



文件编号: XR280E JG
File Number: XR280E JG

XR280E 旋挖钻机
XR280E Rotary Drilling Rig
技术规格书
Technical Specification

					编制 Prepared by		
					审核 Checked by		
					批准 Approved by		
标记 Mark	处数 Revise	更改文件号 Reversion	签字 Signature	日期 Date	审签 Audit	签字 Signature	日期 Date

徐州徐工基础工程机械有限公司
XCMG Foundation Construction Machinery Co., Ltd.



XR280E 旋挖钻机

XR280E Rotary Drilling Rig

技术规格书

Technical Specification

徐州徐工基础工程机械有限公司

XCMG Foundation Construction Machinery Co., Ltd.

二〇一九年十月

October 2019

一 前言 Foreword

XR280E旋挖钻机是公司新一代E系列大吨位产品，在成熟的XR280D基础上增大动力与系统流量，实现作业效率提升；优化大型结构件，如采用工字梁结构回转平台、双动臂大平行四边形变幅机构、分段板厚式钻桅、竖销式动力头托架等，实现作业稳定性与可靠性提升。

XR280E rotary drilling rig is a new generation of E series large tonnage product which increases the power and system flow on the basis of mature XR280D to improve working efficiency. It adopts optimized large-scale structural components such as slewing platform of ‘工’ shape beam, double swing arm parallelogram luffing mechanism, segmented plate thick type drilling mast and vertical pin type rotary drive bracket to improve working stability and reliability.

该钻机广泛用于港口码头、公路、铁路、桥梁、高层建筑等地基的施工。采用机锁式或摩阻式钻杆，配合捞砂斗、筒钻或短螺旋等回转斗作业。也可搭载长螺旋、双动力头、搓管机等工作装置施工。

The rig is widely used in the foundation construction of ports, roads, railways, bridges, high-rise buildings and other projects. It adopts mechanical interlocking or friction Kelly bars to work with rotary buckets such as sand drilling bucket, cylindrical bucket and short auger. It can also be equipped with CFA, dual rotary drive, casing oscillator and other working devices.

XR280E 旋挖钻机亮点介绍

Highlights Introduction of XR280E Rotary Drilling Rig

- 1、一机多能，可实现油缸加压、卷扬加压、搓管机、长螺旋、双动力头等功能快速切换，满足更多不同工程施工需求；
1. As a multi-function machine, it can realize the quick switching of functions such as crowd cylinder, crowd winch, casing oscillator, CFA and dual rotary drive to meet more different construction needs.
- 2、采用旋挖钻机专用 H 型液压伸缩式履带底盘，装备大直径回转支承，保证了超强的稳定性和运输的便捷性；
2. It adopts H-type hydraulic retractable crawler chassis dedicated for rotary drilling rigs and is equipped with large-diameter slewing bearing, which ensures super stability and convenient

