electro-hydraulic proportional control variable pumps and 3 vane pumps from Germany REXROTH Company in a certain combination form, which can produce 26mpa pressure, meet the operating speed requirements of the main and side working cylinders and the locking cylinders of the extrusion cylinder, and realize the closed-loop adjustment of the extrusion speed of 0.2-20.4mm/s.

The isolation valve is designed between each oil pump group. If the two institutions operate at the same time according to the program, they cannot interfere with each other. The pump head valve group is composed of directional and pressure elements, which can realize the functions of isolation between pumps, no-load start, pressure regulation and overload protection.

3 oil pumps for main control system

3 oil pumps for auxiliary control system

2) 各泵驱动电机型号和规格:

轴向柱塞电液比例控制变量油泵:

型号: A15VSO280    26 MPa   280 L/min   985 r.p.m    3台

叶片泵:

型号: SQP43-60-38-86DD   16 MPa   200 L/min   985 r.p.m    2台

型号: SQP4-38-60DD    16 MPa   200 L/min   985 r.p.m    1台

2) 油泵电机:

主电机 :



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持续供油保压。系统中电磁阀可接通锁紧缸和控制锁紧缸卸压速度。

主变量油泵的电液比例控制阀的伺服控制油源由恒压定量油泵供给，系统中设有稳压、精滤（5 $\mu$ m）及压力保护等元件。

油循环系统主要用于液压系统循环冷却，根据需要对系统油液进行冷却。

为满足主柱塞空程前进和快速回程速度要求，在主缸底部安装有大通径的充液阀，可实现高压与低压充排液系统的隔离。充液阀与油箱间设有蝶阀和避震喉。

油箱安装在压机后上方。油箱上设置有空气滤清器、电接点压力式温度计、液位指示器、液位液温计、放油用球阀等。所有集成阀块及其相互间的连接管路均布置在油箱的顶部，布有电缆桥架和电气控制箱。油箱底部直接和充液阀管路相连，在充液口设置了防止回油喷溅的网栅。

油箱周围设有平台、栏杆和梯子。

管道焊接采用亚弧焊打底；高压法兰采用高颈法兰。

#### 2.4.2.2 Operating the system

The hydraulic control system of the extrusion press is composed of an integrated control valve block, which is centrally arranged on the top of the main tank above the rear of the extruder. The integrated control valve block of the main system adopts two-way cartridge valve, which is composed of cartridge parts with different functions, control cover plate and pilot control valve to control the direction, pressure and flow of oil flow in the oil path. It has the characteristics of small flow resistance, quick response, less internal leakage, opening and closing characteristics and good overload protection performance. Pilot valve, cartridge valve and cover plate adopt German REXROTH company products, according to the specified operating procedures, to achieve flexible pressure boost, speed up the system, by controlling the instantaneous action time difference between the valve opening and closing, the working cylinder flexible reversing, smooth operation, reduce vibration and noise, and help to control external leakage. According to the needs of each integrated block of each valve between the necessary safety interlock, is provided with easy to monitor and control the pressure of the pressure sensor system, each pressure interface is provided with a pressure measuring joint, in the pump station set up a centralized seismic pressure gauge device.

In the main and side cylinder system, the pressure regulation by solenoid valve pilot relief valve

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can realize the control and protection of extrusion tonnage and flexible pressure relief of the system.

The locking system of container adopts constant pressure variable pump controlled by solenoid valve pilot, which is put into work when the extrusion cylinder is closed, and the system keeps oil supply and pressure. The solenoid valve in the system can connect the locking cylinder and control the pressure relief speed of the locking cylinder.

The servo control oil source of the electro-hydraulic proportional control valve of the main variable oil pump is supplied by the constant pressure quantitative oil pump. The system is equipped with stabilizing pressure, fine filtration (5 $\mu$ m) and pressure protection components.

Oil circulation system is mainly used for circulation cooling of hydraulic system, according to the needs of the system oil cooling.

In order to meet the requirements of the forward and fast return speed of the main piston air program, the filling valve with large diameter is installed at the bottom of the main cylinder, which can realize the isolation of the high pressure and low pressure filling and discharging system. A butterfly valve and shock absorber throat are arranged between the liquid filling valve and the oil tank.