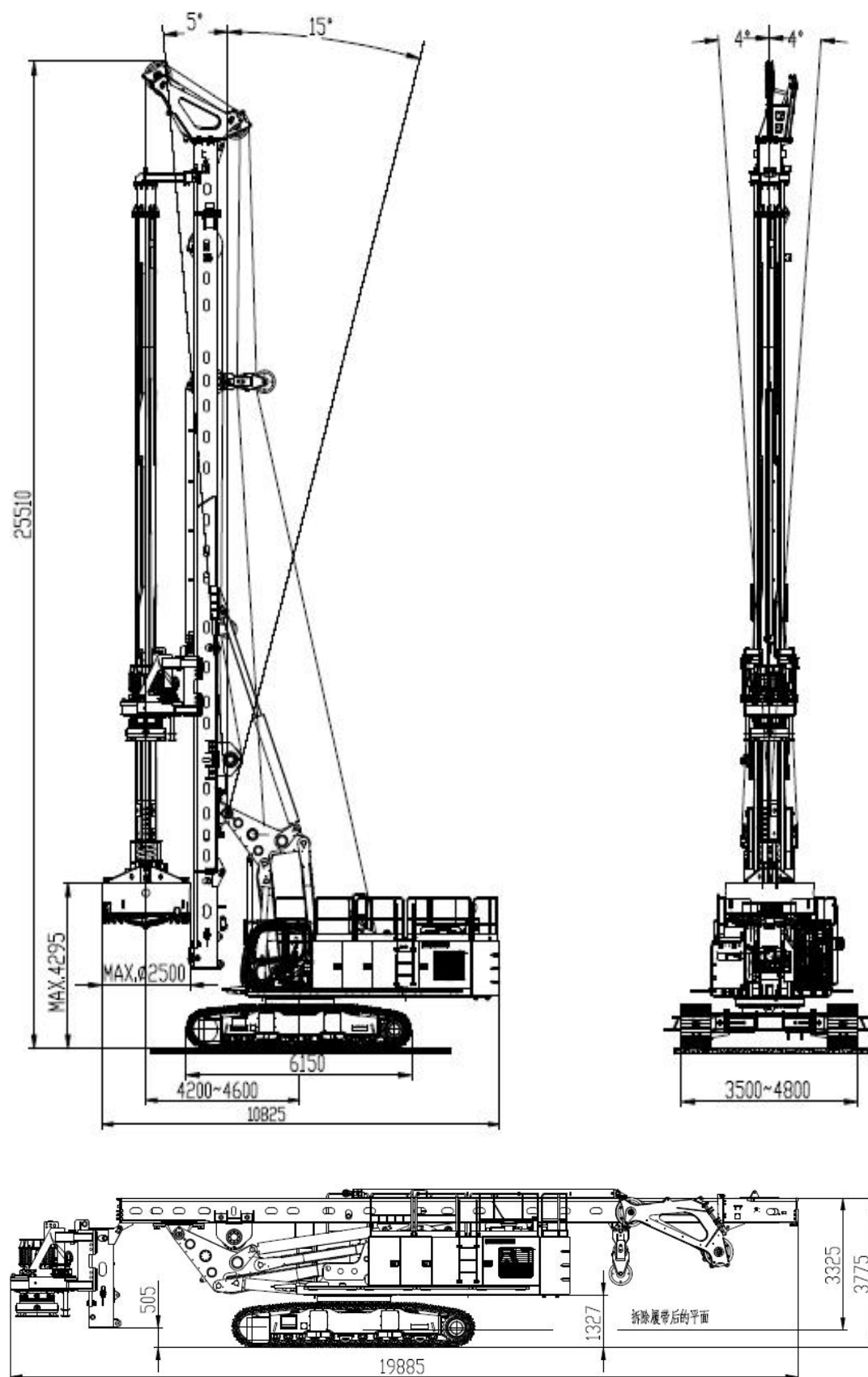
transportation.

- 3、优化设计的双动臂变幅机构，优化铰点位置，兼顾施工稳定性与转场运输便捷性；
3. The optimally designed double swing arm luffing mechanism and optimized hinge point position ensure the construction stability and transport convenience;
- 4、主、副卷扬均采用单排绳技术，钢丝绳寿命比多层绳长 2~4 倍，使用成本更低；
4. The main and auxiliary winches both adopt single-layer rope. The service life of the wire rope is 2~4 times longer than that of the multi-layer rope, which makes the cost lower.
- 5、配置沃尔沃电控涡轮增压发动机，功率更大，动力强劲，油耗更低；
5. It adopts Volvo electronically controlled turbocharged engine with more power and lower fuel consumption.
- 6、液压系统采用负荷传感技术，叠加总功率控制与极限功率控制技术，使液压系统效率更高，更节能，采用独立散热器系统，散热效率高；
6. The hydraulic system adopts load-sensitive, total power control and limit power control technologies to be more efficient and energy-saving. The independent radiator has high heat dissipation efficiency.
- 7、多档位动力头、双马达单排绳主卷扬工作性能提升 20%，作业效率更高；
7. The multi-gear rotary drive and dual motor main winch with single-layer rope improve the working performance by 20%, which ensures higher working efficiency.
- 8、智能控制系统实现钻桅垂直度自动调节与显示、自动回转、自动甩土、长螺旋工法自动提升灌注及桩型显示等功能，采用总线面板设计，有效防止误操作。
8. The intelligent control system can achieve functions such as automatic adjustment & display of mast verticality, automatic slewing, automatic spin-off, and automatic lifting, grouting and pile type display of CFA method, etc. The bus panel design can effectively prevent misoperation.