The fuel tank is mounted above the back of the press. The oil tank is equipped with an air filter, an electric contact pressure thermometer, a liquid level indicator, a liquid level thermometer, and a ball valve for oil discharge. All integrated valve blocks and the connecting lines between them are arranged on the top of the tank, with cable tray and electrical control box. The bottom of the tank is directly connected with the liquid filling valve pipeline, and a grid is set up at the liquid filling port to prevent oil spatter.

The tank is surrounded by platforms, railings and ladders.

Sub arc welding is used for pipe welding. High pressure flanges adopt high neck flanges.

#### 2.4.3 挤压机机械化设备

挤压机机械化设备由运锭小车（从加热炉至供锭器）、推锭装置、供锭机械手、压余溜槽组成。

#### 2.4.3 Mechanized equipment of extrusion press

Extrusion press mechanized equipment from the ingot cart (from the heating furnace to the ingot

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supply), ingot pushing device, ingot supply manipulator, pressure surplus chute.

#### 2.4.3.1 推锭装置

推锭装置由推锭缸及其导向机构、支架和位置检测发讯装置等构成。当运锭小车到达推料位后，由推锭缸将小车上的坯锭推入供锭机械手的“V”形辊子槽。

##### 2.4.3.1 Pushing device

The ingot pushing device consists of the ingot pushing cylinder and its guiding mechanism, support and position detection and sending device. When the ingot cart arrives at the pushing position, the ingot on the cart will be pushed into the "V" shaped roller groove of the ingot feeding manipulator by the ingot pushing cylinder.

#### 2.4.3.2 供锭机械手

供锭机械手的移进和退出采用了齿轮齿条传动机构,使布局更加紧凑合理,非挤压时间缩短,提高了压机的生产效率。

##### 2.4.3.2 Spindle feeding manipulator

The ingot manipulator is moved into and out of the rack and pinion transmission mechanism, so that the layout is more compact and reasonable, the non-extrusion time is shortened, and the production efficiency of the press is improved.

#### 2.4.4 自动检测、控制装置

##### 1) 位置检测

各个机构的行程位置检测、发讯和联锁采用接近开关或位移传感器。

##### 2) 压力检测

主缸和锁紧缸的集成阀块上分别设置了压力传感器，独立检测三缸的工作压力，进行联锁控制、安全保护和泄荷操作，并由触摸屏数字显示。

##### 3) 速度控制

通过比例阀控制器无级调节变量泵流量，实现挤压机主系统各机构运行速度的预设、调整和控制，以及挤压速度的设定、闭环控制和检测。配合坯锭梯度加热等条件，具有恒速挤压功能。

##### 4) 挤压筒温度控制

挤压筒为双区电阻加热通过热电耦检测温度，实现加热时筒内传热平衡，达到节能和延长电热元件寿命的目的。

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## 5) 油箱油温检测和控制

油箱上设置了一个电接点油温表，以防油液超温。

### 2.4.4 Automatic detection and control device

#### 1) Position detection

Proximity switches or displacement sensors are used for travel position detection, transmission and interlocking of each mechanism.

#### 2) Pressure detection

Pressure sensors are set on the integrated valve blocks of the master cylinder and locking cylinder to independently detect the working pressure of the three cylinders for interlocking control, safety protection and discharge operation, and the touch screen digital display.

#### 3) Speed control

Through the proportional valve controller stepless adjustment variable pump flow, the main system of the extruder each mechanism running speed setting, adjustment and control, as well as the extrusion speed setting, closed-loop control and detection. With the condition of gradient heating, it has the function of constant speed extrusion.

#### 4) Temperature control of the container

The extruded tube is heated by double zone resistance and the temperature is detected by thermoelectric coupling to achieve the heat transfer balance in the tube during heating, so as to achieve the purpose of saving energy and prolonging the life of electric heating element.