二 主要技术参数 Main Technical Parameters

名称 Item		单位 Unit	参数值 Parameter Values		
钻孔直径 Drilling Diameter	油缸加压 Crowd cylinder	mm	Æ2500		
	卷扬加压 Crowd winch	mm	Æ2300		
最大钻深 Max. Drilling Depth	钻深 Drilling depth	m	57/73	61/78	86/94
	钻杆 规格 Kelly bar specification	/	JS508-4×16/ MZ508-5×16.1	JS508-4×17/ MZ508-5×17.1	MZ508-6×16.1/ MZ508-6×17.5
	钻杆 重量 Kelly bar weight	t	13.7/14.5	15/14.1	14/15.5
工作高度 Working Height		m	25.5		
工作重量(不含钻头) Working Weight (excluding drilling bucket)		t	100 (钻杆按 15t 计算 The Kelly bar is counted as 15t)		
底盘 Chassis	宽度 Width	mm	3500-4800		
	履带 板宽 Track shoe width	mm	800		
	履带 长度 Track length	mm	6150		
	行走 速度 Traveling speed	Km/h	1.5		
变幅 Luffing	工作 范围 Working range	mm	4200~4600		
钻桅	左右	°	4		

Drilling Mast	倾角 Sidewards inclination		
	前倾 Forwards	°	5
	后倾 Backwards	°	15
动力头 Rotary Drive	扭矩 Torque	kN·m	300
	转速 Rotation speed	r/min	6~27
	高速 甩土 High-speed spin-off	r/min	40
加压 Crowd	加压力 Crowd force	kN	260/330
	提升力 Extraction force	kN	330/330
	类型 Type	/	油缸加压/卷扬加压 Crowd cylinder/crowd winch
	行程 Stroke	m	6 (油缸 Cylinder) /13 (卷扬 Winch)
主卷 Main Winch	提升力 Lifting force	kN	330
	速度 Speed	m/min	75
	绳径 Wire rope diameter	mm	φ36
副卷 Auxiliary Winch	提升力 Lifting force	kN	100
	速度 Speed	m/min	41
	绳径 Wire rope diameter	mm	φ20
发动机 Engine	型号 Model	/	TAD1352VE
	功率 Power	Kw/rpm	315/1900



三 技术介绍 Technical Introduction

1、底盘 Chassis

装备徐工 TDP 系列旋挖钻机专用可伸缩式履带底盘，结构强度高、大直径重载回转支承，具有超强稳定性。行业最成熟的旋挖钻机专用底盘技术，超过 2000 台桩工设备的应用经验。

It adopts XCMG TDP series retractable crawler chassis dictated for rotary drilling rigs which has high structural strength, large diameter heavy-duty slewing bearing and superior stability. The most mature dictated chassis for rotary drilling rigs in the industry has been applied to more than 2,000 piling equipment.

履带长度	6150mm
Track length	
轮距	5175mm
Wheel base	
履带外宽	3500/4800mm
Track outer width	
履带板宽	800mm
Track shoe width	
支重轮数量	2×12 个
Number of track rollers	
驱动力	600kN
Driving force	
行走速度	1.5km/h
Traveling speed	
接地比压	125kPa
Ground pressure	

2、发动机系统 Engine system

发动机选用进口沃尔沃电控涡轮增压发动机，油耗低、满足欧Ⅲ排放标准，可选国四阶段排放，节能环保；足够的动力储备满足高原施工。

The imported Volvo electronically controlled turbocharged engine has low fuel consumption. The engine meets EU III emission standard, and engine of CN IV emission standard is optional, making the system energy-saving and environmental-friendly. Sufficient power reserve can meet the plateau construction requirements.

型号	TAD1352VE
----	-----------

Model	
额定功率	315kW
Rated power	
额定转速	1900r/min
Rated speed	
最大扭矩	2175N·m
Max. torque	
排放标准	欧 III
Emission standard	EU III
燃油箱容积	800L
Fuel tank capacity	

3、液压系统 Hydraulic system

液压主系统采用负载敏感 LUDV 控制技术，响应快，复合动作操控性能最佳，采用恒功率控制主泵，施工效率高。辅系统采用负载敏感 LS 控制技术，节能高效。

The main hydraulic system adopts load-sensitive LUDV control technology to obtain quick response and good control performance of compound actions. Main pump with constant power control provides high working efficiency. The auxiliary system adopts load-sensitive (LS) technology to be energy-saving and efficient.

最大流量	2×380L/min+180L/min
Max. flow	
最大工作压力	33Mpa
Max. working pressure	
液压油箱容积	1000L
Hydraulic oil tank capacity	

4、动力头 Rotary drive

采用竖销连接式动力箱体与托架，可靠性高，且拆装方便快捷；箱体下封盖设计有双层密封，密封性能好，寿命长；标配套管驱动器，钻机下套管能力强。

It adopts vertical pin connected power box and bracket which have high reliability and convenient assembly & disassembly. The lower cover of the box body is designed with double-layer sealing with good sealing performance and long service life. The standard casing driver improves casing running capacity of the rig.

最大扭矩	300kN·m
Max. torque	

转速	6~27r/min
Speed	
特配高速甩土	40r/min
High-speed spin-off (special configuration)	
最大加压力	260kN /330 kN
Max. crowd force	
最大提升力	330kN /330 kN
Max. extraction force	
行程	6m (油缸) /13m (卷扬)
Stroke	6m (Cylinder)/13m (Winch)

5、卷扬 Winch

主、副卷扬均采用徐工引领行业的单排绳技术，有效解决钢丝绳磨损问题，提高钢丝绳使用寿命 2~4 倍。主卷扬满足 M6-T5 使用工况。

The main and auxiliary winches both adopt XCMG industry-leading single-layer rope technology, which effectively solves the wear problem to greatly prolong the service life of wire rope by 2~4 times. The main winch meets the M6-T5 working conditions.

主卷扬:

Main winch:

最大提升力	330kN
Max. lifting force	
钢丝绳直径	φ36mm
Wire rope diameter	
钢丝绳型号	36 NAT 35W× K7+1960 Zz
Wire rope model	

钢丝绳直径允许误差 0~+4%

Allowable error of wire rope diameter

钢丝绳长度	132m
-------	------

Wire rope length

副卷扬:

Auxiliary winch

最大提升力	100kN
-------	-------

Max. lifting force

钢丝绳直径	φ20mm
-------	-------

Wire rope diameter

钢丝绳型号	20NAT6×19W+IWS1770ZS
-------	----------------------

Wire rope model
钢丝绳直径允许误差 0~+4%
Allowable error of wire rope diameter
钢丝绳长度 70m
Wire rope length
加压卷扬 (选配):
Crowd winch (optional)
最大加压力/提升力 330/330kN
Max. crowd force/extraction force
钢丝绳直径 $\phi 26\text{mm}$
Wire rope diameter
钢丝绳型号 HD 8K PPI26-1960ZS
Wire rope diameter
钢丝绳直径允许误差 0~+4%
Allowable error of wire rope diameter
行程 13m
Stroke
加压钢丝绳长度 47.5m
Length of wire rope for crowd
提升钢丝绳长度 59.5m
Length of wire rope for extraction

6、钻杆 Kelly bar

XR280E 旋挖钻机可匹配机锁杆或摩阻杆。机锁杆适用于岩层、摩阻杆适用于土层，钻杆分别有四节机锁杆、五节摩阻杆、六节摩阻杆。

Mechanical interlocking and friction Kelly bars are optional for XR280E rotary drilling rig. Mechanical interlocking Kelly bar is suitable for rock formations and friction Kelly bar is suitable for soil formations. There are four-section mechanical interlocking Kelly bar, five-section friction Kelly bar and six-section friction Kelly bar.

钻杆直径 $\phi 508\text{ mm}$
Kelly bar diameter
方头尺寸 200×200 mm
Rectangular head dimension
钻深 (见下表) Drilling depth (see the table blow)

序号 No.	钻杆配置 Kelly bar	钻深 (m) Drilling depth	钻杆重量 (t) Kelly bar weight (t)	备注 Remark
1	JS508-4×16.0	57	13.65	标配 Standard
2	JS508-4×17.0	61	15.1	选配 Optional
3	MZ508-5×16.1	73	14.5	选配 Optional
4	MZ508-5×17.1	78	14.1	选配 Optional
5	MZ508-6×16.1	86	14.1	选配 Optional
6	MZ508-6×17.5	94	15.5	特配 Special configuration

7、钻桅 Drilling mast

高强材质的箱形结构设计，兼具强度与刚性，配合双动臂大平行四边形变幅机构，支撑范围、支撑角度更大，作业更稳定。

The box-type design of high-strength material combines strength and rigidity. The double swing arm parallelogram luffing mechanism ensures larger support range, support angle and more stable operations.