#### 5) Oil temperature detection and control of fuel tank

An electric contact oil temperature gauge is installed on the tank in case the oil exceeds the temperature

### 2.4.5 挤压工具

挤压工具包括 $\phi 186\text{mm}$ 系统，包括：

双层预应力挤压筒组件

固定挤压杆

固定挤压垫

挤压工具更换方便。

固定挤压垫在出厂前进行胀缩试验，保证现场能够可靠使用。

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## 2.4.5 Extruding tools

Extruding tools include  $\phi 186\text{mm}$  system, including:

Double pre-stressed extrusion drum assembly

Fixed extrusion bar

Fixed extrusion pad

The extruding tool is easy to change.

Fixed extrusion pad before delivery of expansion and contraction test, to ensure reliable field use.

## 2.4.6 电气控制系统      2.4.6 Electrical control system

### 2.4.6.1 压机供电

供电电源为AC 380 V，三相四线制，设备总功率约406kW。45kW以上电动机启动方式采用变频启动，其余电动机采用直接启动；为避免大电流冲击，系统联锁控制各台泵电动机分别启动。380/220V动力供电全部集中于泵站，机上电气设备、电磁阀线圈所采用电压均220V AC。

### 2.4.6.1 Power supply for compressor

Power supply is AC 380V, three-phase four-wire system, the total power of the equipment is about 406kW. Motors above 45kW are started by frequency conversion, and other motors are started directly. In order to avoid high current impact, the system interlocks each pump motor to start separately. 380/220V power supply is all concentrated in the pump station, the electrical equipment on the machine, the solenoid valve coil adopts voltage 220V AC.

### 2.4.6.2 电气设备构成

- 1) 总动力电源柜；
- 2) 电气控制柜，连接主油泵电动机和辅助泵电机及交直流控制电源；
- 3) 操作台、落地式操作台、PLC、继电器、控制电源、调速、挤压筒加热控制柜；
- 4) 位置检测编码器；
- 5) 限位开关、接近开关、二次仪表等检测元件；
- 6) 接线盒和相应电缆管线桥架等。

### 2.4.6.2 Composition of electrical equipment

- 1) General power supply cabinet;



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- 2) Electrical control cabinet, connecting the main oil pump motor and auxiliary pump motor and AC/DC control power supply;
  - 3) Operating table, floor type operating table, PLC, relay, control power supply, speed regulation, extrusion cylinder heating control cabinet;
  - 4) Position detection encoder;
  - 5) Detection components such as limit switch, proximity switch and secondary instrument;
  - 6) Junction box and corresponding cable pipeline bridge, etc.

#### 2.4.6.3 PLC及各种检测和控制系统

电气控制系统由工业可编程序控制器两级控制。通过计算机和PLC系统的协调工作，实现对挤压机工作过程的在线智能管理和控制。操作台上设有操作按钮、挤压速度、行程、挤压力、挤压筒温度等参数的数字显示，以及压机状态和故障指示灯显示。

系统控制采用日本三菱可编程序控制器[PLC]。各种输入/输出模块使PLC直接同电气发讯元件即按钮、接近开关、压力继电器、压力、温度、位置传感器、编码器、比例阀控制器、电液阀连接运行，满足压机的位置、压力、速度、挤压筒温度、各主、辅助机构动作的可靠控制及安全联锁。

I/O点预留10%的余量。

#### 2.4.6.3 PLC and various detection and control systems

The electrical control system is controlled by industrial programmable controller. Through the coordination of computer and PLC system, the online intelligent management and control of the working process of extruder is realized. The operating table is equipped with operation button, extrusion speed, stroke, extrusion pressure, container temperature and other parameters of the digital display, as well as the press state and fault indicator light display.

The system is controlled by Mitsubishi Programmable controller [PLC]. Various input/output module PLC directly with electric transmission element, namely button, close to switch, pressure relays, pressure, temperature, position sensor, encoder, proportional valve controller, electric hydraulic valve connection operation, the location of the meet the press, pressure, speed, container temperature, the main and auxiliary body movements of reliable control and safety interlock.

Reserve 10% allowance for I/O points.

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#### 2.4.6.4 挤压机工作制度

工作制度选择开关分“手动”、“半自动（单机自动）”、“自动（联机自动）”三种工作制度，在操作台上通过转换开关进行选择。

#### 2.4.6.4 Working system of extrusion press

The working system selection switch can be divided into "manual", "semi-automatic (single machine automatic)" and "automatic (online automatic)", which can be selected on the operating table through the transfer switch.