桅杆总长 21405mm (不含鹅头)

Mast overall length 21045mm (excluding cathead)

桅杆左倾/右倾 4°/4°

Mast sideways inclination

桅杆前倾/后倾 5°/15°

Mast forwards/backwards inclination

8、驾驶室 Cab

具有 FOPS 功能的防噪驾驶室，配置冷暖空调，内外照明灯，带喷水功能的风挡雨刮

器等。大天窗设计，视野好；上防护网可打开，便于清洗。座椅、显示屏、监视屏均可调节，为操作手提供舒适的作业环境。

The anti-noise cab with FOPS function is equipped with air conditioner, internal and external lighting, windshield wiper with water spray function, etc. Large skylight design provides a good view; the upper protective net can be opened for easy cleaning. The seat, display screen and monitor screen can be adjusted to provide the operator with a comfortable working environment.

9、电气系统 Electrical system

采用力士乐 RC28 系列控制器及赫斯曼 10.4 寸显示器；显示器页面布局，充分考虑人性化、便捷性，分级处理，数据标定、参数修改等需要不同的权限；倾角、压力等传感器采用进口元件；线束采用编织工艺，防水、耐磨；接插件增加橡胶等小配件，保证防水性能。

The system adopts Rexroth RC28 series controller and Hirschmann 10.4-inch display which takes full consideration of humanization and convenience. The hierarchical processing ensures that data calibration and parameter modification require different permissions. Inclination, pressure and other sensors adopt imported components. The wiring harness adopts knitting technology to be waterproof and wear-resistant, and gadgets like rubber are applied to connectors to ensure waterproof performance.

四 配置 Configuration

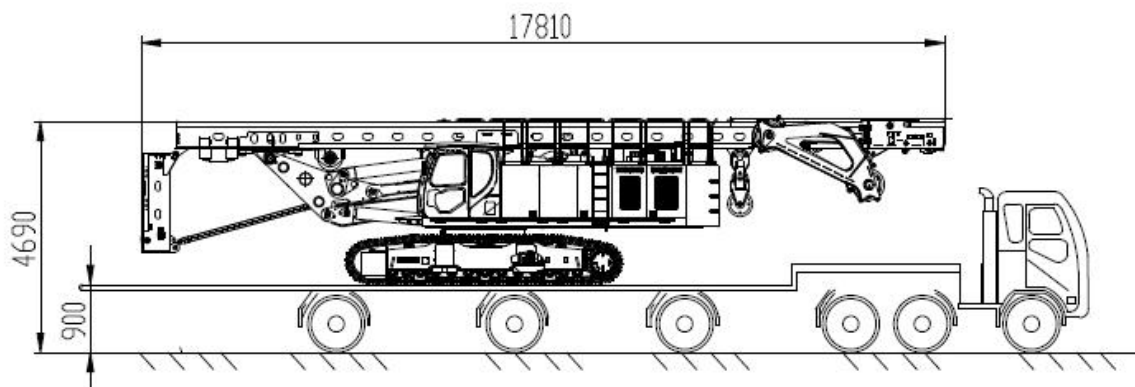
1、功能配置表 Function configuration table

(标配 Standard ●, 选配 Optional ○):			
自动回正 Self-righting	●	主卷浮动 Main winch floating	●
回转角度显示 Slewing angle display	●	主卷触底保护 Main winch bottom protection	○
回转声光报警 Slewing sound-light alarm	●	主卷高度限位 Main winch height limit	●
尾部安全监控 Security monitoring of the tail	●	主卷红外监控 Main winch infrared monitoring	●
		钻孔深度实时检测 Real-time detection of drilling depth	●
变幅限位保护 Luffing limit protection	●	主卷提升力检测 Main winch lifting force detection	●
桅杆限位 (前后、左右) Mast limit (front and back, left and right)	●		
桅杆手动/自动调垂 Manual/automatic adjustment of mast verticality	●	GPS 定位 GPS	●
桅杆垂直度检测 Mast verticality detection	●	水平仪 Gradiometer	●
鹅头油缸 Cathead cylinder	●	收音机 Radio	●
		空调 AC	●

动力头扭矩显示 Display of rotary drive torque	●	油压检测 Oil pressure detection	●
动力头转速显示 Display of rotary drive speed	●	智能故障检测 Intelligent fault detection	●
动力头入岩模式 Rock-entering mode of rotary drive	●	过滤器堵塞报警 Filter clogging alarm	●
自动甩土 Automatic spin-off	●	急停保护功能 Scram protection	●
高速甩土 High-speed spin-off	○	PLC 智能控制模块 PLC intelligent control module	●
套管驱动器 Casing driver	●	集中润滑 Centralized lubrication	●
油缸加压 Crowd cylinder	●	燃油自吸泵 Fuel self-priming pump	●
卷扬加压 Crowd winch	○		
扭矩倍增器 Torque multiplier	○	旋挖钻机长螺旋 CFA	○

五 运输方案 Transportation Plan

1、整机运输 Whole machine transportation



运输重量:76.6t (不包括拖车、钻杆、钻头、动力头总成)

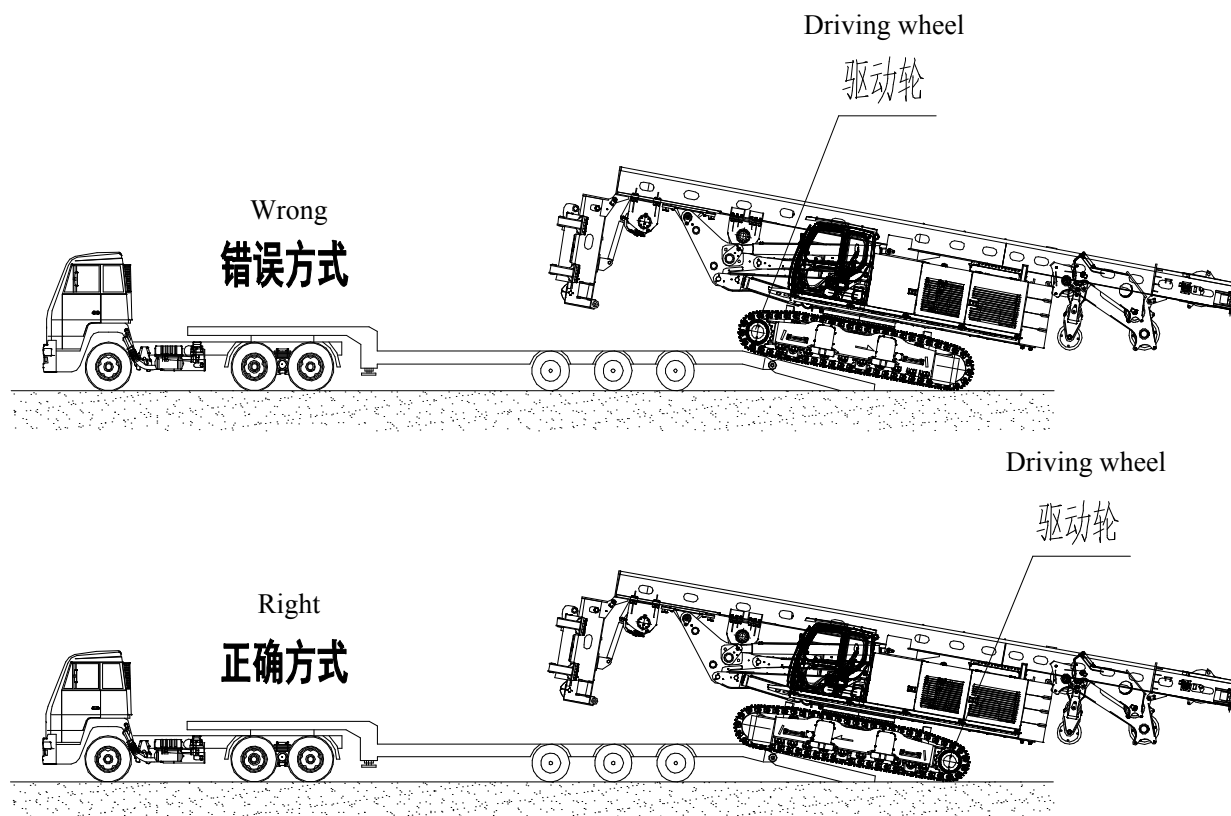
Transport weight: 76.6t (excluding trailer, Kelly bar, drilling bucket and rotary drive box assembly)