附件四: 设备供货范围

#### Appendix IV: Scope of supply of equipment

##### 3.1 设备供货范围

- 1) 2000UST油压单动正向卧式短行程后上料铝挤压机本体 一套
- 2) 锭、垫机械化处理系统包含: 一套
  - (1) 供锭机械手 1台
  - (2) 推锭装置 1台
- 3) 液压操纵系统（含泵站、油箱、平台、梯子、栏杆、设备内部管道等）一套
- 4) 挤压工具包含: 一套
  - (1)  $\phi 186$ 挤压筒装配组件 1件(含本体上安装共2件)
  - (2)  $\phi 178$ 筒配套挤压杆 1件(含本体上安装共2件)
  - (3) 固定挤压垫 1件(含本体上安装共2件)
  - (4) 剪刀片 1件(含本体上安装共2件)
- 5) 电气控制系统和检测装置 一套  
(包含操作台、控制柜、PLC和触摸屏控制系统等)
- 6) 电缆、电线及其施工材料。

##### 3.1 Range of equipment supply

- 1) a set of 2000UST oil pressure single acting forward horizontal Conventional back feeding aluminum extruder body
- 2) Ingot and pad mechanized treatment system includes: 1 set
  - (1) spindle supply manipulator 1 set
  - (2) ingot pushing device 1 set

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3) Hydraulic control system (including pump station, fuel tank, platform, ladder, railings, equipment internal pipelines, etc.) 1 set

4) Extrusion tools include: 1 set

(1)  $\phi 186$  extrusion cylinder assembly component (including 2 pieces installed on the body)

(2)  $\phi 178$  cylinder supporting extrusion rod 1 piece (including 2 pieces installed on the body)

(3) Fixed extrusion pad 1 piece (including 2 pieces installed on the body)

(4) 1 piece of scissors (including 2 pieces installed on the body)

5) 1 set of electrical control system and detection device

(including operating station, control cabinet, PLC and touch screen control system, etc.)

6) Cables, wires and construction materials.

### 3.2 技术资料范围

1) 供土建设计的图纸和文件（包含设备基础图，模具组合图） 1份

2) 易损件图纸及清单（电子文件） 2份

3) 设备操作和维护说明书 1套

### 3.2 Range of technical data

1) Drawings and documents (including equipment foundation drawings and mold combination drawings) for civil engineering design 1 set

2) Drawings and lists of vulnerable parts (electronic files) 2 sets

3) Equipment operation and maintenance manual 1 set

### 3.3 不供货范围

凡不在上述卖方供货范围内的下述所有项目及其相关材料均由用户负责：

1) 基础工程设计、施工及其相关材料；基础任务书中出现的预埋件、基础盖板、梯子、围栏等。

2) 设备以外的配管材料和施工。

3) 液压油及相关消耗件。

4) 压缩空气气源及其管路。

5) 冷却水源及其管路。

6) 设备和挤压工具润滑介质。

7) 压余收集箱。

8) 供水、供电、供气等公用设施。

9) 车间自身起吊运输设施，生产及维修用工具。

10) 挤压机调试所需坏锭。

11) 挤压制品检测工具。

### 3.3 Range of Non-supply

The customer shall be responsible for all the following items and related materials which are not

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within the scope of supply of the seller:

- 1) Foundation engineering design, construction and related materials; Embedded parts, foundation cover boards, ladders, fences, etc.
- 2) Piping materials and construction other than equipment.
- 3) Hydraulic oil and related consumables.
- 4) Compressed air source and pipeline.
- 5) Cooling water source and pipeline.
- 6) Lubricating medium of equipment and extrusion tool.
- 7) Pressure surplus collection box.
- 8) Water supply, power supply, gas supply and other public facilities.
- 9) The workshop itself lifting transportation facilities, production and maintenance tools.
- 10) The billet required for extrusion machine debugging.
- 11) Extrusion products testing tools.

注：本公司对以上参数保留设计修改权

**Note: The company reserves the right to modify the above parameters**