运输宽度:3500mm

Transport width: 3500mm

装车示意图

Loading schematic diagram



2、拆解运输— Disassembly Transportation I

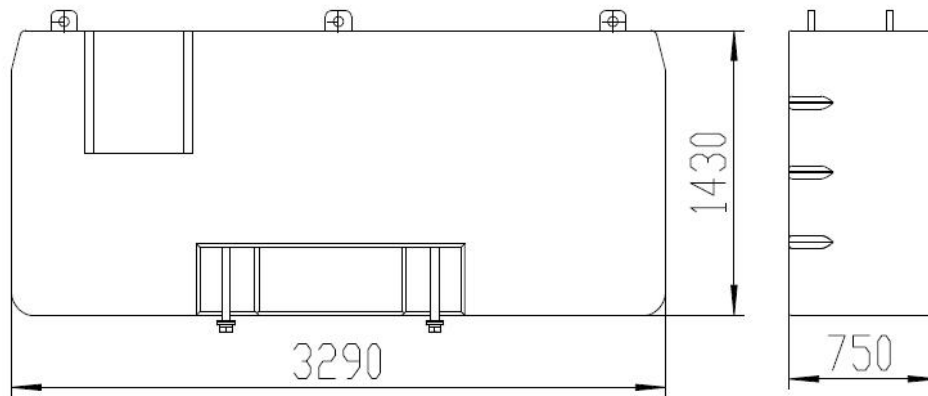
1) 拆卸钻杆、钻头（钻杆、钻头由客户根据实际需要选择）

1) Detach the Kelly bar and drilling bucket (Kelly bar and drilling bucket are chosen according to customers' actual needs)

2) 拆卸配重

2) Detach the counterweight

- 拆掉配重和转台连接处的螺栓，移走配重；
- Detach the bolt connecting the counterweight and rotary table, and remove the counterweight.

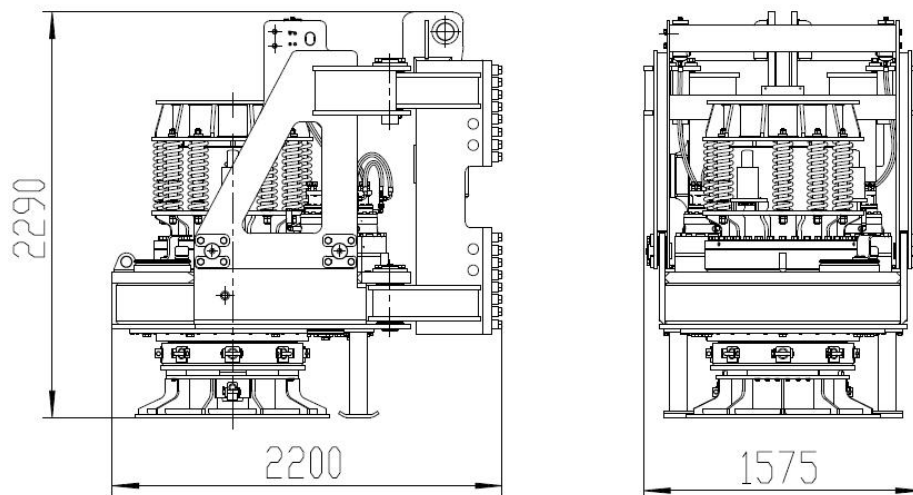


配重重量：9t，总体尺寸见上图。

Counterweight: 9t. See the figure above for overall dimension.

3) 拆卸动力头 Disassemble the rotary drive

- 拆掉动力头阀块至马达侧软管的阀块处接头；
- Detach the joint at the valve block between rotary drive valve block and hose beside the motor;
- 软管用合适的接头和堵头密封；
- Seal the hose with proper joint and end cap;
- 阀块油口用板和堵头密封；
- Seal the valve block oil port with plate and end cap;
- 用辅助吊车吊装拆卸动力头；
- Lift and detach the rotary drive with the auxiliary crane;



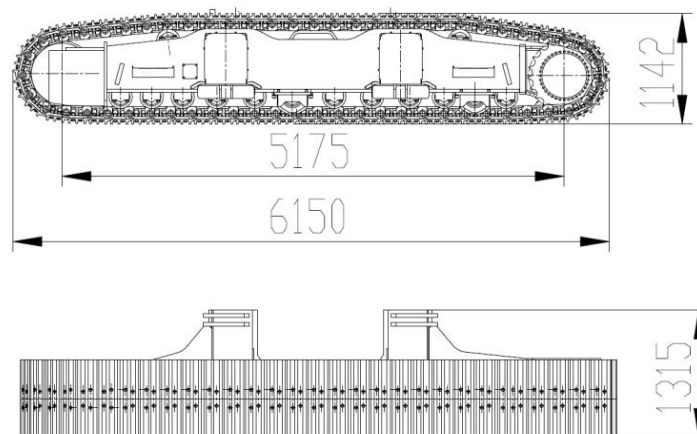
动力头箱体总成重量: 7.9t, 总体尺寸见上图。

Weight of rotary drive box assembly: 7.9t. See the figure above for overall dimension.

4) 拆卸左右纵梁和履带总成

Detach the left and right longitudinal beams and track assemblies

- 拆掉履带伸缩油缸和左右纵梁连接销轴;
- Remove the track extension cylinder and pins connecting the left and right longitudinal beams;
- 拆掉左右行走马达处软管, 软管随主机运输;
- Remove the hose from the left and right travel motor, and transport the hose with the host machine;
- 用辅助吊车吊装拆卸左右纵梁和履带总成;
- Lift and detach the left and right longitudinal beams and track assemblies with the auxiliary crane;



左纵梁和左履带总成重量: 9.4t, 总体尺寸见上图;

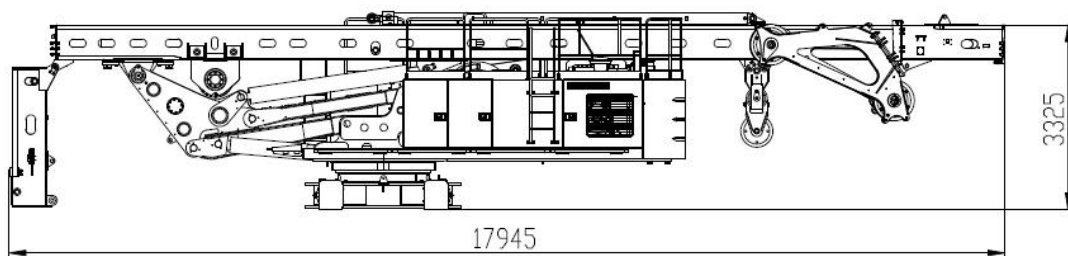
右纵梁和右履带总成重量: 9.4t, 总体尺寸可参考上图。

Weight of left longitudinal beam and track assembly: 9.4t. See the figure above for overall dimension.

Weight of right longitudinal beam and track assembly: 9.4t. See the figure above for overall dimension.

- 5) 拆解后主机, 拆卸钻杆、钻头、配重、动力头、左右纵梁及履带总成后的主机

Host machine after detaching the Kelly bar, drilling bucket, counterweight, rotary drive, left & right longitudinal beams and track assemblies



重量: 49t, 总体尺寸见上图, 运输宽度为: 3500mm。

Weight: 49t. See the figure above for overall dimension. Transport width: 3500mm

- 6) 把拆卸后的各部件及主机吊装到拖车上, 并固定牢靠。

Hoist the detached parts and the host machine onto the trailer and fix them securely.

六 随机技术文件 Attached Technical Documents

XR280E 旋挖钻机发车时随车附带装箱单,包含以下文件:

Packing list is supplied with XR280E rotary drilling rig, which includes the following technical documents:

- 1) 产品合格证 Product Certificate
- 2) 产品使用说明书 Product Operation Instruction
- 3) 产品备件图册 Spare Parts Catalogue
- 4) 发动机使用保养说明书 Engine Operation and Maintenance Instruction
- 5) 装箱单 (包括易损件及备件清单、随车工具清单、运输用件清单)

Packing List (including List of Wearing Parts and Spare Parts & List of Attached Tools & List of Tools for Transportation)